



Shawnee II Digital Programmable Timer

A compact version of the versatile 333 Timer, the **ATC 353B** is its exact functional duplicate. Packaged in a 72mm² DIN-Size housing, it occupies 40% less panel space and costs proportionately less. Modern production and assembly techniques have all but eliminated hand wiring, enhancing the reliability and life expectancy of the 353B.

CONTROL VERSATILITY: The 353B operates either as a repeat cycle pulse generator or in single-cycle interval or delayed mode. You choose the kind of control action you want by installing jumpers on the terminal block. It also provides a choice of control output. Choose a standard plug-in SPDT relay or optional SPST solid-state switch module plus an independent-24VDC output signal at Terminal 16.

COMPUTER TESTED RELIABILITY: The solid-state 353B is manufactured from a series of computer-tested plug-in circuit boards and assembled virtually without hand wiring. Because it has no moving parts in its logic circuits, its life expectancy is practically unlimited. Even the load relay — the 353B's only significant mechanical component — has a life expectancy of 100,000,000 operations (no load), while the optional solid-state switch module has virtually unlimited life expectancy. As a result, the 353B achieves an overall reliability that surpasses even the high level achieved by previous Shawnee timers.

SAVE 40% IN PANEL SPACE AND COST: Packaged in a 72mm² DIN-size housing, the 353B occupies 40% less panel space than previous IC timers. Modern production and assembly techniques have substantially reduced manufacturing costs and resulted in a 45% cost saving.

WIDE RANGE: Each Shawnee II 353B timer covers the overall span of 0.01 SEC to 999.9 MIN in four field-convertible ranges.

EASY TO SET: The Shawnee timer is easily and accurately set even with work gloves on. Push any of its four toggle levers in any sequence until the number you want appears above it. You can decrease as well as increase each number by pushing the levers up or down. You can change the setting at any time, even during a cycle.

NOISE IMMUNITY: The 353B does not have to be shielded: its transformer power supply, full-wave bridges, buffered logic and other design characteristics render it immune to the electrical noise that is sometimes encountered in industrial environments thus eliminating false starts and reset due to voltage spikes.

CYCLE PROGRESS INDICATION: The Shawnee 353B indicating timer provides cycle progress indication on a four-digit display located immediately above the digital setting number wheels. While the non-indicating Model 353B does not provide true cycle progress indication, it has a pilot light which is on during the timing cycle and a legend light which is on when there is power to the timer.

OUTSTANDING REPEAT ACCURACY: Unsurpassed among industrial timers regardless of cost, the Shawnee 353B has a repeat accuracy of ± 10 milliseconds on any setting within its overall range of 999.9 MIN, even in the face of wide swings in temperature or voltage and regardless of the amount of reset time between cycles.

PLUG-IN AND DUST-TIGHT: All 353B timers feature true plug-in design and are dust-tight from the front of panel.

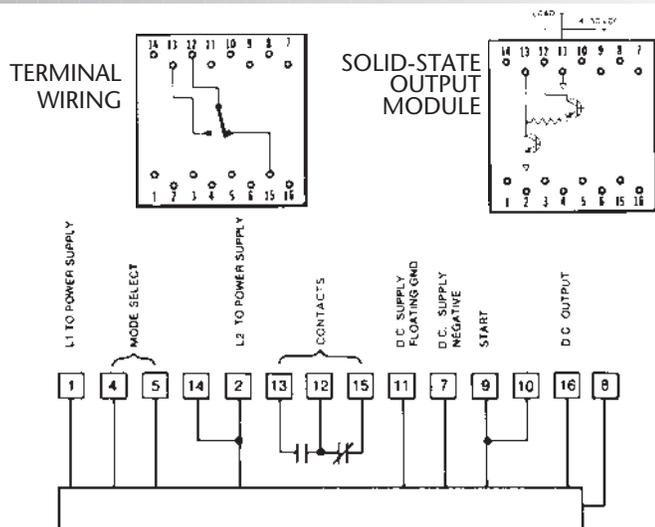
| | | | | |
|---|--------------------------------|-----|----|---|
| MODEL NUMBER >>>>>> | 353B | | 30 | P |
| Range | | | | |
| | 999.9 SEC | 346 | | |
| | 999.9 MIN | 347 | | |
| | 99.99 SEC | 351 | | |
| | 99.99 MIN | 352 | | |
| | Special | 000 | | |
| Voltage & Frequency | | | | |
| | 120/60 | A | | |
| | 240/60 | B | | |
| | 120/50 | C | | |
| | 240/50 | D | | |
| Arrangement | | | | |
| | With Display (on Delay) | 30 | | |
| Features | | | | |
| | Basic plug-in unit | P | | |
| | Standard unit | X | | |
| | With solid-state output module | J | | |
| | Special | K | | |
| ACCESSORIES: 0353-260-27-00: Surface mounting bracket kit 0305-265-61-70: Retrofit kit | | | | |

The 353B Directly Replaces 353A.

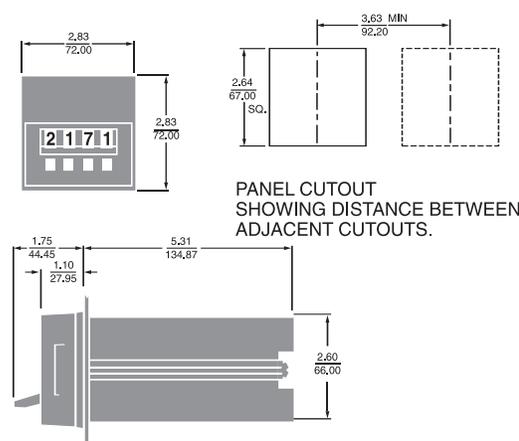
SPECIFICATIONS

| | | | | | | | |
|----------------------------|---|--|-------------------------------------|--|---|---|--|
| MODELS | Both indicating and non-indicating models of the 353B are available. See ordering code. | | POWER REQUIREMENTS | 120V | 95 to 132V, 50/60 Hz inrush – 0.4 A running – 0.04 A | | |
| RANGES | Four field convertible ranges | | DC POWER SUPPLY OUTPUT (Terminal 7) | 240V | 190 to 264V, 50/60 Hz inrush – 0.2 A running – 0.02 A | | |
| | 0.01 - 99.99 SEC | | | Voltage | -24V ± 10% | | |
| | 0.01 - 99.99 MIN | | | Current | 40 mA max. | | |
| | 0.1 - 999.9 SEC | | | Voltage | ON – -24V ± 10% OFF – -1V or less | | |
| TIMING MODES | Single cycle (interval or delayed) and repeat cycle pulse generator. | | DC OUTPUT (Terminal 16) | Current | 40 mA max. | | |
| | | | | Impedance | with relay–5 mA max. without relay–40 mA max on – 10 ohms max. off – 10K ohms. | | |
| VOLTAGE REQUIREMENTS | | | | | | | |
| START/RESET SIGNAL | Positive Polarity | Ready at 4.5V min. Reset at 1.0V max. | PULSE GENERATOR OPERATION | PULSE ON TIME(with relay): 80 mSEC ± 20 mSEC (may be shortened or lengthened by installing a resistor or capacitor, respectively, across Terminals 4 and 11; see Operation Section for details.) | | | |
| | Negative Polarity | Ready at 3.0V min. Reset at 1.0V max | | LOAD RELAY | LIFE 100,000,000 operations (no load.) CONTACT RATING: 5A at 120V AC | | |
| | Max. Continuous Input | 40V. | | | SOLID-STATE SWITCH MODULE (OPTIONAL) | Switches external DC voltage supply of positive polarity, 4 to 30V, 50 mA max. (details of operation described in installation manual.) | |
| | Ripple Voltage | must not go below minimum required | | REPEAT ACCURACY | | ±0.01 SEC on all ranges. | |
| | AC Line Voltage Input Impedance | 5K ohms. | | | MINIMUM SETTING | 99.99 SEC or MIN ranges: 0.01 SEC or MIN, respectively. 999.9 SEC or MIN ranges: 0.1 SEC or MIN, respectively. | |
| | RESET TIME | | | | | | |
| | Circuit Reset | 1 mSEC max. | | MOUNTING ACCESSORIES | Standard | Hardware is provided to mount timer so that it is dust-tight from front of panel. | |
| | Relay Drop-Out | 20 mSEC max. | | | Optional | Surface mounting without and with front-facing terminals. (See Accessory section of catalog) | |
| | START SWITCH REQUIREMENTS (isolated contact) | | | | | | |
| | Switch Rating | 10mA 30V | | TEMPERATURE RATING | NEMA 12 | NEMA 12 case (1 timer) | |
| Min Open Resistance | 1 megohm | WEIGHT | NET: 1 lb., 7 oz. | | SHIPPING: 2 lbs. | | |
| Max. Closed Resistance | 20K ohms | LATCHING MODE OPERATION (interval only) | | | | | |
| Min. Duration Start Signal | 50 µSEC | | | | | | |
| Max. Duration Start Signal | continuous | | | | | | |
| Reset | when signal is removed | | | | | | |

WIRING



DIMENSIONS (INCHES)



Panel Mounted Digital Timers // 353B Series

OPERATION

The Shawnee 353B operates on a digital logic circuit with three main elements: a clock which uses utility line frequency of 50 or 60 Hz as its time base; a read-only-memory (ROM) whose output is set by the timer's digital setting number wheels; and a comparator that continuously examines the outputs of the clock and ROM.

When power is applied (start signal on), the clock begins to count each cycle of the utility line frequency. Translating this count into hundredths of a second, the clock accumulates it and feeds it continuously to the comparator. When clock output exactly equals the output of the ROM, the 353B times out.

At that instant, the clock turns itself off automatically.

At the same instant, the 353B generates one type of control action or another, depending on how it is wired.

When the 353B is wired for interval operation, the timer's output device (either the standard SPDT relay or the optional SPST switch module) is energized from the start to the end of the time cycle; so is the -24 VDC output at terminal 16.

When the 353B is wired for delayed control, the output device is energized at the end of the cycle and remains on until the timer is reset; so is the -24 VDC output. When the 353B is wired as a repeat cycle pulse generator, the output device and the DC signal are both off until the end of the cycle, at which time they are both on for about 80 mSEC. The length of the pulse is included in the time cycle: the cycle runs from the start of one pulse to the start of the next. The 353B automatically starts a new cycle immediately after reset.

The duration of the standard output pulse generated by the 353B is 80 mSEC (± 20 mSEC), but it can be easily lengthened or shortened by using a capacitor or resistor across terminals 4 and 11.

To shorten the output pulse, the size of the resistor (fixed or variable) is calculated as follows:

Where: t = time in milliseconds ($\pm 25\%$)

$$R = \frac{2.2t - 2.64}{80 - t} = R$$

(must be at least 0.2 megohm.)

To lengthen the output pulse, the size of the capacitor is calculated as follows:

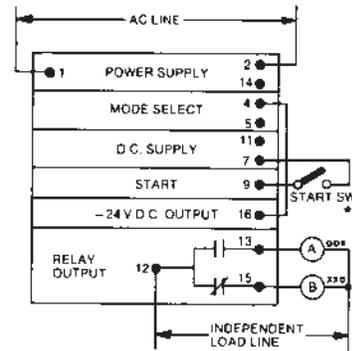
Where: T = time in seconds ($\pm 25\%$)

$$C = \frac{T - 0.08}{1.6} = C$$

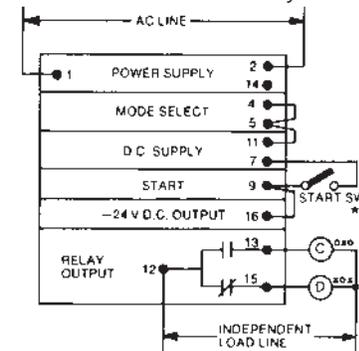
NOTE Observe Polarity: + Terminal of the capacitor goes to 11, - Terminal to 4. To start from AC voltage, jumper terminals 8-9 and 4-11 and start with AC power at terminals 1 and 2.

TYPICAL INSTALLATION

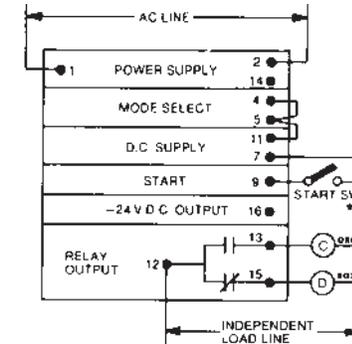
DELAYED MODE — Sustained* start



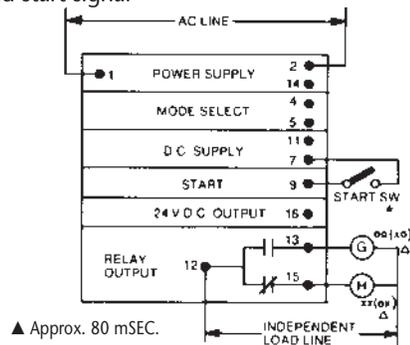
INTERVAL MODE — Sustained* or momentary** start



INTERVAL MODE — Sustained* start



REPEAT CYCLE PULSE GENERATOR — Uninterrupted start signal



*Start switch must be closed — or DC start signal must be on — for entire cycle. Timer resets when start switch opens or DC start signal turns off. To start from DC voltage, apply external ground on 11 and start signal on 9.

**Start switch may be closed — or DC start signal may be on — for less than the entire cycle. Timer resets at end of cycle.