# DC Voltage

## 3300 Series Rugged Seal Meter Relay

- **Wide Variety of Control, Alarm, and Limit Uses**
- **Calibration Not Affected by Steel Panel Mounting**
- **Rugged Metal Case for Rigorous Environments**
- **Two sizes: 3-1/2" and 4-1/2"**
- **Commercially-Sealed, Moisture and Dust Proof**
- **Amplifier Input**

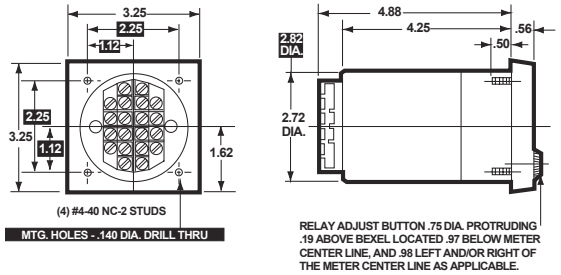

| Model Number | Size | Meter Movement |
|---|---|---|
| 3323AIXA | 3-1/2" | Annular |
| 3324AIXA | 4-1/2" | Annular |

The 3300 Series meter relays offer a wide variety of applications in control, alarm, and limit use. Photo conductor sensing eliminates all interference with the indicating meter. These relays incorporate an amplifier input which drives a rugged high-torque pivot and jewel meter. Metal-cased "Rugged Seal" construction withstands rigorous environmental conditions. The die cast metal case with a drawn steel plated rear case gives complete magnetic isolation for steel panel mounting. In addition, each controller is moisture, dust, and dirt proof for use in wash-down areas. Fail-safe circuitry opens output relays in the event of power failure. Two different sizes, 3-1/2" and 4-1/2", are available in both single and dual set point models. High-gain transistor switch circuitry provides accurate switching with a "dead band" of no more than 0.5% of full scale (F.S.). All DC voltage units offer ±2% of F.S. accuracy. This style meter is ideal for many other electrical functions. See the "Function Reference Table."

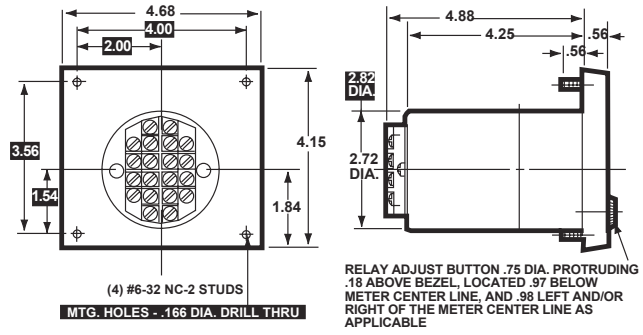
## Dimensions and Compatibility

1 = Panel Meter Cut-out Dimensions

### 3-1/2"-Model 3323AIXA




### 4-1/2"-Model 3324AIXA




### Compatibility Reference Table

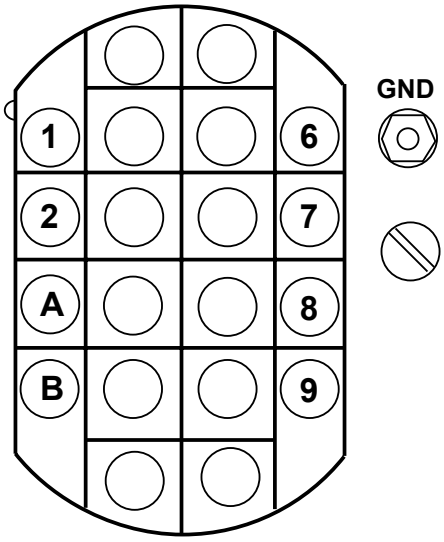
| Manufacturer | Size/Model | |
|---|---|---|
| | 3-1/2" | 4-1/2" |
| **Modutec** | | |
| Y Series | Y3S | Y4S |
| YD Series | YD3 | YD4 |

## Specifications

| | |
|---|---|
| **Accuracy:** | ±2% F.S. |
| **Movement:** | Annular, self-shielding |
| **Suspension:** | Pivot and jewel |
| **Adjustments:** | Single, 0-100% of arc; double, low limit 0-95% of arc; high limit, 5-100% of arc, Adjustable to within 4° of each other |
| **Switching:** | Within 1% of indication |
| **Differential:** | "On", "Off" difference is within 0.5% of F.S. |
| **Auto/Manual Reset:** | Latching function can be enabled independently for each relay by removing jumpers on terminal block. |
| **Contacts/Output Relays:** | DPDT relay contacts for each control point except motor load types. SPDT low point. Each set of contacts rated at 5 amps, 115 VAC. |
| **Repeatability:** | Within 0.5% F.S. |
| **Frequency Response:** | 50-1000 Hz |
| **Power:** | 108-132 VAC, 50-400 Hz |
| **Operating Temperature:** | +41ºF to +122ºF (+5ºC to +50ºC ) |
| **Circuit-to-Ground Voltage:** | 250 RMS maximum |
| **Case:** | Sealed metal, plastic window |
| **Shielding:** | Calibration is unaffected by magnetic panel mounting. |
| **Response Time:** | 1.5 seconds maximum |
| **Overload (1 sec.):** | 10 times F.S. |
| **Overload (Continuous):** | 1.5 times F.S. |
| **Repeatability:** | 2% |
| **Dial:** | Sharp clear scale. Each dial arc is calibrated to track the specific type of movement used. |
| **Resistance:** | ±15% |
| **Tracking:** | ±3% |

## Wiring Diagram

**REAR VIEW OF HEADER**




**TERMINAL DESIGNATIONS**

**A. + SIGNAL INPUT**
**B. - SIGNAL INPUT**
**1. AUTO/MAN. RESET HI SET POINT**
**2. SHORT FOR AUTO**
**6. AUTO/MAN. RESET LO SET POINT**
**7. SHORT FOR AUTO**
**8. 120 VAC ±10% 50-400 Hz**
**9. 4 VA**

**RATED CIRCUIT TO GROUND VOLTAGE: 250V AC RMS MAX.**
**ALL RELAY CONTACT POSITIONS SHOWN WITH RELAYS DE-ENERGIZED**

**Input Signal:** Input to be monitored is connected to terminals A(+) and B (-).

**Input Power:** The power source used is 120VAC ±10%, 50 to 400 Hz. The power requirement is nominally 5VA. Connect power source to terminals 8 and 9.

**Auto/Manual Reset**
There are two modes of relay logic available in the 3324AIXA: Auto Reset and Manual Reset. Auto Reset is a simple on-off action in which the high set point relay is energized when the pointer exceeds the high set point, and is automatically de-energized when the pointer again drops below the set point. The low set point relay is energized when the pointer drops below the low set point, and is automatically de-energized again when the pointer rises above the low set point.

Manual Reset is a latching action. When the pointer exceeds the high set point, the high set point relay energizes and is latched out. It can only pull in after the pointer drops below the high set point and the operator presses a reset button. In the manual reset mode the low set point relay is likewise latched out until the pointer is above the low set point and the operator presses a reset button.

**Installing Auto/Manual Reset**
If Auto Reset is desired, simply connect a jumper between terminals 1 and 2 for the high set point or 6 and 7 for the low set point.

If Manual Reset is desired, connect a normally-open SPST push button switch to the terminals as shown in the terminal designation diagram.

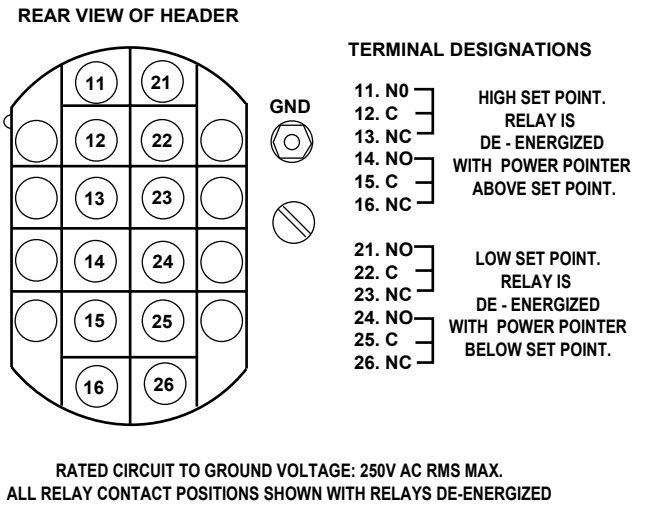
On a dual set point unit, the Auto or Manual mode may be selected for either set point independent of the mode used for the other set point. If both set points of a dual set point unit are connected for Manual Reset, two independent push buttons are usually used. However, one master reset button may be used for both set points provided it is a double pole switch with no electrical connection between poles.

## Relays

Relays can be used to turn on or turn off power to a process that the 3343AIXA and 3344AIXA are monitoring. A light can be turned on when a set point is exceeded, alerting the operator to change a condition in the process. The controller's relays for both single and dual set point meters are double pole, double throw relays.

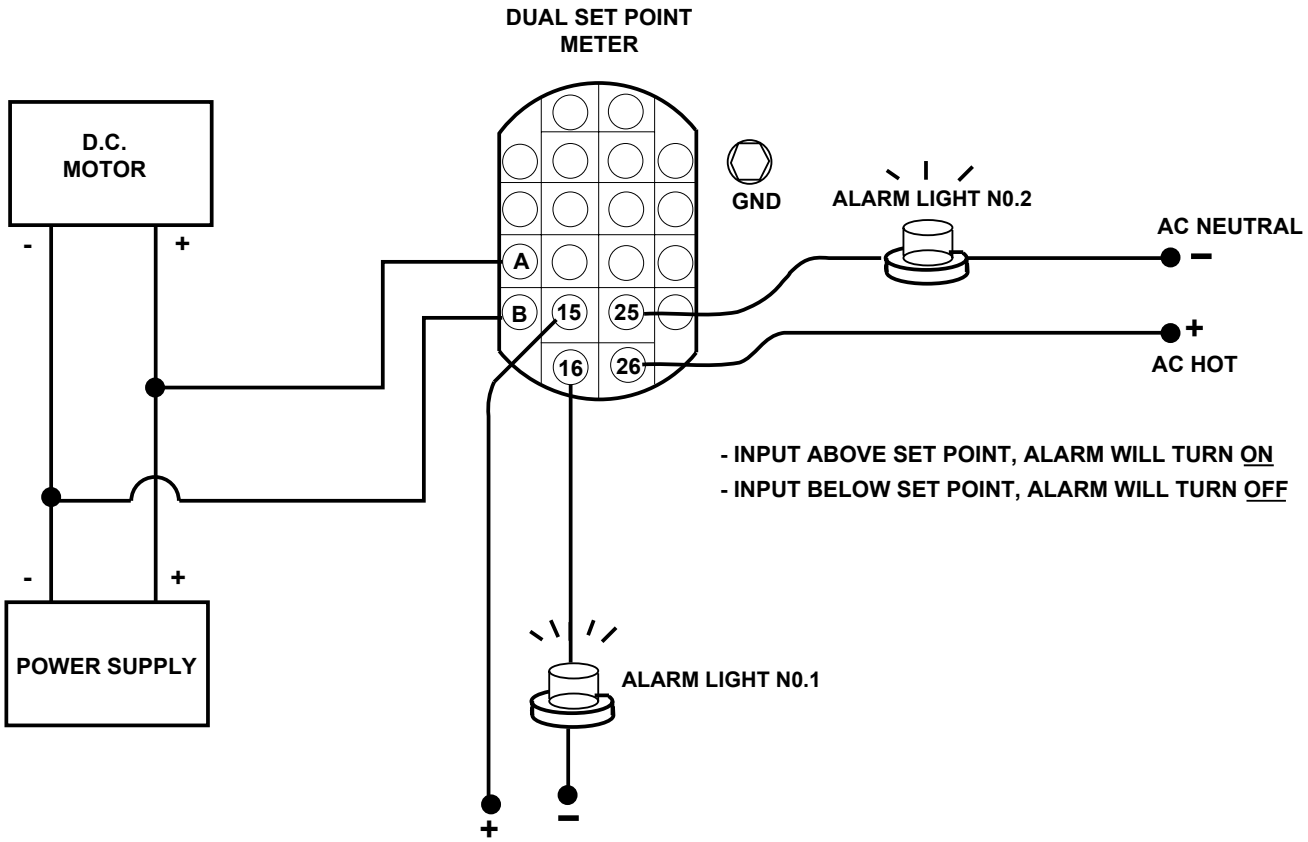
**High Set Point:** The high set point relay contacts (on both single and dual set point meters) are de-energized when the pointer is above the desired set point. For normally open relay connection use terminals 11 and 14. Terminals 12 and 15 are moving contacts. Terminals 13 and 16 are normally closed.

**Low Set Point Connection:** The low set point relay contacts (appear on dual set point meters only) are de-energized when the pointer is below desired set point. For normally open relay connection use terminals 21 and 24. Terminals 22 and 25 are moving contacts or common. Use terminals 23 and 26 for normally closed relays.




RATED CIRCUIT TO GROUND VOLTAGE: 250V AC RMS MAX.
ALL RELAY CONTACT POSITIONS SHOWN WITH RELAYS DE-ENERGIZED

## Application Example

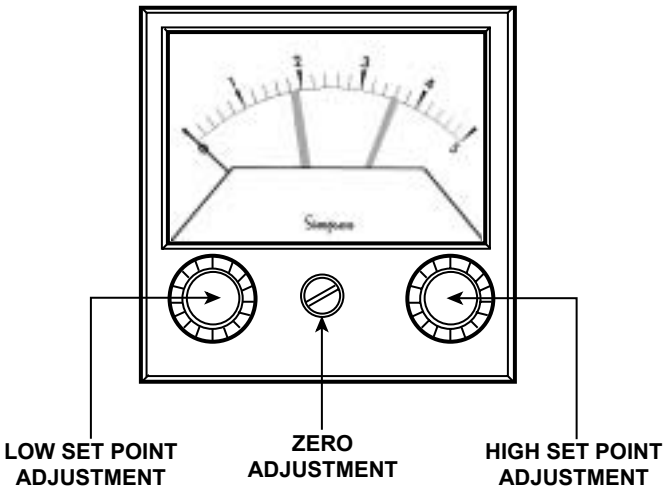



There is a need to monitor the power supply voltage of a 30 volt DC motor. The requirements call for a relay to turn on (de-energize) when the pointer is above 30 volts or below 20 volts. A model 3324AIXA is installed in parallel with the power source. Terminal A is connected to the positive lead of the power supply. Terminal B is connected to the negative lead of the power supply. For the high set point, terminals 15 (common) and 16 (normally closed) are used for normally closed relay connection. For the low set point, terminals 25 (common) and 26 (normally closed) are used for normally closed relay connection. The normally closed relay de-energizes when the signal input equals or exceeds 30 volts and falls below 20 volts. The de-energized relay will trip an alarm to alert an operator of the change in state.

## Adjustments

**Set Point Adjustment**
Low and High Set Point- To adjust dual set point units for low range, turn the adjustment knob at the left on the front face of the meter until the wide red pointer indicates the desired reading (low from 0-95% of arc). High range adjustments are made by turning the black knob at the right on the front face of the meter (Hi from 5-100% of arc).

**Zero Adjustment**
Make sure that all power to the meter has been shut down. For zero adjustment, simply turn the slotted adjustment knob that is flush with the front panel. After zeroing the pointer, turn the knob back a few degrees in the direction opposite from your final adjustment. This frees the zero adjust from the pointer mechanism.




## Ordering Information

**3300 Series** Meter Relays

| Ranges | Approx. Resistance (ohms) | Model/Size and Catalog Number | | | |
|---|---|---|---|---|---|
| | | 3-1/2" Model3323AIXA | | 4-1/2" Model 3324AIXA | |
| | | Single Set point (High Limit) | Dual Set point | Single Set point (High Limit) | Dual Set point |
| **DC Millivolts** | | | | | |
| 0-50 | 1 k | 21663 | 21623 | 21670 | 21630 |
| **DC Voltage Meters** | | | | | |
| 0-1 | 20 k | 21664 | 21624 | 21671 | 21631 |
| 0-50 | 1 M | 21665 | 21625 | 21672 | 21632 |

## Function Reference Table

For your convenience, the table below lists Rugged Seal Controller models for other electrical monitoring functions and page reference.

| Function | Section | Page |
|---|---|---|
| AC Current | E | 27 |
| AC Voltage | E | 47 |
| DC Current | E | 67 |
| Temperature | E | 93 |
| Percent Motor Load | E | 101 |

## Engineer's Notes