EcoStar® & EcoStar SVRS®

Diagnostics Manual

SP3400VSP
&
SP3400VSPVR

Drive r1.13
Interface r3.0.8 residential
Interface r3.0.8C commercial

Table of Contents

HAYWARD

EcoStar VSP(VR)

High Voltage Electrocution Hazard

Hazardous voltage can shock, burn, cause serious injury and or death. To reduce the risk of electrocution and or electric shock hazards:

- Only qualified technicians should remove the panel
- Replace damaged wiring immediately
- Insure panel is properly grounded and bonded

Replacing a Drive

ALWAYS use the included display when changing out an EcoStar drive:

- Be sure to use the display that comes with the replacement drive rather than move the ‘old’ display to the new drive.
- This is important because the new display will have the most recent programming updates, which will ensure the new drive performs as expected.
- Though this means the new display will have to be reprogrammed, using an old display can also lead to unnecessary fault codes.

Standard Model:SPX3400DR
SVRS:SPX3400DRVR

Replacing a Display

EcoStar displays **ARE** backwards compatible.

- This means when changing out just a display, a working drive will not have to be replaced as well.
- All new displays are compatible with previous/existing drives.
- Though a new display is backwards compatible with an older drive, a new drive is not backwards compatible with an older display (see previous page for more information).

Display ONLY:SPX3400LCD

1: Check System
‘PFC-Hi Error’

This error code will be displayed when the drive detects an overvoltage condition (AC mains supply exceeding 280volts). It is **NOT** an indication that something is wrong with the pump or drive.

Power cycle

Step 1A

Shut off the breaker supplying the EcoStar with power for at least 2 minutes, verify screen is blank, then restore power.

Inspect pump display

Step 1B

The error has now cleared. If error frequently reoccurs AND pump is controlled by Hayward automation, proceed to step 1C.

1: Check System
‘PFC-Hi Error’

When connected to Hayward Automation, automatically clear error daily by wiring the pump to the load side of the ‘filter’ relay (do not disrupt low voltage wiring):

Step 1C

Wire the pump to the ‘filter’ relay and set timers in the automation system as desired. Keep in mind, the EcoStar must be powered down for at least 1 minute every 24 hours.

Note: This solution will cause a ‘Bridge Comm Error’ on the controller. This expected error indicates that the pump is not communicating while powered down; this error will clear when pump’s power is restored. Please inform customer prior to employing this solution.

2: Check System
‘Prime Failed’

This error can occur in Stand Alone or Relay Control/Auto Prime modes. It indicates that the pump was unable to prime within 15 minutes of startup.

Inspect plumbing

Step 2A

Verify there are no air leaks on suction side plumbing. If no air leaks, go to step 2B. If air leaks exist, repair plumbing and retry prime.

Inspect basket lid

Step 2B

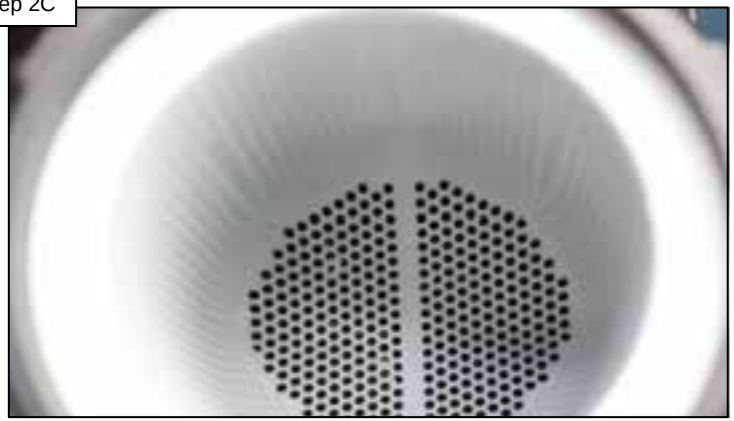
Inspect basket lid ‘O’ ring and ensure a good seal. If ‘O’ ring is damaged replace and proceed to step 2C.

Note: Auto Prime mode may not work when plumbing pipe sizes are smaller than 2”.

2: Check System
‘Prime Failed’

Inspect baskets & filter

Step 2C



Inspect filter, skimmer, and pump baskets for obstructions or debris. Clean filter and clear all debris, then retry. If prime fails go to step 2D.

Remove ‘Auto Prime’

Step 2D

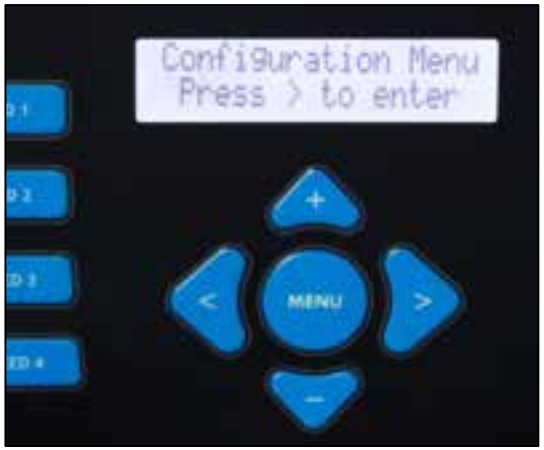
Remove pump from Auto Prime mode and set for 3 minute prime to eliminate the fail to prime error, follow steps on next page.

Plumbing less than 2” in diameter may cause flow restrictions great enough to inhibit Auto Prime from working properly. If diameter is less than 2” setting the pump to 3 minute prime is recommended.

Changing from Auto Prime to 3 Minute Prime

Use the steps provided below to change the EcoStar Prime cycle from ‘Auto Sense’ to ‘3 Minute’:

Step I



Press the Menu button until ‘Configuration Menu – Locked’ appears. Then press and hold the left and right arrow buttons for about 5 seconds until unlocked.

Step II

Press the right arrow button until ‘Set max-speed Prime period:’ appears. Use the plus or minus button to toggle between ‘Auto Sense’ and ‘3 minutes’.

Step III

Once configuration is complete press the ‘Menu’ button. To save changes, press the ‘plus’ button. To disregard changes press the ‘minus’ button.

3: Check System
‘Power Interrupt’

This error occurs when the pump has experienced a brief power interruption of less than 45 seconds. It is **NOT** an indication that there is a problem; it is simply a notification that a power interruption has occurred.

Automatic clear

Step 3A

This error will automatically clear itself within 20 seconds of the outage. To manually clear proceed to step 3B.

Manual clear

Step 3B

To manually clear, shut off the breaker supplying the EcoStar with power for at least 1 minute, then restore power.

4: Check System
‘AC Mains Low’

This error appears when the pump determines that the main voltage feed has dropped below 185VAC:

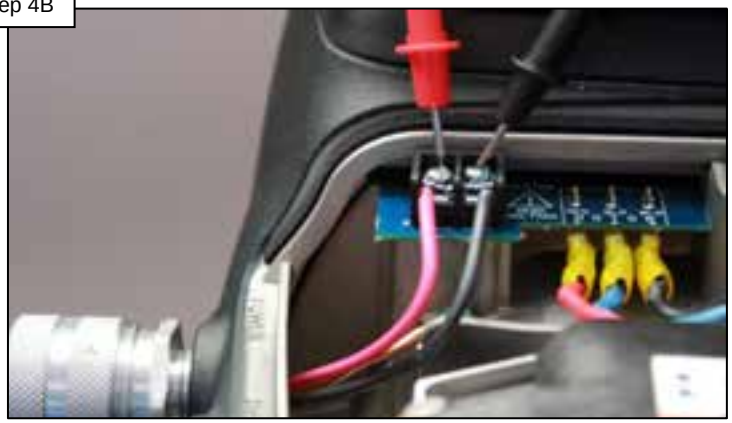
Power cycle

Step 4A

Shut off breaker supplying EcoStar with power for at least 2 minutes, then restore power. Open wiring compartment and go to step 4B.

Verify pump power

Step 4B



With the pump idle, check voltage on mains connector. If voltage is above 200VAC, go to 4C; if below 200VAC, correct supplied power.

4: Check System
‘AC Mains Low’

The EcoStar Drive is factory calibrated. To verify the calibration matches the supplied power follow the steps below:

‘Diagnostics Menu’

Step 4C

Press Menu button until ‘Diagnostic Menu’ appears. Then press right arrow 1 time, then press the minus button once and go to step 4D.

Check calibration

Step 4D

The bottom center value (v) should equal the mains reading (+/- 2VAC). If correct, supplied power; if not, contact support (908) 355.7995.

5: Check System
‘Drive is Overheated’

This error indicates that the internal components of the drive have become overheated.

Check motor airflow

Step 5A

Inspect the airflow path, verifying the pump is receiving ample air supply. Check entire air path and clear any obstructions/debris, then go to 5B.

Power cycle

Step 5B

Shut off breaker, supplying EcoStar with power, for at least 2 minutes. Restore power and run in quick clean; if error reappears, replace drive.

6: Check System
‘Heat sink Overheat’

This error will occur when there is a problem detected inside the EcoStar drive.

Inspect Drive

Step 6A

Inspect motor and drive PCB for evidence of water damage. Replace drive and go to 6B. Prior to installing new drive, fix any problems that may cause future flooding or water damage.

Run with new drive

Step 6B

With replacement drive run the pump on quick clean for a minimum of 20 minutes to verify the motor has not suffered any damage. If error reoccurs, replace the motor as well.

Note: If water has flooded the drive or the motor, the repairs may not be covered under the product warranty. For more information please consult the owner’s manual or contact a local Hayward representative.

7: Check System
‘Stall error’ or ‘Drive Failed to Start’

The pump will attempt to start three times before displaying a stall error. Either message implies there is a failure inside the drive, the motor, or both.

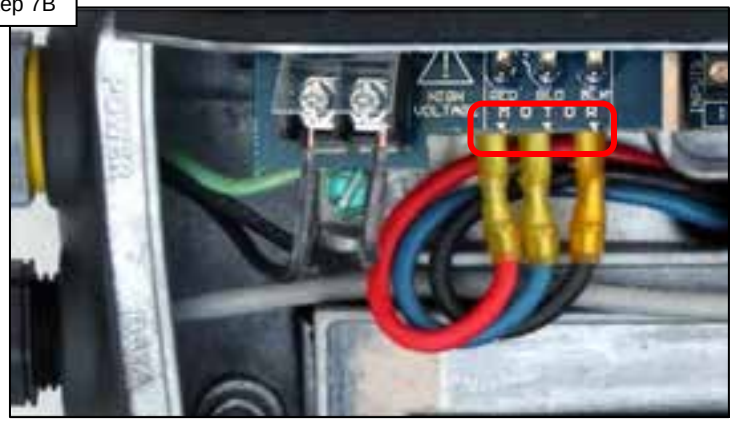
Inspect motor and drive

Step 7A

Inspect both the motor and drive for water damage. If no water damage is visible in the motor AND it moves freely, go to step 7B. Otherwise go to step 7D

Check connections

Step 7B



Check the three connections between the drive and the motor, verifying that they are tight on the drive. If connections are correct, replace the drive and go to step 7C.

Note: These errors are most commonly the end result of water ingress.

7: Check System
‘Stall error’ or ‘Drive Failed to Start’

Run with new drive

Step 8C

With replacement drive run the pump on quick clean for a minimum of 20 minutes to verify the motor has not suffered any damage. If stall reoccurs, replace the motor as well.

Inspect plumbing

Step 8D

If water damage is found in the motor OR the pump is seized, replace the complete pump. Prior to installing a new pump, fix any problems that may cause future flooding or water damage.

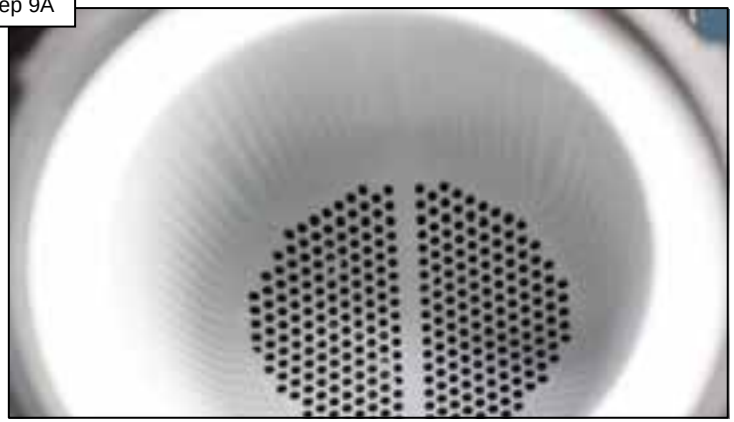
Note: If water has flooded the drive or the motor, the repairs may not be covered under the product warranty. For more information please consult the owner’s manual or contact a local Hayward representative.

8: Check System
‘SVRS Tripped’

This error will only appear in EcoStar SVRS models. While monitoring the safety vacuum release system, if drive amperage varies beyond the threshold the pump will become idle for a minimum of 15 minutes.

Inspect baskets & filter

Step 9A



Inspect filter, skimmer, and pump baskets for obstructions or debris. Clean filter and clear all debris, then retry. If failed again go to step 8B.

Monitor valves

Step 9B

Eliminate or divert features that may change vacuum pressures (such as: automatic cleaning, solar, etc.). If using controls, go to step 8C.

8: Check System
‘SVRS Tripped’

When integrated in Hayward Automation, ‘Freeze Protection’ is often linked to SVRS trips. Check to make sure all automated features and protections are setup to work with SVRS monitoring.

Freeze protect

Step 9C

Verify freeze protection is not the culprit. Make necessary adjustments, go to 8D.

‘Filter off valve change’

Step 9D

Verify features like ‘filter off valve change’ are enabled to eliminate nuisance trips.

9: Check System
‘Warning No Comm’

Generally this error indicates that the display and drive are not communicating with each other.

Inspect data wire

Step 9A

Inspect data wire between display and drive. Snugly reconnect. If display is mounted on the pump, go to step 9B; if off pump go to 9C.

Check diagnostics

Step 9B

Press menu until ‘Diagnostics Menu’ appears, scroll to right until ‘Drive Rev:’ appears, if 0.00 replace drive.

9: Check System
‘Warning No Comm’

The following steps will isolate the drive from the remote control communication wiring:

Step 9C

Step I

Remove the display from the wall bracket and disconnect the RS485. Then bring the display over to the pump to install directly.

Step II

Remove display cover plate on pump and connect the display directly to the pump’s drive wiring harness.

Step III

Press menu until ‘Diagnostics Menu’ appears, scroll to right for ‘Drive Rev’, if 0.00 replace drive, if not, replace/verify comm. wiring.

10: Check System
‘Memory Failure’

Indicates that the drive memory has been damaged or corrupted.

Step 10A

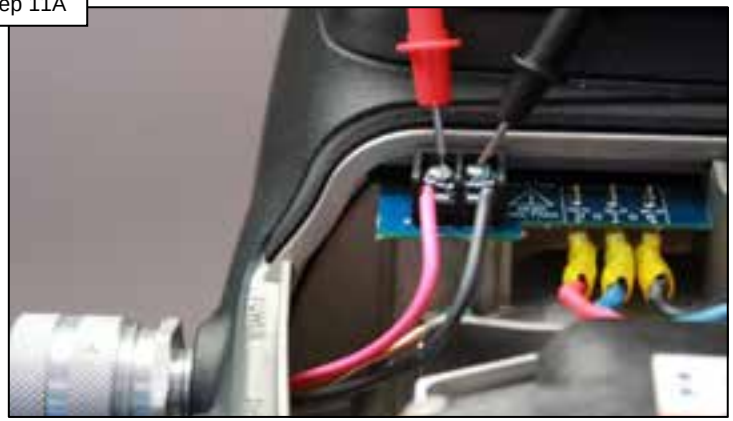
Shut off breaker supplying EcoStar with power for at least 2 minutes, then restore power. If error appears again replace the drive.

11: Condition
Blank/Bad On-Pump Display

When a display is completely blank, typically the pump is not powered; this can be caused by a tripped breaker or possibly related to external automation.

Verify pump power

Step 11A



Check voltage on mains connector. If voltage is between 200-250VAC then go to 11B; if below or 0VAC then correct supply and check breaker.

Inspect harness

Step 11B

Verify the wiring harness is connected snugly and inspect wires for damage. If damaged, replace drive; If not, go to step 11C.

11: Condition
Blank/Bad On-Pump Display

Test display input

Step 11C

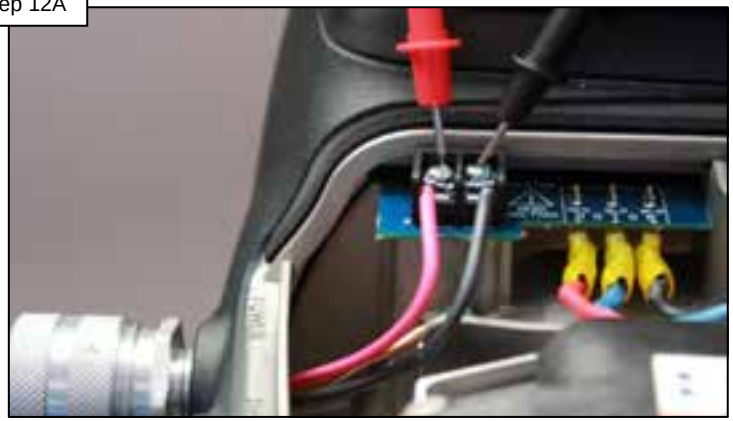
With pump powered on, check voltage on display for value 9-15VDC between 1(-) & 4(+) (right to left) on wiring harness. If correct, replace display only, if below 9VAC – check AC mains power for value above 200VAC, if ZERO replace drive.

12: Condition
Blank/Bad Wall Mount Display

When a display is completely blank, typically the pump is not powered; this can be caused by a tripped breaker or possibly related to external automation.

Verify pump power

Step 12A



Check voltage on mains connector. If voltage is between 200-250VAC then go to 12B; if below or 0VAC then correct supply and check breaker.

Inspect harness

Step 12B

Verify both RS485 blocks are connected snugly, inspect wires and numbering. If damaged, replace comm wires; If not, go to step 12C.

12: Condition
Blank/Bad Wall Mount Display

When a display is completely blank, typically the pump is not powered; this can be caused by a tripped breaker or possibly related to external automation.

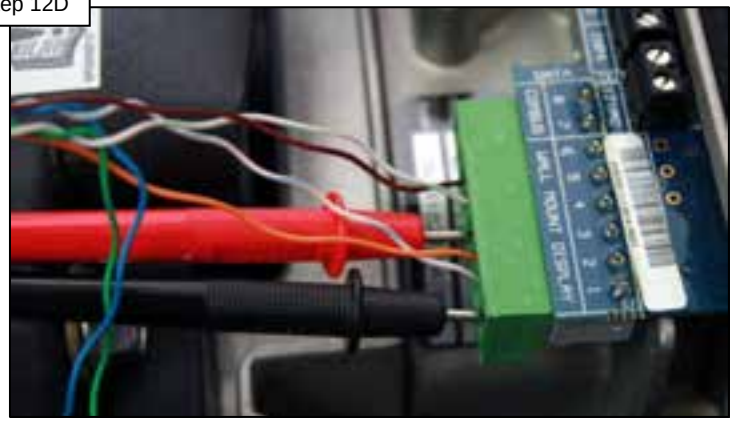
Display comm power

Step 12C

Check voltage on display for 9-15VDC between 1-4 (right to left) on RS485. If correct, replace display only, if no/low go to step 13D.

Drive comm power

Step 12D



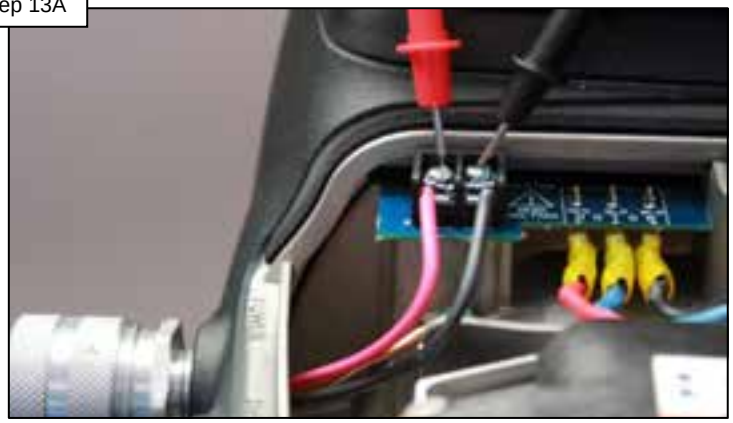
Check voltage on display for value 9-15VDC between 1(-) & 4(+) (right to left) on wiring harness. If correct, replace display only, if below 9VAC – check AC mains power for value above 200VAC, if ZERO replace drive.

13: Condition
Pump Tripping Breaker

When the breaker that supplies the pump with power continually trips, the problem is either a short to ground, the drive, or the breaker.

Inspect incoming power

Step 13A



Verify the incoming power circuit. Make sure wires are clean and are not shorting to the cover plate. Verify and go to 13B.

Disconnect power wires

Step 13B

Disconnect power from mains and engage breaker. If breaker does not trip go to 13C, if breaker trips, wiring has short OR bad breaker.

Note: GFCI breakers are more susceptible to nuisance tripping. Make sure any breakers being used comply with all product specifications (outlined in the installation manuals).

13: Condition
Pump Tripping Breaker

Measure power

Step 13C

Check power being supplied from the breaker. If 200-250VAC go to 13D, if no/low check panel/breaker.

Check breaker type

Step 13D

Check breaker type and all connections. If breaker health and connections are confirmed and problem still exists, replace drive.

Note: In cases where a GFCI breaker experiences nuisance trips (despite confirming the pump and circuit are in good health), the Siemens QF220 has proven effective.

Diagnostics Menu

1. Press the Menu button until the Diagnostic screen appears. This menu provides important information about the performance of the pump that can be used during troubleshooting. Below are the different screens and their meaning. These are all real-time displays. Press the '>' button to view information.

Serial Number
03045433

Drive Rev: 1.13
Display Rev: 3.0.8
← **Displays firmware of drive and display.**

Product Version
SP3400VSP

Input Voltage
Within Range
← **Also shows "too high" or "too low"**

Motor Current
1.1A (0-13.0A)
← **Motor current; range shown in ( )**

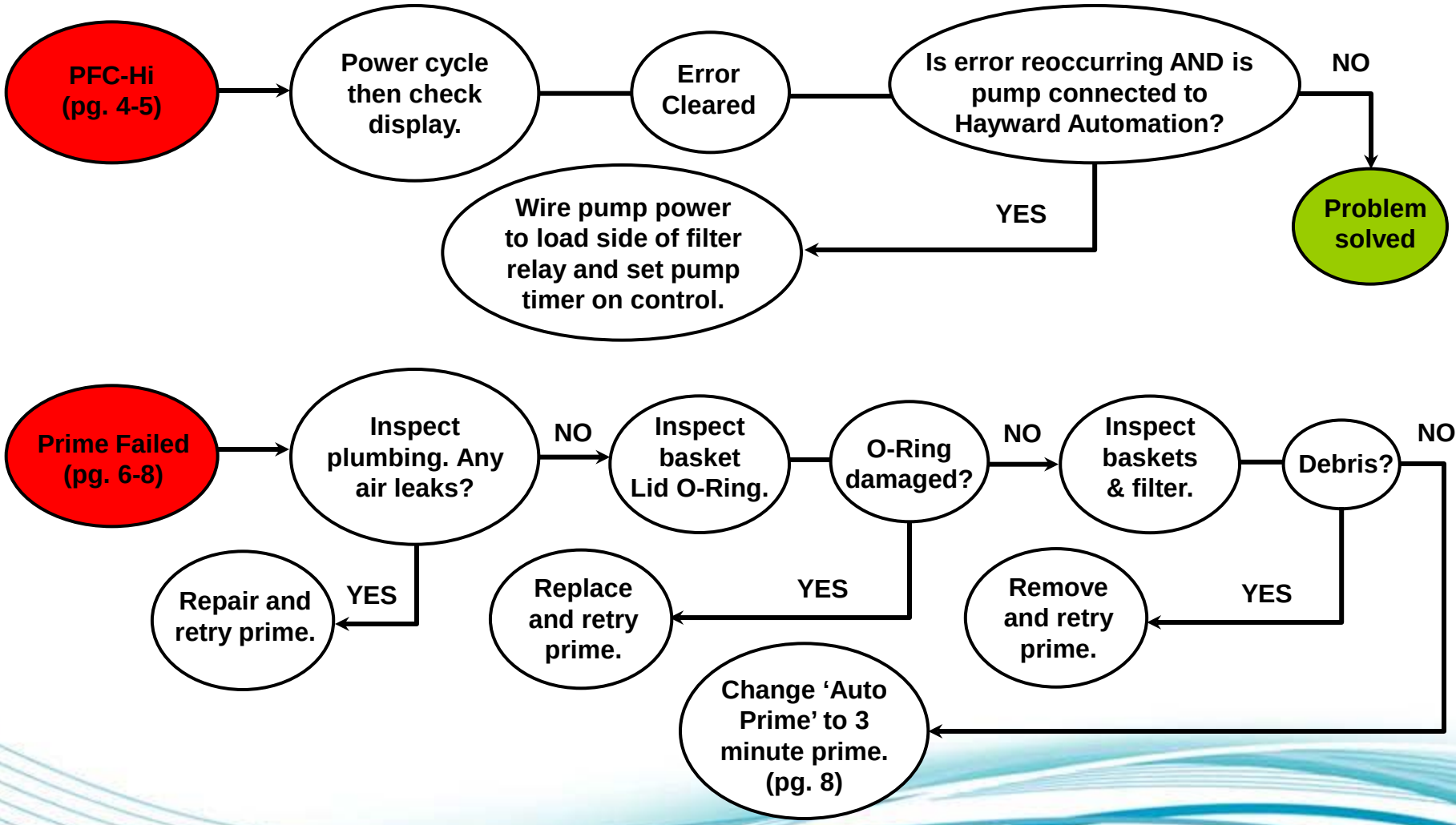
Power Usage
225W (0-2650W)
← **Approximate Power usage; range shown in ( )**

Driver: 78C
Heatsink: 67C
← **Temperature of heatsink and drive in Celsius.**

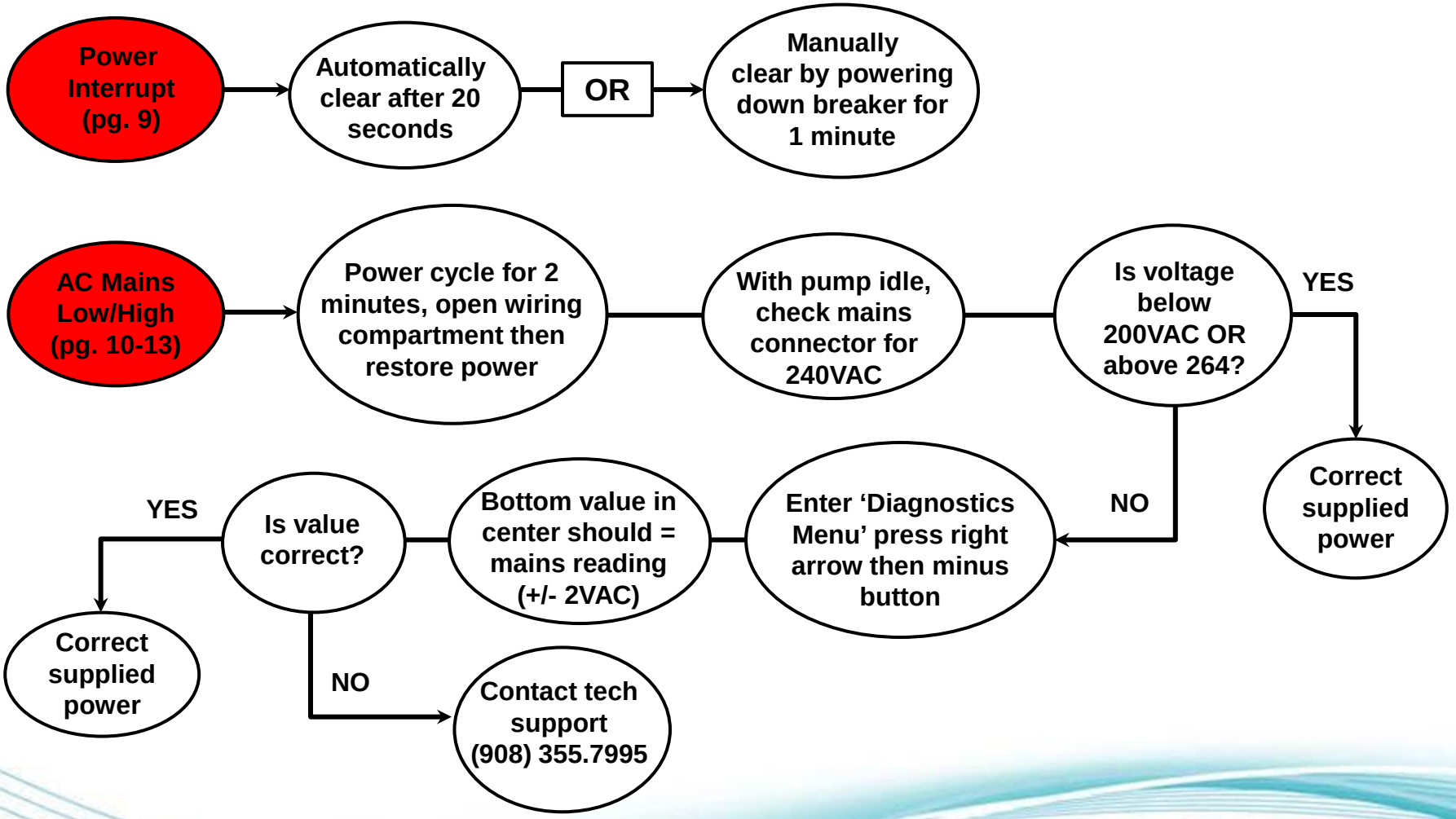
Com Bus
Online (addr: 1)
← **Status of com link between VSC and Hayward control. Reads offline when not connected**

Event Log
Press + to View
↓
By pressing the + button you will see the last 20 error and or trip conditions, as well as the amount of time that has elapsed since the condition occurred.

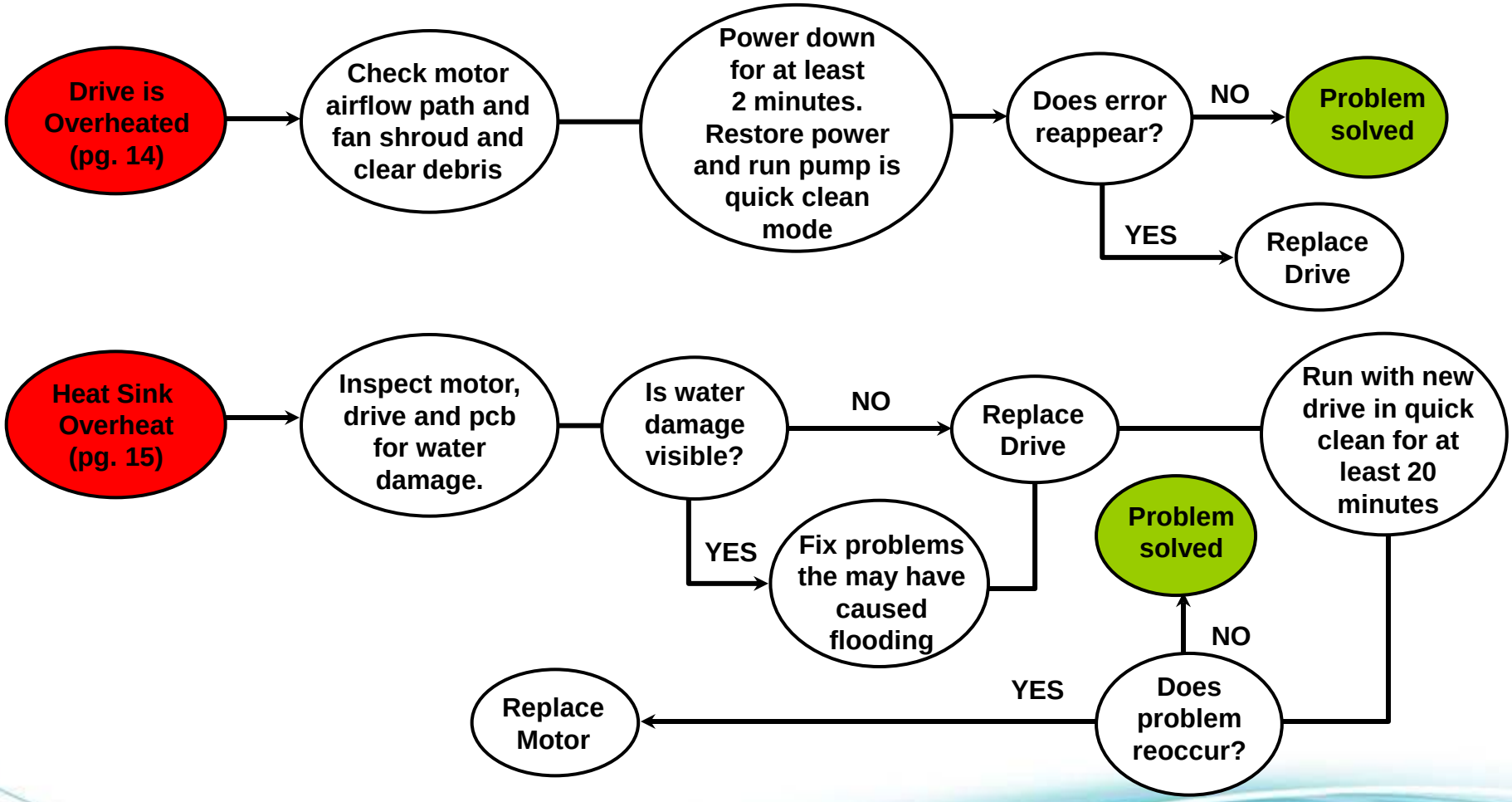
“Check System”
‘PFC-Hi Error’ & ‘Prime Failed’



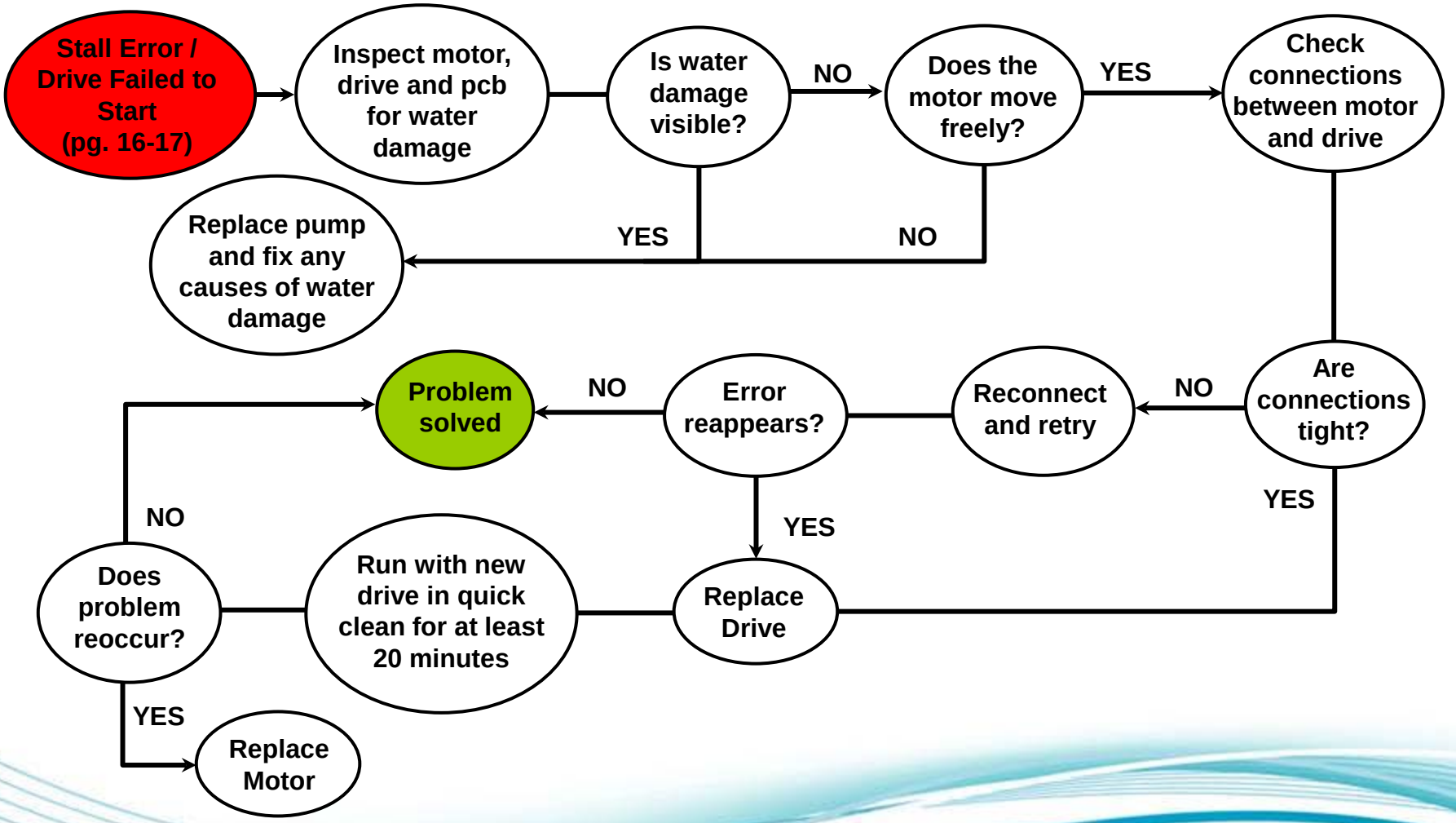
“Check System”
‘Power Interrupt’ & ‘AC Mains Low/High’



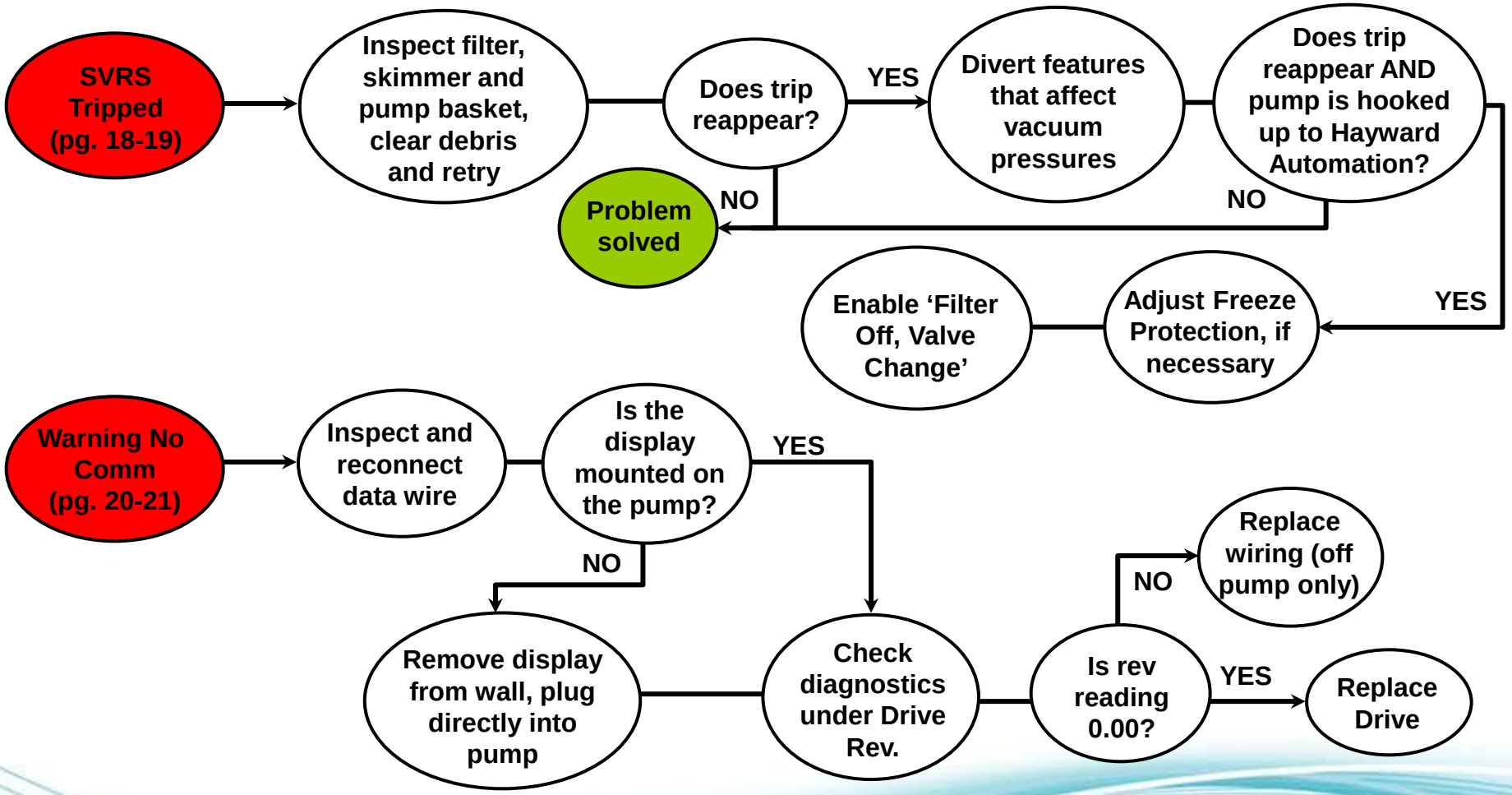
“Check System”
‘Drive is Overheated’ & ‘Heat Sink Overheat’



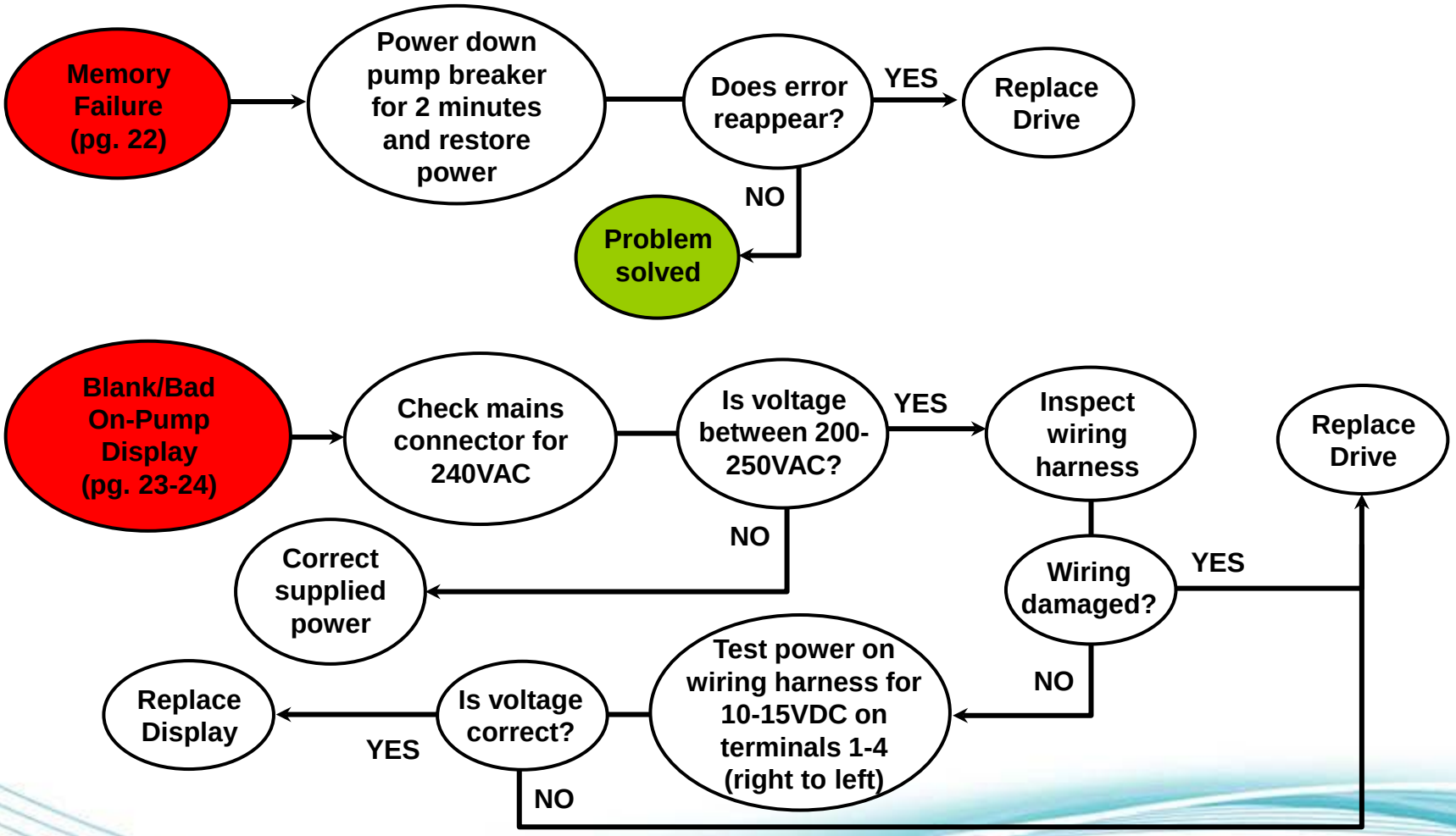
“Check System”
‘Stall Error’ & ‘Drive Failed to Start’



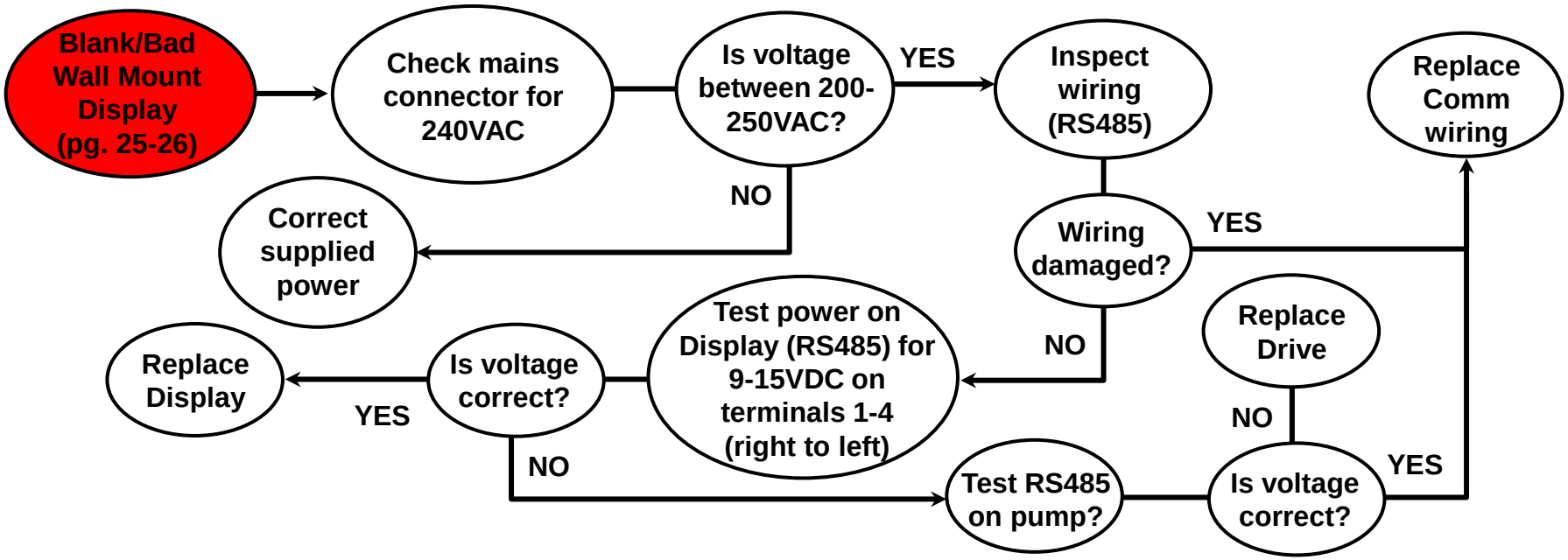
“Check System”
‘SVRS Tripped’ & ‘Warning No Comm’



‘Memory Failure’ &
‘Blank/Bad On-Pump Display’



‘Blank/Bad Wall Mount Display’



‘Pump Tripping Breaker’