# SIMPLE OPERATION OF TM SERIES ====

# BASIC TYPES TM-01 ON DELAY 2 SPDT\* BASIC TYPES TM-11 INTERVAL 2 SPDT BASIC TYPES TM-21 OFF DELAY 2 SPDT

\*On Types TM-01 only, switch (Terminals 3-1, 3-2) is operated by solenoid for interlock use. Switches designated S1 and S2 are untimed.

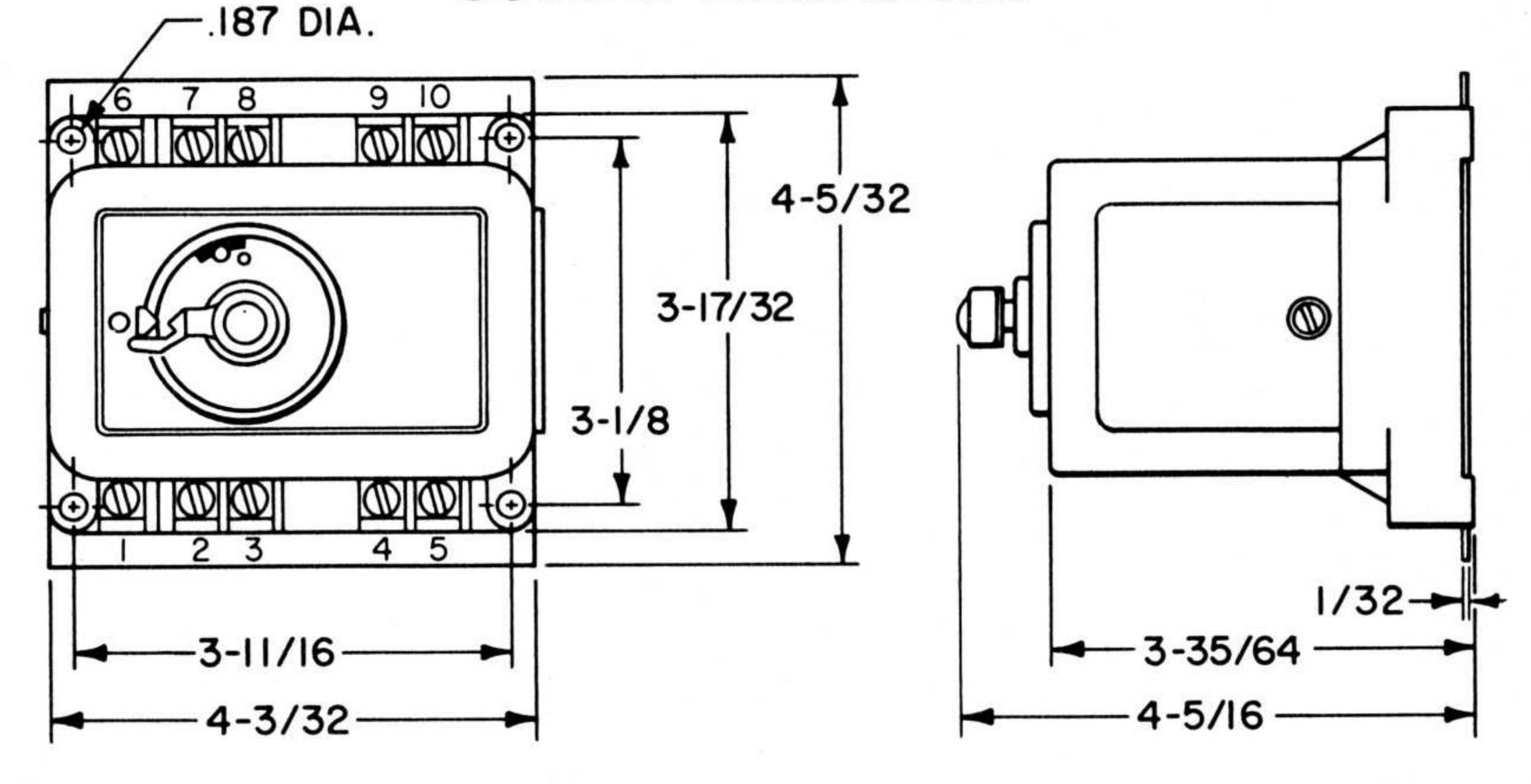
In addition to dependable accuracy, excellent life characteristics and a wide range of timing periods, the TM series offers' very simple setting of timing periods. To set, the copper pointer is depressed and moved to the desired time setting. The silver timing pointer rests against the copper pointer except during timing period.

At the end of timing period, silver pointer operates switches (at zero) and *resets* immediately to setting of copper pointer, even though solenoid remains energized and switches are in timed out position. Detail operation information on the TM series is provided in the "Operating and Installation Instructions" packed with each type.

# U/L LISTED TM SERIES RESET TIMERS

Volts	Series	Model	Time Range	Range of Adjustability
120	ON DELAY	TM-01-020	1 minute	2-60 seconds
120		TM-01-120	3 minutes	6-180 seconds
120		TM-01-220	5 minutes	10-300 seconds
120		TM-01-320	1 hour	2 min1 hour
120		TM-01-420	5 hours	10 min5 hours
240		TM-01-023	1 minute	2-60 seconds
240		TM-01-123	3 minutes	6-180 seconds
120	INITEDIVAL	TM-11-320	1 hour	2 min1 hour
120	INTERVAL	TM-11-420	5 hours	10 min5 hours
120		TM-21-020	1 minute	2-60 seconds
120		TM-21-120	3 minutes	6-180 seconds
120	OFF DELAY	TM-21-220	5 minutes	10-300 seconds
120		TM-21-320	1 hour	2 min1 hour
240		TM-21-123	3 minutes	6-180 seconds

# **OUTLINE DIMENSIONS**



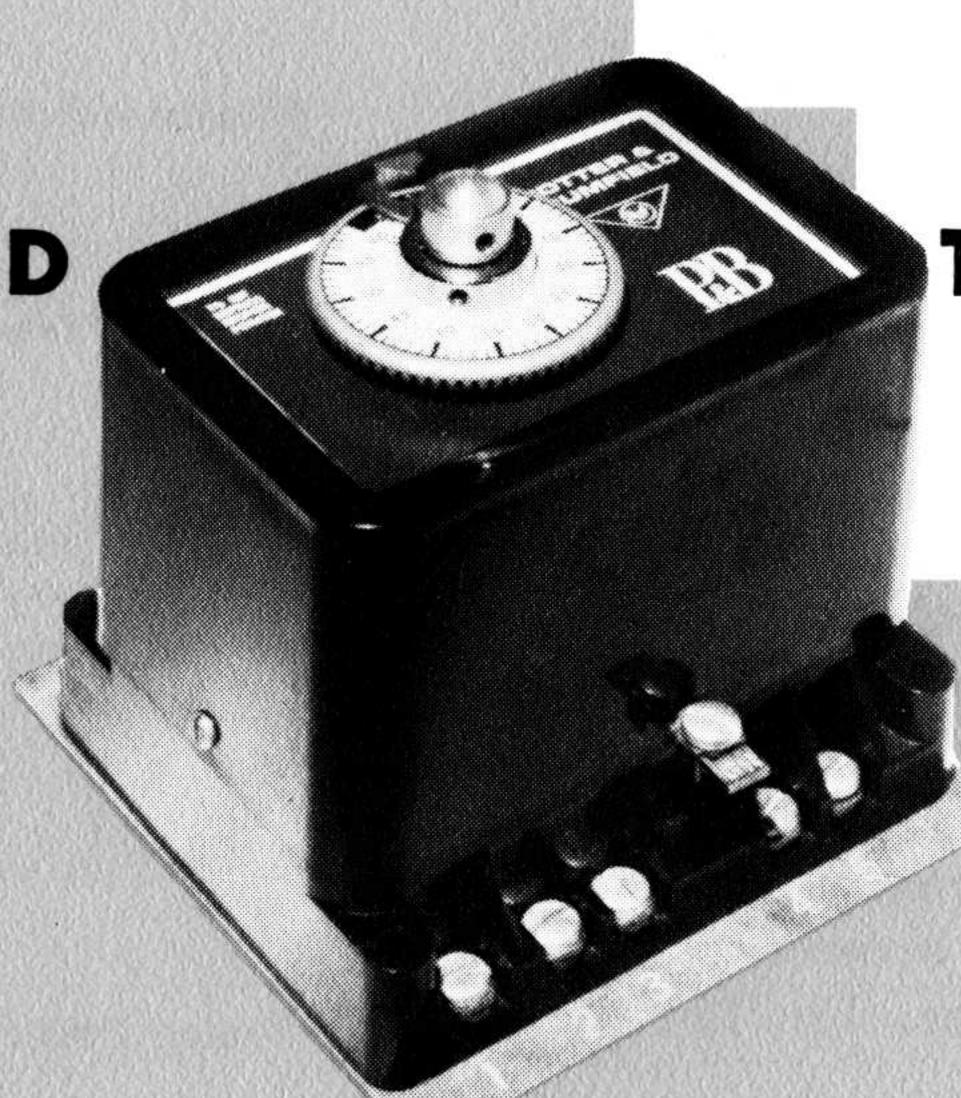
#### INFORMATION REQUIRED WHEN ORDERING

- 1. Specify Model number of time delay relay or automatic reset timer.
- 2. Be sure Model number checks with type, time range, voltage and cycles (Hz) required.
- 3. If undecided in the selection of a specific type for an application, please write the factory. Our application engineers are at your service, but please be sure to specify sequence of operation, type of load, and type of pilot operation to be used.

Standard TM series time delay relays are stocked by leading electronic parts distributors throughout the U.S. and Canada.



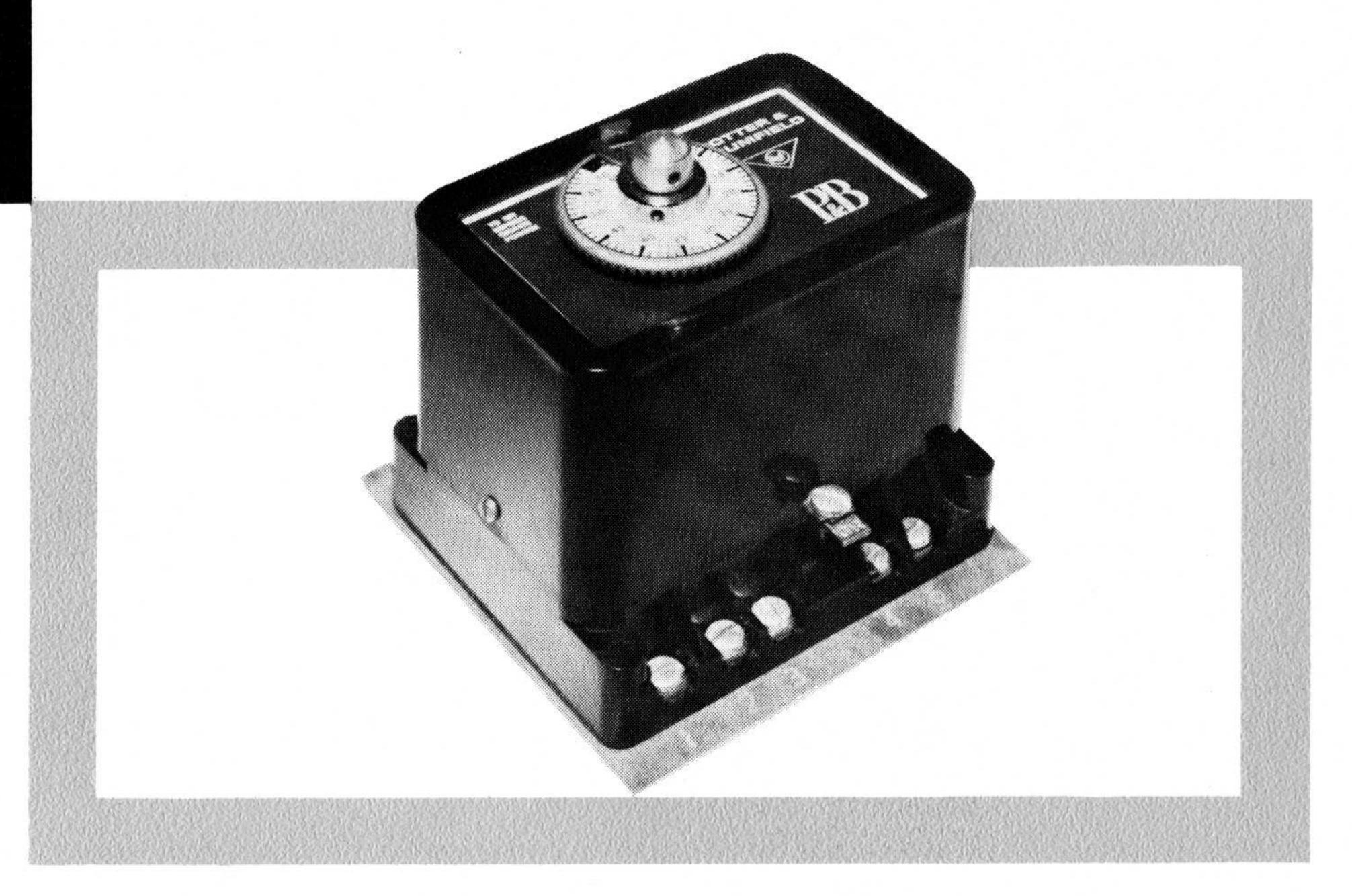
POTTER & BRUMFIELD



TIME DELAY RELAYS



# time delay relays and automatic reset timers



## ENGINEERING DATA

TM series time delay relays and automatic reset timers are available in a wide variety of adjustable timing ranges. Three types of timing sequences are offered:

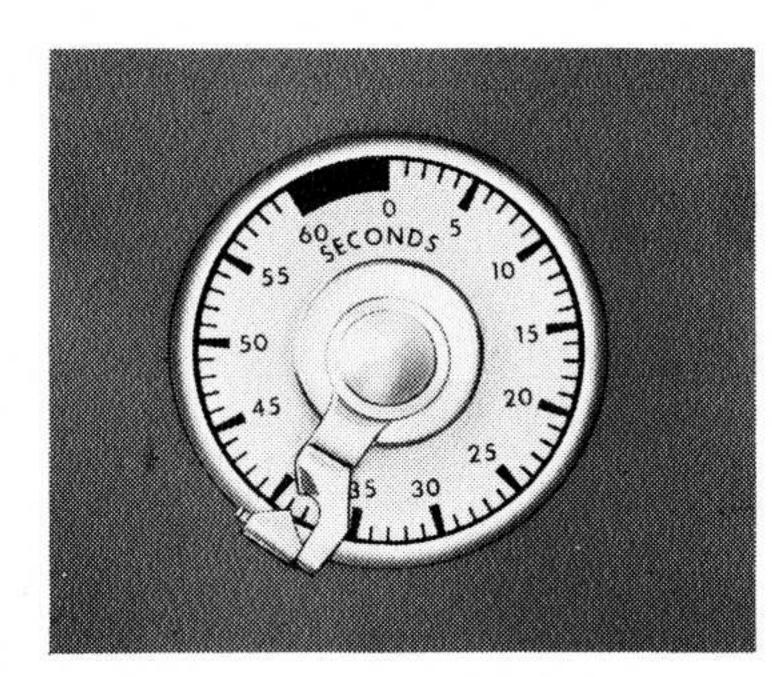
- TYPE TM-01 ON DELAY
- TYPE TM-11 INTERVAL
- TYPE TM-21 OFF DELAY

They assure accurate and dependable timing control for motors, pumps, air conditioning, vending machines, machine tools and many other types of equipment. They are easy to install as all internal timer components are connected to external terminals, thereby providing maximum field flexibility in wiring and application. The 3-watt motor is self lubricated, runs continuously and requires no shut-off switch. The durable ABS styrene cover and phenolic base provide protection against dust and moisture. Barriers are molded between terminals for good electrical isolation of circuits. The TM series is Underwriters' Laboratories listed.

# SPECIFICATIONS

Voltage: 120V or 240V, 50/60Hz.

Switch Load Capacity: 720VA pilot duty; 120V-600V, AC.



Sharply defined graduations of the dial assure accurate settings over a broad time range — from 2 seconds up to 5 hours—depending on the model timer used. Depressing copper dial pointer and moving it clockwise to desired timing sets timer.

Motor: 3 watts, 240V AC maximum. Duty: Continuous.

Accuracy: Plus or minus 1% total dial range.

Minimum Setting: Two dial graduations, or two seconds out of 60 second range, or at zero position.

Ambient Temperature Range:  $-20^{\circ}$ C to  $+50^{\circ}$ C.

Solenoid: Continuous duty rated

Inrush: .7 amps 84 VA at 120V 60Hz. Holding: .08 amps 9.6VA at 120V 60Hz.

Inrush: .33 amps 79VA at 240V 60Hz. Holding: .03 amps 8VA at 240V 60Hz.

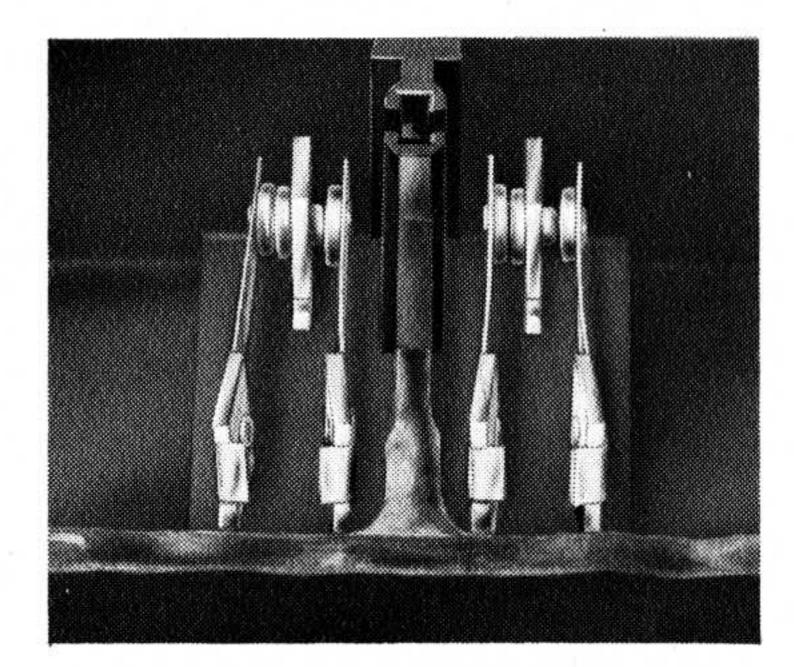
Gears: Precision machined for long life.

Timing Pointer Reset: Silver pointer resets instantly at end of timed period whether solenoid remains energized or not. Switches remain timed out until solenoid is returned to normal.

Switch: Two sets of quick make and break SPDT switches are designed for best AC load characteristics.

Enclosure: ABS styrene cover and phenolic base.

TM series timers have two sets of SPDT quick make and break contacts, forming the switches. These switches are independent of motor and can be wired for loads up to 600V AC, 720VA capacity.



# OPERATION SEQUENCE OF TM SERIES

# TYPE TM-01 TIME DELAY RELAYS (on delay)

The Type TM-01 is an "ON-DELAY" timer. When solenoid is energized, timing starts. Operation of load switch is delayed for time set on dial. A set of instantaneous contacts operate with solenoid.

The on-delay is used for staggering motor load starts, gas oven prepurge applications, refrigeration compressor delays and process sequences where a delayed switch is needed.

The instantaneous contact S1 can be used as an interlock if pushbutton pilots are employed.

Load switches T.C. (Time and Close) and T. O. (Time and Open) are delay switches used to control the load that is to be delayed.

# TYPE TM-11 (INTERVAL) TIMER

The Type TM-11 is an "INTERVAL" timer. When solenoid is energized, switches transfer and timing starts. At the end of time set on dial, switches return to original position.

The Type TM-11 interval timer is used for timing many industrial processes. It can be combined with the Type TM-01 to function as a cycle repeater. It is an ideal timer for water pump backspin protection and refrigeration compressor short cycle elimination.

TM-11 has two sets of SPDT switches that operate in unison. When momentary contact pilot is used, one of the timer switches will serve as an interlock.

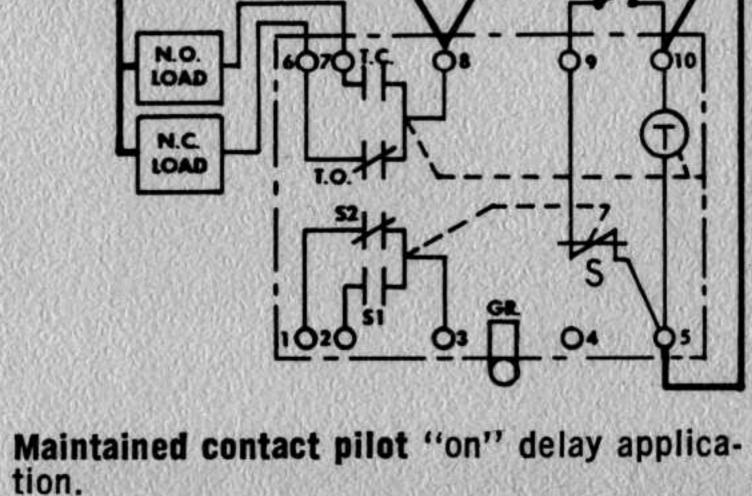
# TYPE TM-21 TIME DELAY RELAYS (off delay)

The TM-21 is an "OFF-DELAY" timer. When solenoid is energized, load switches transfer to pretiming position. No timing occurs until solenoid is de-energized (off). Transfer of load switches is then delayed for time set on dial.

The TM-21 off-delay is used where two loads start together but one is to go off after the other. Post-purge of gas ovens, exhaust fans on processes using noxious fumes, timing processes requiring timer to stop on power failure and complete timing on resumption. Public rest room fan control, piloted by door.

Unlike the Type TM-01, both sets of switches on the Type TM-21 are timed and operate in unison.

Potter & Brumfield TM series time delay relays and automatic reset timers are designed to operate with all types of pilot switches, maintained contact, momentary contact, float, pressure, limit switches and other devices used in conjunction with timing sequences.



Type TM-01 Wiring Diagram

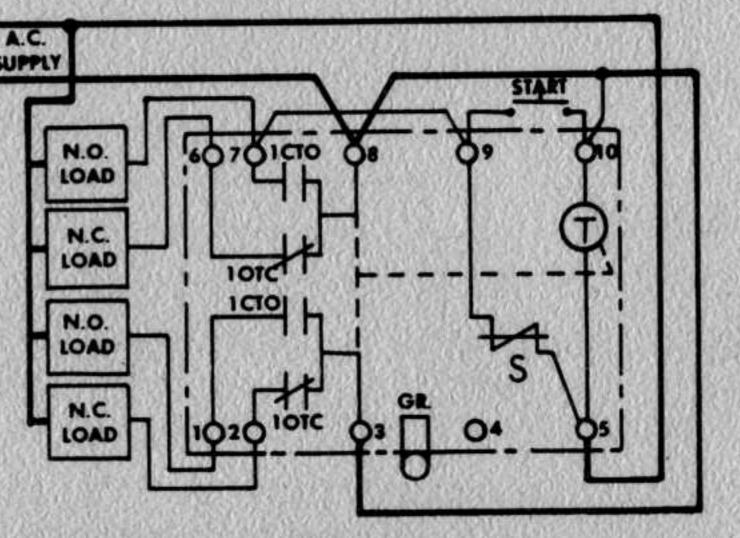
Energized, engaged, or closed.

Deenergized, disengaged or open.

Switches may be wired independent of motor and solenoid "S" switches may be used for

	TERM. NOS.	BEFORE TIMING	DURING TIMING	AFTER TIMING
T.C.	8-7			
T.O.	8-6			
S-1	3-2			134 7.3
3.2	3-1			
Motor	10-5			
Solenoid	9-5			
Clutch				

# Type TM-11 Wiring Diagram



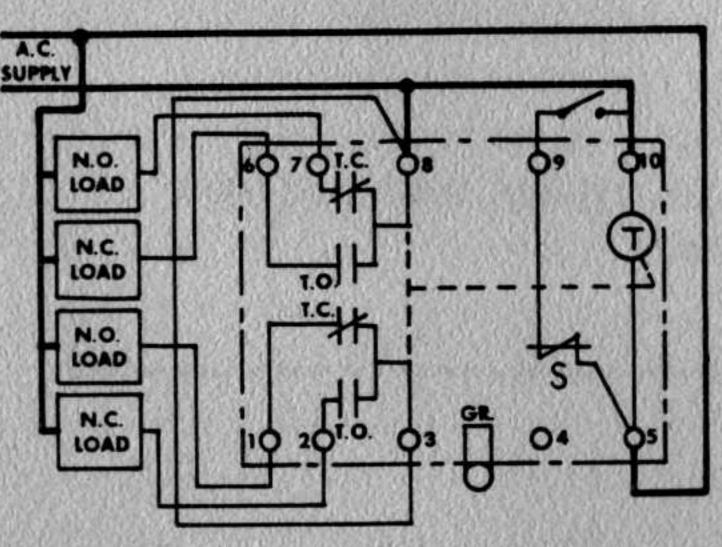
Pushbutton or momentary pilot "interval" timing application.

### Type TM-11 Switch Program

	TERM. NOS.	BEFORE TIMING	DURING TIMING	AFTER TIMING
I.C.T.O.	8-7			***************************************
1.0.T.C.	8-6			
1.0.T.C.	3-2			
I.C.T.O.	3-1			
Motor	10-5			
Solenoid	9-5			
Clutch				

Motor may be independently used to run continuously.

### Type TM-21 Wiring Diagram



Maintained contact pilot "off" delay appli-Load switches may be wired independently. Load switches shown in timed out position.

#### Type TM-21 Switch Program

	SW. TERM.	BEFORE TIMING	DURING TIMING	AFTER TIMING
T.C.	8-7			
T.O.	8-6			
T.O.	3-2			
T.C.	3-1			
Motor	10-5			
Solenoid	9-5			
Clutch				