

## Warrick® Series 16VM Controls Installation and Operation Bulletin

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

### Specifications

**Control Design:** Solid state components enclosed in clear Lexan plug-in style housing. Housing carries no NEMA rating.

**Contact Design:** SPDT (1 form C): one normally open (N.O.) and one normally closed (N.C.), non-powered contacts.

**Contact Ratings:** 10A @ 120 or 240 VAC resistive, 1/3 H.P. @ 120 or 240 VAC.

**Contact Life:** Mechanical- 5 million operations. Electrical- 100,000 operations minimum at rated load.

**Supply Voltage:** 24, 120, or 240 VAC models- factory set. Plus 10%, minus 15%, 50/60 Hz.

**Supply Current:** 120, 240, 24 VAC, Relay energized 4.4 VA.

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

**Sensitivity:** Models operate from 0-1,000,000 OHM maximum specific resistance- factory set.

**Temperature:** -40 to 150° F. ambient.

**Terminals:** All connections #6-32 screw type with pressure clamps.

**Time Delays:** Standard, 0.5 seconds on rising level. Additional time delays on rising and/or falling available as option.

**Listing:** UL listed, Industrial Motor Control (508). 240 volt units are not U.L. limit control recognized.

### Installation

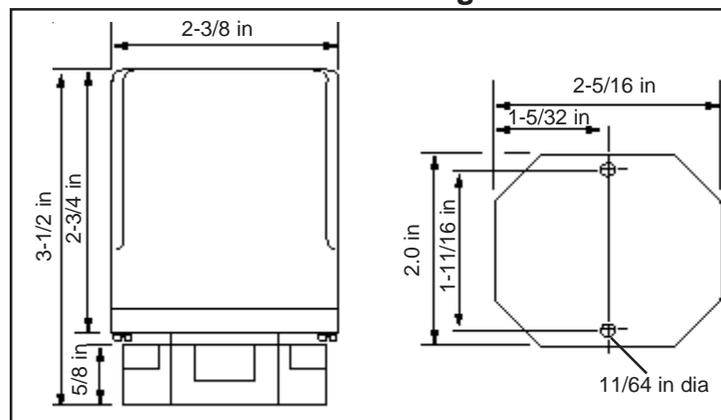
1. Install octal socket in appropriate enclosure using two #6 or #8 metal screws.
  - 1a. Install rail mount socket on appropriate rail (DIN mount) in appropriate enclosure if applicable.
2. Wire control per wiring diagram, following N.E.C. and local codes
3. Install control module in socket.

### Sensitivites vs Maximum Probe Wire Distance\*

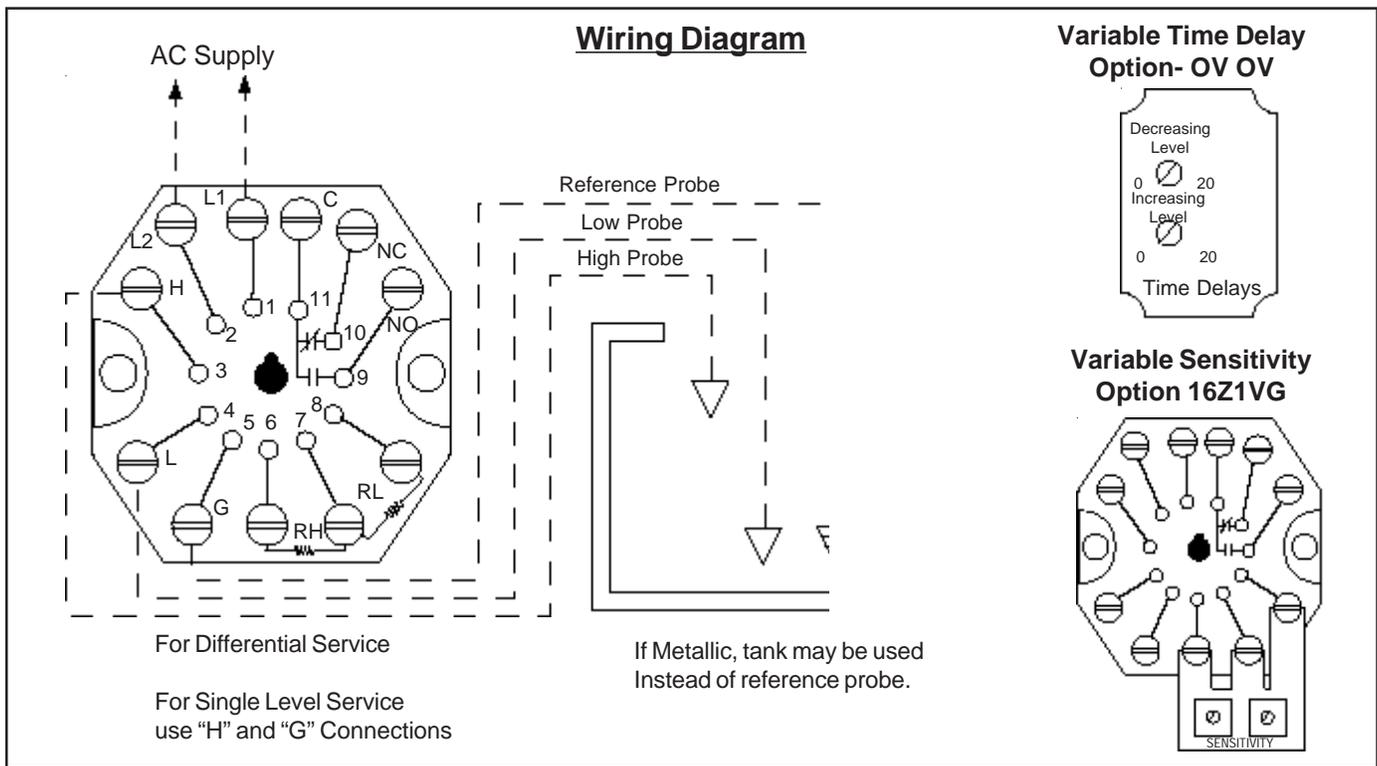
Sensitivity (K Ohms)	Distance (Ft)
4.7	10,000
10	5,700
26	2,200
50	1,075
100	570
470	270
1,000	38
Variable	See Above

\* Based on type MTW or THHN wire, #14 or #16 Awg.

### Dimensional Diagram



Use copper (60/70° C) wire only. Torque to 20 inch pounds.



### Operation

**Direct Mode- Single Level Service:** When the liquid rises to the electrode on terminal 3, 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 3. 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 3, 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 3. The control then energizes.

**Direct Mode- Differential Service:** When the liquid rises to the electrode on terminal 3, 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 4. 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 3, 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 4. The control then energizes.

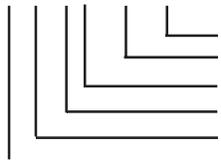
### Optional

**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 3 and 4 must be jumpered together to achieve time delays on both increasing and decreasing levels or just decreasing level.

**Chart #168B  
Set Point Resistor Values**

Sensitivity Desired (K Ohms)	Resistor Value (K Ohms) RH and RL
4.7	5.1
10	10
26	27
50	51
100	100
470	390
1000	680

16VM X X X X XX XX



**Time Delay:** (decreasing level) 1-20 sec fixed or OV for variable  
**Time Delay:** (increasing level) 1-20 sec fixed or OV for variable  
**Enclosure:** 0- none, 1-NEMA 1, 4-NEMA 4, 7-NEMA 7, 12-NEMA 12  
**Socket Style:** A- 11 Pin Octal, <sup>1</sup>B- 11 Pin DIN mount, M- None, module only  
**Supply Voltage:** 1- 120 VAC, 2- 240 VAC, 3- 24 VAC  
**Mode/Sensitivity:** Direct A- Full Set or Resistors (4.7K to 1M Ohms),  
<sup>1,2</sup>Y- variable 0-700K Inverse K- Full Set or Resistors (4.7K to 1M Ohms),  
<sup>1,2</sup>Z- variable 0-700K

<sup>1</sup>Din Mount not available with sensitivity options Y or Z

<sup>2</sup>Y and Z sensitivity options are not U.L. Listed



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