



# Instruction Sheet

## coaxial DEKASTAT® decade resistor



**Electro Scientific Industries**

13900 N.W. SCIENCE PARK DRIVE • PORTLAND, OREGON 97229

MAY 1971

### description

ESI DEKASTAT decade resistors are coaxial precision switched-resistance decades. The models described are typical of through-panel-mounting units. Other models may

differ in details of specifications, but other information on this sheet is applicable to all through-panel-mounting DEKASTATS

### specifications

SPECIFICATION		DS 1265	DS 1365	DS 1463	DS 1464
Accuracy of Resistance	Initial	$\pm(0.01\% + 0.5 \text{ dial division})$ $\pm(0.01\% + 1.5 \text{ dial division})$ with 10.5 $\Omega$ rheostat	$\pm(0.01\% + 7 \text{ m}\Omega)$	$\pm(0.01\% + 0.5 \text{ dial division})$ $\pm(0.01\% + 1.5 \text{ dial division})$ with 10.5 $\Omega$ rheostat	$\pm(0.01\% + 7 \text{ m}\Omega)$
	Long-Term	$\pm(0.02\% + 1 \text{ dial division})$ $\pm(0.02\% + 1.5 \text{ dial division})$ with 10.5 $\Omega$ rheostat	$\pm(0.02\% + 10 \text{ m}\Omega)$	$\pm(0.02\% + 1 \text{ dial division})$ $\pm(0.02\% + 1.5 \text{ dial division})$ with 10.5 $\Omega$ rheostat	$\pm(0.02\% + 10 \text{ m}\Omega)$
Change from Zero Setting					
Short-Term Switching Repeatability		$\pm 0.2 \text{ dial division}$ $\pm 0.5 \text{ dial division}$ with 10.5 $\Omega$ rheostat	$\pm 0.5 \text{ m}\Omega$ (typical)	$\pm 0.2 \text{ dial division}$ $\pm 0.5 \text{ dial division}$ with 10.5 $\Omega$ rheostat	$\pm 0.5 \text{ m}\Omega$ (typical)
Number of Decades		Two plus rheostat	Three	Three plus rheostat	Four
Total Resistance		1.2, 12, and 120 k $\Omega$	1.2, 12, and 120 k $\Omega$	12 and 120 k $\Omega$	1.2, 12, and 120 k $\Omega$
Resistance at Zero Setting (Approximate)		30 m $\Omega$	20 m $\Omega$	30 m $\Omega$	20 m $\Omega$
Breakdown Voltage (Peak to Case)		1000 V	1000 V	1000 V	1000 V
Dimensions	Width	3 in. (7.6 cm)	3 in. (7.6 cm)	3 in. (7.6 cm)	3 in. (7.6 cm)
	Height	3 in. (7.6 cm)	3 in. (7.6 cm)	3 in. (7.6 cm)	3 in. (7.6 cm)
	Depth	6.1 in. (15.5 cm)	6.1 in. (15.5 cm)	8.5 in. (24 cm)	8.5 in. (24 cm)
	Behind Panel	4.9 in. (12.5 cm)	4.9 in. (12.5 cm)	6.9 in. (17.5 cm)	6.9 in. (17.5 cm)
Weight		1.7 lb (800 gm)	1.7 lb (800 gm)	2.2 lb (1 kg)	2.2 lb (1 kg)

RATINGS PER STEP FOR EACH DECADE  
Models DS 1265, DS 1365, DS 1463, and DS 1464

RESISTANCE PER DECADE ( $\Omega$ )	SMALLEST STEP ( $\Omega$ )	INCREMENTAL ACCURACY		COEFFICIENTS		MEASUREMENT DUTY** MAXIMUM RATINGS		PEAK VOLTAGE (V/step)
		INITIAL (%)	LONG-TERM (%)	TEMPERATURE (ppm/ $^{\circ}\text{C}$ )	POWER (ppm/mW/step)	POWER (mW/step)	CURRENT (mA)	
10 M	1 M	0.02	0.03	5	0.3	22	0.15	300
1 M	100 k	0.02	0.03	5	0.3	220	1.5	300
100 k	10 k	0.02	0.03	5	0.3	500	7	
10 k	1 k	0.02	0.03	5	0.3	500	23	
1 k	100	0.02	0.03	5	0.3	500	71	
100	10	0.03	0.03	15	0.9	500	230	
10	1	0.1	0.12	20	1.2	500	710	
1	0.1	1.0	1.0	60	6	250	1600	
0.1	0.01	10	10	400	60	160	4000	
1050	10*	0.5 div	1 div			40	60	
105	1*	0.5 div	1 div			40	200	
10.5	0.1*	1 div	1.5 div			5	230	

\*Interpolating rheostat ( $\Omega$ /dial division).

\*\*Intermittent use such that temperature rise of the resistor will not appreciably exceed that which would occur in free air.

U.S. Patents 2,786,122, D-198,163, and 3,150,634

# mounting instructions

## REMOVE DIALS FROM CONTROL SHAFT

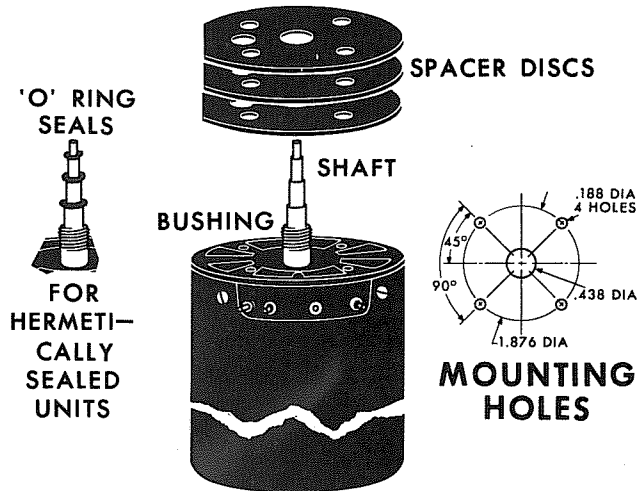
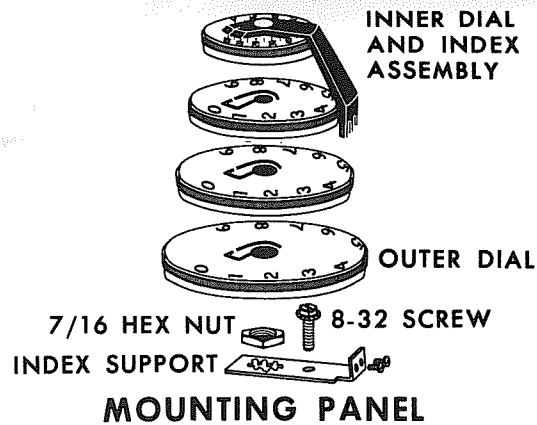
1. *Important:* Set all dials to zero before disassembling.
2. Loosen 2 index-mounting screws.
3. Turn inner dial to 3 (or 30) and loosen setscrew near number 5 (or 50).
4. Turn inner dial to 0 and loosen setscrew near number 8 (or 80).
5. Lift inner dial and index assembly straight off of shaft.
6. Loosen setscrew on each of the other dials.
7. Lift each dial straight off of shaft. On hermetically sealed units, remove all 'O' rings.
8. Remove 7/16 in. hexagonal nut.
9. Remove 8-32 screw and remove dial index support.

## MOUNT THROUGH PANEL

10. Drill or punch panel mounting holes either for bushing mount or four-screw mount. See panel mounting hole diagram.
11. Remove spacer discs, if necessary, to obtain effective panel thickness between 1/4 in. and 3/16 in. Each spacer is approximately 1/16 in. thick.
12. Insert DEKASTAT shaft and bushing through mounting hole.
13. Place index support and 7/16 in. nut over bushing and tighten finger-tight.
14. Rotate index support over hole below and to right of bushing.
15. Fasten index support to DEKASTAT through panel with 8-32 screw.
16. If four-screw mounting is used, insert and tighten three additional 8-32 mounting screws in appropriate holes.
17. Tighten 7/16 in. nut.

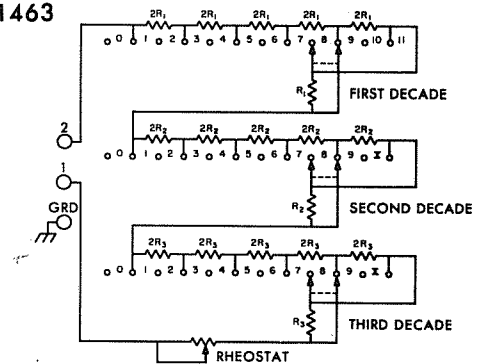
## REASSEMBLE

18. Slip the dials on the shaft. On hermetically sealed units install 'O' ring under each dial except the largest. Position the numbers so that 0 is at 9 o'clock. The dial index support should be between numbers 4 and 5. Do not tighten dials.
19. Slip the inner dial and index assembly on the shaft with 0 lined up with index mark.
20. Line all dials up with index, being careful not to turn shafts under dials. If any dial turns the shaft, it will move a switch to a detented position. If this happens, turn the dial back to reset the switch, and try to slip it carefully to the proper position. If any dial is not lined up and will not slip easily on the shaft, remove the dials and try again to line them up as they are reassembled.
21. Pull outer dial slightly away from panel to avoid friction with bushing. Spread other dials apart evenly. On hermetically sealed units (before tightening setscrews), press dial so there is slight compression of 'O' ring seals. Tighten setscrews, being careful not to turn the dials. On the inner dial tighten only the setscrew near 8 (or 80).
22. Connect a low-resistance ohmmeter or low-resistance bridge to the terminals to check for proper zero setting. If the resistance is more than 20 or 30 milliohms, turn the dials to find the minimum resistance. Especially check inner dials that operate rheostats. Some rheostats have a slight detent at 00, others do not. In either case, minimum resistance should be at 00.
23. If any dial is set incorrectly, loosen setscrew and adjust it for correct reading, being careful not to turn the shaft. On hermetically sealed units (before tightening setscrews), press dial so there is slight compression of 'O' ring seals. Retighten setscrew, and check again for zero setting.
24. Turn inner dial to 3 (or 30) and tighten setscrew near number 5 (or 50).



## schematic diagram

### MODEL DS 1463



## warranties

### WARRANTY OF QUALITY

Electro Scientific Industries, Inc. warrants its products to be free from defects in material and workmanship for the following periods:

1. Two years for components and instruments using passive circuitry.  
One year for repairs of out-of-warranty items.
2. One year for components and instruments using active circuitry (see ESI Metrology Catalog). Six months for repairs of out-of-warranty items.

During the in-warranty periods, we will service or, at our option, replace any device that fails in normal use to meet its published specifications. Batteries, tubes and relays that have given normal service are excepted.

### WARRANTY OF TRACEABILITY

Electro Scientific Industries, Inc. maintains reference standards of measurement which are compared with the U. S. National Standards through frequent tests by the U. S. National Bureau of Standards.

ESI working standards and testing apparatus used are calibrated against the ESI reference standards in a rigorously maintained program of measurement control.

The manufacture and final calibration of all ESI instruments are controlled by use of the ESI reference and working standards and testing apparatus in accordance with established procedures and documented results. (Reference MIL-C-45662)

Final calibration of this instrument was performed with reference to the mean values of the ESI reference standards or to ratio devices that were verified at the time and place of use.