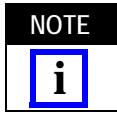


1. INTRODUCTION

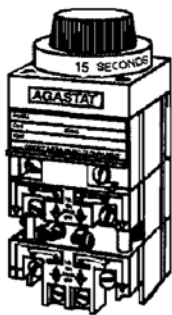
This instruction sheet covers the installation and operation of the AGASTAT* Nuclear E7000 Series 4-Pole Timing Relays (Models E7014 and E7024). Read these instructions thoroughly before installing the relay.



Dimensions in this instruction sheet are in millimeters [with inches in brackets]. Figures are not drawn to scale.

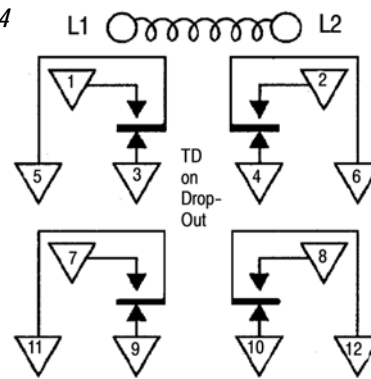
2. DESCRIPTION (Figure 1)

Each relay is a precise timing instrument which balances pneumatic, electrical, and mechanical forces using a minimum of moving parts.

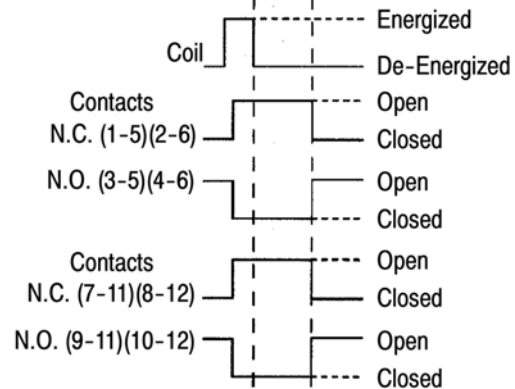


4-Pole Timing Relay (Typ)

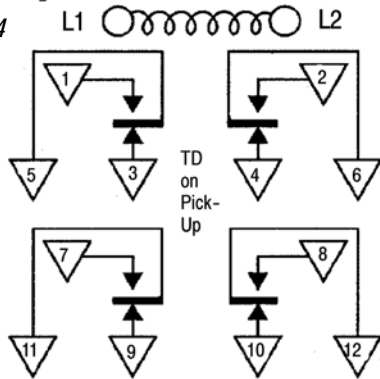
Model E7024



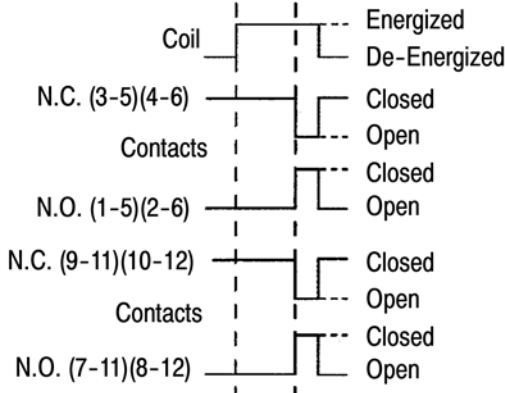
Delay Setting



Model E7014



Delay Setting



LINEAR TIMING RANGES

| TIME RANGE CODE | MODEL E7014† | MODEL E7024 |
|-----------------|-------------------|-------------------|
| A | 0.2 to 2 Seconds | 0.1 to 1 Second |
| B | 0.7 to 7 Seconds | 0.5 to 5 Seconds |
| C | 2 to 20 Seconds | 1.5 to 15 Seconds |
| D | 10 to 100 Seconds | 5 to 50 Seconds |
| E | 30 to 300 Seconds | 20 to 200 Seconds |
| F | 1.5 to 15 Minutes | 1 to 10 Minutes |
| H | 3 to 30 Minutes | 3 to 30 Minutes |
| I | Not Available | 6 to 60 Minutes |
| K | Not Available | 1 to 300 Cycles |

†Model E7014 is available with letter calibrated dials only. The upper end of the time ranges in this model may be twice the values shown.

Basic models are furnished with dials calibrated in linear increments covering the range selected. In addition, time-calibrated ranged B through K provide non-linear adjustment from 0.2 second to the beginning of the linear zone. For easiest adjustment and lowest cost, select the shortest time range suitable for the application.

Repeat accuracy at any fixed temperature is ±10%. The first time delay afforded by units with H (3 to 30 minutes) and I (6 to 60 minutes) time ranges will be approximately 15% longer than subsequent delays due to coil temperature rise.

NOTE: Dial settability with respect to the marking on the regulating dials is NOT included in the above repeatability value.

Figure 1 (Cont'd)

| AC COIL UNITS | | | DC COIL UNITS | |
|---------------|------------------------|------------------------|---------------|---------------|
| CODE LETTER | RATED VOLTAGE AT 60 Hz | RATED VOLTAGE AT 50 Hz | CODE LETTER | RATED VOLTAGE |
| A | 120 | 110 | M | 28 |
| B | 240 | 220 | N | 48 |
| C | 480 | -- | O | 24 |
| D | 550 | -- | P | 125 |
| E | 24 | -- | Q | 12 |
| F | -- | 127 | R | 60 |
| G | -- | 240 | S | 250 |
| H | 12 | -- | T | 550 |
| I | 6 | -- | U | 16 |
| J | 208 | -- | V | 32 |
| | | | W | 96 |
| | | | Y | 6 |
| | | | Z | 220 |

All units draw approximately 8 watts power at rated voltage.

Minimum operating voltages are based on vertically mounted Model E7012 (on-delay) units.

The AC units drop out at approximately 50% of rated voltage. The DC units drop out at approximately 10% of rated voltage.

The operating voltage range of AC relays is 90% to 110% (DC relays are 85% to 110%) of nominal rated value.[†]

[†] All units may be operated on intermittent duty cycle at voltages 10% above the listed maximums. (Intermittent duty - maximum 50% duty cycle and 30 minutes "on" time.)

| CONTACT RATINGS - NUCLEAR | |
|----------------------------|--------|
| Resistive at 125 Vdc | 1.0 A |
| Resistive at 120 Vac 60 Hz | 10.0 A |

| CONTACT RATINGS - NON-NUCLEAR (Contact Capacity in Amperes - Resistive Loads) | | |
|--|----------------------------|------------------------------|
| CONTACT VOLTAGE | MINIMUM 100,000 OPERATIONS | MINIMUM 1,000,000 OPERATIONS |
| 30 Vdc | 15.0 | 7.0 |
| 110 Vdc | 1.0 | 0.5 |
| 120 Vac 60 Hz | 20.0 | 15.0 |
| 240 Vac 60 Hz | 20.0 | 15.0 |
| 480 Vac 60 Hz | 12.0 | 10.0 |

Contact ratings are Listed under the Underwriters Laboratories Inc. Component Recognition Program for 100,000 operations:

- 10 A Resistive, 240 Vac (per pole)
- 1/4 Horsepower, 120 Vac/240Vac (per pole)
- 15 A, 30 Vdc (per pole)
- 5 A, General Purpose, 600 Vac

Inductive and capacitive loads should not have inrush currents that exceed five times the normal operating load.

Figure 1 (End)

3. MOUNTING INSTRUCTIONS (Figure 2)

The relay must be mounted in a vertical position. Four No. 8-32 tapped holes are provided in the back plate.



Mounting screws should not project more than 3.63 mm [5/32 in.] into the back of the unit, to prevent internal damage.

A bracket, lockwashers, and required screws are supplied with each unit for mounting the unit from the front. The bracket extends approximately 9.52 mm [3/8 in.] from each side of the unit.

Models E7014 and E7024 (Mounting Dimensions)

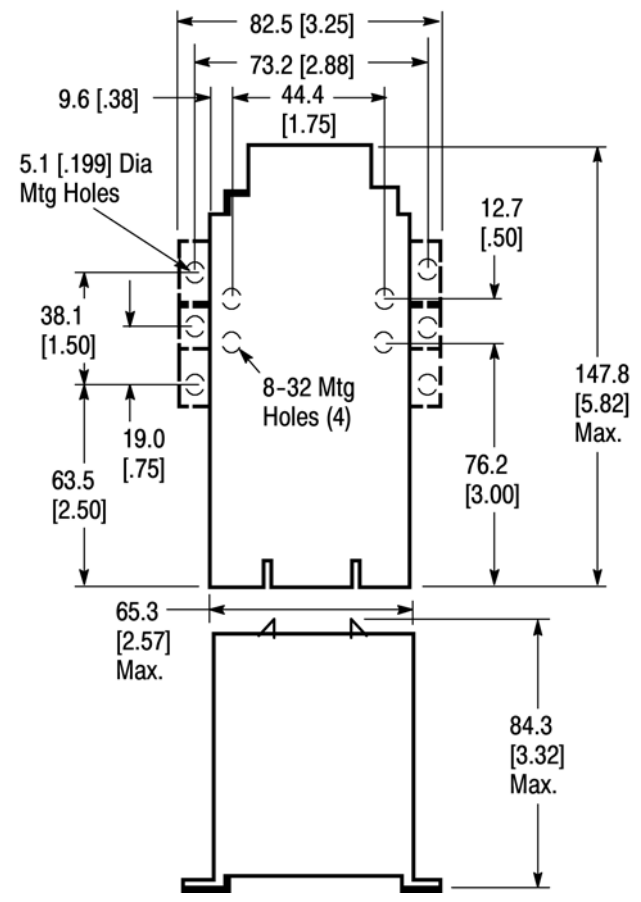


Figure 2

4. DELAY SETTING

Dial calibrations are provided to minimize the time required to set the unit to a specific delay. Rotate the dial CLOCKWISE to increase the delay and COUNTERCLOCKWISE to decrease it.

The following procedure is recommended if the unit must be set to a very precise delay value.

1. Set dial to the desired time delay. On letter calibrated units, this requires an approximation of a percentage value between the arrowhead "▼" on the dial, which provides minimum time, and the letter "E", which provides maximum time.

2. Record as many time delays as required to establish a stable average.
3. If the recorded average delay is shorter than the desired time, turn the dial slightly CLOCKWISE, if it is longer, turn the dial COUNTERCLOCKWISE.
4. Repeat Step 2 after each adjustment, until required delay is recorded.

Because of a variety of environments in which time delay relays are applied, a re-check of the time delay is recommended after approximately three hours of operation. If any change from the initial time setting is apparent, the relay should be re-set to the desired delay.

The time delay accuracy should then be monitored on a monthly basis for several months, and if no substantial change in time delay has taken place, the frequency of checking may be reduced. It is recommended that this procedure be incorporated in the Operating Instructions for your equipment.

5. QUALIFICATIONS

The E7000 Series Nuclear Timing Relays are Listed by Underwriters Laboratories Inc. (UL) in File No. E15631, and Certified to the Canadian Standards Association (CSA) in File No. LR29186. The basic relays have been qualification tested to IEEE STD 323-1974 and IEEE STD 344-1975.

6. REVISION SUMMARY

Since the previous version of this document, the following changes were made:

- Removed sentence from Section 2.
- Updated document to corporate requirements.