

This bulletin should be used by experienced personnel as a guide to the installation of Series 16 controls. Selection or installation of equipment should always be accompanied by competent technical assistance. We encourage you to contact Gems Sensors Inc. or its local representative if further information is required.

Specifications

Control Design: Open circuit board design

Contact Design: DPDT (2 form C): two normally open (N.O.) and two normally closed (N.C.), non-powered contacts.

Contact Ratings: 5A @ 120 or 240 VAC resistive (120°F), 1 A @ 120, 240 VAC resistive (150°F), 1/6 H.P. @ 120, 240 VAC (120°F)

Contact Life: Mechanical: 5 million operations.

Electrical: 100,000 operations minimum at rated load.

Supply Voltage: 120, 240 or 24 VAC models: +10% - 15%, 50/60 Hz. 208/240 Model: 187 Vmin to 255 Vmax. VAC 50/60 Hz

Supply Current: Relay energized at 4.4 VA.

Secondary Circuit: 12 VAC RMS voltage on probes, 1.5 milli-amp current.

Sensitivity: Models operate from 0 to 1,000,000 Ohm maximum specific resistance

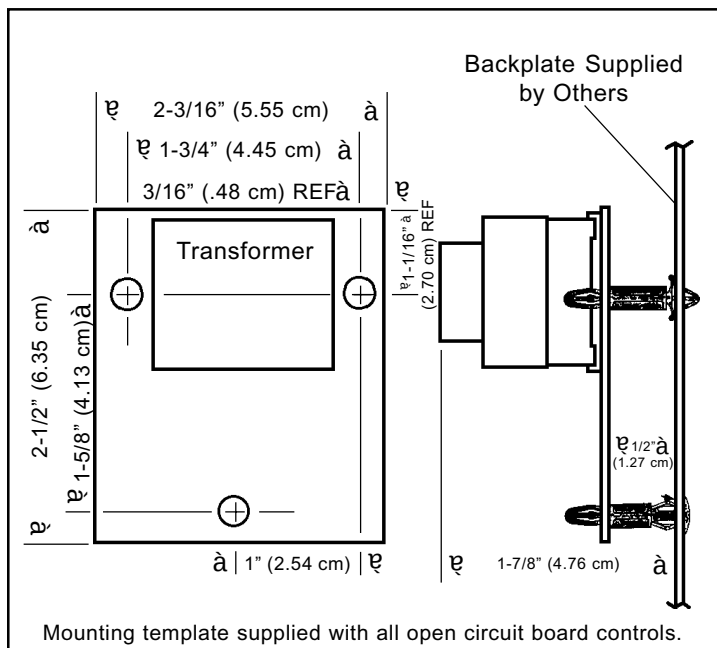
Temperature: -40 to 150° F. ambient.

Terminals: Probe connections 3/16" spade: Line and power connections 1/4" space

Time Delays: Standard H probe, 0.5 seconds on rising level

Listing: U.L. recognized, Industrial Motor Control (508)

Dimensions



Notes

If panel mount stand-off is to be used, thru-holes to be drilled in back plate should be .187" Dia.

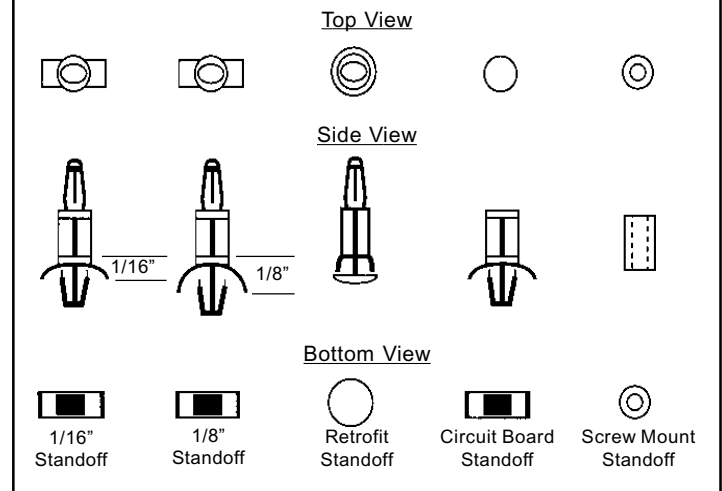
If retrofit stand-off is to be used, thru-holes to be drilled in back plate should be .250" Dia.

Installation

1. Drill three .187 dia. holes in customer supplied backplate using stick on template supplied with control. Standard standoffs are designed for backplate thickness of .062 (1/16"). Standoffs are available for backplates of .125 (1/8") nominal thickness. If retrofit plate standoffs are used, drill three .250 dia. holes in proper location.
2. Install three standoffs onto backplate. Install circuit board onto standoffs by pushing down on circuit board at outer edges of all four corners. Use both hands to slide board onto standoffs until standoffs lock. **CAUTION:** Do not overflex circuit board during installation. Do not push down on transformer or relays during installation. See sketch for proper installation. Install control in appropriate enclosure.
3. Wire control per diagram, following N.E.C. and local codes. Use appropriately sized spade terminals.

Standoffs

We have four different types of standoffs, designed to connect circuit boards to panels

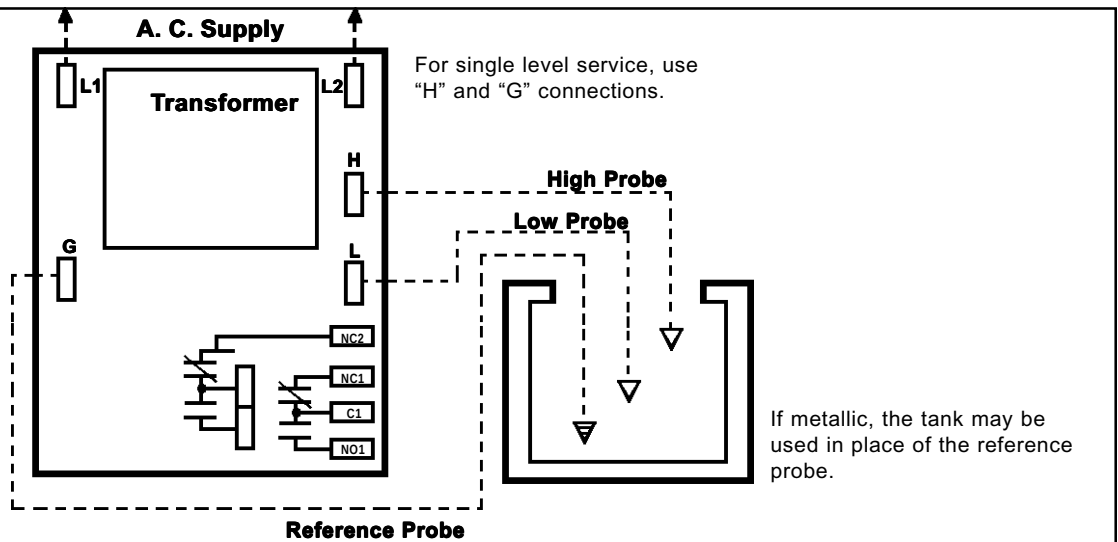


Sensitivities vs Maximum Probe Wire Distance*

Sensitivity Character	Sensitivity (K Ohms)	Distance (Ft)
A or K	4.7	10,000
B or L	10	5,700
C or M	26	2,200
D or N	50	1,075
E or P	100	570
F or R	470	270
G or S	1,000	38

* Based on type MTW or THHN wire, #14 or #16 AWG

Wiring Diagram



Operation

Direct Mode - Single Level Service

When the liquid rises to the electrode on terminal H, the control energizes, changing state of the load contacts. (LED will be lit) The control remains energized until the liquid level recedes below electrode on terminal H. The control then de-energizes, (LED will not be lit) returning load to original state.

Inverse Mode - Single Level Service

Control energizes with power, changing state of the load contacts. (LED will be lit) When the liquid rises to the electrode on terminal H, the control de-energizes, returning the load contacts to shelf state. (LED will not be lit) The control remains de-energized until liquid level recedes below the electrode connected to terminal H. The control then

energizes.

Direct Mode - Differential Service

When the liquid rises to the electrode on terminal H, the control energizes, changing state of the load contacts. (LED will be lit) The control remains energized until the liquid level recedes below electrode on terminal L. The control then de-energizes, (LED will not be lit) returning the load contacts to original state.

Inverse Mode - Differential Service

Control energizes with power, (LED will be lit) changing state of the load contacts. When the liquid rises to the electrode on terminal H, the control de-energizes, returning load contacts to shelf state. (LED will not be lit) The control remains de-energized until the liquid level recedes below the electrode on terminal L. The control then energizes.

Optional

Time Delays: With time delay on increasing level, the liquid must be in contact with the short electrode for the full duration of the time delay before control will operate. With delay on decreasing level, the liquid must be below long electrode for the full duration of the time delay before control will operate. In single level service, terminals H and L must be jumpered together to achieve time delays on both increasing and decreasing levels or just decreasing level.

Model Number Designation

16DXXX-X-XX-XX

Time Delay: (Decreasing level) 1-20 sec.

Time Delay: (Increasing level) 1-20 sec.

Optional Character: R (Retrofit Plate)

Enclosure: 0=None, 1=NEMA 1, 4=NEMA 4, 7=NEMA 7, 12=NEMA 12

Standoff Style: A=1/16" Panel, B=1/8" Panel, C=Screw Mount, D=Retrofit

Supply Voltage: 1=120VAC, 2=240VAC, 3=24VAC, 8=208/240VAC

Mode/Sensitivity:

Direct: A=4.7K, B= 10K, C=26K, D=50K, E=100K, F=470K, G=1M

Inverse: K=4.7K, L=10K, M=26K, N=50K, P=100K R=470K S=1M

Series 16D Control: Double Pole, Double Throw

(DPDT) Load Contacts



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