

THE NUMERIK INDICATOR

Selection of the best available readout indicator has been an important part of the development of new in-line-presentation instruments like the one described in this issue.

In the majority of general-purpose applications, and particularly in transistor circuits, the use of incandescent lamp illumination is especially suitable. Transistors operate typically at low voltages, and incandescent lamps adapt easily to these conditions without requiring complicated ancillary circuitry.

After a careful survey of available designs, the products of K.G.M. Electronics, Richmond, England, were judged to have the best combination of these desirable characteristics:

1. Excellent presentation with clear, brilliant readout. The white light is both more pleasing to the eye and actinically more efficient than the orange-red of neon displays.
2. Neat, compact design, with effective means of heat dissipation to insure long lamp life.
3. Use of standard, readily available replacement lamps. Replacement, infrequently required, is easily done.

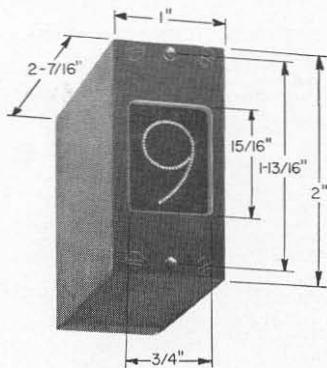


Figure 1. View of the Type IND-0300 NUMERIK Indicator, with dimensions. (Allow additional $\frac{1}{16}$ " on depth, for common terminal.)

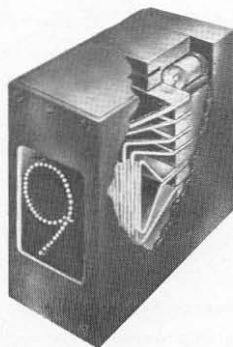


Figure 2. Cut-away view of the Type IND-0300, showing construction.

4. Efficient use of light from low-power lamps.
5. Low parallax. All symbols appear to be nearly in the same plane.
6. Wide viewing angle.
7. Reasonable price.

The TYPE IND NUMERIK Indicators combine ten (or twelve) incandescent bulbs which can be illuminated individually and which, in turn, end-fire illuminate clear plastic strips, as illustrated in Figure 2. Light is introduced at one end of a thin, clear acrylic plate and is conducted with little attenuation along reflective ducting to the display surface where it is translated into a bright display by closely spaced dots scribed in the form of the numeral or symbol. A stack of ten plates is just over $\frac{5}{16}$ inch deep.

Light transmission through the acrylic is so good that the bottom symbol of the stack appears to have about the same brightness as the top symbol. Thin sheets of reflective opaque material, which separate the paths through which the light to the display surface is conducted, reduce cross illumination to the point where all symbols except the one illuminated are, for practical purposes, not visible.

Because of the thin stack and excellent light conductivity, the NUMERIK Indi-

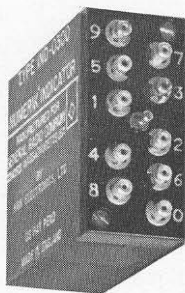


Figure 3. Rear view of the Type IND-0300, showing terminals.

icator has the unusually wide viewing angle of 120°.

The units are conveniently mounted behind the panel with only two screws.

To achieve long lamp life, the lamps are mounted in a drilled, solid aluminum block which serves as an efficient heat sink. Further, the sink is joined to the front panel of the instrument by large-cross-section aluminum side blocks. This configuration leads to cool operation and to lamp life averaging 5,000 hours under switching conditions.

Lamps are readily replaced. The removal of two screws at the back of the

Indicator frees the lamp block and terminal plate as a unit.

Typical uses of the NUMERIK Indicator are found in annunciators, computers, counters, digital voltmeters and similar instruments, indicator boards for process control, paging systems, programmers, radar, timing systems, and clock displays.

Two types are available from stock: The TYPE IND-0300, which has ten numerals, zero through nine; and the TYPE IND-1801, which has the ten numerals plus a comma on the right side and a decimal point centered on the left side of the numerals. Additional types with letters and other symbols are available on special order.

The NUMERIK Indicators are manufactured for General Radio by K.G.M. Electronics under an agreement that makes General Radio the exclusive distributor for the United States and Canada.

SPECIFICATIONS

Lamps: 14-volt, 80-milliampere, 0.5 candle-power T-1¾ bulb; G.E. #330 or equal. Working life approximately 5000 hours (switching with 10% duty ratio).

Viewing Angle: 120° horizontal; 60° vertical.

Symbol Height: 1⅜ inch.

Lamp Holder Block: Solid aluminum heat sink

with nylon-filled Bakelite backing block. Nickel-silver contact springs and 11 silver-plated terminals (13 for TYPE IND-1801), one for each lamp and a common ground. The ground connection is to the case of the TYPE IND-0300; it is insulated from the case in the TYPE IND-1801.

Mounting: Back-of-panel by two 4-40 screws.

	TYPE IND-0300	TYPE IND-1801
Window Size:	¾ by 1⅝ inch	¾ by 1⅞ inches
Mounting:	1⅜ inches, centers	2⅜ inches, centers
Dimensions: Width Height Depth (including terminals)	1 inch	1 inch
	2 inches	2⅜ inches
	2½ inches	2⅞ inches
Net Weight:	4½ ounces	5 ounces
Code Word:	INDAK	INDIG
Prices:	1-19	\$33.20
	20-49	30.60
	50-99	28.60
	100-299	27.20
	300-999	24.70
	1,000-4,999	22.00
	5,000-9,999	18.40
10,000-up	16.90	
		\$33.60
		32.00
		30.00
		28.60
		26.10
		23.30
		19.60
		18.10

Patent Applied For.