control

INSTRUCTIONS

pneumatic time delay relay — CR2820B SERIES A

CONTACT RATINGS

SINGLE POLE SWITCHES			DOUBLE POLE SWITCHES		
ALTERNATING CURRENT			ALTERNATING CURRENT		
Volts	Make	Break	Volts	Make	Break
115 230 460 575	40 amp 20 amp 10 amp 8 amp	15 amp 10 amp 6 amp 5 amp	0– 115 115– 600	30 amp 3450 va	3 amp 345 va
DIRECT CURRENT-PILOT DUTY			DIRECT CURRENT-PILOT DUTY		
Volts	SPDT	SPST	Volts	DPDT	DPST
115 230 600	0.50 amp .20 amp .02 amp	2.0 amp .5 amp .1 amp	115 230 600	0.2 amp .1 amp	1.0 amp .3 amp .1 amp

SPST forms are suitable to control ½ hp motors at 115/230 volt ac.

Double-pole forms are suitable for continuous 10 amperes maximum ac.

TIPS ON USE

The Pneumatic Time Delay Relay is designed for use in circuits, to introduce a time interval between the operation of an electrical contact and the actual initiation of the controlled function.

Typical applications are machine tool and automation circuits where an adjustable time delay of from 1/5 to 180 sec. is desired.

DESCRIPTION

The relay consists of an operating solenoid, pneumatic head, and snap-action timing contacts in the form of a precision snap-acting switch, all mounted on a single base. The pneumatic head contains a diaphragm and an adjustable orifice which act as the timing meduim.

The Pneumatic Time Delay Relay is available for either time delay after energizing the coil or time delay after de-energizing the coil, and is designed to be easily converted, from one form to the other, in the field. (For conversion, see "OPERATION".)

For Pneumatic Time Delay Relay forms which have the time delay after energization of the coil, the relay operates in the following sequence: the solenoid is energized causing the solenoid plunger to move away from the timing stem: a spring acting on the stem causes the diaphragm to enlarge a chambe r allowing air to enter at a controlled rate through an adjustable orifice. The time delay contacts are operated as the stem approaches the end of its motion. When the coil is de-energized, the solenoid plunger, timer stem, and timer contacts reset instantaneously as the air is expelled from the chamber through a check valve.

Relays are available with one or two timing circuits, and one or a maximum of two instantaneous circuits. Each of the circuits has one normally open and one normally closed double break contact. The instantaneous circuits are mechanically linked to the solenoid plunger and operate instantaneously. Auxiliary instantaneous contacts are also available as accessories for customer installation.

INSTALLATION

The relay should be solidly mounted, in a vertical plane, on a firm surface. The key-slot type mounting holes provide for ease in mounting, and it is necessary only to LOOSEN the mounting screws for removal of the relay.

All terminals are readily accessible from the front of the relay and the large panhead screws on the contact terminals (A & B), Fig. 1 as well as the saddle terminals (1 & 2) on the coil make for an easy job of wiring.

If both the NO and the NC contacts of the contact unit are used, they should be wired to the same side of the line.

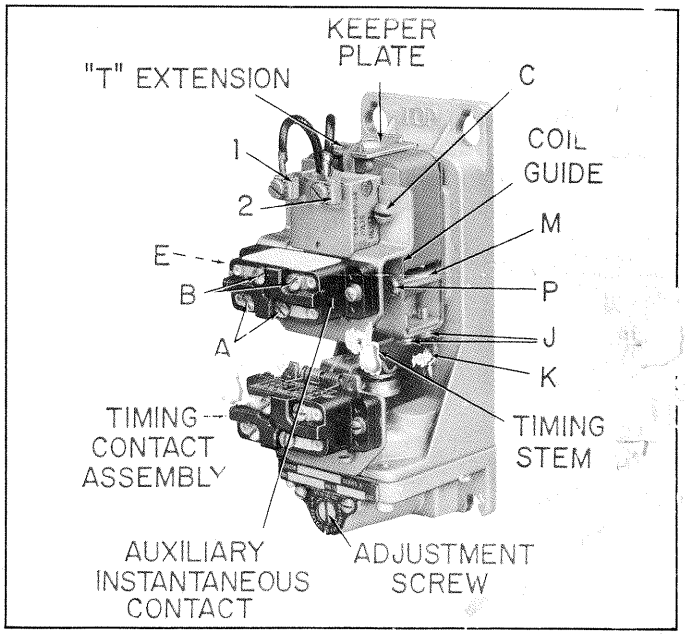


Figure 1 – Typical relay with instantaneous unit

OPERATION

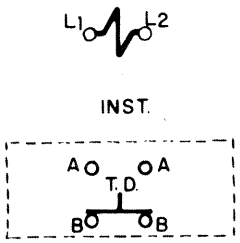
The time setting is adjustable from 1/5 to 180 sec. The relay has repetitive accuracy of plus or minus 10%.

connection diagrams

(Time delay occurs after energization)

TIME DELAY ENERGIZED

CR2820 B110



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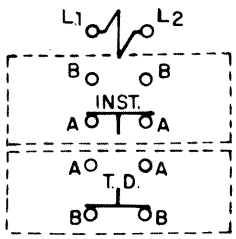

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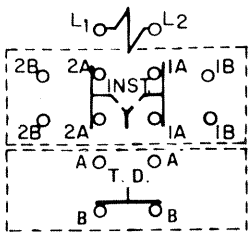

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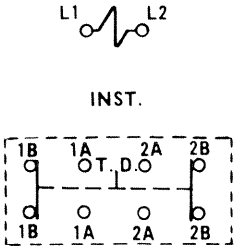

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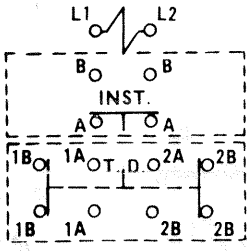

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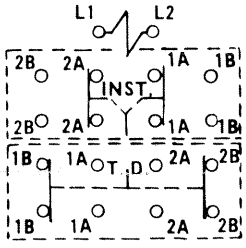

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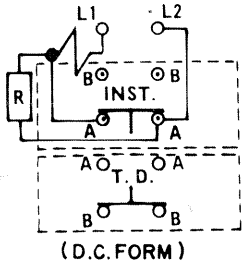

(D.C. FORM)

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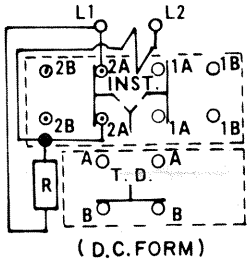

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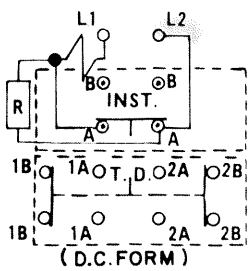

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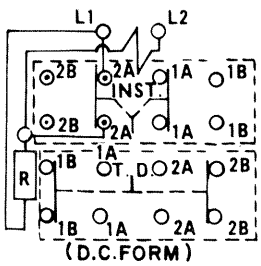

(D.C. FORM)

NOTE: Terminals on coils
⊙ Terminals not

control

TIME DELAY DE-ENERGIZED

(Time delay occurs after de-energization)

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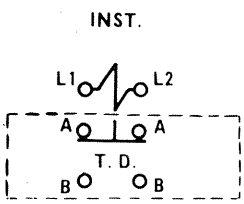

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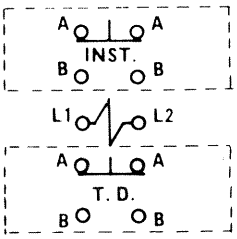

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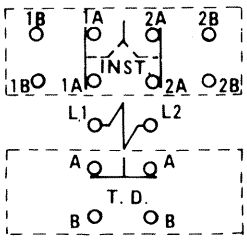

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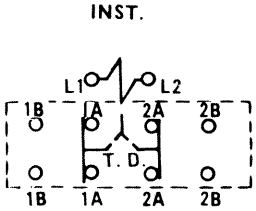

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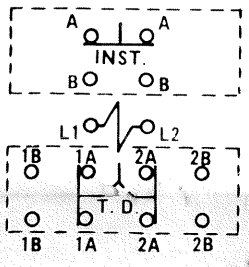

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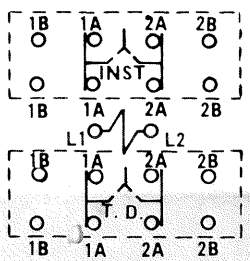

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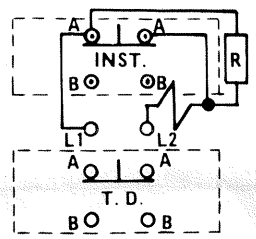

(D.C. FORM)

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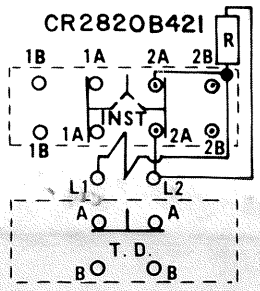

(D.C. FORM)

re not connected internally.
customer wiring.

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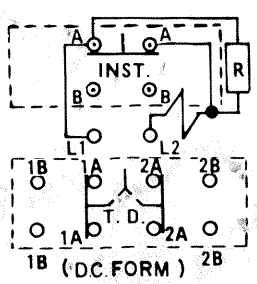

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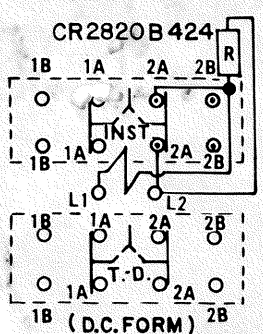

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To adjust the time delay, start with the adjustment screw turned closkwise to the extreme "F" (fast) position, turn the screw counter clockwise toward "S" (slow), checking occasionally until the desired setting is approached. Always make the final adjustment in small increments from "F" to "S". In the event the desired setting is accidentally passed, turn the adjustment screw one full turn back toward "F", then proceed as above until the desired setting is reached.

NOTE: The rate of change of timing in relationship to the adjusting screw position is greater for long time delays than for short time delays. It will be noted that considerably greater adjustment is required at the "F" (fast) end than is required at the "S" (slow) end to produce an equal effect.

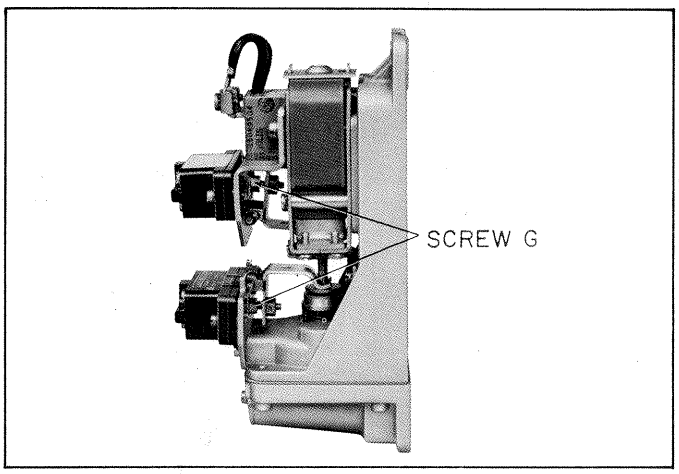

Figure 2 – Typical relay (side view)

The timing contacts should operate when the timing stem is approximately 3/32 of an inch from the top of its stroke. If not, screw G (Figure 2) should be readjusted until 3/32 of an inch operation point is obtained. (See ADJUSTMENT OF CONTACTS). The operation point of the auxiliary instantaneous contact unit is adjusted in the same manner.

To change from time delay on energization to time delay on de-energization, unscrew screws C and remove auxiliary instantaneous contact assembly, if supplied. Replace and tighten screws C. Loosen screws K and unscrew screw P. Invert solenoid assembly loosely with screws P and support posts M in the upper pair of slots in the base. With magnet in energized position and timing contact lever in the depressed position, move solenoid assembly to approximately .010 inches beyond the initial timing stem contact point. Tighten screws P and K, making sure that the timing stem is not binding in its guide. Check that the timing stem moves freely and is in contact with the magnet in the de-energized position. Unscrew screws C and replace auxiliary instantaneous contact, if supplied, and replace and tighten screws C.

To change from time delay on de-energization to time delay on energization, unscrew screws C and remove auxiliary instantaneous contact assembly, if supplied, and replace and tighten screws C. Loosen screws K and unscrew screws P, invert solenoid assembly, and reassemble loosely with screws P and support posts M in the lower pair of slots in the base. With magnet in de-energized position and timing contact lever in the depressed position, move solenoid assembly to approximately .010 inches beyond the initial timing stem contact point. Tighten screws P and K making sure that the timing stem is not binding in its guide. Check that the timing stem moves freely and is in contact with the magnet in the energized condition. Unscrew screws C and replace auxiliary instantaneous contact, if supplied, and replace and tighten screws C.

When inverting the solenoid assembly to time delay de-energized position care should be taken that the "T" extension mechanically interlocks in the slot of the bearing support. Check "ADJUSTMENT OF CONTACTS".

ADJUSTMENT OF CONTACTS

If re-adjustment of the various contact units is required, the following procedure should be followed.

OPERATIONS CHECK OF TIMED CONTACT UNITS

Time-delay energized

Depress the solenoid plunger by hand. The contact unit will trip when the timing stem is approximately 3/32" from the top of the stroke when properly adjusted.

Time-delay de-energized

Manually operate the timing stem. The contact unit should trip when the timing stem is approximately 3/32" from the top of its stroke.

Instantaneous Contact Unit

Manually depress the solenoid plunger slowly. The contact unit will trip when the plunger is approximately 3/32" from seating when properly adjusted.

Adjustment – All contact units

Adjust screws G (Figure 2) according to each of the conditions described in the preceeding instructions. The self-locking nut will hold the screw in place.

MAINTENANCE

Changing Coil

1. Remove screws E and P, Figure 1.
2. Lift magnet assembly up and away from the device.
3. Push magnet frame up into coil guide.
4. Remove the keeper plate and spring from the coil guide.
5. Pull the magnet frame up and out of the coil guide and remove from the magnet frame.
6. Insert new coil and reassemble in reverse order. (Check adjustment of contacts).

Addition Of Instantaneous Contact Unit

1. Remove Screws C, Figure 1.
2. Add new contact unit to device and secure in position with screws C.
3. Adjust screw G, Figure 2, if necessary.

DO NOT LOOSEN OR REMOVE SCREWS J OR K at any time as this adjustment is preset at the factory. The timing head should at no time be disassembled.

TIME DELAY SETTING

The time setting is adjusted in the same manner as described under OPERATION.

FOR COMPLETE RENEWAL PARTS INFORMATION, SEE GEF-4244.

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