

# Condition Sensing Specifications

Bulletin Number 808, 836, 836T, 837, 840

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## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.





**Technical Data**

**Technical Terms**

**Tank Operation** — When the liquid in a tank reaches a preset low level, the float switch will start a pump to begin filling the tank. When the liquid level reaches a preset high level, the float switch will stop the pump.

**Sump Operation** — Liquid is being collected in a sump. When the liquid reaches a preset high level, the float switch will start a pump to empty the sump. When the liquid reaches a preset low level, the float switch will stop the pump.

**Operating Force** — Contact force required to trip the float switch. Operation depends on the type of switch, liquid, float, and float operator assembly.

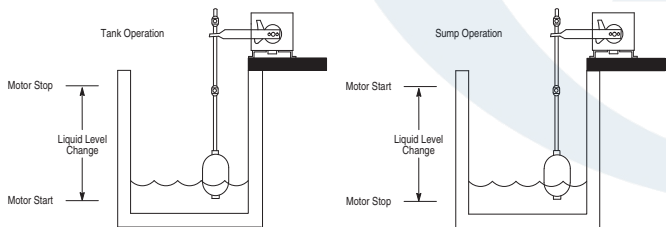
**Turbulence** — Waves or agitation in the liquid. Excessive turbulence may cause improper switch operation — for example, early switching or switching between operating points.

**Buoyancy** — Force supporting the float equal in magnitude to the weight of the displaced liquid.

**Theory of Operation**

Bulletin 840 Float Switches provide automatic control for motors that pump liquids from a sump or into a tank. The switch must be installed above the tank or sump, and the float must be in the liquid for the float switch to operate. **Tank Operation:** A float operator assembly is attached to the float switch by a rod, chain or cable. The float switch is actuated based on the location of the float in the liquid. The float switch contacts are open when the float forces the operating lever to the UP position. As the liquid level falls, the float and operating lever move downward. When the float reaches a preset low level, the float switch contacts close, activating the circuit and starting the motor. The contacts can directly activate a motor or provide input for a logic system to fill the tank. As the liquid level rises, the float and operating lever move upward. When the float reaches a preset high level, the float switch contacts open, deactivating the circuit and stopping the motor. **Sump Operation:** Sump operation is opposite tank operation.

**Figure 1**  
**Tank and Sump Operation**



**Temperature Range (Switch)**

The temperature range for the switch mechanism at +32 °F (0 °C) or below is based on the absence of freezing moisture, water, or other fluids that may solidify and impede the operation of the control. Temperature ratings are as follows:

Operating: -22...+150 °F (-30...+66 °C)

Storage: -22...+200 °F (-30...+93 °C)

**Temperature Range (Float)**

The temperature range for the float mechanism at +32 °F (0 °C) or below is based on the absence of freezing moisture, water, or other fluids that may solidify and impede the operation of the control. Temperature ratings are as follows:

Operating and Storage:  
-22...+200 °F (-30...+93 °C)

**Conversions**

Bulletin 840 **Styles A and B** Float Switches are assembled for tank operation but can be easily converted to sump operation. **Style A** switches can be changed from tank to sump operation by moving the float rod to the opposite end of the double arm lever.

**Styles B** switches can be converted in either of the following ways:

- Remove the lever, turn the shaft 90° counterclockwise and replace the lever in its original position.
- Remove the lever and replace 180° from the original position.

**Style D** is for tank operation only. **Style DS** is for sump operation only. These switches cannot be converted.

**Contacts**

Bulletin 840 Float Switches have a snap action mechanism for quick-make and quick-break contact operation. This feature provides high snap-through forces once the mechanism has traveled the required distance. See table below.

**Maximum Contact Rating per Pole**

Max. V AC	AC — NEMA A600				DC — NEMA N300		
	Make	Break	Make	Break	Max. V DC	Make	Break
120	60 A	6.0 A	7200V A	720V A	—	—	—
240	30 A	3.0 A	7200V A	720V A	125	2.2 A	2.2 A
480	15 A	1.5 A	7200V A	720V A	250	1.1 A	1.1 A
600	12 A	1.2 A	7200V A	720V A	—	—	—

**Maximum Horsepower Ratings**

Style	Single-Phase AC		2- or 3-Phase AC		DC		
	115V	230V	115V	230-460-575V	32V	115V	230V
<b>A</b> — Tank or Sump	1	1	—	—	.025	0.25	0.125
<b>B</b> — Tank or Sump	1.5	3	—	2	—	1	1
<b>D</b> — Tank	1.5	2	2	3	0.25	0.5	0.5
<b>DS</b> — Sump	1.5	2	2	3	0.25	0.5	0.5

**Contact Wiring Configurations**

