INSTRUCTIONS

IC2824-34 INDUCTION-TYPE THERMAL OVERLOAD RELAY

Before any adjustments, servicing, parts replacement or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, the POWER SUPPLY MUST BE DISCONNECTED.

DESCRIPTION

The IC2824-34 single-pole a-c temperature overload relay provides motor overload protection with compensation for changes in relay ambient temperature. For applications where variable or unusually high ambient temperatures are encountered, this compensation permits the motor to carry its rated load without causing unnecessary tripping of the relay.

Different forms of the relay are identified in the following table:

RELAY FORMS

Form	Contact Arrangement	Max Volts	Frequency Cps	Type of Trip
IC2824-34C	Normally closed	600	60	Slow
-34H	Normally closed	600	60, 50	Medium
-34L	Normally closed	600	60, 50	Fast
-34N	Normally open	600	60, 50	Medium
-34T	Normally open	600	60, 50	Fast
-34V	Normally open	600	60	Slow

The relay is constructed with a series coil for connection in the motor circuit. Mounted within the series coil is a steel core over which is a short-circuited bimetallic helix acting like a short-circuited secondary of a transformer. When an overload occurs, the current in the helix heats it to the point where its rotation opens the relay contacts.

The effect of changes in ambient temperature on the operation of the relay is minimized by means of a compensating strip of bimetal. This strip is so arranged that temperature changes produce a deflection opposite and closely equal to that of the bimetal helix. Compensation is such that the current required to trip in a given length of time will vary less than three percent with each 10 C change in ambient.

The relay is manually reset by the reset button provided on the front. For resetting from a remote location, a solenoid-operated electric-reset relay can be supplied.

Contacts operate with positive snap action. Ratings are as follows:

Make	30 amp
Carry (continuous)	10 amp
Interrupt (a-c)	
110 volts	20 amp
220 volts	10 amp
440 volts	5 amp
550 volts	4 amp

APPLICATION

In general, medium-trip relays should be used for normal application of general-purpose motors. Slow-trip relays should be used for long accelerating times. Fast-trip relays should be used for motors subject to unusually fast heating under stalled conditions.

Relay current ratings are determined by the selection of operating coils. Coils are rated in nominal values of ultimate tripping current. The actual ultimate tripping current will fall between 90 and 100 percent listed value in a 40 C ambient temperature with the relay on 100 percent setting. Settings are adjustable over a range of 90 to 110 percent normal trip current.

Time-current characteristics of the relays operating on 60 cycles with 100 percent setting are shown in Fig. 2, 3 and 4. Settings other than 100 percent change tripping currents approximately in proportion to the setting.

Available coils and recommended motor applications are given on page 4. When relays are applied to 50 C rise and 55 C rise continuous rated motors, the relay trip setting should be adjusted to the motor in accordance with the following formula:

$$\text{Setting in percent} = \frac{\text{Motor FL amp}}{\text{Coil rating in amp}} \times 115$$

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.

GENERAL ELECTRIC

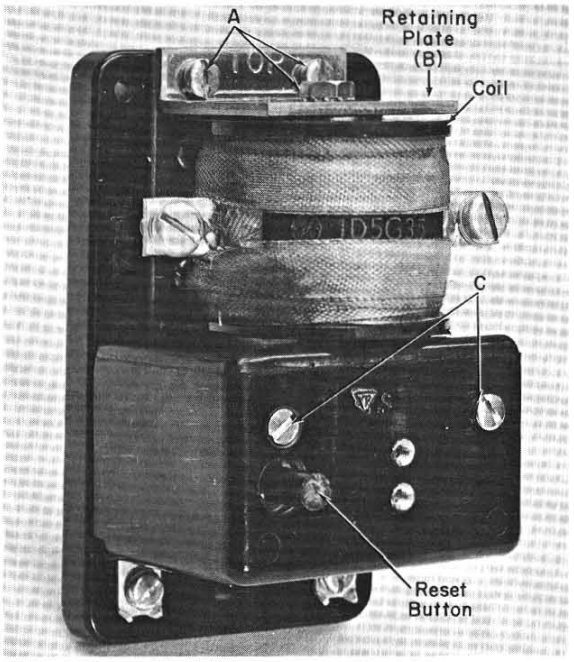

Fig. 1. IC2824-34C thermal induction overload relay

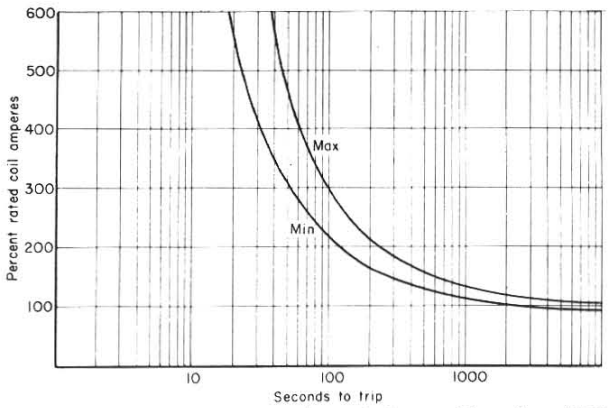

Fig. 2. Time-current curve, slow-trip forms, 60 cycles, 40 C ambient temperature.

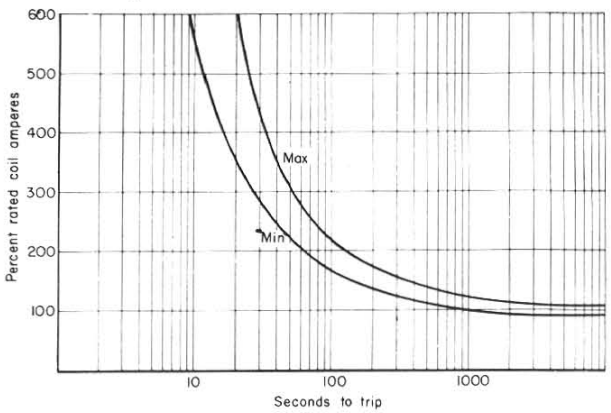

Fig. 3. Time-current curve, medium-trip forms, 60 cycles, 40 C ambient temperature.

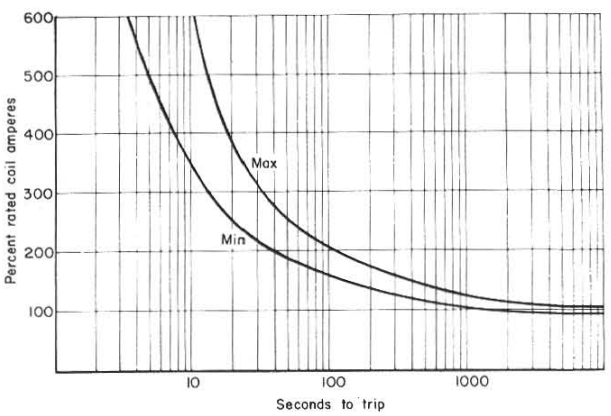

Fig. 4. Time-current curve, fast-trip forms, 60 cycles, 40 C ambient temperature.

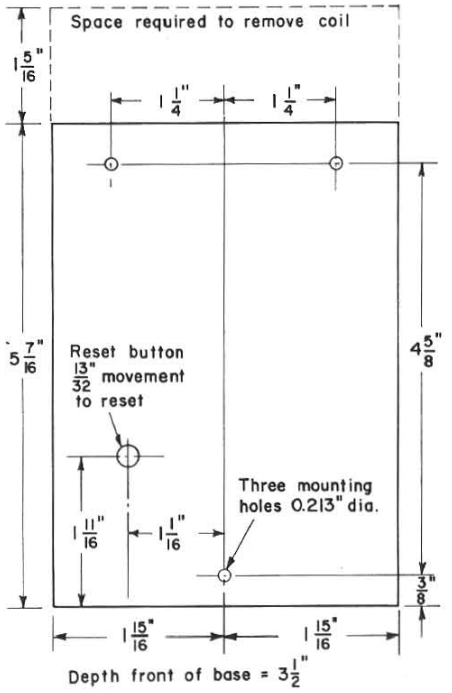

Fig. 5. Panel layout dimensions.

INSTALLATION

Install the relay in a vertical position with the coil at the top, as shown in Fig. 1. Panel layout dimensions are given in Fig. 5.

If it is necessary to adjust the relay trip, the cover must be removed in the following manner, in order to reach the adjusting screw: (Refer to Fig. 1) First remove the retaining screws (c). If the cover is of the type held by retaining pins, it will also be necessary to remove the three screws (A), the re-

taining plate (B) and the coil in order to permit the cover to be taken off.

To make the trip adjustment: Loosen the adjustment locking screw, turn the adjusting screw as required, and retighten the locking screw. Reassemble the relay, taking care to mount the coil with the two locating pins (see Fig. 6) on the lower side and the retaining plate (see Fig. 1) squarely against the end of the coil core.

No maintenance other than replacement of coil should be attempted. Removal of contacts or other essential operating parts may destroy the accuracy of calibration. Do not bend the bimetal helix on the compensating bimetal.

To replace the coil: (see Fig. 1) Remove the three screws (A) and retaining plate (B). Be sure the two locating pins on the lower side of the new coil (see Fig. 6) engage the corresponding holes in the relay frame and that the retaining plate rests squarely against the end of the core.

PERFORMANCE CHECK

If it is desired to determine that a relay has not been changed or tampered with in service, it can be given a performance check. With the relay on 100 percent setting and at room temperature (cold start), apply a current equal to 300 percent coil rating and note the time required to trip. Compare the tripping time with the relay time-current curves (Fig. 2, 3, or 4) after correcting for any deviation of ambient temperature from the standard 40 C. Make the correction in the current value, adjusting it by 2.5 percent for each 10 C difference in ambient. If the tripping time based on adjusted current falls within the Max-Min range of the tripping curve, the relay is satisfactory.

Example:

Given an IC2824-34H36 relay (coil F1D5G36) to be checked in a 25 C ambient. Set trip adjustment at 100 percent and apply a current of 300 percent times 10 amperes (coil rating) or 30 amperes. Time to trip is found to be 38 seconds.

$$\text{Ambient correction} = 2.5\% \times \frac{40-25}{10} = 3.75\%$$

Equiyalent percent current at 40 C = 96.25% x 300% = 289%

From the time-current curve for medium trip relays (Fig. 3) a tripping time of 38 seconds at 289 percent rated coil current is seen to be within acceptable limits and the relay is satisfactory.

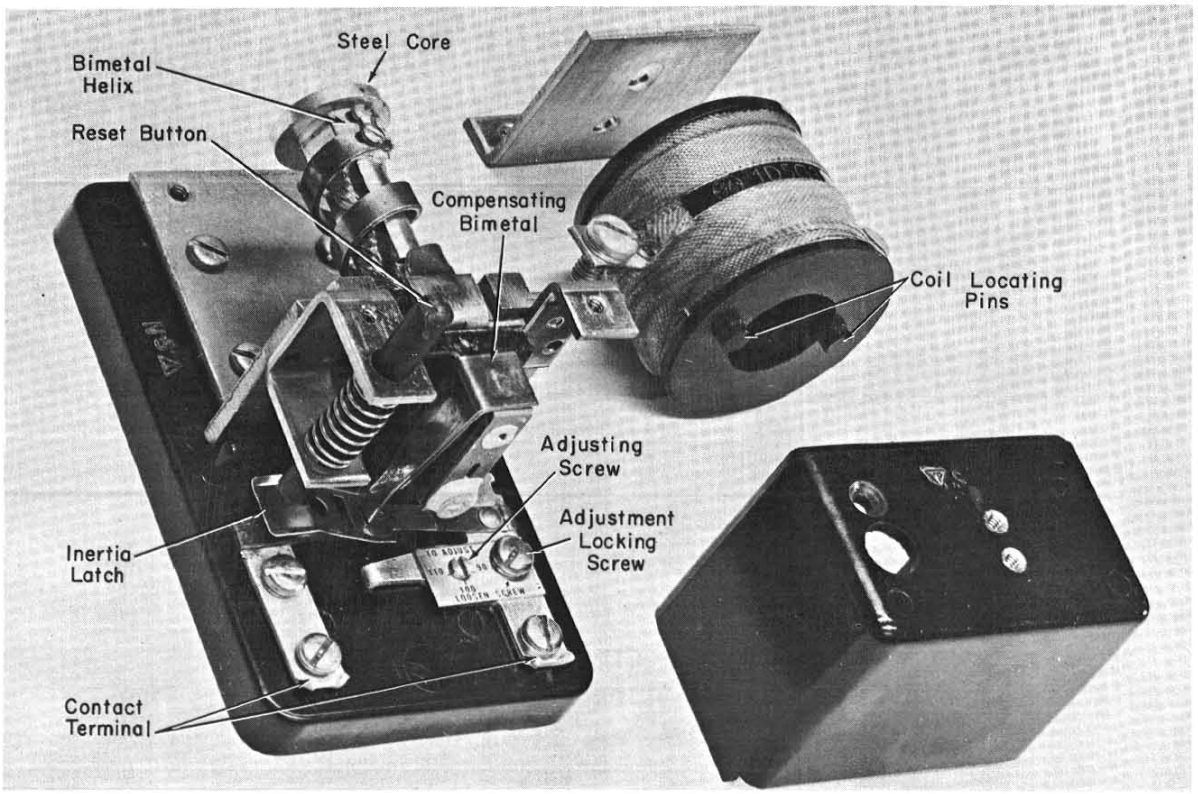

Fig. 6. Relay with coil and cover removed.

COIL SELECTION TABLE

IC2824-34C, -34H, -34N, and -34V Relays

Coil Cat. No.	Coil Rating in Amp at 40 C	Recommended Application Motor Full-load Amp
F1D5G8	0.71	0.57—0.62
G9	0.78	0.63—0.69
G10	0.86	0.70—0.76
G11	0.94	0.77—0.82
G12	1.03	0.83—0.91
G13	1.13	0.92—1.00
G14	1.24	1.01—1.10
G15	1.36	1.11—1.20
G16	1.50	1.21—1.33
G17	1.65	1.34—1.45
G18	1.82	1.46—1.60
G19	2	1.61—1.77
G20	2.20	1.78—1.94
G21	2.42	1.95—2.13
G22	2.65	2.14—2.33
G23	2.92	2.34—2.58
G24	3.20	2.59—2.82
G25	3.52	2.83—3.10
G26	3.87	3.11—3.40
G27	4.25	3.41—3.74
G28	4.68	3.75—4.12
G29	5.15	4.13—4.54
G30	5.60	4.55—4.94
G31	6.22	4.95—5.48
G32	6.85	5.49—6.03
G33	7.55	6.04—6.66
G34	8.30	6.67—7.32
G35	9.10	7.33—8.03
G36	10	8.04—8.83
G37	11.1	8.84—9.70
G38	12.2	9.71—10.8
G39	13.5	10.9—11.9
G40	14.7	12.0—13.0
G41	16.1	13.1—14.2
G42	17.8	14.3—15.7
G43	19.3	15.8—17.1
G44	20.7	17.2—18.2
G45	22.7	18.3—20.0
G46	25	20.1—22.0
G47	27.7	22.1—24.4
G48	29.5	24.5—26.1
G49	31.2	26.2—27.4
G50	33.3	27.5—29.4
G51	35.7	29.5—31.4
G52	38.5	31.5—33.9
G53	41.7	34.0—35.9
G54	45.5	36.0—40.3
G55	50.0	40.4—44.1
G56	55.6	44.2—49.0
G57	62.5	49.1—55.3
G81	68.8	55.4—60.5
G58	71.5	60.6—63.0
G82	78.7	63.1—69.5
G59	83.5	69.6—74.0
G83	91.7	74.1—81.0
G60	100.0	81.1—88.2
G84	110	88.3—98.0
G75	125	98.1—111.0
G273	137	111.1—121.0
G274	150	121.1—133

COIL SELECTION TABLE

IC2824-34L and -34T Relays

Coil Cat. No.	Coil Rating in Amp at 40 C	Recommended Application Motor Full-load Amp
F1D5G8	0.78	0.63—0.69
G9	0.86	0.70—0.76
G10	0.94	0.77—0.82
G11	1.03	0.83—0.91
G12	1.13	0.92—1.00
G13	1.24	1.01—1.10
G14	1.36	1.11—1.20
G15	1.50	1.21—1.33
G16	1.65	1.34—1.45
G17	1.80	1.46—1.60
G18	2.00	1.61—1.77
G19	2.20	1.78—1.94
G20	2.42	1.95—2.13
G21	2.65	2.14—2.33
G22	2.92	2.34—2.58
G23	3.22	2.59—2.82
G24	3.52	2.83—3.10
G25	3.87	3.11—3.40
G26	4.25	3.41—3.74
G27	4.68	3.75—4.12
G28	5.15	4.13—4.54
G29	5.65	4.55—4.94
G30	6.20	4.95—5.48
G31	6.85	5.49—6.03
G32	7.55	6.04—6.66
G33	8.34	6.67—7.32
G34	9.16	7.33—8.03
G35	10.0	8.04—8.83
G36	11.1	8.84—9.70
G37	12.2	9.71—10.8
G38	13.5	10.9—11.9
G39	14.9	12.0—13.0
G40	16.1	13.1—14.2
G41	17.8	14.3—15.7
G42	19.6	15.8—17.1
G43	21.7	17.2—18.2
G44	22.9	18.3—20.0
G45	25.0	20.1—22.0
G46	27.5	22.1—24.4
G47	30.6	24.5—27.1
G48	32.4	27.2—28.7
G49	34.4	28.8—30.4
G50	36.7	30.5—32.5
G51	39.3	32.6—34.8
G52	43.3	34.9—38.4
G53	45.8	38.5—40.6
G54	50.0	40.7—44.1
G55	55	44.2—49.0
G56	61	49.1—53.7
G57	69	53.8—60.8
G81	72.5	60.9—63.9
G58	79	64.0—69.6
G82	84	69.7—73.1
G59	92	73.2—81.0
G83	96.6	81.1—85.0
G60	110	85.1—96.9
G84	121	97.0—106.5
G75	137	106.6—121.0
G273	144	121.1—127.0

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