Troubleshooting Common Issues - Centrifugal Pumps and Controls

This guide was developed to assist you in troubleshooting common centrifugal pump issues for small turf and irrigation applications (5hp and below). If you need additional assistance, please contact Munro Pump at 1.800.942.4270 or contact your local irrigation wholesaler.

Common Issues

“My pump is running, but the sprinklers are not acting normal.” See Reduced Performance (Pg. 4)

“The pump is running, but there is no water coming out.” See Pump Runs But No Water (Pg. 5)

“The water comes out, then goes away. Then it comes out…” See Pump Surging/Flow Cycles (Pg. 6)

“The motor just sits there and hums.” See Motor Hums (Pg. 7)

“When I turn the pump on, nothing happens.” See Motor Does Not Run At All (Pg. 8)

“The pump runs for a little while and then stops and then starts again.” See Motor Cycles and/or Nothing Happens (Pg. 9)

“Nothing is happening. I have a pump start relay.” See StartBox (Pg. 10)

“My pump runs for 30 seconds and shuts off and does not restart.” See SmartBox (Pg. 11)

Evaluating the System

1. Have there been any changes to the system environment?
   a. New fencing – Possible post damage to pipework
   b. Added zones – Pump is now undersized
   c. Aeration or animals – Damage to sprinkler heads or pipework
   d. Water source – Lower levels than usual

2. Look for obvious problem areas
   a. Leaking from case or seal area
   b. Cracked or worn components
   c. Clogged filters or screens
   d. Damaged gaskets in camlocks and o-rings

3. Determine the primary issue
   a. Reduced Performance (Pg. 4)
   b. Pump Runs but No Water (Pg. 5)
   c. Pump Surging/Flow Cycles (Pg. 6)
   d. Motor Hums (Pg. 7)
   e. Motor Does Not Run (Pg. 8)
   f. Motor Cycles (Pg. 9)
   g. Munro StartBox (Pg. 10)
   h. Munro SmartBox (Pg. 11)

Safety Precautions

- Remember when using any tool, refer to the manufacturer’s guidelines for proper use.
- ALWAYS turn the breaker off to work on a pump. Some troubleshooting checks require the pump to be energized, be sure the area is secure prior to the task. Be sure to turn the breaker off again if problem persists.
- NEVER examine, make wiring changes, or touch the motor before disconnecting the electrical supply. Thermal overload protectors automatically reset and can close the electrical circuit without warning.
How To

Check Volts Entering Pump:
Use a voltmeter to determine if line voltage getting to the motor is the same as indicated leaving the breaker box.

Check for Air Leaks Using Plastic Wrap:
Wrap plastic wrap tightly around a potential air leak path (union joint or cam fitting), turn pump ‘on’, if an air leak exists at that point, the plastic wrap will tighten to the area.

Clear Centrifugal Switch:
Debris can get caught in the centrifugal switch inside the motor. A soft hammer or 2x4 board can be used to firmly tap the butt of the motor. After three or four taps, try to engage the motor. If necessary, repeat.

Access the Wrench Slot:
Check the motor shaft for a slot to fit an open-ended wrench. This can aid in diagnosis and teardown/assembly procedure.

Tear Down and Reassembly of a Pump, Including to Replace a Seal or Clean the Impeller:
Change to: Refer to the Owners Manual for instructions on tearing down the pump to replace the seal, clean the impeller, or access the inside of the pump for any reason.

Tools You May Need
- Soft faced hammer or 2x4
- Thin profile wrench - 9/16 and 5/8
- Wrench or socket set
- Voltmeter
- Pry bar
- Flathead Screwdriver
- Plastic Wrap
- Lubricant
- Pipe Wrench

Did You Know?
A pressure gauge on the pump is a good indicator of system performance. Low pressure while the pump is running indicates a suction or obstruction problem. Normal pressure readings at the pump commonly indicate a sprinkler head or pipework problem.

Possible Replacement Parts
- Squarecut, diffuser, or cam fitting gaskets
- Seals
- Union O-rings
Troubleshooting Guide - Reduced Performance

Did You Know?
You cannot always find a suction leak by pressurizing a line. Air can escape even if water will not.

Has anything in the system environment changed?

Yes
- Was it fencing, aeration, animals or something similar?

No
- Refer to “Pump Runs but No Water” troubleshooting guide. (Pg. 5)

Yes

No

Pump Works

Is there a change to the water source?

Yes
- Refer to “Pump Surging” troubleshooting guide. (Pg. 6)

No
- Refer to “Pump Runs but No Water” troubleshooting guide. (Pg. 5)

Yes

No

Pump Works

Reduce the number of heads per zone, change nozzles, or add a separate zone. Is the performance better?

Yes

No

Refer to “Pump Runs but No Water” troubleshooting guide. (Pg. 5)

Pump Works

Refer to your pump’s performance curve. You may need to replace the pump. If the pump is appropriate for the system, refer to “Pump Runs but no Water” troubleshooting guide. (Pg. 5)

Check the pipework for damage or breaks. Repair if needed. Is the performance better?

Yes
- Pump Works

No
- Refer to “Pump Surging” troubleshooting guide. (Pg. 6)

Were new sprinkler heads added to an existing zone?

Yes

No

Refer to “Pump Runs but No Water” troubleshooting guide. (Pg. 5)

Yes

No

Refer to “Pump Surging” troubleshooting guide. (Pg. 6)

Check if it was fencing, aeration, animals or something similar?

Yes
- Refer to “Pump Surging” troubleshooting guide. (Pg. 6)

No
- Refer to “Pump Runs but No Water” troubleshooting guide. (Pg. 5)

Has anything in the system environment changed?
Troubleshooting Guide - Pump Runs but No Water

Did You Know?
Cam fittings are best used with the handles to the top and bottom. It reduces the chance of leaking from the weight of the hose.

* Refer to the pump Owners Manual for tear down and reassembly instructions.
Troubleshooting Guide - Pump Surging (Flow Cycles)

Did You Know?
Union joint O-rings and cam fitting gaskets should be inspected or replaced every year or two. O-rings and gaskets can harden over time and become brittle, causing air leaks.

Did this new install or has anything changed on the suction side of your pump?

Yes
*Check/repair gaskets and unions for air leaks. (See Pg. 2)
Is the flow normal?

No
Check the level of the water in the ditch. Is the foot valve fully submerged?

Yes
Submerge the foot valve. Is the flow normal?

No
Check/clean obstructions in line and foot valve. Is the flow normal?

Yes
Pump works.

No
Check/clean impeller of debris. Does the water flow now?

Yes
Pump works.

No
Contact qualified service repairman.

Is this new install or has anything changed on the suction side of your pump?

Yes
Check the suction assembly for air leaks and repair or replace if needed. (See Pg. 2)
Is the flow normal?

No
Contact qualified service repairman.

Is the flow normal?

Yes
Pump works.

No
Check/clean impellers debris. Does the water flow now?

Yes
Pump works.

No
Contact qualified service repairman.

*Check/repair gaskets and unions for air leaks. (See Pg. 2)

Is the flow normal?

Yes
Pump works.

No
Contact qualified service repairman.

Is this new install or has anything changed on the suction side of your pump?

Yes
Check the suction assembly for air leaks and repair or replace if needed. (See Pg. 2)
Is the flow normal?

No
Check the suction assembly for air leaks and repair or replace if needed. (tip on Pg. 2)
Is the flow normal?

Yes
Pump works.

No
Contact qualified service repairman.

*Check/repair gaskets and unions for air leaks. (See Pg. 2)

Is the flow normal?

Yes
Pump works.

No
Contact qualified service repairman.

*Check/repair gaskets and unions for air leaks. (tip on Pg. 2)

Is the flow normal?

Yes
Pump works.

No
Contact qualified service repairman.

*Refer to the pump Owners Manual for tear down and reassembly instructions.
Troubleshooting Guide - Motor Hums

**Did You Know?**

To avoid an unnecessary trip, try jostling any debris inside the pump free before bringing your pump to a repair man. (Tip on Pg. 3 “Clear Centrifugal Switch”)

---

**Does the shaft spin freely?**

- **Yes**
  - Firmly tap butt of motor 3-4 times with a soft-faced hammer or 2x4 to jostle free debris. Does the pump turn on?
    - **Yes**
      - While the pump is turned on check voltage at the motor with a voltmeter (tip on Pg. 3) Is the voltage the same as indicated by the breaker? T
        - **Yes**
          - Take to motor shop for diagnosis.
        - **No**
          - Call electrician to troubleshoot wiring.
    - **No**
      - Repeat the previous step. Does the motor turn on now?
        - **Yes**
          - Take the pump to motor shop for diagnosis.
        - **No**
          - Call an electrician to troubleshoot wiring.

- **No**
  - With a wrench in the wrench slot on the shaft, apply gentle torque on the wrench. Can you break the impeller free?
    - **Yes**
      - Does the pump run now?
        - **Yes**
          - Remove housing and diffuser to clean.* Reassemble. Does the pump run now?
        - **No**
          - Pump works. Take to qualified repair center.
    - **No**
      - Does the pump run now?
        - **Yes**
          - Pump works. Take to motor shop for diagnosis.
        - **No**
          - Take to motor shop for diagnosis.

---

* Refer to the pump Owners Manual for tear down and reassembly instructions.
Troubleshooting Guide - Motor Does Not Run at All

Did You Know?
A motor may start with low voltage but cannot maintain running at low voltage. It will eventually wind down to a stop.

Did You Know?
A two-pull motor with 60 cycle current will run an estimated 3600 RPM.

Note: For systems without a pump start relay, also see Pg. 9. For systems with a pump start relay, also see Pg. 10.
Troubleshooting Guide - Motor Cycles and/or Nothing Happens

Did You Know?
A capacitor start motor has 1.5 times more torque for starting a motor.

Does the pump run a short time and then stop?

Yes
Using voltmeter, check wire voltage at the pump (tip on Pg. 3) Are they the same? K & L

No
Check breaker box to assure breaker is "on." Does the pump run now?

Yes
The pump works!

No
Is the pump controlled by a lawn controller?

Yes
Refer to "SmartBox" or "StartBox" troubleshooting guide. (Pg. 10, 11)

No
Is the pump controlled by a float?

Yes
Verify float control configuration. Does it work now?

No
Is the pump controlled by a manual on-off switch?

Yes
The pump works!

No
Call electrician to check wiring.

Motor may be damaged. Contact local EASA rated motor shop for assistance.

Rewire motor according to nameplate diagram. Does the pump work now?

Yes
The pump works!

No
Wiring may be damaged. Call an electrician to troubleshoot wiring.

Wiring between pump and the breaker box may be damaged. Call an electrician to troubleshoot wiring.

Does the pump run now?

Yes
The pump works!

No
Call electrician to check wiring.

Start/Stop (Signal) Voltage

Pump Start Relay

Breaker Box

Did You Know?
A capacitor start motor has 1.5 times more torque for starting a motor.

Using voltmeter, check wire voltage at the pump (tip on Pg. 3) Are they the same? K & L

Compare the "at the pump" voltage (from previous step) to the voltage listed on the motor nameplate. Are they the same? V

Verify float control configuration. Does it work now?

Yes
The pump works!

No
Call electrician to check wiring.

Verify switch wiring and functionality. Is the pump working now?

Yes
The pump works!

No
Call electrician to troubleshoot wiring.

Using voltmeter, check wire voltage at the pump (tip on Pg. 3) Are they the same? K & L

Does the pump run now?

Yes
The pump works!

No
Call electrician to troubleshoot wiring.
Troubleshooting Guide - StartBox

Did You Know?
A pump start relay can be signalled by a float switch.

Note: The StartBox & SmartBox troubleshooting guides do not apply to 2-wire decoder systems.
Troubleshooting Guide - SmartBox

Did You Know?
During a normal “run” cycle, no lights should be lit on the time delay. Should a sensor detect a possible system problem, the “on” light will engage. If the system is shut down during a cycle both the “on” and “up” lights will be lit for the duration of the lawn controller cycle.

1. **Does the pump run at all?**
   - Yes: Check time delay. Is it working? U, Cross M & N
   - No: Check wiring according to the wiring diagram. Is the wiring correct? Verify voltage matches coil voltage. Does the voltage match? S

2. **The control works.** Refer to the pump troubleshooting guide. (See Pg. 2)
   - Yes: The pump control works.
   - No: Wiring problem between lawn controller and SmartBox. Call an electrician to troubleshoot wiring.

3. **Does the pump run at all?**
   - Yes: The control works. Refer to the pump troubleshooting guide. (See Pg. 2)
   - No: The pump control works.

4. **Restart irrigation system and/or increase time on time delay to allow for filling. U**

5. **Check pressure sensor with a voltmeter for continuity.**

6. **Call electrician to troubleshoot wiring.**

Note: Filling system lines may require multiple run cycles to build enough pressure to initiate the sensor.

* Turn the time delay down to 5 seconds. Next, cross the red and blue wire. The “on” light should turn on. After 5 seconds the system should shut off and both the “on” and “up” lights should be on.

---

**Diagram:**
- **Lawn Controller / Clock**
- **Time Delay Presets**
- **Pressure Sensor**
- **Relay**
- **Breaker Box**
- **Low Voltage Signal Wires**
- **Common 24V Wires Wires**

---

---