



## Duplex Level-Tek Model 314B

### GENERAL DESCRIPTION

The Robertshaw Model 314B Level-Tek is an all solid state RF control instrument providing ON/OFF control with two independently adjustable setpoints each with its own output control relay. For use with a vertically mounted probe assembly, the independent and non-interacting control points may be adjusted throughout the length of the probe up to the limits of the capacitance range.

This true "duplex" or dual Level-Tek provides application versatility with cost and space savings not previously obtainable. Available by order in fail-safe control modes for "High" and "Low", "High" and "High-High", or "Low" and "Low-Low". The operational mode may be changed in the field by soldered jumper connections on the chassis assembly.

The Model 314B has two independent set-points, each with adjustable differential. The Set-point and Differential adjustments are by means of nominal 20 turn sealed potentiometers with light-emitting diodes on the chassis assembly to indicate relay operation as an aid in calibration.

The aluminum die-cast enclosure for the Model 314B is suitable for use in hazardous areas classified Class I Division 1, Groups C & D as well as NEMA 4 watertight.

### PRINCIPLES OF OPERATION

The Model 314B is an all solid state instrument utilizing the latest concepts in semiconductor technology including integrated circuit differential amplifiers for increased reliability. This circuit design incorporates a patented principle for stable, anti-coating operation. Resistive values from product buildup must be ignored, otherwise errors in measurement will occur. This design permits the instrument to reliably "read through" conductive coatings and see the true, actual level.

The sensing probe capacitance is directly proportional to the process variable which is the signal desired. This "true" capacitance value is "charged" through a fixed resistor from a regulated DC Voltage source within the instrument. When the charged value reaches a pre-determined voltage level, it is instantaneously discharged and the cycle is repeated. This charging rate is compared to the charge rate of fixed reference capacitors, each fixed charge rate being adjustable by means of



Probe shown for illustration only. Must be ordered separately.

the individual set-point adjustment potentiometers. When the probe charging rate is equal to either of the fixed reference capacitor charging rates, integrated circuit amplifiers cause the appropriate control relay to de-energize.

This unique circuit requires no oscillator transformers or variable capacitors and results in continuous adjustment capability of the set-point by the use of potentiometers.

### FEATURES AND BENEFITS

- **Patented Anti-Coating Principle**  
Minimizes error due to material build-up on probe.
- **Two independent set-points and control relays**  
Space and cost savings.
- **Wide Range Adjustability**  
Operates over larger level spans.
- **Adjustable Differential on each set-point**  
Greater versatility of applications.
- **Single unit system mounts directly on the probe**  
Lower purchasing and installation costs.
- **Field selectable fail-safe modes of operation**  
Simple soldered jumper links.

**SPECIFICATIONS**

**ENVIRONMENTAL DATA**

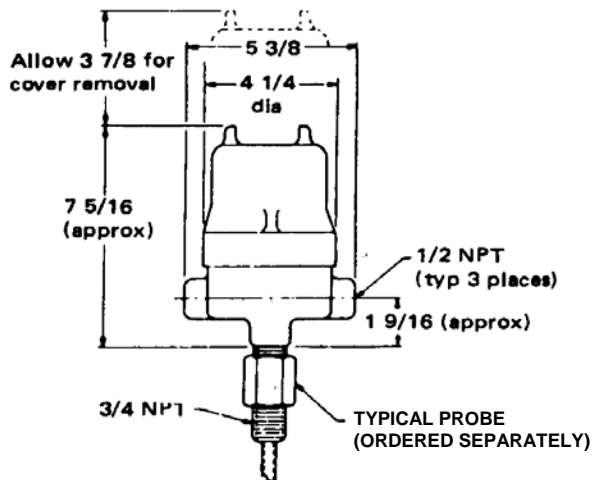
Enclosure: Explosion proof, suitable for Class I, Div. 1, Groups C & D; Class II, Div. 1, groups E, F, G hazardous locations and NEMA 4.

- Operating Temperature Limits* ..... -40°F to +160°F
- Storage Temperature Limits* ..... -55°F to +225°F
- Vibration Limits*..... 2 g's to 100 Hz
- Enclosure Classification* ..... Class 1, Division 1, Groups C and D and Watertight NEMA 4
- Operating Humidity Range* ..... 0% to 90% RH
- Temperature Coefficient* ..... 0.0065 pF/°F

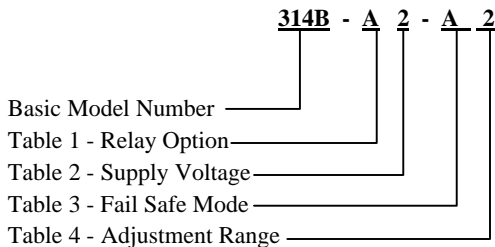
**ELECTRICAL DATA**

- Supply Voltage* ..... 26.5 VDC ± 10%, 120 VAC ± 10% or 240 VAC ± 10%
- Supply Power* ..... 5 VA Maximum
- Output Relay:*
  - Form* ..... SPDT (Electro-Mech Relays)
  - Rating* ..... 5A, 120 VAC or 28 VDC
  - Set-Point Adjustment Range* ..... 15-500 pF
  - Differential (Deadband)* ..... 0.2 pF to approximately 50% of set-point
  - Minimum Difference Between the Two Relay Set-Points* ..... 1 pF
  - Response Time* ..... 50 milliseconds
  - Repeatability* ..... Within 0.2 pF

**DIMENSIONAL DATA**



**ORDERING INFORMATION**



**BASIC MODEL**

Model No.	Description
314B	Duplex Level-Tek Control Instrument

**TABLE I - RELAY OPTION**

Designation	Description
A	Two SPDT Relays

**TABLE 2 - SUPPLY VOLTAGE**

Designation	Description
1	26.5 VDC ± 10%
2	120 VAC ± 10%, 50/60 Hz
3	240 VAC ± 10%, 50/60 Hz

**TABLE 3 - FAIL SAFE MODE**

Designation	Description
A	High and Low
B	Low and Low-Low
C	High and High-High

**TABLE 4 - ADJUSTMENT RANGE**

Designation	Description
2	Adjustable range 15 to 500 pF



**U.S.A. & Canada**

Robertshaw Industrial Products  
 1602 Mustang Drive  
 Maryville, Tennessee 37801  
 Phone: (865) 981-3100 Fax: (865) 981-3168  
<http://www.robertshawindustrial.com>

**Exports**

Invensys Appliance Controls  
 1701 Byrd Avenue  
 P.O. Box 26544  
 Richmond, Virginia 23261-6544  
 Phone: (804) 756-6500 Fax: (804) 756-6561