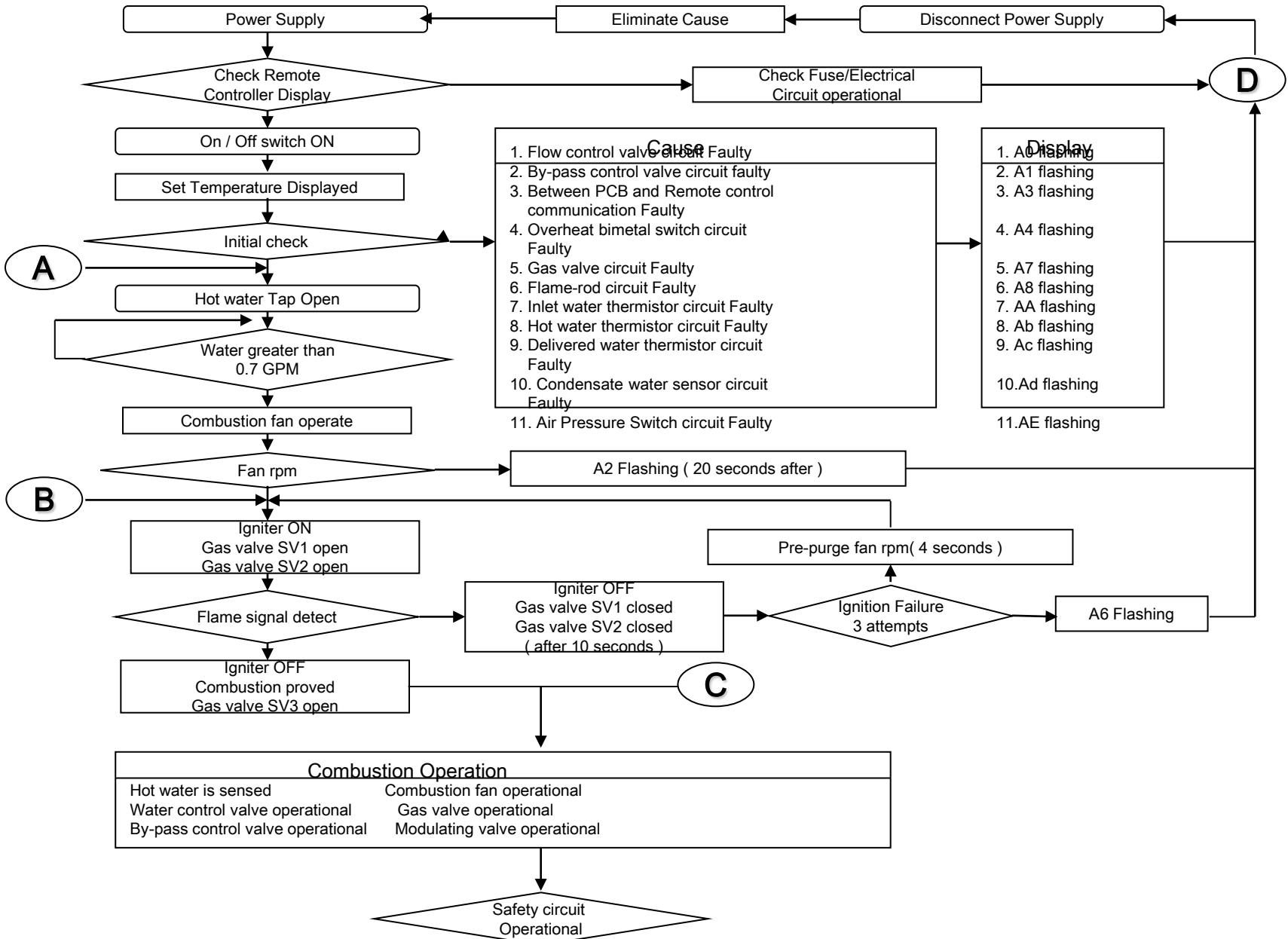
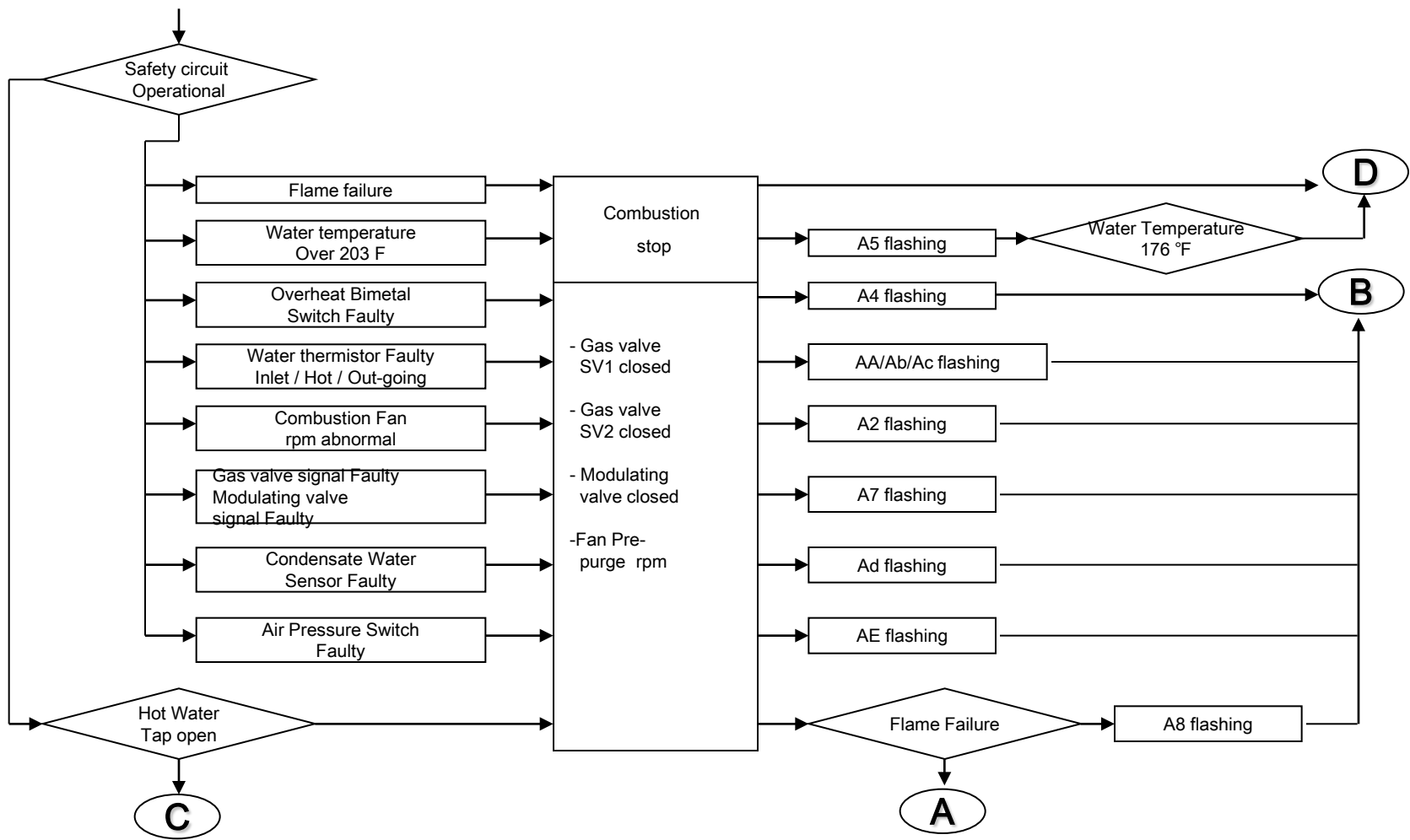


Quietside ODW

Troubleshooting

19. Operation Flow Cart





Fault Codes

Code	Fault Description	Code	Fault Description
A0	Flow Control Valve (FCV) Faulty	A8	Pseudo Flame
A1	By-pass Control Valve (BCV)	A9	Freeze Protection
In	Combustion Fan Failure	AA	Inlet Temp Sensor Failure
A3	Communication Error	Ab	HX Temp Sensor Failure
A4	Over Heat	Ac	Delivered Water Temp Sensor
A5	Outlet Water Temp	Ad	Condensate
A6	Ignition Failure	AE	Air Pressure Switch
A7	Gas Valve Failure	AF	

Fault Codes

- All Fault codes with the exception of A5 and A9 are a hard lockout, meaning that the power to the unit has to be cycled to reset the system
- If the wired remote is broken, removing it and crossing the wires together will allow the unit to run, but with the setpoint of 104 DegF – still needs flow to operate

Fault Codes

- Not a Fault Code but if the unit is not operating but 115V is available check the 2 x 5 Amp Glass Fuses or the On/Off switch
- Fuses available at Radio Shack or Auto parts stores

A0 – Flow Control Valve Error

- Flow control Valve has 2 functions, sense the flow rate and control to flow to maintain the set temperature
- If the flow rate demand exceeds the unit capacity the valve will throttle to maintain set temperature, rather than reducing the delivered temperature and maintain flow



A0 – Flow Control Valve Error

- A0 will show if the micro commands the solenoid to open or close and it does not, OR
- If the signal from the flow sensor cannot be read by the micro
- Solution – check connections



A0 – Flow Control Valve Error

- **Checking Connections**
- First – Unplug and re-plug – check wires

- **ODW 99 & 120**
- Red to Black 12V DC – If not replace PCB

- **ODW 180 & 199**
- Yellow – Yellow 11V AC – If not replace Transformer
- Red to Black 12V DC – If not replace PCB

A0 – Flow Control Valve Error

- **Checking Connections**
- If Voltage is correct then Replace Valve
- Resistance Values
 - Orange – Brown 70-74Ω
 - Orange – Gray 34-38Ω
 - Orange – Blue 70-74Ω
 - Orange – Yellow 70-74Ω

A1 – Bypass Valve Error

- Bypass Valve also has 2 functions, act as a mixing valve to provide a stable delivered temperature and also protect the HX from over condensing
- $T_{hx} > T_d + 18\sim 27\text{ F}$



A1 – Bypass Valve Error

- A1 will show if the micro commands the valve to open or close and it does not
- Both valves are worm drive solenoid style similar to the EEV on a Samsung unit
- Solution – Check connections,



A1 – Bypass Valve Error

- **Checking Connections**
- First – Unplug and re-plug – check wires

- **ODW 99 & 120**
- Red to Black 12V DC – If not replace PCB

- **ODW 180 & 199**
- Yellow – Yellow 11V AC – If not replace Transformer
- Red to Black 12V DC – If not replace PCB

A1 – Bypass Valve Error

- **Checking Connections**
- If Voltage is correct then **Replace Valve**
- Resistance Values
 - Orange – Brown 70-74Ω
 - Orange – Gray 34-38Ω
 - Orange – Blue 70-74Ω
 - Orange – Yellow 70-74Ω

A2 – Combustion Fan Error

- Combustion Fan is a BLDC type fed with 4 wires from the micro
- Fan speed varies with capacity, signal is from 5V-45V DC
- Fan signals back to the micro, it's speed and rotation as part of the feedback loop



A2 – Combustion Fan Error

- A2 fault is caused by the fan either not operating, going backwards or not sending a feedback signal to the Micro
- White wire is feedback, should be $>100\text{Hz}$ with fan running
- Black ~ Yellow is 12V DC, if no voltage is present = faulty microprocessor



A2 – Combustion Fan Error

- A2 fault is caused by the fan either not operating, going backwards or not sending a feedback signal to the Micro
- Black ~ Red is variable 5V – 45V DC, with the motor disconnected should read 45V DC, connected dependant on capacity



A2 – Combustion Fan Error

- A2 fault is caused by the fan either not operating, going backwards or not sending a feedback signal to the Micro
- **ODW 180 & 199 :**
- Disconnect 9 Pin from Transformer
- Measure Red – Red = 38V AC
- Measure Yellow – Yellow = 11V AC



A2 – Combustion Fan Error

- If everything checks out then replace the Fan Assembly
- Unplug the fan motor
- Remove the Philips head screws (2)
- Slide out Fan Motor
- Slide in New



A3 – Communication error

- Micro and Wired remote communicate together for set point error codes etc
- DC voltage 12V DC
- A3 is shown when Micro and Controller cannot communicate
- Solution : Check wiring between units (not polarity sensitive), replace controller



A3 – Communication error

- Solution : Check wiring between units (not polarity sensitive)
- Voltage at Yellow wires should be 12V DC
- **ODW 180 & 199**
- Disconnect 9 Pin connector from Transformer
- Measure Black – Orange – 20V AC
- If all is correct replace remote



A4 – Over Heat Error

- Auto Reset Bi metallic Over Heat Cut Out
- Opens at 203 F, closes at 176 F
- Check the connections Red & Black wires
- Switch should be Normally closed, Open circuit for a fault
- Check with multi-meter



A5 – Outlet Water Temp Error

- Sensed by the Delivered Water Temperature sensor
- If the Delivered water temp exceeds 203 F the unit will shut down and display A5
- Auto Reset, when water Temperature falls below 194 F (90 C)



A5 – Outlet Water Temp Error

- Sensed by the Delivered Water Temperature sensor
- 40°F = 20,000Ω
50°F = 15,500Ω
60°F = 12,600Ω
- 120 F = 3,400Ω
- 140 F = 2,500Ω
- 160 F = 1,800Ω



A4 & A5 – Why

- Why :
- Low Flow condition – unit cycles Off and On very quickly
- Reduced flow due to scale build up – clean using de-scaling solution
- Strainer blocked – Remove and clean as necessary



A6 – Ignition Failure

- Unit will try to start 3 times before giving this error code
- Causes
 - No Gas
 - Faulty Gas Valve
 - Micro problem
 - Faulty Igniter
 - Flame Detection



A6 – Ignition Failure

- **No Gas**
- Remove Philips head screw check for gas pressure
- If none check SV1 for power (120V AC) and check gas supply
- Also there is a master On/Off switch in the unit controlling output to the gas valve, make sure that is ON
- Check gas supply outside unit, especially for LP fuelled units



A6 – Ignition Failure

- **No Gas**
- Incoming Gas Pressures
-
- **Natural Gas Pressure - Primary**
 - 3.5" to 10.5" WC
- **LP Gas Pressure - Primary**
 - 8" to 13" WC
- Secondary Gas Pressure
 - **99/120** 0.7" (WC) MIN
 3.1" (WC) MAX
 - **180/199** 0.7" (WC)
 3.7" (WC)



A6 – Ignition Failure

- **Faulty Gas Valve**
- Check voltage to SV1, SV2 and SV3 for 120V AC
- If voltage is present, check resistance of SV1, SV2, SV3
- SV1 = 1650 Ω
- SV2 = 1650 Ω
- SV3 = 1650 Ω



A6 – Ignition Failure

- **Faulty Gas Valve**
- Check Voltage to modulating coil should be between 5V DC to 15V DC (Min fire to Max Fire)
- MV resistance is 77Ω
- If there is zero volts at the Modulating valve gas pressure should still read approx 3/8" WC if SV1 is open



A6 – Ignition Failure

- **Microprocessor**
- No voltage being supplied to either SV1, SV2 or SV3 and the modulating valve is a microprocessor problem
- If there is zero volts at the Modulating valve gas pressure should still read approx 3/8" WC if SV1 is open
- Voltage to the Igniter, should be 120V AC



A6 – Ignition Failure

- **Faulty Igniter**
- Check voltage to the igniter, primary voltage should be 120V AC
- Secondary voltage is 15kV to 18kV
- Check Primary/Secondary resistance to ground
- Primary : 1M Ω
- Secondary : 720 Ω



A6 – Ignition Failure

- **Flame Detection**
- Micro sends a 24V AC signal to the flame detector
- No Flame is a 0V signal back to the micro, flame is 12-18V AC
- If a Flame is present, should read $0.3\mu\text{A} \sim 1.2\mu\text{A}$ to ground



A7 – Gas Valve Error

- **Faulty Gas Valve**
- Failure of SV1 or SV2 to open
- Check voltage to SV1, SV2 and SV3 for 120V AC
- If voltage is present, check resistance of SV1, SV2
- SV1 = 1650Ω
- SV2 = 1650Ω
- If voltage is not present, problem lies with the Micro
- Solution : Replace whichever component is faulty



A8 – Pseudo Flame

- Pseudo Flame is where the unit receives a signal from the flame detector either prior to SV1, 2 or 3 opening OR detecting a flame after the unit has shut down
- Either faulty flame sensor or Microprocessor, but we can check to make sure no gas is leaking through the gas valve solenoids

A9 – Freeze Protection

- Freeze Protection occurs when the cold water temperature entering the unit is below 23 F OR - 5°C
- This is to protect the unit against freezing and also against over production of condensate
- Unit will restart when the incoming cold water is above 32 DegF



AA – Inlet Temperature Sensor

- Inlet temperature sensor measures the incoming cold water to the unit
- Very important as this helps set the capacity requirement
- Error occurs if the sensor is open circuit or out of range, check with multi meter for resistance
- 40 F = 20,000 Ω
- 50 F = 15,500 Ω
- 60 F = 12,600 Ω



Ab – HX Temperature Sensor

- HX temperature sensor measures the water temp leaving the heat exchangers
- Very important as this sets the By Pass valve opening for a stable delivered water temperature
- Should measure about 15-20 F higher than delivered water temperature
- Error occurs if the sensor is open circuit or out of range, check with multi meter for resistance
- 120 F = 3,400 Ω
- 140 F = 2,500 Ω
- 160 F = 1,800 Ω



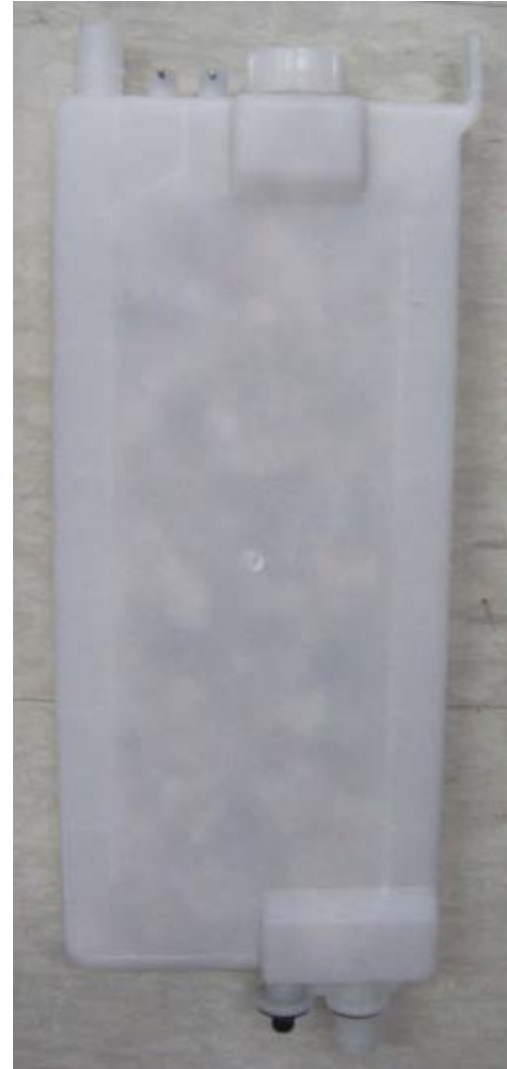
Ac – Delivered Water Temp Sensor

- Delivered water temperature sensor measures the final delivered water temperature to the faucet
- This is the temperature seen by the end user
- Error occurs if the sensor is open circuit or out of range, check with multi meter for resistance
- 104 F = 4,900 Ω
- 110 F = 4,200 Ω
- 120 F = 3,400 Ω



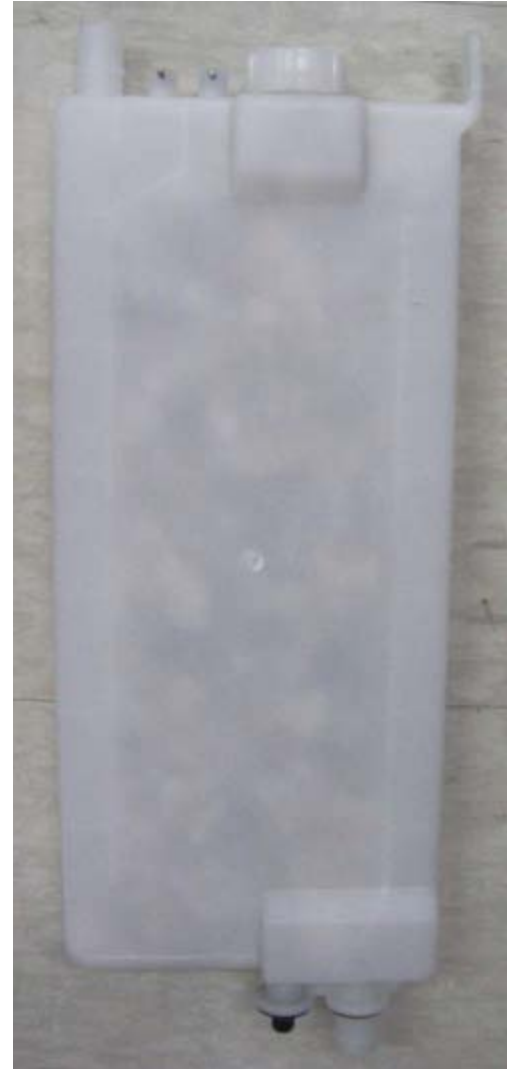
Ad – Condensate Overflow

- Unit produces condensate which is collected in a siphon, if the drain is blocked the condensate can back up into the wet recuperative HX, causing issues with airflow and other components
- We have an electrode to sense if the siphon is full and stop the unit before this can occur
- Micro sends 24V AC signal to electrode which as it is above the water has a resistance of ∞



Ad – Condensate Overflow

- Unit produces condensate which is collected in a siphon, if the drain is blocked the condensate can back up into the wet recuperative HX, causing issues with airflow and other components
- If the electrode touches the condensate resistance fall to $<100\Omega$ and the error occurs
- Voltage from the Condensate sensor to Ground with the units running should be 7-10V AC



AE – Air Pressure Switch

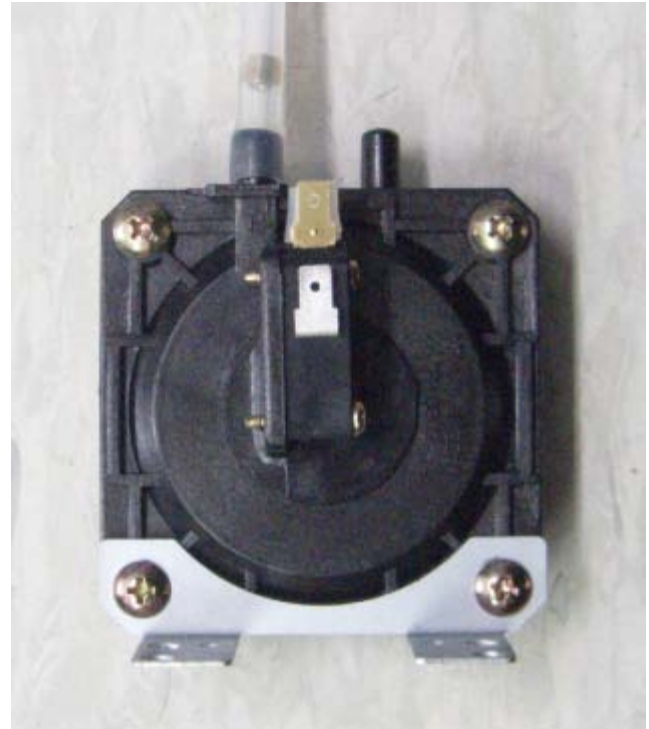
- Monitors flue pressure across the unit, compared to atmospheric pressure
- Normally closed switch, opens on failure

ODW 99-120

- Opens at ½" WC

ODW 180-199

- Opens at 5/8" WC
- Control voltage 5V DC



AE – Air Pressure Switch

- Two hoses
- #1 – Back of cabinet for atmospheric pressure, very important that no insulation be applied to the back or the unit and the unit is not mounted flush to the wall
- #2 – Fan Throat, upper port on the back of the fan
- Failure can be due to, blocked flue, flue over max length, vent terminal facing prevailing winds, Condensate backed up into HX's

