Electronically Controlled Resistance Boxes

AutomatoR AR100, AR200 and AR300

The automatoR Electronically Controlled Resistance Boxes are variable resistance output devices having many advanced features. Resistance values are entered via a calculator-style keypad or incrementally using a rotary switch. Values are prominently displayed, in ohms, on a large LCD. Two banana jacks at the base of the device provide easily accessible outputs. Each device comes with stacking dual banana plug to mini-alligator clip test leads for simple connection to any application.

Key Features

> **Quick Value keys** - stores/recalls up to 4 frequently used resistance values with one touch. User-definable.

> **Memory keys** - 10 additional resistance memory locations (0 - 9).

> **Current Limiter** - limits the amount of current passing through the device to prevent possible damage.

> **Increment Value setting** - for use with rotary switch, user-definable or selects standard resistance values (1%, 5%, 10%).

> **Open key** - isolates the device from the application with the touch of one key.

> **Automatic Residual Resistance** - the residual resistance of the device is automatically included in the output resistance value.

> **100% mechanical isolation** - device circuit is completely mechanically isolated from the output resistance.

> **Auto-Off Power** - the device automatically shuts off after four minutes of inactivity to conserve power.

> **Translation Table Add-On** - downloads and stores up to three different tables for translating a known physical characteristics to a resistance value. This feature is useful in simulating transducers such as platinum resistance thermometer (PRT), strain gauge and conductivity sensors etc.

> **Flash Firmware Updates** - downloads and installs the latest firmware updates from Guildline website.

KEY	DESCRIPTION	FUNCTION
menu	Displays the following submenu: 1: Standard Values 1: 1% Std Values 2: 5% Std Values 3: 10% Std Values 4: Ratiometric 2: Contrast 3: Calibrate 4: Version	Press "menu" and select one of the following: 1: Standard Values – each click of the rotary switch increases/decreases the displayed resistance value to the nearest industry standard value. Select one of the following: 1: 1% Std Values 2: 5% Std Values 3: 10% Std Values 4: Ratiometric (increases/decreases displayed value by 0.8%) 2: Contrast – adjusts display contrast 3: Calibrate – device field calibration *Refer to Calibration section* 4: Version – displays current firmware version and release date
Quick Value A, B, C, D	Recalls a resistance value with one touch. Default: A: 10 kΩ, B: 100 kΩ, C: 1 MΩ, D: 10 MΩ	To change Quick Values, enter a resistance value using the number keys. Press "sto", then "A", "B", "C", or "D".
volt	Limits the amount of current passing through the device to protect it from possible damage. Default value: 0.5 V	Press "volt". Using the number keys, enter the estimated value of the voltage being applied across the device's outputs. Press "enter" to save.
incr	Defines the amount each click of the rotary switch increases or decreases the displayed resistance value. Default value: Ratiometric (0.8% of displayed value)	Press "incr". Using the number keys, press the desired increment value. Press "enter" to save.
table	Loads up to 3 stored data tables for the translation of known physical characteristics to resistance values	**Translation Table Add-On required.** For more information, contact Guildline Instruments Limited or visit http://www.guildline.ca/
open	Isolates the device by establishing an open circuit across the device outputs.	Press "open" to open the circuit. Press "open" again to close the circuit.
←	Deletes from the display the last character entered.	Press "←".
sto	Stores a resistance value in a Quick Value (A – D) or memory location (0 – 9).	Enter the desired resistance value. Press "sto", then the desired Quick Value or memory location: A – D, 0 – 9.
rcl	Recalls a previously stored resistance value from a memory location (0 – 9).	Press "rcl", then a number key (0 – 9).
enter on / off	Turns the device on or off, and is used to select a resistance value.	To turn device on, press "enter" and release. To turn off, press "enter" and hold for 3 seconds. Auto-Off after 4 minutes of inactivity.
0 - 9, 000	Enters a numerical value.	Key "000/(-)" multiplies the displayed value by 1000. (-) is used with Translation Table Add-On only.

SPECIFICATIONS

	Model AR100	Model AR200	Model AR300
Range	Up to 24,000,000 Ω	Up to 24,000,000.0 Ω	Up to 1.500,000.00 Ω
Resolution	1 Ω	0.1 Ω	0.01 Ω
Accuracy	± 1Ω (≤1000Ω) ± 0.1% (>1000Ω)	± 0.5Ω (≤1000.0 Ω) ± 0.1% (>1000.0 Ω)	± 0.1Ω (≤5000.00 Ω) ± 0.01% (>5000.00 Ω)
Residual Resistance	1Ω±0.5Ω		
Power Rating	1.0 W		
Power Supply	4 AA batteries		

CALIBRATION

An **annual calibration** by Guildline Instruments Limited is highly recommended in order to maintain results consistent with product specifications. Only perform a field calibration when inaccurate values are suspected.

Field Calibration Overview

The total number of device resistance values to calibrated are: AR100 = **26**, AR200 = **30**, AR300 = **26**
To abort calibration, press "menu" at any time prior to entering the final residual resistance value. None of the previously entered resistance values will be saved.

Required Tools

A calibrated, high precision ohmmeter having an accuracy greater than or equal to the device being calibrated. The ohmmeter must have 4-wire ohms measurement capability and a minimum 6.5 digit resolution.

Instructions

1. Connect the automatoR to the ohmmeter using a 4-wire ohms measurement setup, at the end of the test leads to be used, in order to automatically include the test leads resistance in the calibration.
2. Press "menu", then select "3: Calibrate".
3. Using the number keys, enter the resistance value requested by the screen prompt. Press "enter" to continue.
4. Follow the screen prompts for the remaining resistance values.
5. Enter the final residual resistance value and press "enter".
6. When the message "Calibration Saved" is displayed, calibration is complete

OPERATING INSTRUCTIONS

1. Turn on the device by pressing and releasing "enter".
2. Select a desired resistance value in one of the following ways:
   a) Rotate switch;
   b) Enter a value using the number keys, then press "enter";
   c) Press a Quick Value key (A – D) to display a user-defined value or a factory default value. Default values are: A: 10 kΩ; B: 100 kΩ; C: 1 MΩ; D: 10 MΩ
   d) Press "rcl" then a number key (0 – 9) to display a user-defined value or a factory default value. Default values are: 0: 100 Ω; 1: 1 kΩ; 2: 2 kΩ; 3: 3 kΩ; 4: 4 kΩ; and so on.
3. Press "volt" and input the application voltage using the number keys, then press "enter". (Default: 0.5 V). This feature restricts the use of resistance values that would cause the device to exceed its 1 W rating. **It is important to check this setting prior to using the device.**
4. With the test leads provided, insert the dual banana plug into the output jacks on the device, and then connect the mini-alligator clips to the application.
5. To isolate the device from the application, press "open" to open the circuit. Press "open" again to close the circuit.
6. To turn off the device, press and hold "enter" for 3 seconds. Auto-Off after 4 minutes of inactivity.

Dimensions 19.51 x 10.11 x 4.39 cm (7.68 x 3.98 x 1.73 in)

Weight 526 g (18.5 oz)

ACCESSORIES

Translation Table Add-on ..... Part No. 91.0001
-Download Translation Data Tables to Simulate Transducers

Test Leads .... Part No. 91.0002
-Dual Banana Plug to Mini-Alligator Clips

Communication cable. .... Part No. 91.0003
5'communication cable and adapter for use with 91.0001

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