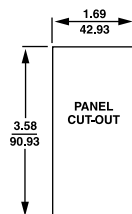
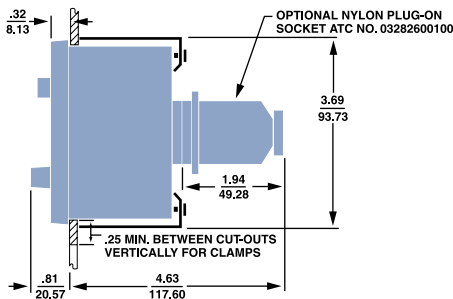
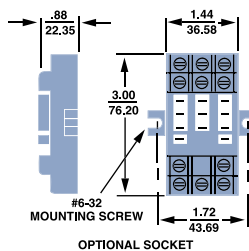
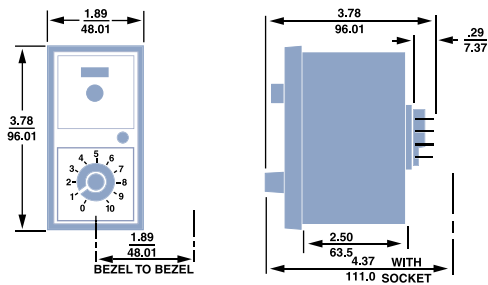




# Series 328

## Multi-Range TDR



### PRODUCT HIGHLIGHTS

#### DESIGNED FOR INDUSTRIAL SERVICE

With a load relay that is rated for 100,000,000 mechanical operations, and power supply that protects circuit components against the voltage transients that are typical of industrial plants, the 328 has a long life expectancy even in tough environments.

#### CYCLE PROGRESS INDICATION

The 328's LED annunciator provides a unique and extremely effective method of cycle progress indication. **Off** before timing, the LED blinks at an ever-increasing rate as the cycle progresses: once every 3 1/2 seconds during the first 10% of the cycle, twice during the second 10%, and so on. At time-out, the LED stays on constantly, pulsing at a high rate. (In the 1 and 10-second ranges, the LED is **off** before timing, steady **on** during timing, and pulsing **on** after time-out.)

#### VERSATILE MOUNTING

The standard 328 has an 11-pin base which accepts push-on connectors or plugs into a surface-mounted socket. Since all connections are made to the socket, the 328 is readily removed without disturbing the wiring. It is also available with an optional quick-connect plug and brackets for flush panel-mounting.

#### MULTIPLE RANGES REDUCE INVENTORY REQUIREMENTS

Because the 328 has six switch-selected ranges--from 1 sec to 10 hours--each timer can provide any dial-adjustable timing period between 50 ms and 10 hours...thus greatly reducing inventory requirements especially for large users. The range selector switch knob can be easily removed to prevent unauthorized range change.

#### HIGH ACCURACY

The 328's digital circuit maintains rated accuracy from cycle to cycle, regardless of reset time variations. Its oscillator-based circuit is also effectively compensated for changes in temperature and voltage and thus achieves excellent overall accuracy.

#### VERSATILE CONTROL CAPABILITY

Every 328 can be used for either **On-Delay**, **Off-Delay** or interval operation, depending on how its terminal block is wired.

#### APPROVALS

See Agency listing on page 391.

### The 328D Directly Replaces 328A, 328B, and 328C.

*An extremely versatile dial-adjustable time delay relay, the ATC 328 provides a choice of ON-Delay, OFF-Delay or interval operation for any timing period between 50 ms and 10 hours...all in the same timer. Based on a unique digital circuit, it features cycle progress annunciation and is suitable for the most demanding industrial service.*

## OPERATION

The 328's digital circuit comprises a *variable frequency oscillator* (VFO) whose frequency depends on the settings of the range selector and dial adjustment and whose output feeds a *digital counter*. The frequency of the VFO determines how fast the counter reaches the limit of its fixed range and, therefore, how fast the 328 times out.

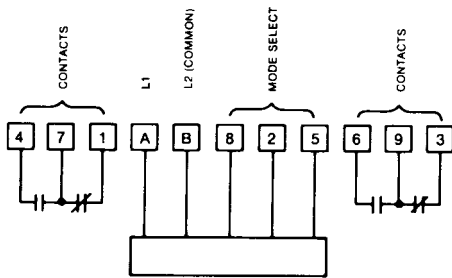
Control action of the 328 depends on how its terminal block is wired (see diagrams below.)

In **ON-Delay** operation, timing begins when the *start* switch is closed. The load relay contacts transfer at the end of the timed period. Reset occurs when the *start* switch is opened or when there is a power interruption.

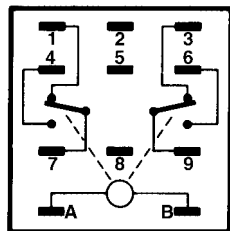
In **OFF-Delay** operation, timing begins when the *start switch* is opened. The load relay contacts transfer at the end of the timed period and back again at reset. Reset occurs when the *start* switch is closed. Control action of all loads is delayed, either *closed-closed-open* or *open-open-closed*.

In *interval* control, timing begins when the *start* switch is closed. The load relay contacts transfer at the beginning and at the end of the timed period, thus providing true interval control, either *open-closed-open* or *closed-open-closed*. The start signal may be either sustained or momentary; in the latter case, the *start* signal is "latched in" by wiring it to one of the load relay's two sets of contacts. Power interruption resets the timer.

## WIRING



## TERMINAL WIRING



## TYPICAL INSTALLATIONS

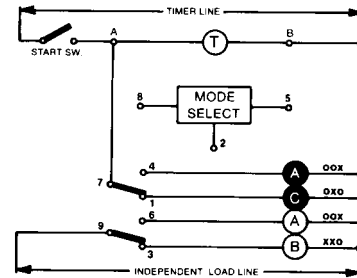
### KEY SYMBOLS

- ⊙ TIMING CIRCUIT
- INDEPENDENT LOADS
- DEPENDENT LOADS
- ⊖ MOMENTARY STARTING CONTACT
- ⊢ SUSTAINED STARTING CONTACT
- ⊗ LOAD ENERGIZED
- ⊙ LOAD DE-ENERGIZED

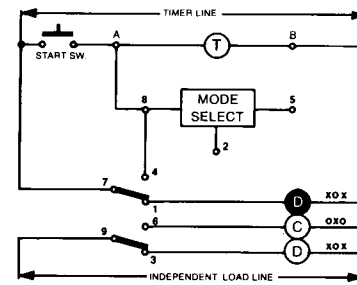
All timers shown in "before start" position. Diagrams shown with power off unless otherwise marked.

Maximum load current through any load carrying contact is 7 amperes.

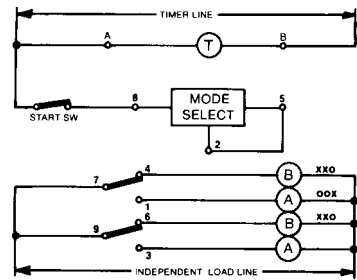
### DELAY-ON-MAKE



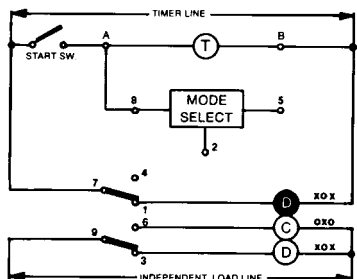
### ONE-SHOT



### OFF-DELAY (Shown with power on)



### INTERVAL



## SPECIFICATIONS

### MODELS

One model provides all ranges and control modes. 328D200F10XX

### RANGE

Six switch-selected ranges:  
 1 sec. 10 min.  
 10 sec 1 hr.  
 1 min. 10 hr.

### MINIMUM SETTING

2% of range, except 50 ms on 1 sec. range.

### REPEAT ACCURACY

Varies with changes in line voltage and ambient temperature but *not* with reset time:  $\pm 0.5\%$  of setting or 15 ms. over the entire voltage and temperature range

### TIMING MODES

On-Delay/Off-Delay/Interval

### RESET TIME

**ON-DELAY:** 100 ms. max.

**OFF-DELAY:** 50 ms. max.

**INTERVAL:** 100 ms. max.

### LOAD RELAY:

TYPE: DPDT

LIFE: 100,000,000 operations (no load)

CONTACT RATING:

AC - 10 A (resistive)

at 125-250V. 1/8 HP

DC 10A at 30 VDC.

### INDICATOR

Timing LED

### POWER REQUIREMENTS

24 VAC to 240 VAC and 24 VDC

AC (+10%, -20%) 50/60Hz

DC (+20%, -20%)

Maximum Ripple @ 100 Hz-5%

### SETTING ACCURACY

10% of range

### TEMPERATURE RATING

0° to 140° F

-18°C to 60°C

### MOUNTING

STANDARD: 11 pin case plugs into matching socket with 11 screw terminals; pins also accept 0.187 in. push-on connectors.

OPTIONAL: kit provides 11-pin plug-in socket and 2 brackets for flush panel mounting.

### WEIGHT

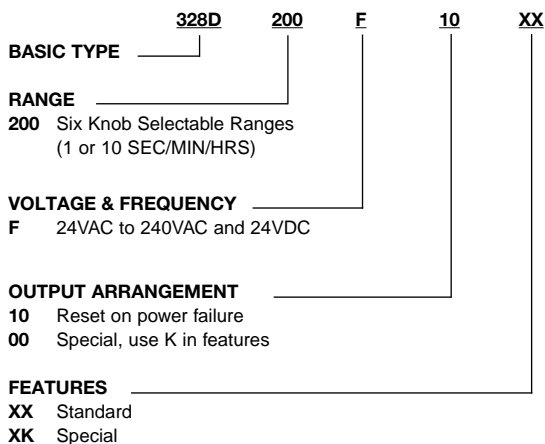
NET: 7 oz.

SHIPPING: 1 lb.

### HOUSING

Plug-in design; dust, moisture and impact-resistant molded plastic case. DIN size (48mm x 96mm)

## ORDERING CODE



### ACCESSORIES

0000-825-69-00 Surface Mounting Socket w/hold down clips

0000-825-89-00 DIN rail socket

0328-260-01-00 Panel Mounting Plug-on socket

0328-260-02-00 Panel Mounting Kit consisting of gasket and 2 clamps

For prices and further information, consult factory

**The 328D Directly Replaces 328A, 328B, and 328C.**

Before starting your design, read the safety statement on the inside back cover of the ATC catalog.