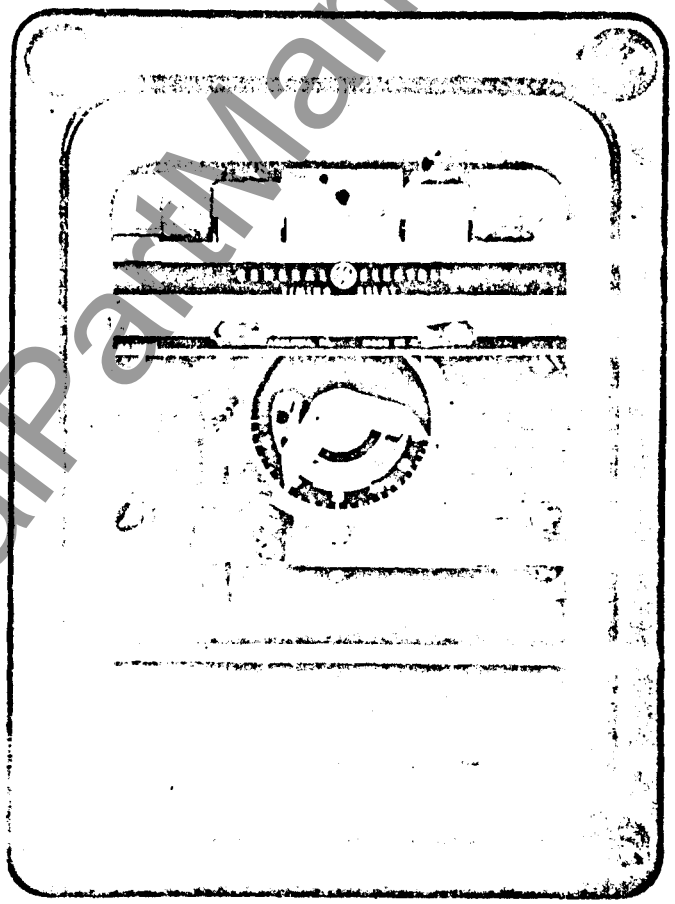
TIMING RELAYS



Types
RPM13A, 13B, 13D
RPM15A, 15B and 15C

LOW VOLTAGE SWITCHGEAR DEPARTMENT
GENERAL ELECTRIC
PHILADELPHIA, PA.

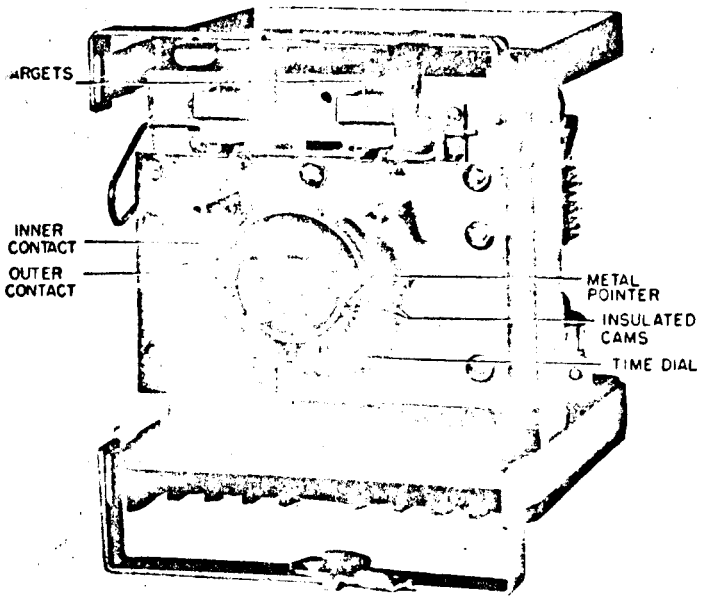


Fig. 1 (8030298) RPM Relay, Unit Withdrawn From Case (Front View)

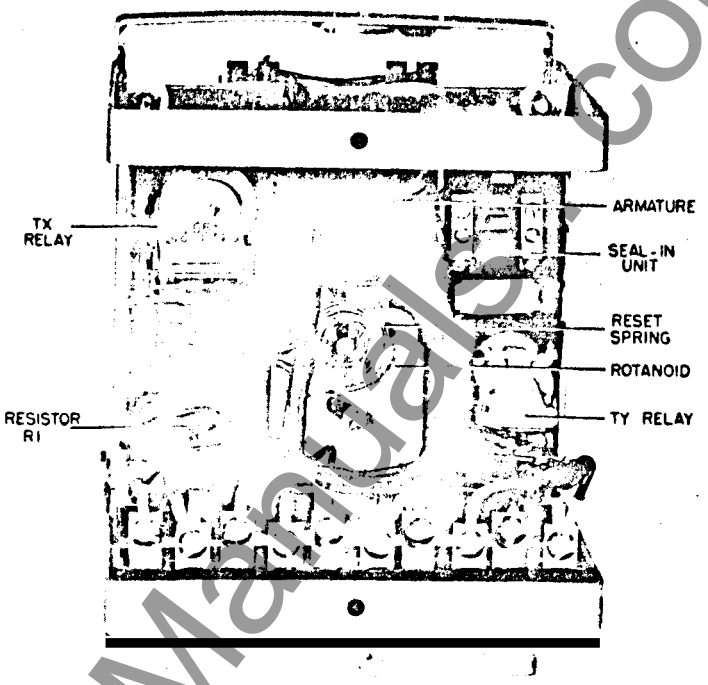
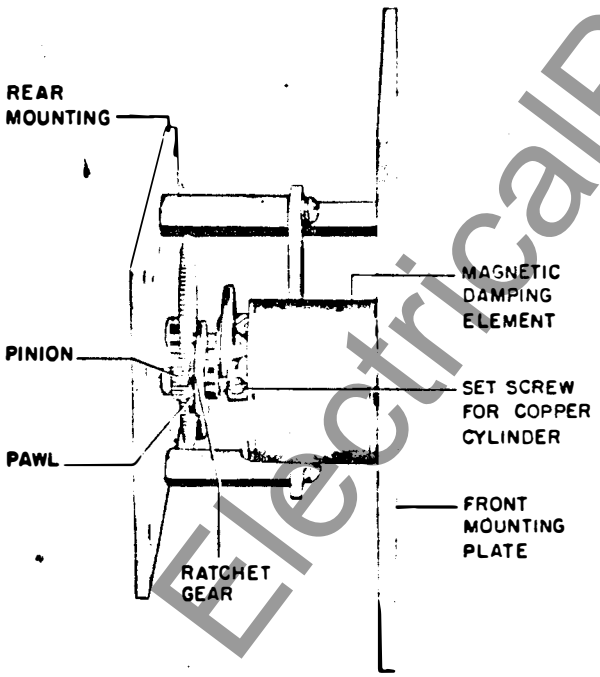
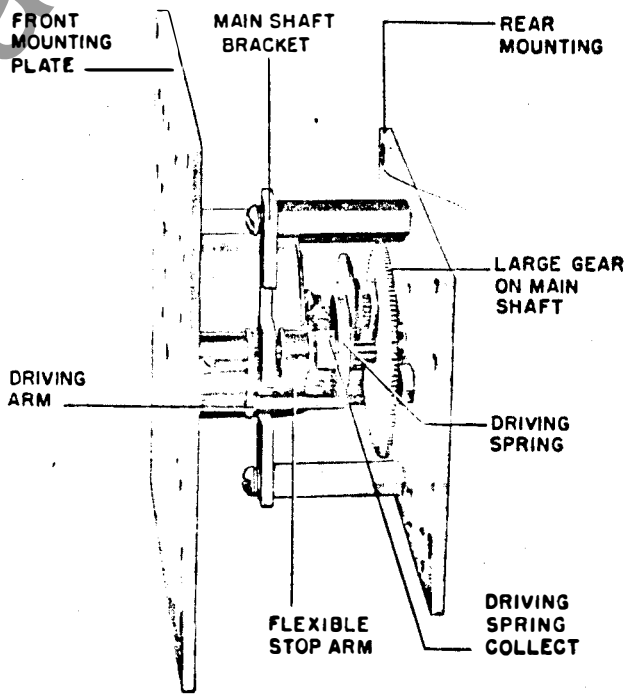


Fig. 2 (8030297) RPM Relay, Unit Withdrawn From Case (Rear View)



Left Side View



Right Side View

Fig. 3 (8004823 & 8004824) RPM11A Relay Unit Subassembly Between Front and Rear Mounting Plates

TIMING RELAYS
TYPE RPM

INTRODUCTION

The RPM 13 and 15 relays mounted in an S1 drawout case are general purpose direct current operated auxiliary timing relays having two cam operated closing contacts. Each contact has an independent adjustable time setting with the exception that the contacts must always close in the same sequence with a minimum time of several cycles between the closings of the two contacts. See the section on CHARACTERISTICS for further discussion of the minimum time between contact closings. Each contact has its own target and the relay has one electrically separate seal-in unit generally used with the TU-1 contact. In addition the RPM15 relay employes a telephone type relay, TY, to provide a continuous coil rating. See Table No. A for different models.

APPLICATION

These RPM relays can be applied wherever an accurate, direct current operated, timing device with adjustable timing ranges of 0 to 1 second or 0 to 3 seconds is required. A typical application is illustrated in Fig. 4 where the RPM13 relay is used to provide a time delay before the back-up fault relays become effective. The fault relays together with the RPM relays are used here to provide back-up protection for a unit type generator installation against prolonged multiphase faults on the adjacent system. When the fault relays operate, they start the RPM relay which trips the main breaker after a predetermined time thru its own TU-1 contact and the fault relay contacts. If for some reason the generator is still connected to the fault, the fault relays will remain picked up and when the second RPM contact (TU-2) closes after an additional predetermined time it will operate a lockout relay, Type HEA, which shuts down the unit generator.

Fig. 5 shows the RPM15 relay substituted for the RPM13 relay in a similar application.

The RPM relay contacts should always be used in series with the initiating relay contacts in a trip circuit. In this way any overtravel which may exist in the RPM relay is negated by the opening of the initiating relay contacts.

The TX coil of the RPM relay has a very low drop-out voltage. This low drop-out makes it possible for an indicating lamp in series with the TX coil to keep that element picked up after it has operated. For this reason it is important that caution be exercised in the application of the relays to insure that there are no sneak circuits which can permit the TX coil to be sealed in through a lamp or some other device.

TABLE A

MODEL	TIMING RANGE	COIL CIRCUIT TIME RATING	CONTACT DWELL TIME	
			TU-1	TU-2
	Seconds	Seconds	Cycles (60 Cycle Base)	
12RPM13A11 & Up	0.15 - 3.0	60	9-15	9-15
12RPM13B11 & Up	0.10 - 1.0	60	Maintained	3-5
12RPM13D11 & Up	0.15 - 3.0	60	Maintained	9-15
12RPM15A1 & Up	0.15 - 3.0	Continuous	9-15	Maintained
12RPM15B11 & Up	0.10 - 1.0	Continuous	Maintained	Maintained
12RPM15C1 & Up	0.15 - 3.0	Continuous	Maintained	Maintained

RATINGS

These RPM relays are available with operating coils for 24 to 250 volts D.C. As indicated in Table A the RPM13 relays have coils rated for one minute and the RPM15 relays have continuously rated coils.

The target and seal-in units are current operated devices with ratings of either 0.2 or 1.0 amperes.

The timing contacts TU-1 and TU-2 are for circuit closing only. They will carry a maximum of 30 amperes for the time it takes to trip a breaker and have no interrupting rating. Since these contacts have no interrupting rating, any control circuit involving these contacts must be cleared by a circuit breaker auxiliary switch or other suitable means.

The contact interrupting rating of the telephone type relays are shown in Table B.

The contact rating of the seal-in unit is shown in Table C.

CONTACT INTERRUPTING ABILITY

TABLE B

Volts	Interruption Current (Amps)	
	Inductive*	Non-Inductive
48-DC	1.0	3.0
125-DC	0.5	1.5
250-DC	0.25	0.75
115-60 cy.	0.75	2.0
230-60 cy.	0.5	1.0

* Inductance of Average Trip Coil

TARGET AND SEAL-IN UNIT

TABLE C

	2 Amp Tap	0.2 Amp Tap
DC Resistance	0.13 ohms	7 ohms
Minimum Operating	2.0 amps	0.2 amps
Carry Continuously	3.5 amps	0.35 amps
Carry 30 amps for	4 secs.	---------
Carry 10 amps for	30 secs.	0.2 secs.
60-cycle Impedance	0.53 ohms	52 ohms

CHARACTERISTICS

OPERATING PRINCIPLE

The RPM relay operates on the principle of using the energy from a charged spring.

The spring is charged by a solenoid called a rotonoid because of its circular shaped plunger. The energy of the spring is dissipated through a gear train at a rate controlled by a damping magnet. The timing contacts are operated by cams attached to this gear train.

MINIMUM OPERATING VOLTAGE

The operation of the rotonoid designated as "TU" is controlled by the contacts of the telephone type relay designated as "TX".

Both this telephone type relay "TX", and the telephone type relay "TY" which is used in the RPM15 relays will operate at 80% of rated voltage or above.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.