Suggestion

KF INDUSTRIES, INC. ☐ 230 WEST DAUPHIN STREET ☐ PHILADELPHIA, PA. 19133 ☐

4/12/79

Dr. Harold Denton
Nuclear Regulating Commission
Washington D.C.

Dear Dr. Denton:

According to newspaper accounts the recent incident caused 250,000 gallons of water to flood the containment building, before appropiate action was taken.

For many years we have manufactured a simple and inexpensive device to detect the presence, or absence, of water.

I know you are probably inundated with similar letters from manufacturers. It is not my purpose to waste your time. I just thought I would enclose a catalog sheet describing the product.

There are probably a number of applications in a reactor installation where the absence or presence of water are of signal importance.

Very truly yours,

Kurt Gruensfelder

Kurt Gruensfelder, P.E.
gk

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SOLID STATE ELECTRONIC WATER SENSORS & ACCESSORIES

Will detect presence or absence of most any conductive liquid, simply and at very low cost.

- For industrial processes using water tanks
- Air conditioning condensate monitoring
- Sump pumps • Washing machines • Wells • Flood Control

Or most any control or monitoring problem dealing with water or water based liquids.

This series of sensors and related equipment has been designed to economically sense the presence or absence of water or water-based liquids.

The rugged construction of the sensor means reliable performance.

They can be mounted with clamps or they can be cemented in place.

Each sensor is constructed in a cylindrical aluminum container which is then filled with epoxy. Two probes extend from the sensor. Twenty feet of two wire cable are molded right into the rear of the sensor.

Below are listed specifications which are common to all sensors manufactured. Individual characteristics are then described for each device.

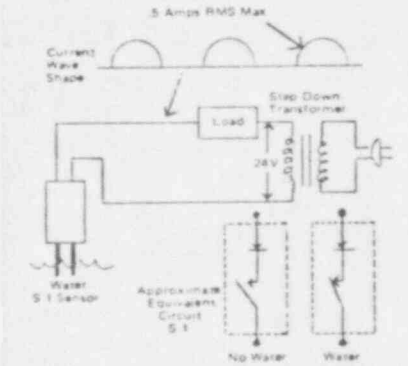
- Size: 7/8" dia. x 2-3/4" long.
- Current thru probes: See description for each sensor.
- Input voltage: 24-28Vac.
- Voltage drop within sensor: IV max.
- Max. output current: See description for each sensor.
- Sensor material: Anodized aluminum, filled with epoxy.
- Probe material: Tinned brass.
- Temperature limit: 160°F.
- Cable: 20 ft. of twin cable, each stranded #24 AWG, PVC insulated.

MODEL S-1.

This sensor will close a circuit upon contact with water. The lowest cost sensor in the line, it will deliver half-wave pulses. It should therefore only be used where this waveshape can be handled. A good load for this device is a relay with a coil, 10 VA max., with a 100 MFD capacitor across it (watch polarity).

An AC buzzer or bell rated at 24V can be used as an alarm indicator, or our alarm unit (#200.1) already has a transformer within its enclosure. This is described further on in this bulletin.

Indicator lights should be rated between 12V and 18V for good brightness.



SPECIFICATIONS: S-1 SENSOR.

Current thru sensing probes: 700 microamps peak 200 microamps avg.
Output current: 1/2 wave, .5A RMS max. – continuous
Sensitivity: 500,000 ohms maximum will cause output current flow

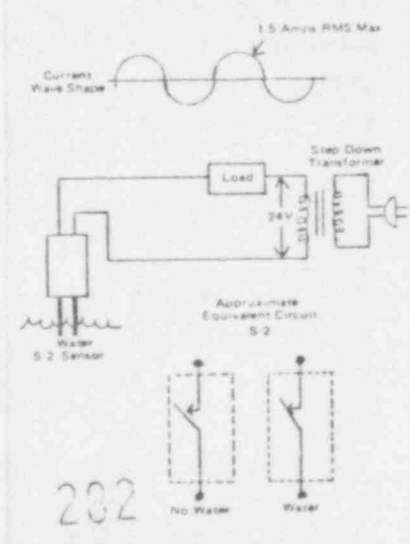
MODEL #S-2.

This sensor acts like the preceding #S-1. It will close a circuit when the probes contact water. However, it has several distinct properties.

1. The output is standard AC rather than a half-wave rectified DC.
2. The current capability is larger.
3. The average current flowing in the probe circuit thru the water is essentially zero.

The last feature is important if the unit is used in, say, the food or beverage industry. Unbalanced currents cause electrolysis which may affect the taste of the product.

If the device is used in an application where it is always immersed in water, then, again, electrolytic corrosion becomes important, since it eats away the probe ends. For instance, if it were desired to monitor a storage tank and to keep it always full of water, then in this application the probe ends would be constantly immersed. The model #S-2 device would satisfactorily perform in this service.



SPECIFICATIONS: S-2 SENSOR.

Current thru sensing probes: 100 microamps peak 1 microamps avg.
Output current: Sine wave, 1.5 amps RMS max. – continuous
Sensitivity: 500,000 ohms maximum will cause output current flow.

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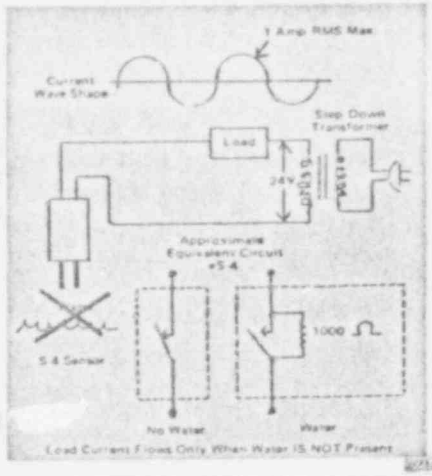
POOR ORIGINAL

MODEL #S-4

This sensor is of the "inverting" type. It will close a circuit in the absence of water.

Conversely, it will open the circuit when the probes contact water.

This sensor has many applications where the loss of water should, say, sound an alarm, open a water valve or other similar functions. The output of this device is standard AC. Since it is a balanced sensor the current that flows in the probe tips when immersed in water is exceedingly small.



SPECIFICATIONS: S-4 SENSOR

Current thru sensing probes: 100 microamps peak 1 microamps avg.

Output current (probes out of water): Sine wave 1 amp RMS max. – continuous

Pilot current flowing thru load when proves are in water: .024 amps max. (See equivalent circuit)

ACCESSORIES FOR WATER SENSORS

The water sensors as described in this bulletin are completely self-contained electronic "water switches." However, some users may find the following accessories make it even simpler to use these sensors.

MODEL #200.1 ALARM AND POWER UNIT

This instrument contains the necessary step-down transformer and a loud AC buzzer housed in an attractive compact metal case. A two-screw terminal board is mounted on the enclosure. The sensor wires are connected to this board and you now have an inexpensive water alarm unit.

If used with sensor #S-1 and #S-2 the horn will sound when the sensor is immersed into water.

If used with the S-4 model alarm will sound when no water is present.

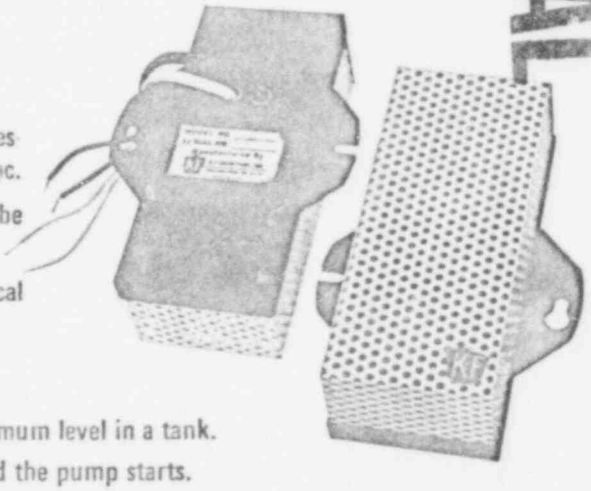
- 4" x 2-1/_" wide x 2-1/4" high
- 1 Lb.
- 115V AC 60 Cycles
- Sound Output 84 DB at 5 feet

MODEL #300 CONTROLLER.

This instrument contains a 115V step-down transformer which supplies the necessary 24V and a relay with a normally open set of contacts, rated at 8 Amps 250 Vac.

The device can be used either with our S-2 or our S-4 "inverted" sensor. (Cannot be used with S-1 sensor).

Instrument is mounted onto a 4" round cover to fit a std. four inch round electrical box. 6" pigtails extend thru an opening in the cover to make connections.



Some examples of uses are listed below:

Let us say an auxiliary pump must be started when the water level reaches a maximum level in a tank.

Use the S-2 sensor. When the level reaches the probe tips the relay is energized and the pump starts.

For another example, let us say that electric heaters may not go on until the vessel is filled with water. Relay will only close when water reaches S-2 probe tips.

The "inverted" sensor S-4 has just as many uses. Here the relay closes when there is no water – to start a large pump, to sound an alarm, to operate a valve.

The above are, of course, only illustrative.

Whenever the presence or absence of water must be known the devices described in this brochure can fulfill the function economically.

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MANUFACTURED BY

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