



# MODEL 70A

## RESISTANCE SENSING POWER RELAYS



- Operates when the input resistance drops below the trip point (or reverse mode).
- Choose from 3 adjustable trip point ranges of 20 megohms, 100 megohms, or 40k ohms.
- Useful for sensing presence of moist solids, slurries, chemicals, liquids, water, ice, etc.
- Suggested applications include storage tank level controls, sump pump control, ice bank control, feed water control, livestock, feeders, protective control systems, alarms, interface, etc.

### OPERATION IS SIMPLE

Model 70A **Resistance Sensing Power Relays** are operated by a change of input resistance, usually detected by (but not limited to) exposed electrodes. Their operation is quite simple ... when the input resistance drops below the trip point, the relay circuit is energized... when the input resistance rises significantly above the trip point, the relay circuit is de-energized. By means of a simple wire connection on the terminal strips, the control can be operated in a “fail-safe” mode; i.e. relay normally operated but dropped out on probe contact or loss of power.

### TYPICAL APPLICATIONS

Typically, these control devices might be used with exposed electrodes to detect the presence of a wide variety of moist solids, liquids, chemicals, or slurries in a storage tank or bin; to detect ice formation; to detect the presence of an unwanted substance in a protective control system; or other applications where the detection of a change of resistance is desired.

Model 70A is available with your choice of a 40k ohm, 20 megohm, or 100 megohm trip point. The 20 megohm trip point would be suggested for use with ores, pellets, granules, or other moist solids; the 100 megohm trip point for certain dry materials; the 40k ohm trip point for water, condensation, and other liquids.

### SPECIAL FEATURES

A sensitivity control on the Model 70A permits a moderate adjustment of the actual trip point to provide closer control in more critical applications. They are also available with or without a plug-in electro-mechanical power relay; or with a solid-state power relay for conventional switching of any load or “zero-voltage” switching of resistive loads.

### EASY AND SAFE TO USE

**Resistance Sensing Power Relays** are completely solid state and have no moving parts except the electro-mechanical power relay if specified. The resistance sensing input circuit is isolated from other circuitry, operates with less than 16 volts on the electrodes, and uses alternating current on the 40k ohm model to prevent damage from electrolytic action. See specifications on page 2 of this bulletin.

**POWER REQUIREMENTS:**

All standard models are for 115 VAC, 50/60 cps, single phase, less than 10 VA. Other line voltages and/or frequencies are available by special order at additional cost.

**AMBIENT TEMPERATURE RANGE:**

0 to + 140° F.

**PACKAGING AND TERMINATION:**

All circuitry except electro-mechanical power relay is solid state. The electromechanical power relay and solid state power relay are a standard octal plug-in type. All terminations are at screw terminals on top of unit. NEMA enclosures can be supplied for all models.

**RESISTANCE SENSING CIRCUIT:**

Isolated from other circuitry; less than 16 VAC at less than .0005 amperes on 40k ohm and 100 megohm models; less than 16 VDC on 20 megohm models. All models available with choice of nominal trip point of 40k ohms, 20 megohms or 100 megohm. Trip points adjustable over moderate range by sensitivity control.

**TIME DELAY:**

The Model 70A-2 (20 megohm sensitivity) may be ordered with a short time delay circuit (up to 5 seconds) to eliminate tripping from short duration transient material hitting the probes.

70A-2R	20 megohm	no delay
70A-4R	40k ohm	no delay
70A-1	100 megohm	no delay
70A-2T5	20 megohm	5 sec delay
70A-2T4	20 megohm	4 sec delay
70A-2T3	20 megohm	3 sec delay
70A-2T2	20 megohm	2 sec delay
70A-2T1	20 megohm	1 sec delay
70A-2T.1	20 megohm	0.1 sec delay

**POWER RELAY OUTPUT CIRCUIT:**

All models are available with your choice of either an electro-mechanical power relay, a solid-state power relay, or without an output switching device.

**Electro-Mechanical Power Relay:**

Two form C contacts (DPDT) UL rated at 10 amps resistive load, 1/4 HP, 115/230 VAC. Has standard octal plug-in base.

**Solid State Power Relay:**

Your choice of conventional switching for any type load, or “zero-voltage” switching for resistive loads only; use standard octal plug-in base; current ratings of 5, 10, or 15 amperes AC. (More information may be found in separate Bulletin “SR’.)

**Circuit Specifications:**

For those interested in ordering models without an output switching device, the circuit will deliver 12 VDC nominal to a 150 ohm resistive load.

**FAIL SAFE OPERATION:**

All models may be operated in either the normal manner (switching circuit de-energized in non-operative condition), or for “fail-safe” operation (switching circuit energized in non-operative condition) by simple terminal connection change.

**HOW TO ORDER:**

Order by the Model Number. Models with specifications different from those shown here are available only by special order at additional cost (a complete written description is necessary). Call us for more information.

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Badger Magnetics, Inc. **Resistance Sensing Power Relay**  
Model 70A

