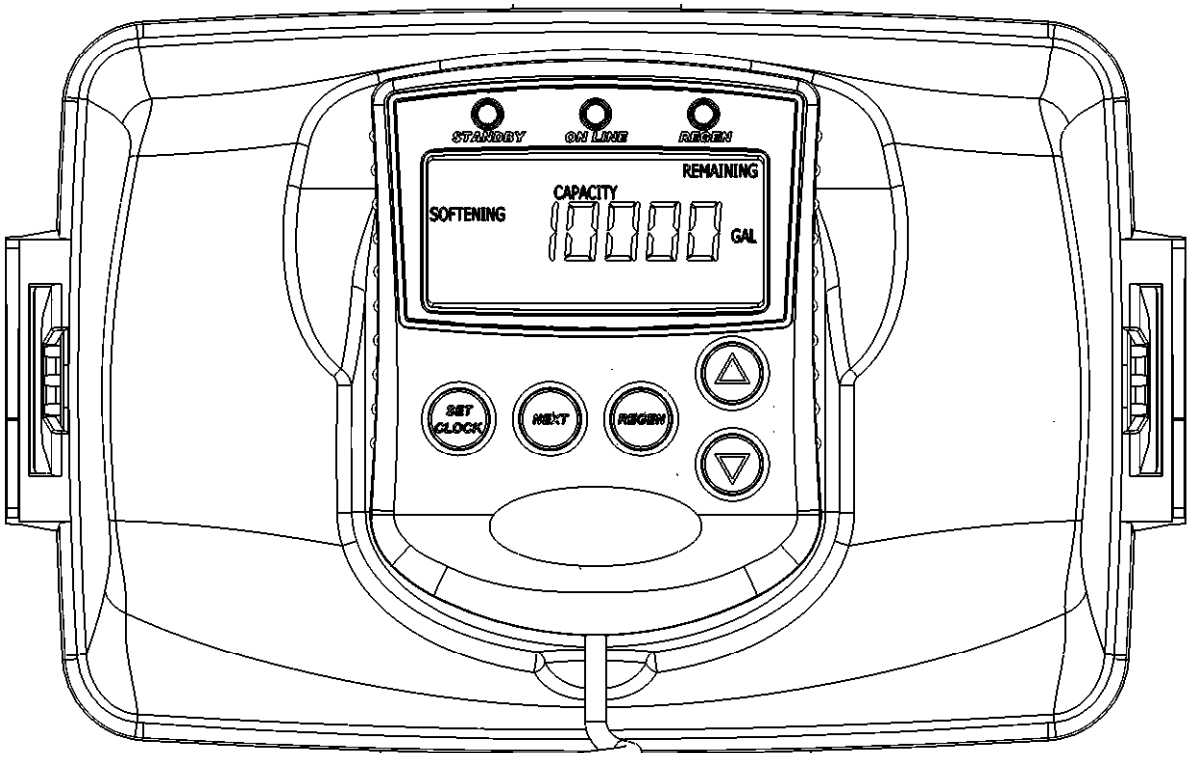
Trouble Shooting Guide for WS2H and WS3 Control Valves



WS2H/ WS3 Error Codes

Possible Errors	
Code	Description
1001	No Encoder Pulses
1002	Unexpected Stall, Main Drive
1003	Run Time To Long, Main Drive
14001	Message Queue Full
15003	Run Time To Long, Bypass Drive
15010	Run Time To Short, Bypass Drive Could Not Drive Offline
15011	Run Time To Short, Bypass Drive Could Not Drive Online
16001	Communication Lost With Unit 2
16002	Communication Lost With Unit 3
16003	Communication Lost With Unit 4
16004	Regen List Full
17000	Run Time To Long, Separate Source Drive
17002	Run Time To Short, Separate Source Drive
18000	Reset Performed
18001	Power Loss
18002	Power Restored

WS2H/ WS3 Trouble Shooting Guide

Problem	Possible Cause	Solution
1. No Display on POD	a. No power at electric outlet b. Control valve Power Adapter not plugged into outlet or power cord end not connected to PC board connection c. Improper power supply d. Poor connection between POD connector and PC Board. e. Defective Power Adapter f. Defective PC Board	a. Repair outlet or use working outlet b. Plug Power Adapter into outlet or connect power cord end to PC Board connection c. Verify proper voltage is being delivered to PC Board d. Check connector on POD, possible broken wire or terminal pin not inserted properly in connector. Clean pins on PC Board by plugging & unplugging the POD connector a few times to remove excess protective coating. e. Replace Power Adapter f. Replace PC Board
2. POD does not display correct time of day	a. Power Adapter plugged into electric outlet controlled by light switch b. Tripped breaker switch and/or tripped GFI c. Power outage d. Defective PC Board	a. Use uninterrupted outlet b. Reset breaker switch and/ or GFI switch c. Reset time of day d. Replace PC Board
3. Display does not indicate that water is flowing. Refer to user instructions for how the display indicates water is flowing	a. Bypass/ isolation valve in bypass position b. Meter is not connected to meter connection on PC Board c. Restricted/ stalled meter turbine d. Meter wire not installed securely into three pin connector e. Defective meter f. Defective PC Board	a. Turn bypass/ isolation handles to place in service position b. Connect meter to three pin connection labeled FLOW on PC Board c. Remove meter and check for rotation or foreign material d. Verify meter cable wires are installed securely into three pin connector labeled FLOW e. Replace meter f. Replace PC Board
4. Control valve regenerates at wrong time of day	a. Power outage b. Time of day not set correctly c. Time of regeneration set incorrectly d. Control valve set at “on 0” (immediate regeneration)	a. Reset time of day. b. Reset to correct time of day c. Reset regeneration time d. Check programming setting and reset to dEL (for a delayed regen time)
5. Time of day flashes on and off	a. Power outage	a. Reset time of day.
6. Control valve does not regenerate automatically when the REGEN button is depressed and held.	a. Defective PC Board b. For the case of systems, another unit in regen would not allow another unit to go into regeneration.	a. Replace PC Board b. Wait for unit in regeneration to finish

Problem	Possible Cause	Solution
7. Control valve does not regenerate automatically but **does** when the REGEN button is depressed and held.	a. Bypass/ isolation valves in bypass position b. Meter is not connected to meter connection on PC Board c. Restricted/ stalled meter turbine d. Incorrect programming e. Meter wire not installed securely into three pin connector f. Defective meter g. Defective PC Board	a. Turn bypass/ isolation valves handles to place in service position b. Connect meter to three pin connection labeled FLOW on PC Board c. Remove meter and check for rotation or foreign material d. Check for programming error e. Verify meter cable wires are installed securely into three pin connector labeled FLOW f. Replace meter g. Replace PC Board
8. Hard or untreated water is being delivered	Check water quality directly at unit outlet 1) Water quality is good a) Bypass/ isolation valves are open or faulty 2) Water quality is poor a) Damaged seal/stack assembly b) Faulty riser tube or seal c) Control valve body type and piston type mix matched 3) Media is exhausted, water quality is poor a) Higher than anticipated water usage b) Meter not registering c) No regenerant or low level of regenerant in regenerant tank d) Control fails to draw in regenerant e) Water quality fluctuation f) Fouled media bed	1) External Bypass Leak a) Fully close bypass/ isolation valves or replace 2) Internal Bypass Leak a) Replace seal/stack assembly b) Verify seal placement & engagement with riser c) Verify proper control valve body type and piston type match 3) No internal leaks a) Check program settings or diagnostics for abnormal water usage b) See Troubleshooting Guide #3 c) Check refill setting in programming. Check refill flow control for restrictions or debris and clean or replace, check refill flow control rate for proper fill time. d) Refer to Troubleshooting Guide # 12 e) Test water and adjust program values accordingly f) Replace media bed
9. Control valve uses too much regenerant	a. Improper refill setting or refill fill flow control is not sized properly b. Improper program settings c. Control valve regenerates frequently	a. Check refill setting and check refill flow control for proper refill rate. b. Check program setting to make sure they are specific to the water quality and application needs c. Check for leaking fixtures that may be exhausting capacity or system is undersized

Problem	Possible Cause	Solution
10. Residual regenerant being delivered to service	a. Low water pressure	a. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	b. Plugged, fouled, or incorrect injector size	b. Inspect and clean or replace injector, or replace injector with correct size for the application
	c. Restricted drain line	c. Check drain line for restrictions or debris and clean
	d. Damaged seal/ stack assembly or piston allowing leakage during draw	d. Check seal/ stack assembly and piston for damage and replace
	e. Draw time too short	e. Program proper draw time needed
	f. Excessive refill	f. Program proper refill time needed
	g. Vacuum leak in draw line / elbow	g. Locate vacuum leak and fix
11. Excessive water in regenerant tank	1) Tank is being overfilled a) Improper program settings b) Missing refill flow controller	1) Excess from fill cycle a) Verify program settings b) Visual inspection / measure volume output into container
	2) Previous regenerant is not being drawn out	2) See Troubleshooting Guide #12
12. Control valve fails to draw in regenerant	a. Injector is plugged	a. Remove injector and clean or replace
	b. Faulty regenerant piston	b. Replace regenerant piston
	c. Regenerant line connection leak	c. Inspect regenerant line for air leak
	d. Drain line restriction or debris cause excess back pressure	d. Inspect drain line and clean to correct restriction
	e. Drain line too long or too high	e. Shorten length and/or height
	f. Low water pressure	f. Check incoming water pressure – water pressure must remain at minimum of 25 psi
	g. Damaged seal/ stack assembly	g. Inspect seal stack assembly for damage and replace
13. Water running to drain	a. Power outage during regeneration or unit is currently in regeneration	a. Upon power being restored control will finish the remaining regeneration time. Reset time of day.
	b. Damaged seal/ stack assembly	b. Replace seal/ stack assembly
	c. Piston assembly failure	c. Replace piston assembly
	d. Drive cap assembly not tightened properly	d. Re-tighten the drive cap assembly

Problem	Possible Cause	Solution
14. Err – 1001 = Control unable to sense motor movement	a. Motor not inserted fully to engage pinion, motor wires broken or disconnected	a. Disconnect power, make sure motor is fully engaged, check for broken wires, make sure two pin connector on motor is connected to the two pin connection on the PC Board labeled REGEN. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	b. PC Board not properly snapped into drive bracket	b. Properly snap PC Board into drive bracket and then Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	c. Missing reduction gears	c. Replace missing gears
	d. Damaged or dirty reduction gear reflectors	d. Clean or replace reduction gear
	e. Faulty or dirty optics on back of PC board	e. Clean or replace PC Board
15. Err – 1002 = Control valve motor ran too short and was unable to find the next cycle position and stalled	a. Foreign material is lodged in control valve	a. Open up control valve and pull out piston assembly and seal/ stack assembly for inspection. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	b. Mechanical binding	b. Check piston and seal/ stack assembly, check reduction gears, check drive bracket and main drive gear interface. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Check that pinion is not pressed up tight against motor
	c. Main drive gear too tight	c. Loosen main drive gear. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Verify free motion by rotating main drive gear by hand, driving piston in and out
	d. Improper voltage being delivered to PC Board	d. Verify that proper voltage is being supplied. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.

Problem	Possible Cause	Solution
16. Err – 1003 = Control valve motor ran too long and was unable to find the next cycle position	a. Motor failure during a regeneration	a. Check motor connections then Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	b. Foreign matter built up on piston and stack assemblies creating friction and drag enough to time out motor	b. Replace piston and stack assemblies. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	c. Drive bracket not snapped in properly and out of position enough that reduction gears and drive gear do not interface	c. Snap drive bracket in properly then press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
17. Err - 14001 = Message queue full	a. Master PC Board did not receive a response from slave units.	a. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
18. Err -15003 = Motorized Bypass or MAV for NHBP valve motor ran too long and unable to find the proper park position Motorized Alternating Valve = MAV No Hard Water Bypass = NHBP	a. Control valve programmed for ALT A or noHbP without having a motorized drive securely connected to the 2 pin terminal labeled “BYPASS” on the main PC Board	a. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Then re-program valve to proper setting
	b. Poor wire connection	b. Remove power and check connection for Motorized Bypass or MAV for NHBP motor to PC Board two pin connection labeled BYPASS. Make sure wires in connector are inserted securely and no wires are broken. Clean pins on PC Board by plugging and unplugging the connector a few times to remove excess protective coating. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	c. Excess drag causing timeout before stall	c. Open up Motorized Bypass or MAV for NHBP to check for obstructions
	d. Motorized Bypass or MAV for NHBP motor not fully engaged with reduction gears	d. Properly insert motor into casing, do not force into casing. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.

Problem	Possible Cause	Solution
19. Err – 15010 = Motorized Bypass or MAV for NHBP valve motor ran too short (stalled) while trying to drive **off-line** Motorized Alternating Valve = MAV No Hard Water Bypass = NHBP	a. Foreign material is lodged in Motorized Bypass or MAV for NHBP valve b. Mechanical binding	a. Open up Motorized Bypass or MAV for NHBP and check for foreign material. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. b. Check poppet drive assembly or piston and seal/ stack assembly, check reduction gears, drive gear interface, and check Motorized Bypass or MAV for NHBP black drive pinion on motor. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
20. Err – 15011 = Motorized Bypass or MAV for NHBP valve motor ran too short (stalled) while trying to drive **on-line** Motorized Alternating Valve = MAV No Hard Water Bypass = NHBP	a. Foreign material is lodged in Motorized Bypass or MAV for NHBP valve b. Mechanical binding	a. Open up Motorized Bypass or MAV for NHBP and check for foreign material. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. b. Check poppet drive assembly or piston and seal/ stack assembly, check reduction gears, drive gear interface, and check Motorized Bypass or MAV for NHBP black drive pinion on motor. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.

Problem	Possible Cause	Solution
21. # of units error: Communications has been broken with the unit specified in the error message. These errors are logged as 16K series errors as follows: 16001: error with unit 2 16002: error with unit 3 16003: error with unit 4		1) Correct all errors on satellite units before attempting to reset error on master
	a. System is programmed for the wrong number of units or a Slave unit is in "error # of units" mode due to loss of power.	a. Pressing any button while in the # of units error will enter the user into the setting screen. Adjust to the correct units for the system and press NEXT to exit the set up screen. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Re-program valve to proper setting.
	b. Poor connection on PC Boards	b. Make sure wires in connector are inserted securely and no wires are broken. Clean pins on PC Board by plugging and unplugging the connector a few times to remove excess protective coating. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	c. More than one unit has determined that it is the master control	c. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Then re-program each valve to operate as single individual unit. Re-program the control that is to be the master control and it will filter down the programming to the slave controls automatically.
22. Err – 17000 = MAV for Separate Source valve motor ran too long while trying to find proper park position	a. Control valve programmed for "ON SEP In" with out having a MAV for separate source attached	a. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. Re-program valve to proper setting
	b. MAV for separate source motor wire not connected to System Board or poor connection	b. Remove power and check connection on MAV for separate source motor wire to System Board two pin connection labeled AUX DRIVE. Make sure wires in connector are inserted securely and no wires are broken. Clean pins on System Board by plugging and unplugging the connector a few times to remove excess protective coating. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
	c. MAV for separate source motor not fully engaged with reduction gears	c. Properly insert motor into casing, do not force into casing. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.

Problem	Possible Cause	Solution
23. Err – 17002 = MAV for Separate Source valve motor ran too short while trying to find proper park position	a. Foreign material is lodged in MAV for separate source valve b. Mechanical binding	a. Open up MAV for separate source and check for foreign material. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position. b. Check poppet drive assembly or piston and seal/ stack assembly, check reduction gears, drive gear interface, and check MAV for separate source black drive pinion on motor. Press NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.
24. Err – 18000 = Reset was performed, this error code will display in the diagnostics under the error log	a. Press the NEXT and REGEN buttons for about 3 seconds to resynchronize software with piston position.	
25. Err – 18001 = Power loss, this error code will display in the diagnostics under error log	a. When power is lost a signal is sent to log the power loss	
26. Err – 18002 = Power restored, this error code will display in the diagnostics under error log	a. When power is restored a signal is sent to log the power being restored	

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