RECLOSING RELAY

NLR21L

GENERAL ⒼⒺ ELECTRIC

RECLOSING RELAY

TYPE NLR21L

INTRODUCTION

These instructions are a supplement to instruction book GEK-34123 (included), which covers the NLR21A relay. This supplement covers the operating features of the NLR21L relay which are different from the NLR21A; refer to GEK-34123 for information on the NLR21L not covered in the supplement.

DESCRIPTION

The internal circuitry of the NLR21L differs from that of the NLR21A as follows:

1. The C relay coil is not connected to the SCR circuit. Thus, the C relay is not shorted down by the SCR.

2. The SCR is connected directly to the stepping switch SA. Thus each time the SCR fires, SA takes a step.

3. The only other difference is in the use of terminals 5 and 6. The C relay seal-in contact at terminal 6 must be connected to terminal 5 either directly or via external circuitry. Terminal 6 must not connect to terminal 13 or 14, as in the NLR21A, or the C relay will remain continuously sealed up, or will not reset at the lock-out position.

The internal and external connections diagrams are shown in Fig. 1 and 2 of this supplement respectively.

APPLICATION

The Type NLR21L reclosing relay is designed to initiate reclosing impulses to a circuit breaker under the supervision of synchronism check relay contacts (or other blocking contacts). Its circuit is arranged so that as each reclosing point is reached, the reclosing circuit (i.e., from terminal 14 to terminal 7 of the relay) is maintained until the circuit breaker closes, or until the NLR21L reaches its lock-out position. If the supervising relay contact is already closed when the reclosing point is reached, the automatic reclosure will occur immediately. If the supervising contact is not closed, the closing circuit will be maintained while the NLR continues to time towards lockout, or until a subsequent operation of the supervising contact permits a reclosure.

Following a reclosure attempt, the NLR21L circuit between terminals 14-17 will be open until the next reclosing point is reached. If the reclosure is successful the NLR

will reset as described in the included instructions for the NLR21A. If the reclosure attempt is unsuccessful, the NLR will continue to time to the next reclosing point when the sequence described above will be repeated, or will time to lockout if there are no further reclosure points.

OPERATING PRINCIPLES

At each reclosing point the stepping relay in the NLR21L takes one step which does not involve a time period and which is not recovered. Assume that the relay is set for instantaneous first reclosure followed by two delayed reclosures. At the instantaneous point SA takes one step immediately, and at each delayed reclosure point as SA steps to the lock-out point, an additional step is taken immediately. Therefore in calculating the required positions of the adjustable cams to obtain the desired delayed reclosure points, one step must be added for every previous reclosing point. For the example used above, assume the first delayed reclosure is to occur at ten seconds and the second is to occur 15 seconds later. Assuming five-second step intervals, the ten-second reclosure is set at step 3, and the cam for the last reclosure point is set at step 7. This is explained as follows: The ten-second point was preceded by the instantaneous reclosure, so the step setting is two plus one. For the 25-second point there were two previous reclosing points, so the step setting is five plus two.

The "unrecovered" instantaneous steps also affect operation when the rapid reset selection link is placed in the "step-2" position. Because of the instantaneous step which occurs at each reclosing point, rapid reset will occur five seconds (or one step time interval) after any successful breaker reclosure. The other two reset link positions result in operation as described in included instructions GEK-34123.

When the RS contact is used to open the closing path of external permissive contacts, such as dead line and dead bus relays, it should be noted that the RS contacts can be adjusted to be in one position for any four steps and will be in the other position for the remaining 32 steps. Assume that contact RS is to open the dead line/dead bus relay contact circuit at some point after the reclosing relay has been initiated. The transfer of RS from being closed for four steps to being open for 32 steps must occur four steps or more after the reclosing cycle starts.

The RS switchette is adjusted at the factory so that its contact between studs 9 and 10 is closed at reset and between steps 4-6 before lockout but open between steps 1 to 30-32.

STEPPING SWITCH CONTACTS

CONTACTS	SWITCH CONTACTS		
	RESET	STEPS 1-34 INC.	LOCKOUT
SL ($\neq$)	CLOSED	CLOSED	OPEN
SL ($\perp$)	OPEN	OPEN	CLOSED
SR ($\perp$)	OPEN	CLOSED	CLOSED
SR ($\neq$)	CLOSED	OPEN	OPEN
SC ($\perp$)	CLOSED BY ADJUSTABLE CAMS IN ANY 3 NON-ADJACENT STEPS		
SC ($\neq$)	CLOSED WHEN SC CONTACTS ($\perp$) ARE OPEN		
SA ($\perp$)	CLOSED WHEN STEPPING SW. COIL IS ENERGIZED		
SA ($\neq$)	OPEN WHEN STEPPING SW. COIL IS ENERGIZED		

MODEL	FORM			
12NLR21L(-)A	1	2	3	
VOLTS	250	125	48	
RESISTANCE IN OHMS				
C COIL	14,000	3,600	500	
R COIL	16,000	3,600	600	
SA COIL	1,500	400	70	
R1	IMEG.	IMEG.	IMEG.	
R2	18,000	8,000	2,000	
CAPACITANCE VALUE				
C1	luf	luf	luf	

Fig. 1 (0246A3333-2, Sh. 1) Type NLR21L Internal Connections Diagram

Fig. 1 (0246A3333-1, Sh. 2) Type NLR21L Internal Connections Diagram
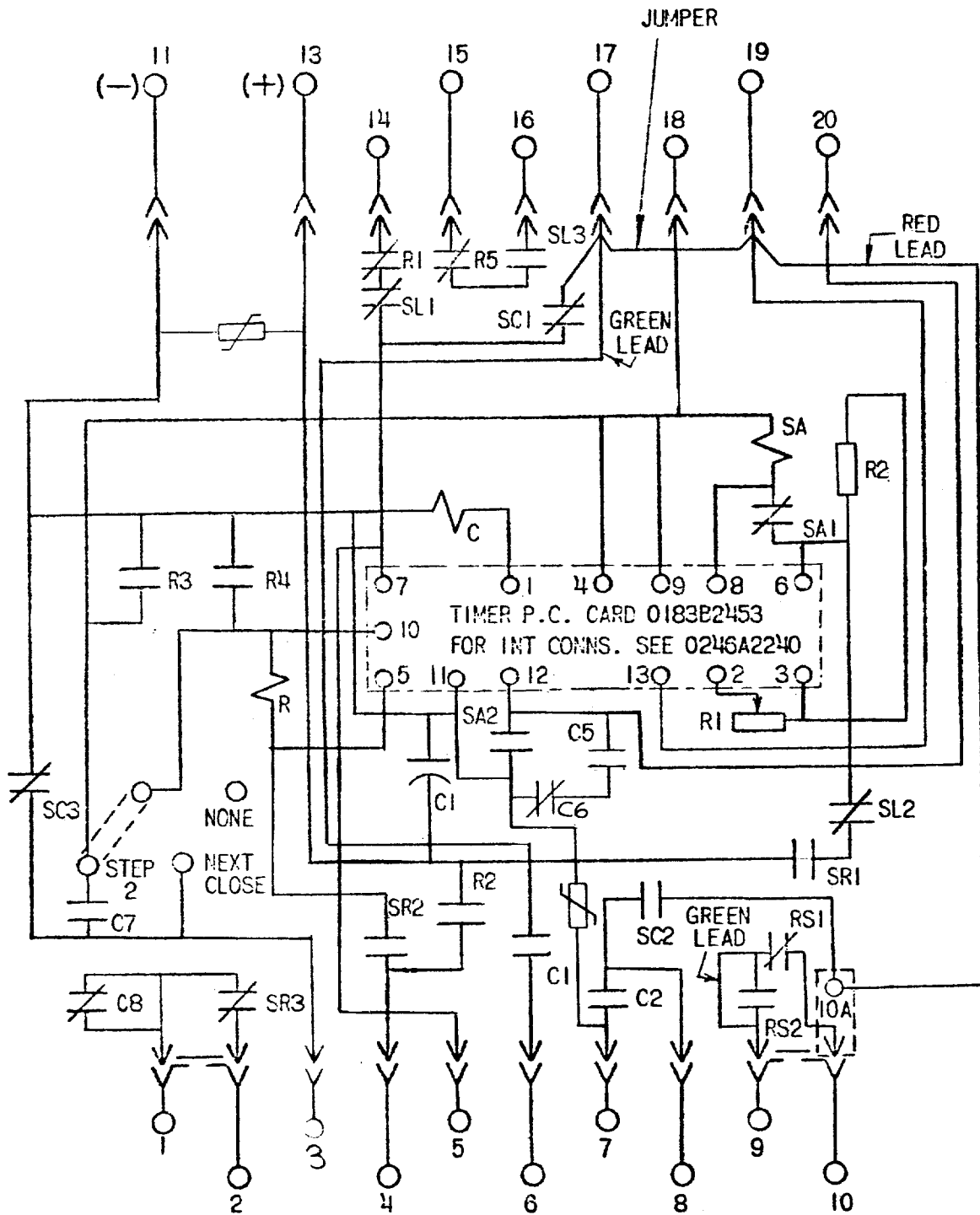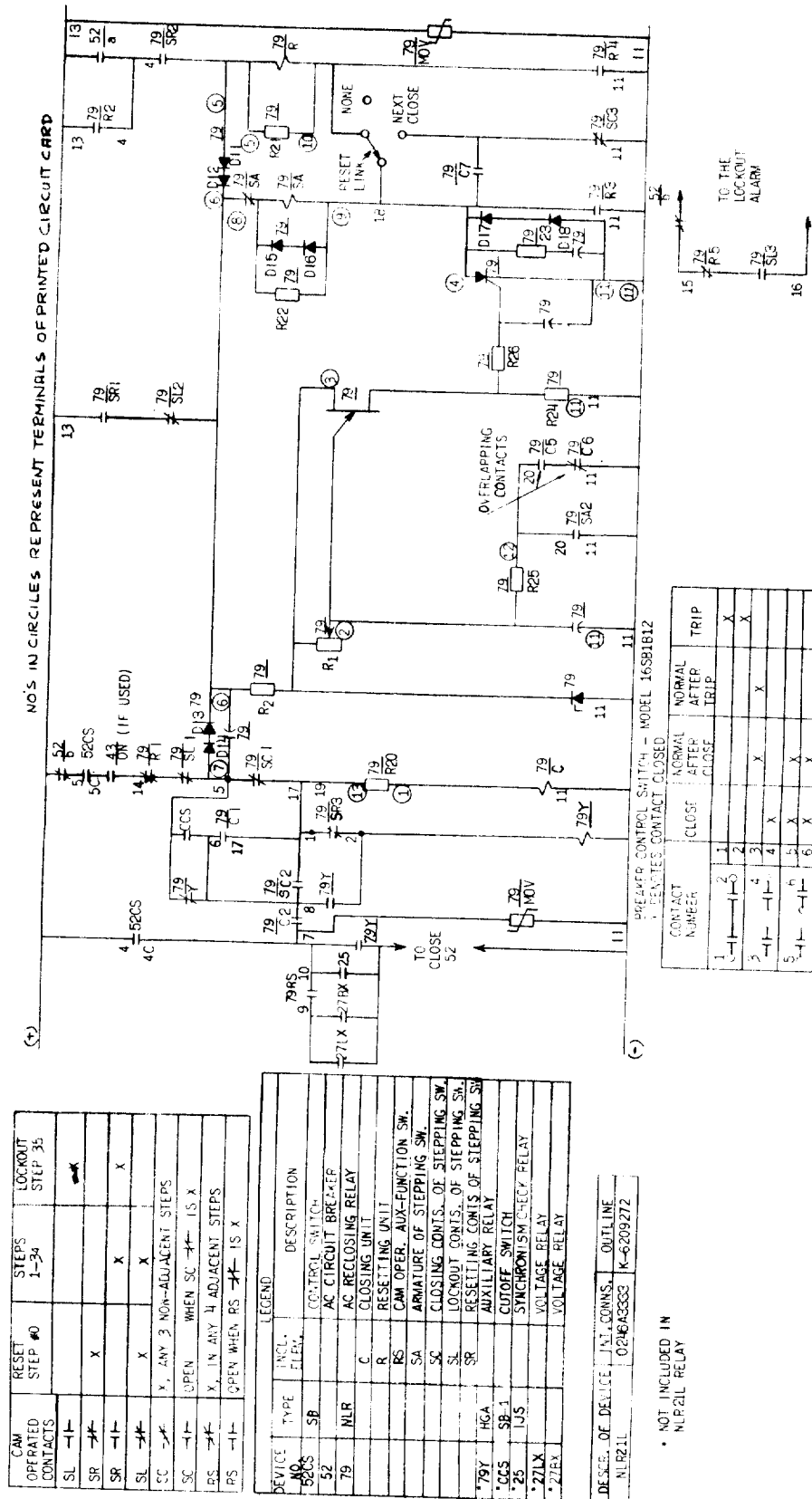
O = POST NO. ON PRINTED CIRCUIT CARD

Fig. 2 (0165B2637-0) Type NLR21L External Connections Diagram

GE Power Management

215 Anderson Avenue
Markham, Ontario
Canada L6E 1B3
Tel: (905) 294-6222
Fax: (905) 201-2098
www.ge.com/indsys/pm