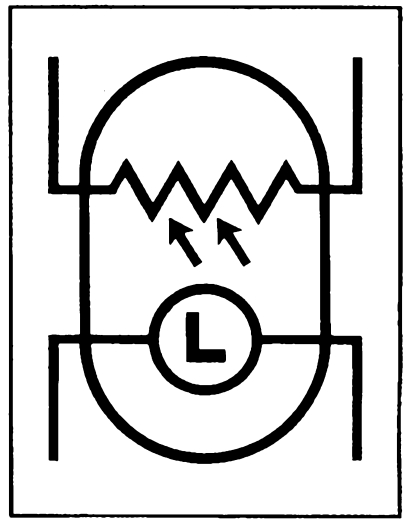
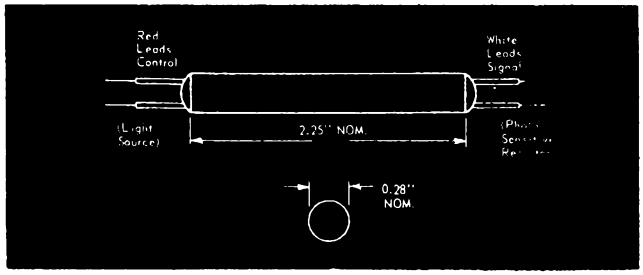
RAYTHEON the raysistor®

The Raysistor is a four terminal optoelectronic device which performs a variety of control functions, providing noise-free control of AC or DC signals over a wide dynamic range without transients or contact (or wiper) chatter. Since there are no moving parts, Raysistors are exceptionally rugged and have inherently long life in typical applications as variable resistors, solid state switches, relays, and voltage or signal isolators.

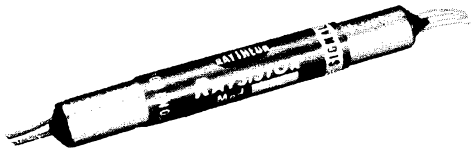
Operation of the Raysistor is on the principle of controlled light acting on a photoresistive element. No electrical or mechanical connection exists between the control and signal circuits.



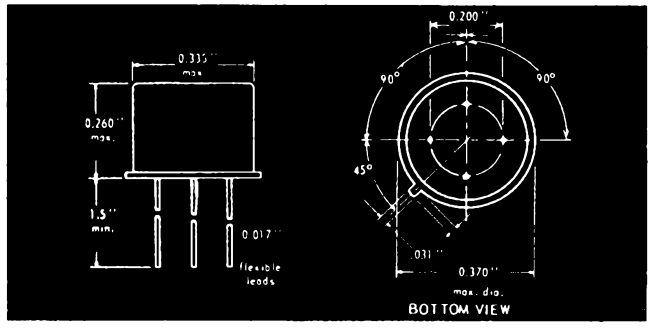


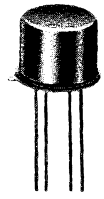
TERMINAL CONNECTIONS

Red leads to control circuit (Light Source)
White leads to signal circuit (Photocell)



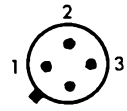
CK1101, CK1102, CK1103, CK1104, CK1111, CK1112





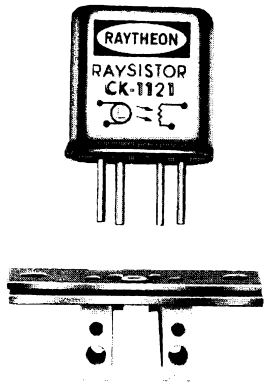
CK1114, CK1115, CK1116

TERMINAL CONNECTIONS

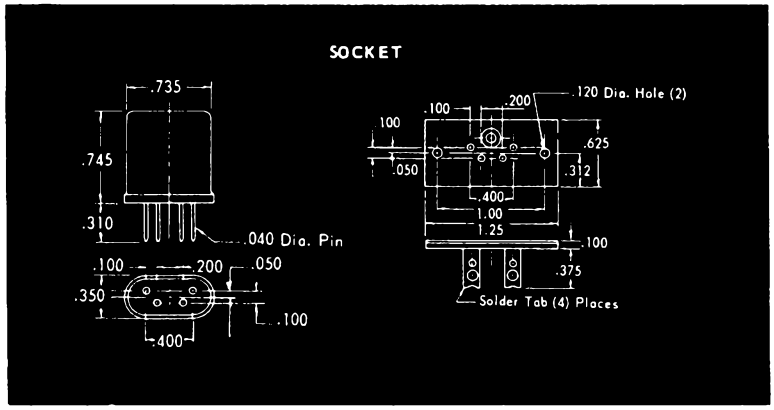


BOTTOM VIEW

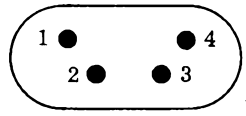
Leads 2 and 4 . . Control Circuit (Light Source)
Leads 1 and 3 . . . . Signal Circuit (Photocell)



CK1121, CK1122,
CK1123, CK1124

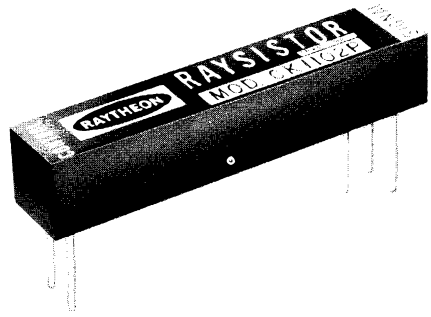


TERMINAL CONNECTIONS

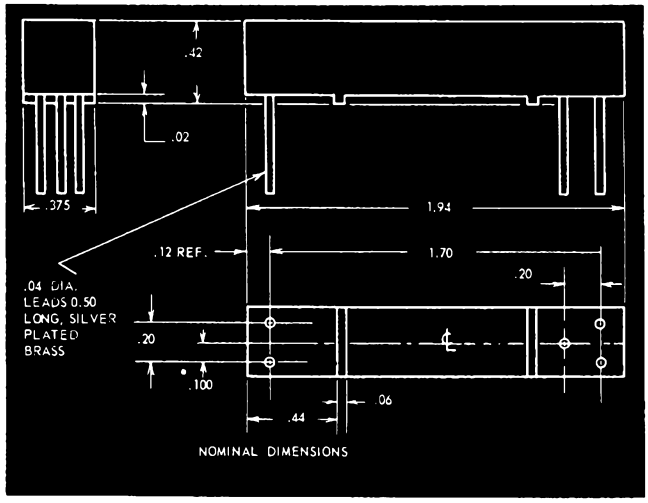


Bottom View

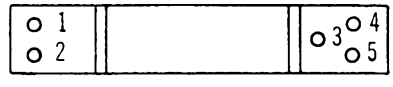
Pins 1, 2 Control Circuit (Light Source)
Pins 3, 4 Signal Circuit (Photoresistor)



CK1101P, CK1102P, CK1103P,
CK1104P, CK1111P, CK1112P



TERMINAL CONNECTIONS



Bottom View.

Pins 1, 2. Control Circuit (Light Source)
Pin 3. Shield (Ground)
Pins 4, 5. Signal Circuit (Photocell)

MODEL	CONTROL LAMP		SIGNAL—PHOTOCELL								GENERAL				MODEL
	VOLTAGE	NOMINAL CURRENT RANGE (MA)	RESISTANCE IN OHMS ON[D] TYP.	ON[D] MAX.	OFF[E] 50V TYP.	OFF[E] 50V MIN.	VOLTAGE (MAX.)	MAX. POWER[I] (MW)	TYPICAL SWITCHING TIME[H] (SECONDS) ON[F]	TYPICAL SWITCHING TIME[H] (SECONDS) OFF[G]	SHUNT CAPACITY (pf)	COUPLING CAPACITY (pf)	WEIGHT (OZ.)	LIGHT SOURCE TYPE[A]	
CK1101 CK1101P	120[B]	1-3[C]	600	1000	5×10^7	10^7	60	75	.0012[K]	.060	4	.001	.2	N	CK1101 CK1101P
CK1102 CK1102P	0-1	0-50	550	700	10^7	10^6	60	75	.020	.300	4	.003	.2	I	CK1102 CK1102P
CK1103 CK1103P	0-5	0-175	55	150	10^7	10^6	60	75	.020	.800	4	.005	.2	I	CK1103 CK1103P
CK1104 CK1104P	0-25	0-37	55	150	10^7	10^6	60	75	.010	.450	4	.01	.2	I	CK1104 CK1104P
CK1111 CK1111P	120[B]	1-3[C]	14K	30K	7×10^8	2.5×10^7	300	75	.002[K]	.105	.8	.002	.2	N	CK1111 CK1111P
CK1112 CK1112P	0-10	0-17	340	700	10^7	10^6	60	50	.030	.400	4	.04	.2	I	CK1112 CK1112P
CK1114	0-1	0-17	450	850	3×10^8	10^6	100	100	.018	.060	1.5	1.0	.04	I	CK1114
CK1115	0-4	0-55	100	200	10^8	10^7	200	100	.010	.300	2	1.0	.04	I	CK1115
CK1116	0-4	0-14	200	350	10^8	10^7	200	100	.010	.200	2	1.0	.04	I	CK1116
CK1121	0-5	0-55	100	150	10^9	5×10^7	200	100	.004	.250	2	.1	.1	I	CK1121
CK1122	0-10	0-17	650	1000	10^9	5×10^7	200	100	.030	.225	2	.1	.1	I	CK1122
CK1123	0-25	0-37	100	150	10^9	5×10^7	200	100	.010	.300	2	.1	.1	I	CK1123
CK1124[J]	150[B]	.1-1.2	2500	3000	10^8	2×10^7	200	100	.002[K]	.100	2	.1	.1	N	CK1124[J]

NOTES

A. Letter "N" designates a gas discharge type light source; "I" designates an incandescent type light source.

B. Voltage stated is DC or Peak. A current limiting resistor must be used in series with the control lamp. A typical value is 20 K ohms. (100 K ohms for CK1124).

C. The control current is linear with voltage over the stated range. It is possible to operate the light source below the lower limit, but either a constant current source must be used or the supply voltage and series limiting resistor must be increased to improve stability.

D. The nominal "on" resistance is the typical value of resistance of the photocell when the nominal voltage is applied at the control terminals, measured at 25° C. Under these conditions the "on" resistance will not exceed the maximum value indicated.

E. The "off" resistance has a negative temperature coefficient. Typical values of "off" resistance are 100 megohms at 25° C, 20 megohms at +65° C, and 1000 megohms at −55° C, measured with a 50 volt signal voltage.

F. The "on" switching time is defined as the time required for the voltage across the photocell to fall to 10 per cent of its initial value, measured from the instant that maximum rated control voltage is applied to the lamp. It is a function of both the signal voltage and of the signal circuit load. In general, "switch-on" time decreases with lower signal voltages and decreases with increased load resistance.

G. The "off" switching time is defined as the time required for the voltage across the photocell to rise to 90 per cent of its final value from the instant that maximum rated control voltage is removed from the lamp. It is also a function of both the signal voltage and of the signal circuit load. In general, "switch-off" time decreases with lower signal voltages and increases with increased load resistance.

H. Test conditions for switching time:
signal voltage— 50 volts
signal circuit load—100K Ohms

I. The 100 milliwatt rating on the photocell applies only to room ambient temperatures and below. Maximum dissipation at 65° C is 25 milliwatts.

J. Correct polarity must be observed to realize performance specified. Pin number 1 must be positive with respect to pin number 2.

K. Switch-on time is dependent upon rate of successive firing of the lamp. Initial switch-on time may vary up to 100 ms. Specified values apply when control circuit is energized at a rate of 2 cps or faster.

Distributors of Raytheon Components in the United Kingdom

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RAYTHEON