#### **CONTACT RATINGS:**

Standard Contact Material: KHP and KHS: 3/2" Gold-flashed silver. Both rated 3 amps at 30 VDC or 120 VAC Resistive.

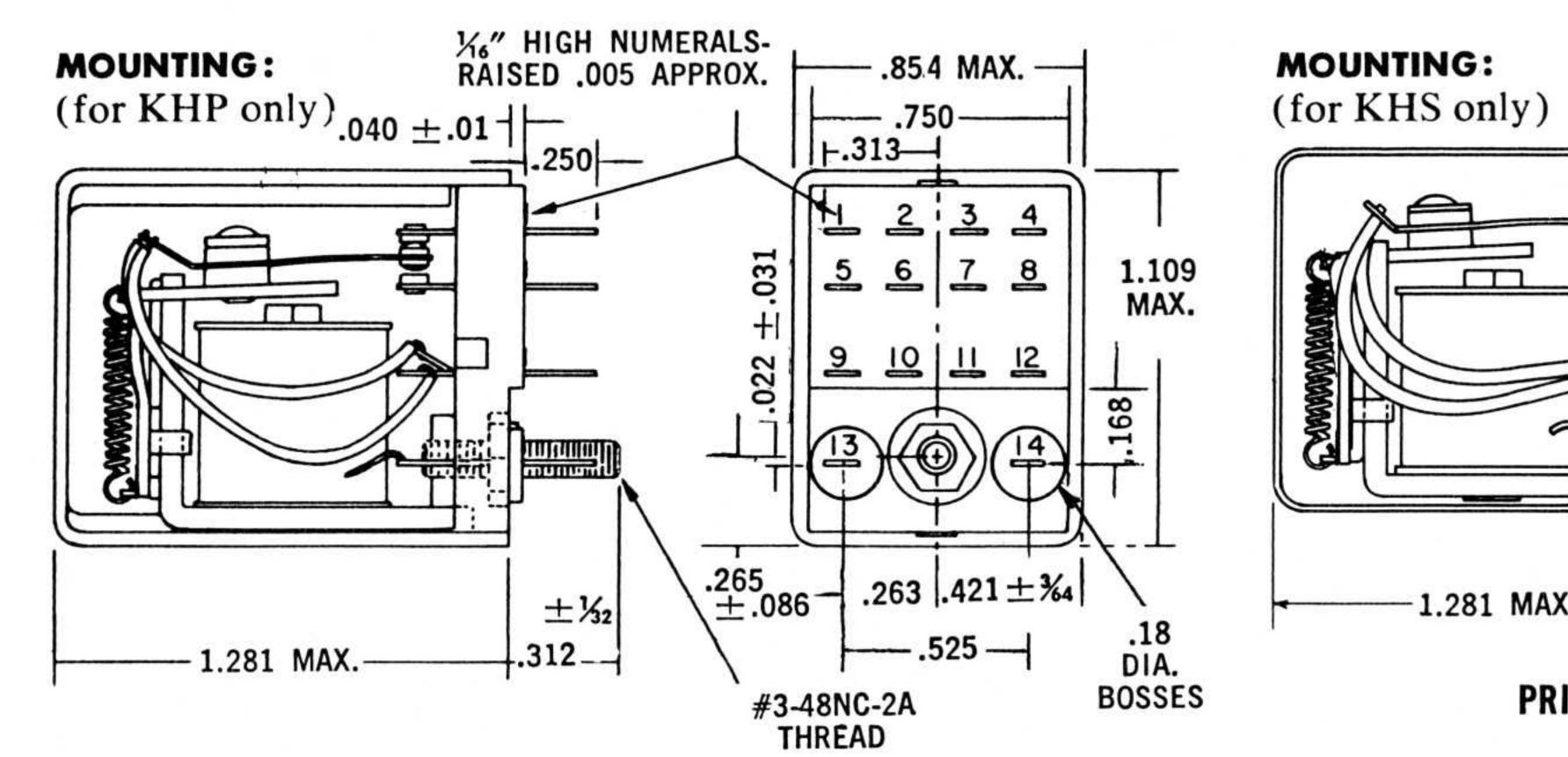
Also Available: KHP and KHS: 3/2" Silver Cadmium Oxide: Rated 3 amps at 30 VDC or 120 VAC Inductive. Ideal for arc resisting and non-sticking characteristics.

KHP only: 3/2" Palladium: Rated 3 amps at 30 VDC or 120 VAC Resistive—for longer mechanical life. 3/32" Gold Alloy: For low level applications up to 2 amps Resistive. .770 ---

# TIME VALUES FOR STANDARD RELAYS:

Nominal Voltage $@+25^{\circ}$ C.	Maximum Time Values	
Pull-in time	13 milliseconds	
Drop-out time	10 milliseconds	

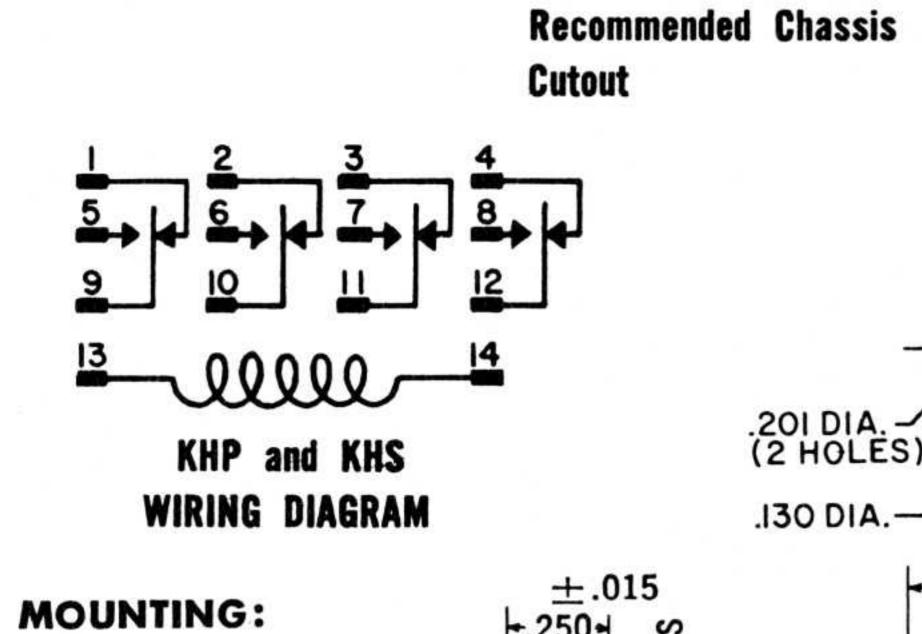
Standard KHP and KHS relays are stocked by leading electronic parts distributors throughout the United States and Canada.

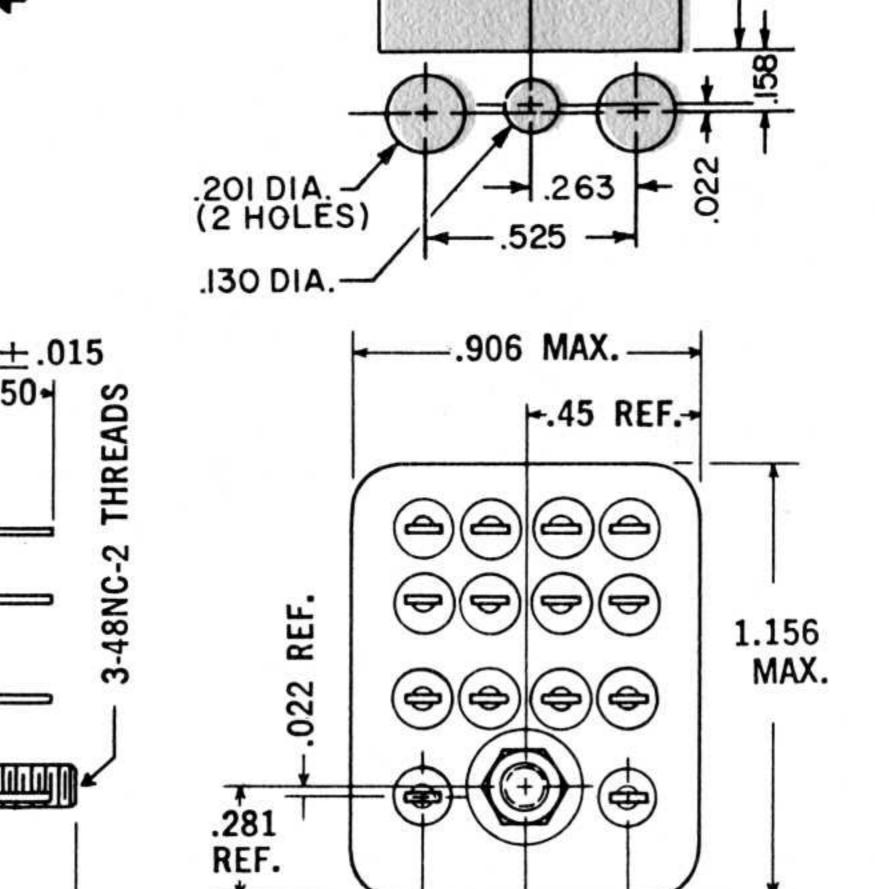


Type 731R available

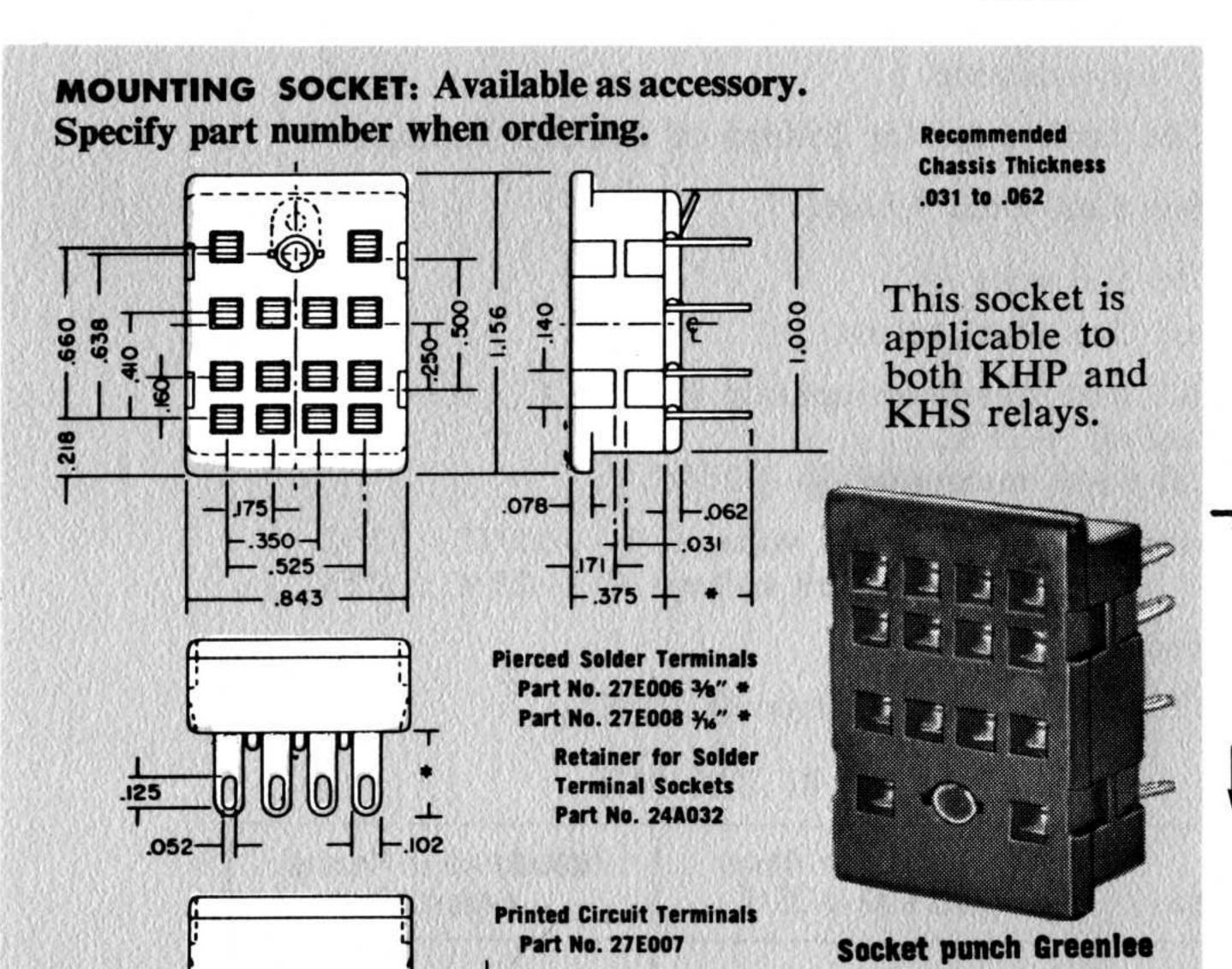
Rockford, Illinois.

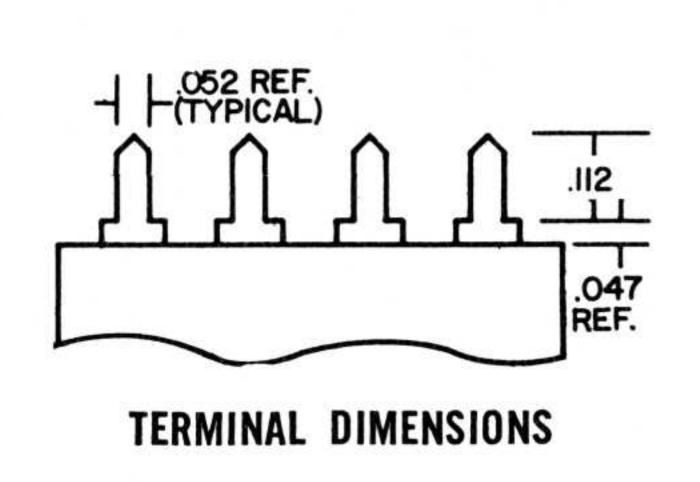
from Greenlee Tool Co.,

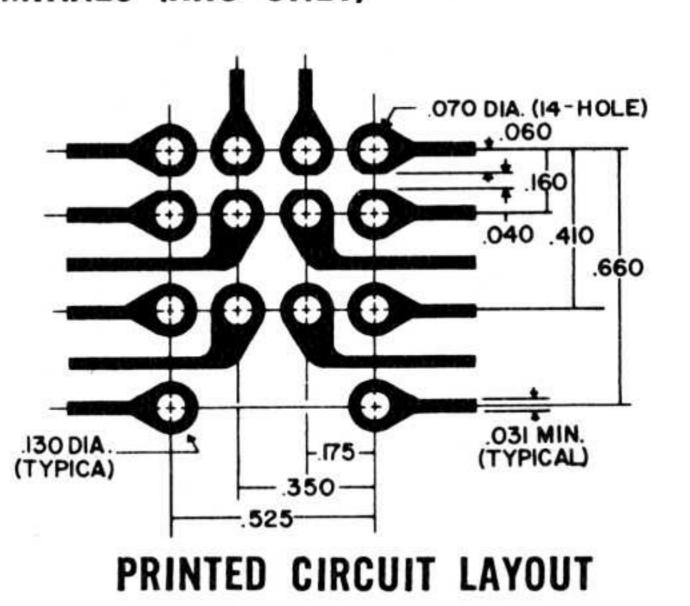


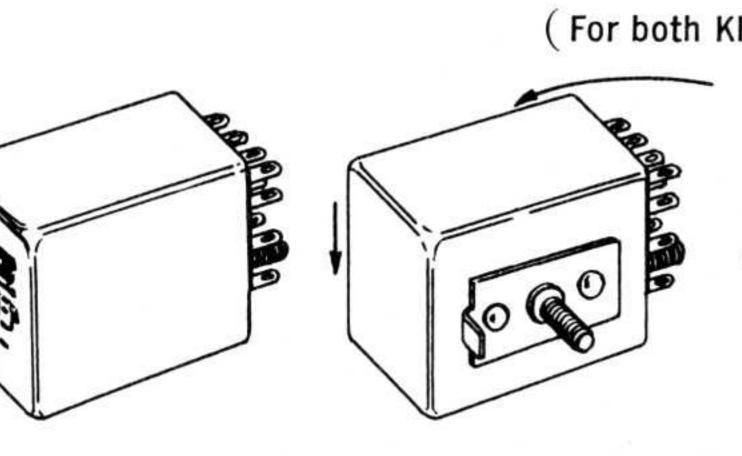


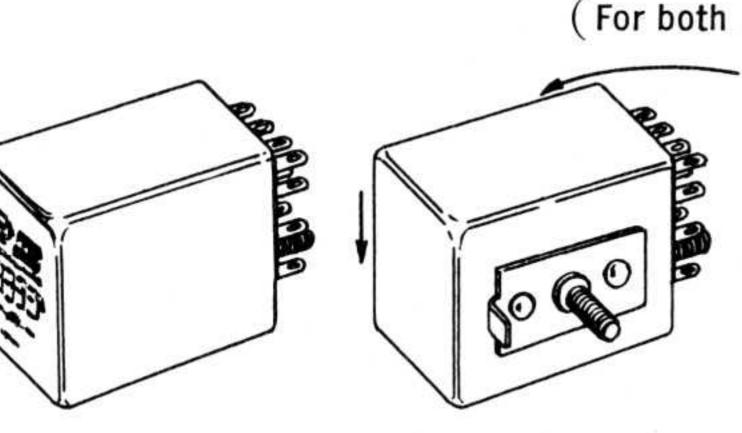
PRINTED CIRCUIT TERMINALS (KHC ONLY)

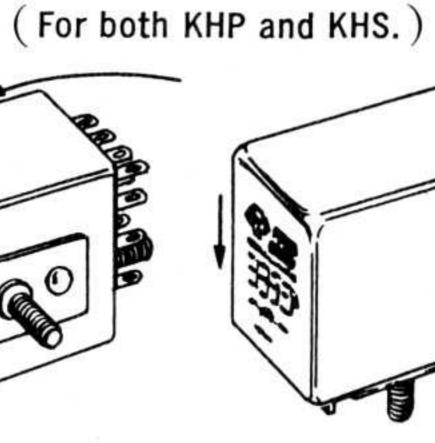




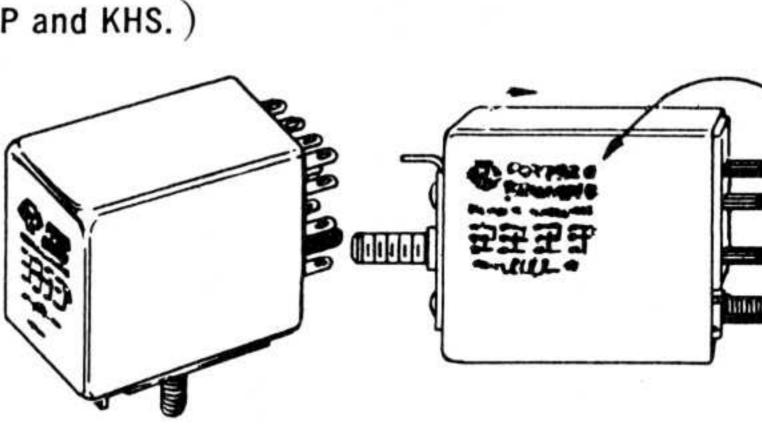








MOUNTING PLATE WITH STUD:

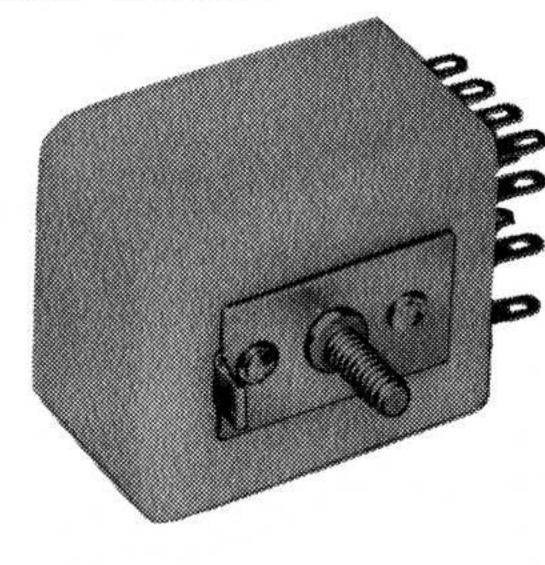


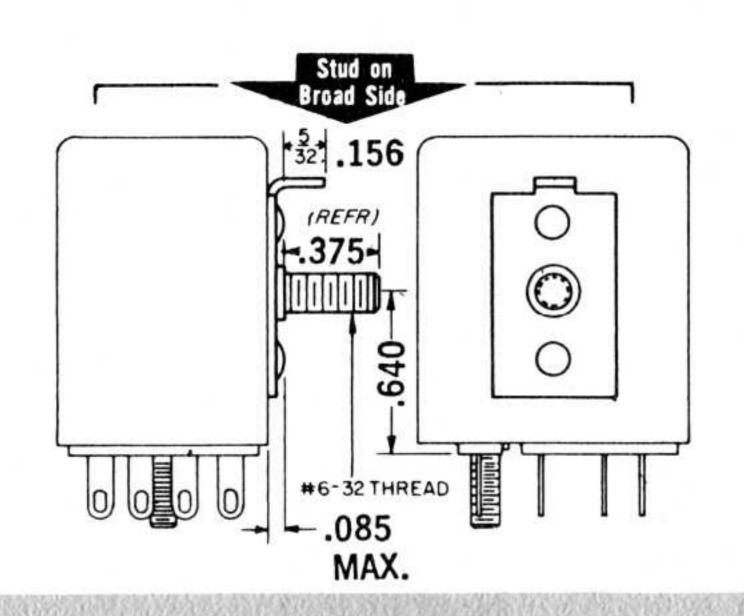
Markings on opposite opposite bracket. end from terminals.

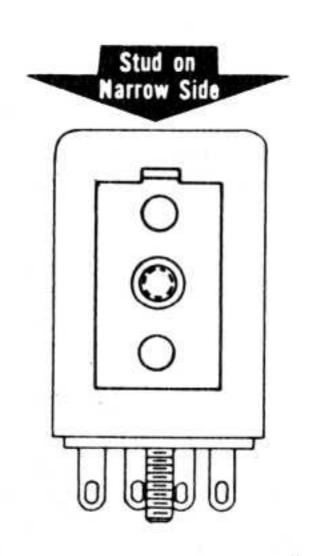
from terminals.

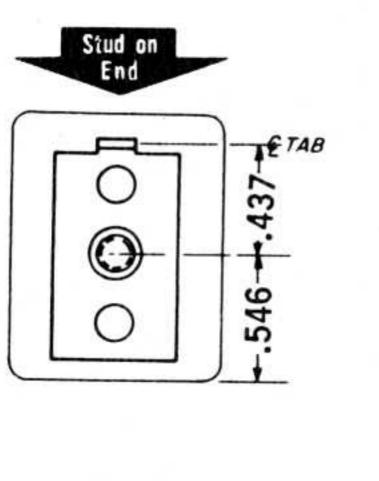
Mounting No. 1 plain Mounting No. 2 Stud Mounting No. 3 Stud Mounting No. 4 Brackcase. Stud on front. on broad side of case. on narrow edge. Mark- et opposite terminals. For both KHP and KHS. Markings on side ings on end opposite Markings on left side relative to header when stud is on bottom.













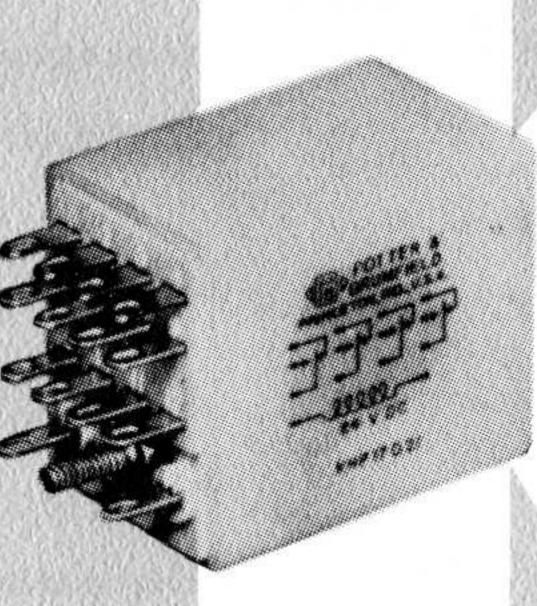
# POTTER & BRUMFIELD

DIVISION OF AMERICAN MACHINE & FOUNDRY COMPANY, PRINCETON, INDIANA

FORM NO. 13C154 3-67

PRINTED IN U.S.A.

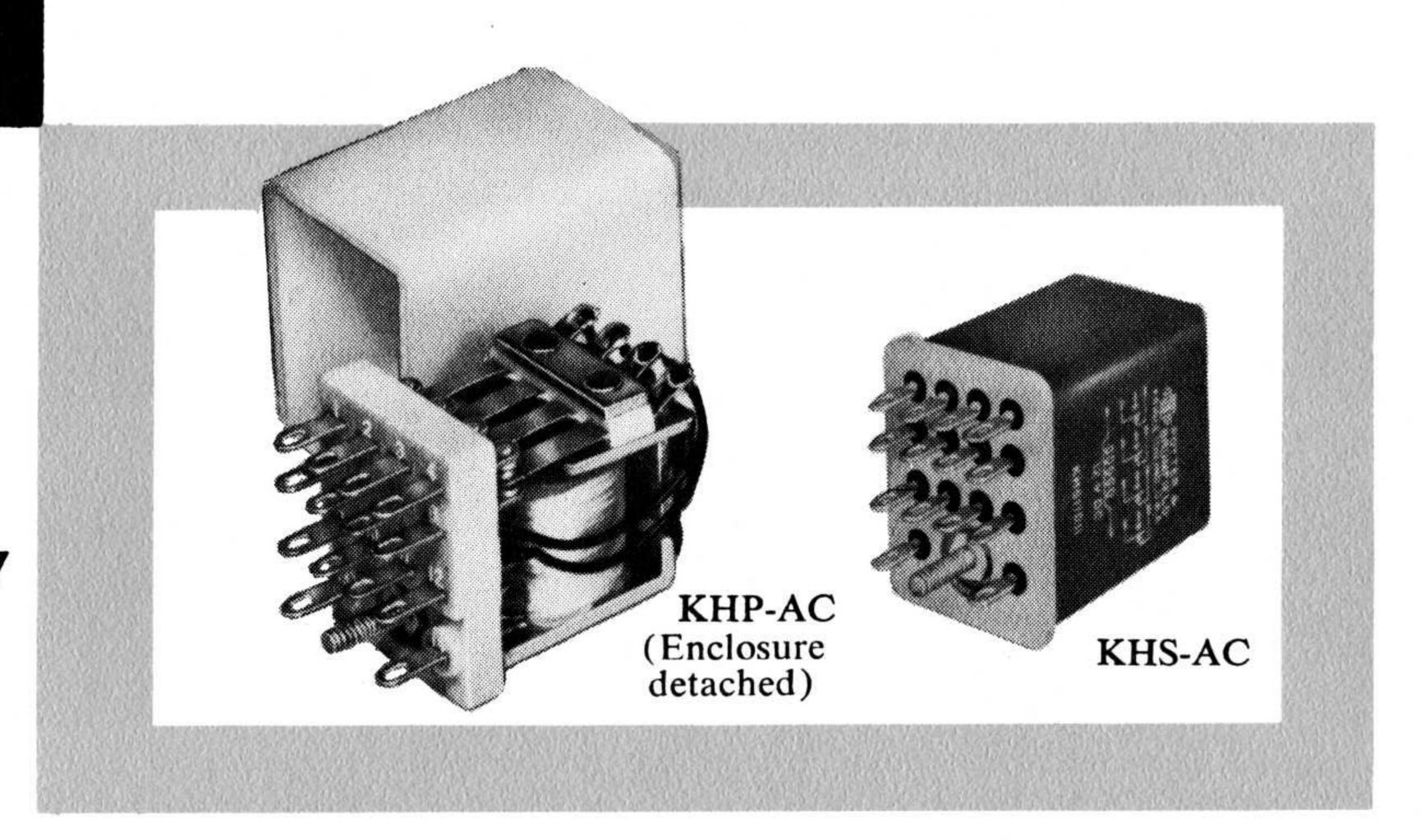
POTTER & BRUMFIELD



"KH" SERIES RELAYS



# long life, AC 4PDT, 3 amp miniature relay



# ENGINEERING DATA

Only slightly larger than a cubic inch, yet designed for high performance and multi-pole capacity, the KHP and KHS series relays enable direct operation with alternating current. They save the expense and necessity of adding diode or rectifier circuits to convert a DC relay to AC operation, and will perform dependably in critical applications where AC operation is required.

Available in 4 Form C or 2 Form Z contact arrangements, with contacts rated at 3 amps at 120 volts AC or 30 volts DC resistive, power requirements are only 1.2 volt amperes at nominal voltage.

The KHP series is furnished in plastic dust enclosures, while the KHS series is hermetically sealed in metal cases. A variety of mountings and terminations, as well as sockets with solder or printed circuit terminals for plug-in mounting, is available.

#### **GENERAL:**

Insulating Material: Molded glass reinforced alkyd.

Insulation Resistance: 1,500 megohms minimum.

Expected Life: Mechanical: 50 million operations.

Electrical: 100,000 operations min. @ rated load.

Breakdown Voltage: 500 volts rms 60 Hz between contacts

and all other elements.

Temperature Range: -45°C to +70°C.

Time W.L. Coo beat access

Time Values: See back page.

Approximate Weight: KHP: 1½ ozs.; KHS: 15/8 ozs.; without sockets.

Terminals: Solder lugs for KHP and KHS. Taper tab for KHP only. Sockets available for both series with printed circuit or solder lug terminals (See Mounting).

The KHC terminal design consists of printed circuit terminals on the KHP relay. The mounting stud is deleted on the standard KHC but is available as a special. See drawing and printed circuit layout on back page.

Enclosures: The KHP has a nylon dust cover. This nylon cover is available in red, blue, green, yellow and black for color coding circuits, and also in heat-resistant, transparent Polycarbonate, on special order. The KHS is hermetically sealed in a steel enclosure.

### CONTACTS:

Arrangements: 4 Form C (4PDT). 2 Form Z (DPDT-DB).

Material: 3/32" diameter silver is standard. Silver cadmium-oxide, gold-alloy and palladium contact materials are available.

Rating: See back page for listings of Contact Ratings.

COILS: (See Coil Data Chart.)

Voltage: to 120 volts AC, 50/60 Hz.

Resistance: See chart below.

Power: 1.20 volt amperes nominal @ +25°C, .550 volt amperes minimum @ +25°C.

Temperature Rise: Nominal voltage @ +25°C.: 35°C. 25% over voltage @ +25°C.: 65°C.

Pickup: 85% of nominal voltage @ 25°C.

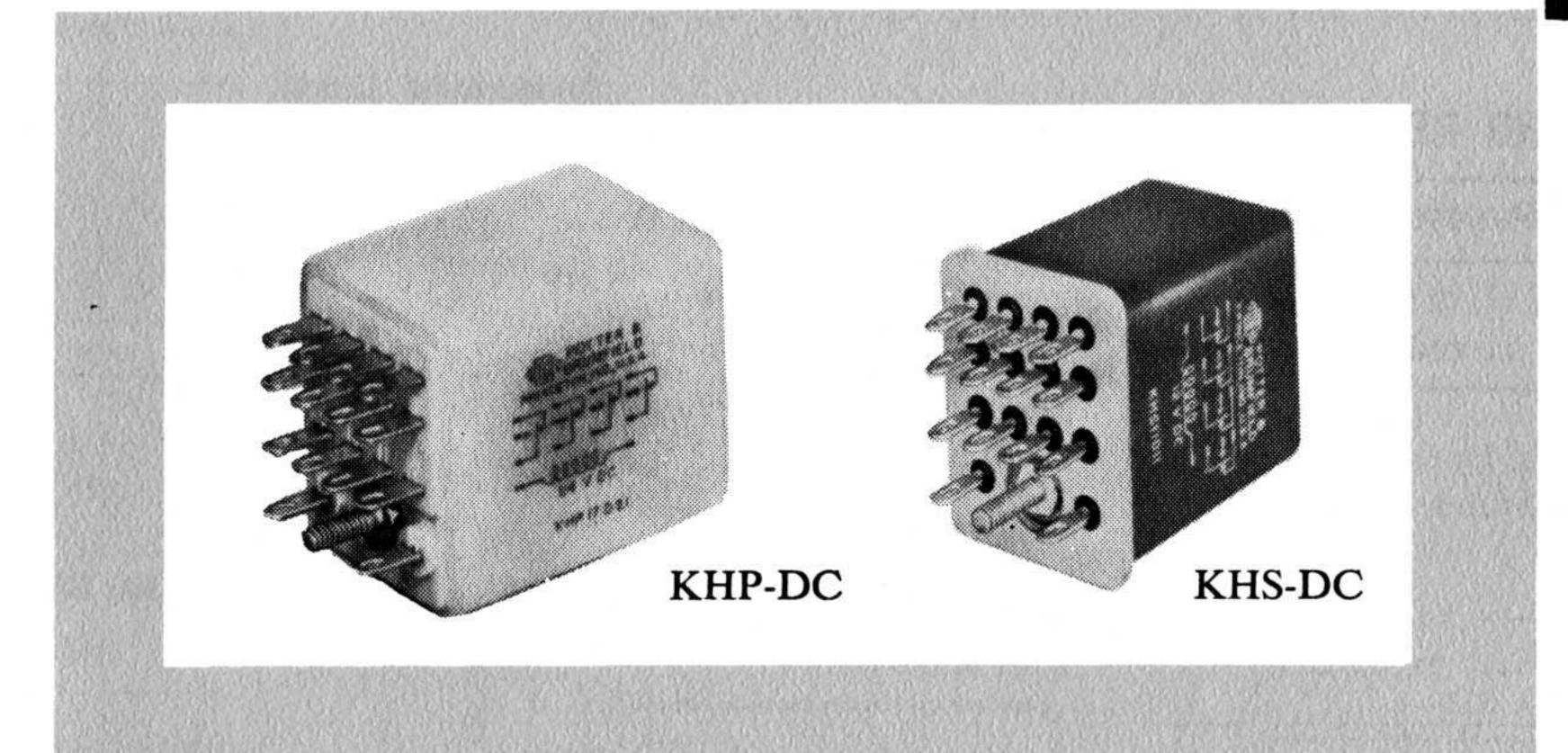
# STANDARD AC COIL DATA

AC Voltage	Resistance in Ohms (approx.)	Average AC Current in ma	
6	10.5	200	
12	43	100	
24	160	52	
48	668	25	
120	3,900	11.0	

MTG No*	Location of Mtg. Stud	Solder Terminals	Taper-Tab Terminals KHP Only	Solder Terminals Tap	er-Tab Terminals KHP Only
		SILVER	CONTACTS	SILVER CADMIUM	OXIDE CONTACTS
1.	Plain Case—Front Mtg.	KHP17A11	KHP17A51	KHP17A12	KHP17A52
	On Broad Side of Case	KHP17A21	KHP17A61	KHP17A22	KHP17A62
3.	On Narrow Side of Case	KHP17A31	KHP17A71	KHP17A32	KHP17A72
4.	On End of Case	KHP17A41	KHP17A81	KHP17A42	KHP17A82
		GOLD ALLOY CONTACTS		PALLADIUM CONTACTS KHP ONLY	
1.	Plain Case—Front Mtg.	KHP17A13	KHP17A53	KHP17A14	KHP17A54
	On Broad Side of Case	KHP17A23	KHP17A63	KHP17A24	KHP17A64
3	On Narrow Side of Case	KHP17A33	KHP17A73	KHP17A34	KHP17A74
7 Total 1 Tota	On End of Case	KHP17A43	KHP17A83	KHP17A44	KHP17A84

<sup>\*</sup>See back for illustrations.





# long life, DC 4PDT, 3 amp miniature relay

#### ENGINEERING DATA

Small, rugged, engineered for high performance... the KHP and KHS series DC relays add a new dimension in reliability to electromagnetic switching. These 4PDT relays were specifically designed to meet the exacting requirements of data processing, computer, process control and other applications.

The results of extensive tests of these relays reflect good sensitivity and extremely long mechanical life of 100 million operations minimum. These relays are capable of absorbing without damage many of the abuses of shipping and handling. The KHP is available in a variety of mountings, making it easy to install using modern production techniques. The KHS is for applications where a hermetically sealed relay is required.

## GENERAL:

Insulating Material: Molded glass reinforced alkyd.

Insulation Resistance: 1,500 megohms minimum.

Expected Life: Mechanical: In excess of 100 million operations.

and all other elements.

Electrical: 100,000 operations min. @ rated load.

Breakdown Voltage: 500 volts rms 60 Hz between contacts

Temperature Range:  $-45^{\circ}$ C to  $+70^{\circ}$ C.

Time Values: See back page.

Approximate Weight: KHP: 1½ ozs.; KHS: 15% ozs.; without sockets.

Terminals: Solder lugs for KHP and KHS. Taper tab for KHP only. Sockets available for both series with printed circuit or solder lug terminals (See Mounting).

The KHC terminal design consists of printed circuit terminals on the KHP relay. The mounting stud is deleted on the standard KHC but is available as a special. See drawing and printed circuit layout on back page.

Enclosures: The KHP has a nylon dust cover. This nylon cover is available in red, blue, green, yellow and black for color coding circuits, and also in heat-resistant, transparent Polycarbonate, on special order. The KHS is hermetically sealed in a steel enclosure.

## CONTACTS:

Arrangements: 4 Form C (4PDT). 2 Form Z (DPDT-DB).

Material: 3/32" diameter silver is standard. Silver cadmium-oxide, gold-alloy and palladium contact materials are available.

Rating: See back page for listings of Contact Ratings.

COILS: (See Coil Data Chart.)

Voltage: to 110 volts DC.

Resistance: See chart below.

Power: 0.5 watt minimum operate @ +25°C., 0.9 watt nominal @ +25°C.

2.0 watts maximum @ +25°C.

Temperature Rise: Nominal voltage @ +25°C.: 33°C.

25% over voltage @ +25°C.: 45°C.

Duty: Continuous.

Pickup: 75% of nominal voltage @ 25°C.

# STANDARD DC COIL DATA

DC Voltage		Resistance in Ohms ±10% @ +25°C	Inductance In Henrys (approx.)	
	6	40	.08	
	12	160	.28	
	24	650	1.0	
	48	2,600	4.5	
	90	9,000	13.5	
	110	11,000	17.0	

	Solder Terminals	Taper-Tab Terminals KHP Only	Solder Terminals Tap	per-Tab Terminals KHP Only
	SILVER	CONTACTS	SILVER CADMIUM	OXIDE CONTACTS
lain Case—Front Mtg.	KHP17D11	KHP17D51	KHP17D12	KHP17D52
n Broad Side of Case	KHP17D21	KHP17D61	KHP17D22	KHP17D62
n Narrow Side of Case	KHP17D31	KHP17D71	KHP17D32	KHP17D72
n End of Case	KHP17D41	KHP17D81	KHP17D42	KHP17D82
	GOLD ALLOY CONTACTS		PALLADIUM CONTACTS KHP ONLY	
ain Case—Front Mtg.	KHP17D13	KHP17D53	KHP17D14	KHP17D54
아이지 역사가 없었다면 그는 이 사람이 살이 꾸면 맛이 있는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그	KHP17D23	KHP17D63	KHP17D24	KHP17D64
n Narrow Side of Case	KHP17D33		KHP17D34	KHP17D74
n End of Case	KHP17D43			KHP17D84
	lain Case—Front Mtg. In Broad Side of Case In Narrow Side of Case In End of Case In Broad Side of Case In Narrow Side of Case In Narrow Side of Case In End of Case In End of Case	lain Case—Front Mtg. In Broad Side of Case In Narrow Side of Case In End of Case Islain Case—Front Mtg. Islain Case—Front Mtg. In Broad Side of Case In Narrow Side of Case Islain Case—KHP17D13 In Broad Side of Case Islain Case—KHP17D23 In Narrow Side of Case Islain Case—KHP17D33	n Broad Side of Case n Narrow Side of Case n End of Case SHP17D31 NHP17D71 NHP17D81  GOLD ALLOY CONTACTS SHAIN Case—Front Mtg. NHP17D13 NHP17D53 NHP17D63 NHP17D63 NHP17D73 NHP17D73	lain Case—Front Mtg.  In Broad Side of Case In Narrow Side of Case In End of Case In End of Case In End of Case In End of Case In Broad Side of Case In End

<sup>\*</sup>See back for illustrations.