

DiversiTech Brand Condensate Handling Products Literature for model PTC

WARNING

Gas supply shall be shut-off and the electrical power disconnected before proceeding with the conversion. Failure to do so could result in fire, explosion, electrical shock, or the unit starting suddenly resulting in injury.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these kits must be performed by a qualified installation and service agency.
2. The supplier instructions that ship with the DiversiTech accessories must be used in conjunction with the Installation and Service manual originally shipped with the unit heater, in addition to any other accompanying component supplier literature.



Condensate Pump CP-22
Modine Item Code 57869



Condensate Pump Treatment SCM-186-6
Modine Item Code 57871



Overflow Switch SOS-1
Modine Item Code 57927

This PDF is a compilation of DiversiTech created literature pieces for the Condensate Pump, Condensate Pump Treatment, and Condensate Drain Line Overflow Switch, and is current as of August, 2009.

For updated literature or additional information, please visit the DiversiTech website at www.diversitech.com. DiversiTech products supplied by Modine will ship with vendor supplied installation instructions.

Modine Manufacturing Company has a continuous product improvement program, and therefore reserves the right to change design and specifications without notice.

DiversiTech Condensate Pumps



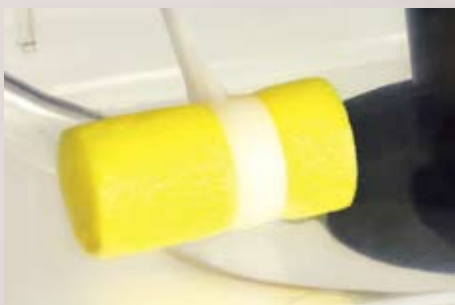
Metal Hang Tabs

Shatterproof stainless steel hang tabs have hole-and-slot design for easy mounting. Tabs are located on convenient 8" centers.



Indicator Lights

Red, yellow, and green indicator lights show the pump status. Green for power applied, yellow for pump running, and red for high level alarm.



A Float that Floats

A float manufactured from foamed polyethylene is a simple, chemical and environmentally resistant, long lasting float. Rather than mold a trapped air float from a material that sinks, or use an expanded polystyrene (EPS) float, the DiversiTech float simply floats.



Four Inlet Holes

Four inlets versus two or three on other pumps provide the greatest installation versatility. Inlet holes have a reinforced wall for durability.



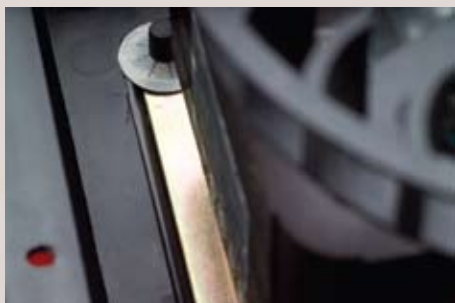
Rubber Feet

Rubber feet dampen vibration which reduces noise.



Pan Pill Dispenser

A pan tablet dispenser is included free with every pump. Perfectly compatible with DiversiTech's Pro-Treat® pan tablets.



Vibration Isolation

An elastomeric motor mounting gasket dampens vibration.



Check Valve

Removable check valve for easy cleaning.

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This information is available as a contractor handout.
Order item number LIT-FLY-PUMP.



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Overflow Safety Switch

1/4" quick connect terminals provide easy connection to the built-in overflow switch. Three terminals are provided allowing the installer flexibility to connect air handler shut-down and optional alarm as needed. Switch features SPDT isolated contacts ready for connection to building automation systems.



22' Lift

22' of lift standard versus 20' from other pumps.

Suitable for use with condensate from condensing boilers and high efficiency (condensing) furnaces.



Condensate Pump

Installation and
Safety Instructions



**CP-22
CP-22LP
CP-22T
CP-22LPT**

**CP-22-230
CP-22LP-230
CP-22T-230
CP-22LPT-230**

Rated Voltage

120 Volts / 60 Hz

220 Volts / 60 Hz
(208-230)

Rated Current Draw

1.9 Amps

1.0 Amps

Input Type

USA 3-prong plug

NEMA 6-15 plug

Head Height

22 ft. maximum

22 ft. maximum

Flow Rate at Zero Head

1.6 GPM

1.6 GPM

Product Dimensions (LxWxH)

11.8" x 5.9" x 6.7"
(4.9"H low profile)

11.8" x 5.9" x 6.7"
(4.9"H low profile)

Product Weight

5 lbs.
(4.7 lbs. low profile)

5 lbs.
(4.7 lbs. low profile)

Inlet Height from Base

4.4" (1.75" low profile)

4.4" (1.75" low profile)

Included Accessories

- Instruction Sheet
- Stainless Steel Hang Tabs
- Plug Protector
- Algacide Tablet Dispenser
- 4' Remote Shutoff Leads with Insulated Terminals
- Polyethylene Inlet Covers (3)

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Wiring Color References

Black - Live/Hot
White - Neutral
Green - Ground

Brown - Live/Hot
Blue - Neutral
Green/Yellow - Ground

All installations must conform to NEC requirements

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General Information

Thank you for the purchase of this DiversiTech condensate pump. This pump is designed to automatically remove the condensate water that collects from appliances such as air conditioners, high-efficiency furnaces and de-humidifiers.

The pump has a built-in tank that collects the water from the appliance. When the water collected reaches sufficient level inside the pump tank, the pump switches on and pumps the water to a remote location for disposal. When the tank is sufficiently empty the pump automatically switches off.

The pump is capable of lifting water to its rated height and is equipped with a check valve that prevents water from flowing back into the tank when the pump shuts off.

The pump is outfitted with lights that show the status of power available, motor running and high water (alarm) conditions.

The pump is also equipped with a switch that activates when the water in the tank reaches an overflow condition. The overflow safety switch may be connected to turn off the appliance if the high water condition occurs. The switch also has an alarm terminal that may optionally be connected to an audible alarm or remote indicator light to indicate a trouble condition.

Pump should be stored indoors.
The chosen location should be clean and dry.



**CHECK FOR
SHIPMENT
DAMAGE**

Unpacking

Carefully open the carton to avoid damage to the pump. Do not use a knife or other sharp object that may scratch the pumps cover. After opening carton, look for damage. If damage is found file a claim with the freight carrier.

CAUTION: Be sure to remove the cardboard insert. It is used to protect the float during shipment. Failure to remove the insert will cause the pump to run continuously.

Power Source

Supply voltage and frequency must match what is shown on the pump nameplate. Source voltages lower than rated supply can reduce performance and cause the pump to overheat.

Pump Installation

The pump must be level and should be placed on a solid surface or floor. The pump has rubber feet to reduce noise and keep it in place during operation.

Do not use this pump in the presence of spraying or standing water, it may cause a shock. This pump is not suitable for use in Class I or Class II (explosive gas or dust locations).

Do not cover the pump air vents. The pump is air cooled. Do not cover the vent holes located on the top or sides of the pump housing. The pump may be operated continuously as long as the air vents are not covered.

Mounting

The condensate pump is equipped with metal mounting tabs which allow the tank to be screwed to a wall or equipment side panel. The screw-to-screw distance is 8". When mounting into drywall or concrete walls the screws must have anchors which provide the necessary support in the wall material.

The pump top is reversible. It may be turned around to allow easy access to the pump outlet, pan tab tray or power connection as may be required by the particular installation.

Inlets

4 inlet holes are located in the top deck of the pump. Flexible vinyl tubing or PVC may be connected to any of the pump inlets. Pop out covers are provided to cover unused inlets. Be sure to cover the unused holes to prevent the pump from collecting debris or insects.

Tubing installed into the inlet holes must be straight. The tubing must not bend inward where it will interfere with the pump or float mechanism.

When using rigid tubing such as PVC, be sure to cut the end at an angle. This will allow the condensate water to drain freely and keep the tubing end from being blocked by the tank bottom.

It may be desirable to use a "P" or "U" trap between the AC unit and the condensate pump to provide a liquid barrier to air flow from the air conditioner. These types of "traps" always contain some water which blocks the flow of air from the AC unit which is wasteful and can cause other problems such as accelerated algae growth.

Outlets and Tubing Connections

The pump is equipped with a combination barb-type fitting and check valve. The fitting allows the connection of 3/8" flexible vinyl tubing such as DiversiTech "CVT" clear vinyl. Attach the tubing by pressing it over the barb fitting and secure with a screw type hose clamp.

Route the tubing up and away from the pump; avoid compressing or kinking the tubing. The tube route should be the shortest possible distance from the pump to the building exterior or other drain location. For best results the distance that the water must go UP should be shorter than the distance that it goes DOWN. With the longer DOWN tubing, the length will help siphon the condensate from the tank, speeding the pump out time.

Pro-Treat® Tabs

The pump features a dispenser which holds DiversiTech Pro-Treat pan treatment tablets. The dispenser may be filled with multiple tablets to aid in keeping the pump, tank and outlet tubing slime free.

Pump Electrical Connections

Connect the pump power to a properly grounded outlet capable of providing power that exceeds the requirements listed on the pump nameplate. Avoid the use of extension cords wherever possible. The pump must be operated by a continuous source of power and must not be connected to switched outlets or other power supplies that may be inadvertently or automatically turned off.

All aspects of the installation must conform to requirements of the NEC, and any applicable local codes.

Safety Switch

The pump safety switch should be used on 24V Class II control circuits only. The pump safety switch connections are available on standard ¼" quick connect terminals located on the top cover.

Two wires with pre-crimped connectors may be plugged onto the COMMON and RUN terminals and wired into the 24 Volt thermostat circuit to shut off A/C systems should an overflow condition occur. The Safety Switch operates with or without power provided to the pump. Optional alarm or remote trouble light connection



The third terminal of the safety switch closes when the water exceeds the high level limit. This terminal be connected to a light or buzzer to indicate system trouble.

Pump Operation

Apply power by plugging in the pump. Check for green LED indication the power is available. Test float and safety switch by filling the tank or manually operating the float. (see disassembly below)

Test Safety Switch operation (if used) to be sure that the A/C system shuts down and the red ALARM LED lights when the float is raised to the upper part of its travel.

Leak Check: Operate the pump by filling tank to trigger operation. Pump RUN will be indicated by the yellow RUN LED.

Homeowner Instruction: Instruct the homeowner about the pump's general operation, how to add Pro-Treat tablets, and to look for the ALARM LED if they think that there is system trouble.

Pump Maintenance and Disassembly

Always disconnect power before performing maintenance. Pump and deck may be removed from the tank by pushing tabs located on the tank sides away from the deck while lifting on the pump cover.

Periodically inspect the Pump tank to assure it is free of accumulated dirt or sludge. Do not use solvent cleaners. Clean Tank with soap and warm water only. The check valve may be removed for cleaning or replacement by unscrewing with a 9/16 wrench. (illustration)

Clean inlet and outlet piping. Tubing may be cleared of slime or debris instantly with a Wagner brand Gallo Gun tool and Swoosh cartridges.

Add Pro-Treat Tabs to the tablet tray.

Reassemble system and check for correct operation.



Limited Warranty

All pumps manufactured by or for DiversiTech Corporation (the Company) and sold by the Company under the DiversiTech brand are warranted to be free of defects in workmanship and materials for a period of 24 months from date of sale from the distributor to the contractor. The Company will credit, repair or replace, at its option, any Pump if deemed defective within this time period. All products returned to the Company must include a return authorization issued by the Company. The returned product should be suitably packaged and shipped prepaid from the point of shipment to the point designated in the Company's return authorization.

This warranty is a limited warranty and shall be in lieu of any other warranties, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. There are no other warranties that extend beyond the description of the face hereof. The liability of the Company arising out of its supply of said products, or their use shall not in any case exceed the cost of correcting defects in the products as set forth above. The Company shall not be liable for any costs or damage incurred by its customers in the removal or replacement of defective products from units in which the products have been assembled. In no event shall the company be liable for loss of profits, indirect, consequential, or incidental damages.

SAFETY WARNING

FOLLOW ALL SAFETY INFORMATION TO REDUCE POTENTIAL ELECTRICAL SHOCK.
DISCONNECT POWER BEFORE SERVICING UNIT. PUMP MUST BE PROPERLY GROUNDED.

NEVER USE THE PUMP TO MOVE FLAMMABLE LIQUIDS.

NEVER USE THE PUMP IN AN EXPLOSIVE GAS ENVIRONMENT,
OR WHERE GAS FUMES OR VAPOR MAY BE PRESENT.

ALWAYS DISCONNECT THE POWER PRIOR TO MOVING,
ADJUSTING OR SERVICING THE PUMP OR ATTACHED SYSTEMS.

MSDS# Flow-Plus
Date: 04/01/09

Total Pages: 2

Flow-Plus™ Condensate Pan Treatment

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Manufactured by: Specialty Chemical Manufacturing
A DiversiTech Company
1633-B High Bridge Road
Quincy, FL 32351

EMERGENCY Phone No.: 1+800.434.9300 Chem-Tel (Chemical Emergencies Only)
Phone Number for Information: 850-875-1716 Fax: 850-627-2699
Date Revised: April 2009
Prepared by: Anthony Jernigan

SECTION 2. HAZARDOUS INGREDIENTS INFORMATION

INGREDIENT	CAS No.	OSHA PEL	ACIGH TLV	OTHER STEL	% or Range
Alkyl dimethylbenzyl ammonium chloride	68424-85-1		None established		

SECTION 3. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: N/A
Vapor pressure (mm Hg): N/A
Vapor Density (Air = 1): Same as water
Solubility in water: Water soluble
Appearance and odor: Waxy blue solid with a wintergreen odor

Specific gravity (H2O = 1): 1.03
Melting Point (Pour Point): 175° F
Evaporation Rate (Water = 1): N/A

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): None
Flammable Limits: None
Extinguishing media: Not applicable
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

SECTION 5. REACTIVITY DATA

Stability-Stable Conditions to avoid: None
Incompatibility (Materials to avoid): Strong oxidizers
Hazardous Decomposition or Byproducts: May evolve carbon monoxide, carbon dioxide, and other unidentified fragments if this product is involved in a fire.
Hazardous Polymerization: Will not occur.

SECTION 6. HEALTH HAZARD DATA

Routes of Entry: Inhalation: No (mists) Skin: No Ingestion: Yes Eyes: No
Health Hazards (acute and chronic): The toxicological properties of this compound have not been fully tested. Analogous compounds are essentially non-toxic.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No
Signs and symptoms of exposure:
Inhalation: Not applicable
Skin: Irritation or other physiological effects are unlikely from contact or prolonged exposure.
Ingestion: Do not take internally. Low toxicity on ingestion. May cause nausea or diarrhea.
Eyes: May cause temporary eye irritation.
Medical Conditions Aggravated by Exposure: Contact may exacerbate existing skin disorders.
Emergency and First Aid Procedures:
Eyes: Flush with water for 15 minutes. Consult a physician if irritation persists
Skin: Remove contaminated clothing. Wash the affected area with soap and water. Launder or dry clean clothes before reuse.
Inhalation: Remove affected individual to fresh air.
Ingestion: DO NOT induce vomiting. Force fluids. Administer activated charcoal tablets.

Flow-Plus™ Condensate Pan Treatment

SECTION 7. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:

Remove contaminated garments promptly. Remove unnecessary personnel from the area. If this product is wet with water, it becomes very slippery. Use care to avoid falling when walking on floors where wet product is present. If the product is spilled, sweep or pick up and return to the container, if uncontaminated. Product that is contaminated with hazardous material should be treated on the basis of the hazardous contaminant.

WASTE DISPOSAL METHODS: Incinerate this material and all associated wastes, or bury in an approved landfill in accordance with governmental regulations. Dispose of product that is contaminated in a manner that is appropriate for the hazardous contaminant. Observe all local, state, and federal regulations when disposing of recovered materials. If the stated options for disposal are unavailable, consign the material to a licensed hazardous waste contractor for proper disposal.

HANDLING AND STORAGE: Keep containers closed when not in use. Store this product in a dry, cool, well-ventilated area. Empty containers may retain residue. All containers should be disposed of in an environmentally safe manner, and in accordance with all governmental regulations. Keep this and all chemicals out of the reach of children.

SECTION 8. CONTROL MEASURES

Respiratory Protection (Specify Type): Not required

Ventilation: Local exhaust is recommended when used in enclosed areas.

Protective Gloves: Neoprene or other materials may be used to minimize contact with sensitive skin.

Eye protection: Not required for normal use.

Other Protective Clothing: Not required for normal use.

Work Hygienic Practices: Use proper industrial hygiene practices to minimize exposure. Wash hands after handling this material, and before eating or smoking.

SECTION 9. ADDITIONAL INFORMATION

Transportation Information:

DOT HAZARD LABEL: None

DOT Description: Cleaning Compound, Liquid, NOS (Non-hazardous)

TSCA: All ingredients are TSCA approved.

SARA TITLE III Reporting Requirements:

Section 302: EHS reporting not required

Section 304: Hazardous releases reporting not required

Section 311: Community Right To Know reporting is required if the inventory is above the Threshold Planning Quantity.

Section 312: R-T-K Inventory data reporting is not required.

Section 313: Emissions and release reporting may be required for users of this product within the manufacturing sector. This does not apply to service companies.

10. MANUFACTURED FOR:

Diversitech

6650 Sugarloaf Parkway, Suite 100

Duluth, GA 30097

Phone 1+678.542.3600

EMERGENCY Phone No. 1 800-255-3924 Chem-Tel (Chemical Emergencies Only)

11. REFERENCE NUMBER AND DATE OF ISSUE:

COSHH Safety Data Sheet: Flow-Plus

Issued 04/01/2009

This information is, to the best of our knowledge and belief, accurate and reliable as of the date completed. However no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the completeness and suitability of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information, nor do we offer any warranty against patent infringement.

Safety Overflow Switch (SOS™)

What is the Safety Overflow Switch (SOS™)?

Designed for use on 3/4" PVC condensate drain line, the SOS snaps easily over existing drain line tubing and can be glued in place using PVC cement.

The SOS electronically senses water near the inside wall of the PVC drain tubing. By locating the SOS with its body away from the normal flow, it can detect a possible overflow condition when the PVC drain line becomes full with water. Like a culvert, a condensate drain line is normally mostly empty with a small amount of water flowing in the lower parts of the horizontal run. Since the SOS's sensor component only covers part of the tubing, a low volume of flowing water does not activate the switch. The pipe must be full or near full to activate the switch. The SOS can be mounted horizontally, vertically, or at any angle.

The SOS works with 24 VAC control circuits and typical contactors. When not detecting water, it is normally closed and allows normal air conditioner operation. When water nears the SOS's sensor, the switch triggers and the control circuit is opened. Then, the LED indicator lights to show that there may be system trouble.

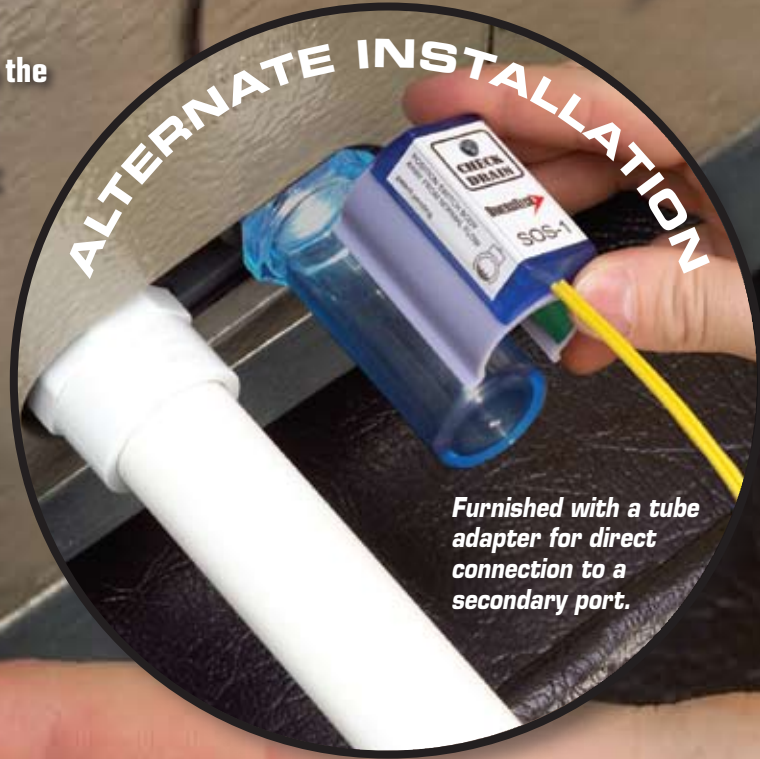
Furnished complete with switch, 5' (1.5 meter) 18 AWG, 2 wire lead, and a 3/4" PVC male fitting adapter for direct coupling to a primary pan drain line connection.



This information is available as a contractor handout.
Order item number LIT-FLY-COND.



- SOS electronically senses water in the PVC drain tubing.
- SOS is designed for use on 3/4" PVC condensate drain line.
- SOS snaps easily over existing drain line tubing.



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CONDENSATE DRAIN LINE SWITCHES



Safety Overflow Switch (SOS)

The SOS-1 is a patent pending drain line switch that operates by sensing an electrical property of water called Dielectric Constant. When a material, which does not conduct electricity, is slid between the two parallel metal plates of a capacitor, the capacitance value will usually increase. The ratio of the capacitance before and after the material is placed between the two plates, is equal to the dielectric constant of the center material.

The dielectric constant of a vacuum is 1.00. Dry air is 1.0006. Distilled Water is 80.

The SOS Switch uses a sensor which has been made by curving the metal plates of a special clip-on capacitor. These plates are clipped onto the PVC (or other plastic or non-conducting) drain line.

When there is little or no water present inside the PVC drain the dielectric constant is very low; near that of air or the PVC plastic of the pipe. As the pipe fills with water, the dielectric constant and the capacitance increase. The SOS Switch compares the capacitance value from the sensor to a reference value, and if that value is exceeded, the SOS Switch opens and turns the AC compressor off.

The Magic Formula:

The table to the right lists the dielectric constant of some common materials. Note that water has a high dielectric constant. Water and objects containing mostly water dramatically increase the capacitance when inserted between the capacitor plates. Other types of materials do not significantly affect the capacitance.

If it is only sensitive to water, why does it trip when I touch it?

The skin of the human finger is thin and the human blood under the skin makes a nice electrical conductor. The outside surface area of the human body is also large compared to the scale of the SOS Switch. The act of touching a human finger to a metal surface will cause a sizable capacitance change. Touching the center electrode of the SOS causes it to sense the added capacitance and, like water in the PVC, will cause the SOS switch to trip to the off position.

Why is the SOS Switch is better than mechanical level switches?

- The SOS Switch detects water and is not significantly affected by debris which can foul mechanical type switches.
- The SOS Switch does not have moving parts or touching electrical contact points that may be subject to failure from corrosion, acid, and vibration.
- The SOS Switch does not require tees, penetrations or cutting into the drain line in any way. There is nowhere for system air to leak or blow-by the switch and a vent is not normally required. The SOS Switch simply snaps onto existing PVC condensate drains.
- Once tripped, the SOS Switch locks out the system until the problem is solved. A handy yellow LED located on the SOS switch top helps the homeowner or technician locate the problem area. The LED indicates "check drain" before condensate buildup becomes a problem.

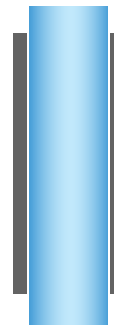
CONDENSATE DRAIN LINE SWITCHES

Vacuum = 1.00
Air = 1.0006
Bakelite plastic = 5.0
Dry wood = 1.5 – 5.0
Paper = 2.0 – 3.0
Teflon plastic = 2.1
Paraffin wax = 2.5
Polyethylene plastic 2.3
Polystyrene plastic = 2.6
Distilled Water = 80
Plexiglas plastic = 2.8
Rubber = 3.0 – 4.0
Celluloid plastic = 4.0
Quartz = 4.0 – 5.0
Formica = 4.7
Mica = 4.5 – 8.0
Pyrex Glass = 4.8
Window glass = 7.0 – 8.0
Porcelain 5.0 – 6.0

What Powers the SOS Switch?

The SOS Switch is super-efficient and very smart. It tests the water level 120 times each second (at the start of each AC power cycle) (60 sets of complete positive and negative cycles = 120). The SOS Switch is wired in series with the contactor. Since the SOS Switch draws a very small fraction of an Amp, it does not cause the contactor to energize – the contactor simply passes all of the voltage to the SOS. At the beginning of each AC power cycle, the line voltage is zero. As the voltage rises the SOS switch sensor circuitry starts to operate. If it detects that there is no water present, it shorts itself out and passes the power to the load (compressor contactor). Since the switch is closed and the power consuming part of the SOS is shorted out, the SOS does not draw any power for the rest of the power cycle. If the sensor detects that there is water, it remembers and tests for a few more cycles. If the water remains, the switch never turns on and the system is locked out.

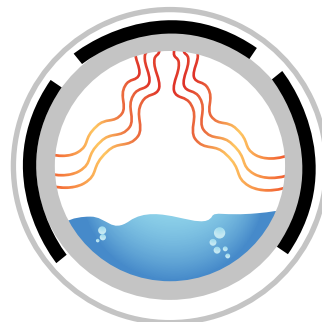
Typical Capacitor



2 metal plates with separator "dielectric" in between

SOS Switch Sensor 3 Rounded Plates

Low Water and Debris
Do Not Intercept Field



High Water
Completely Intercept Electrostatic Field

