



Series 356

SHAWNEE II Digital Predetermining Counter

The 356B Directly Replaces 356A.

A compact version of the 336 counter, the ATC 356 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 356.



PRODUCT HIGHLIGHTS

FAST, ACCURATE AND BOUNCE-PROOF

The repeat accuracy of the 356 is 100%. It maintains full accuracy even at pulse rates up to 4,000/minute, even with pulses that are as brief as 1 millisecond, and even in the face of severe contact bounce...which it ignores by virtue of an extremely effective anti-bounce circuit.

EASY TO SET AT ALL TIMES

The Shawnee counter 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.

PLUG-IN AND DUST-TIGHT

All 356 counters feature true plug-in design and can be replaced in seconds without disturbing the housing or disconnecting the wiring. The dial assembly is gasketed so that the counter body is dust-tight from the front of panel.

CYCLE PROGRESS INDICATION

The Shawnee 356 indicating counter provides cycle progress indication on the four-digit display located immediately above the digital setting number wheels. While the non-indicating Model 356 does not provide true cycle progress indication, it can be wired so that the *legend light* is **on** during the cycle and the *pilot light* flashes with each pulse.

COMPUTER-TESTED RELIABILITY

The solid-state 356 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 356's only significant mechanical component -- has a life expectancy of 10,000,000 operations (no load). As a result the 356 achieves an overall reliability that surpasses even that achieved by previous Shawnee counters.

NOISE IMMUNITY

The 356 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.

SAVE 40% IN PANEL SPACE AND COST

Packaged in a 72 mm² DIN-size housing, the 356 occupies 40% less panel space than previous IC timers. Modern production and assembly techniques have substantially reduced manufacturing costs resulting in a 45% cost saving.

LOW INVENTORY COSTS

Each Shawnee 356 covers the active count range of 1 to 9,999, easily satisfying the vast majority of industrial requirements... and thus greatly reducing inventory expense especially for large users.

APPROVALS

See Agency Listing on inside back cover of catalog.

OPERATION

The Shawnee 356 operates on a digital logic circuit with three main elements: a *pulse circuit*; a *read-only-memory* (ROM) whose output is set by the counter's digital setting number wheels; and a *comparator* that continuously examines the outputs of the pulse circuit and ROM.

When power is applied (start signal **on**), two things happen simultaneously; the instantaneous DPDT relay is energized transferring both sets of contacts, and the pulse circuit begins to count each input pulse whose duration is at least 1 millisecond. The pulse circuit accumulates the count and feeds the total continuously to the comparator. When pulse circuit output exactly equals the output of the ROM, the comparator causes the 356 to count out.

At this point, (1) the DPDT delay relay is energized, immediately transferring both sets of contacts and (2) the pulse circuit turns itself off automatically. Since the pulse circuit stops counting even if the *start* signal remains **on**, it is not necessary to tie up one of the 356's delayed contacts to do this job.

To reset the 356, power must be removed from terminal 1 (L1) for 75 milliseconds or more. The 356 operates in the **on delay** mode only, always resetting whenever there is a power outage and starting a new cycle when power is restored.

CYCLE PROGRESS INDICATION

When the counter is in the reset condition, the LED display is blank. During the cycle, the display counts up from 0, thus always indicating the number of counts that have elapsed since the start of cycle. At count-out, the display shows the total elapsed count and thus equals the numbers on the digital setting wheels.

SWITCHING SEQUENCE*				
RELAY	CONTACTS	Before Start	During Cycle	End of Cycle
INSTANTANEOUS	14-9/6-8	Gray	Blue	Blue
	14-10/6-7	Blue	Gray	Gray
DELAYED (D ₂)	11-12/4-5	Blue	Blue	Gray
	11-13/4-3	Gray	Blue	Gray

*Assumes a sustained closed start signal (i.e. longer that the setting on the digital display)

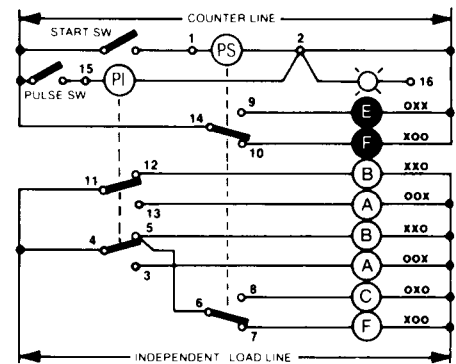
■ BLUE — Circuit Closed ■ GRAY — Circuit Open

TYPICAL INSTALLATIONS

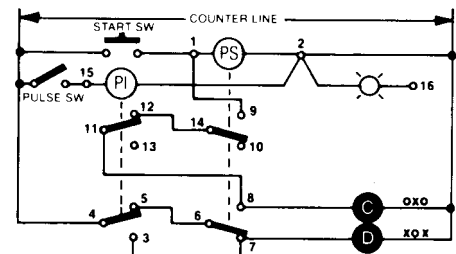
KEY SYMBOLS

- Ⓟ POWER SUPPLY
 - Ⓟ PULSE INPUT
 - INDEPENDENT LOADS
 - DEPENDENT LOADS
 - Ⓞ MOMENTARY STARTING CONTACT
 - Ⓞ SUSTAINED STARTING CONTACT
 - Ⓞ NORMALLY CLOSED RESET CONTACT
 - LOAD DE-ENERGIZED
 - Ⓧ LOAD ENERGIZED
 - Ⓟ DELAYED CONTACTS
 - Ⓟ INSTANTANEOUS CONTACTS
- All timers shown in "before start" position. Diagrams shown with power off unless otherwise marked.
- Maximum load current through any load carrying contact is 5 amperes.
- Pilot light leads are brought out to terminal block. Pilot light can be wired to show practically any desired function; unit energized, cycle running, instantaneous or delayed switch closed, etc.
- ON DELAY—Reset on power failure.
- Contacts transfer simultaneously when unit "times out" and all digits are zero.
- Contacts are transferred when power supply is energized; transferred back, as shown when de-energized.

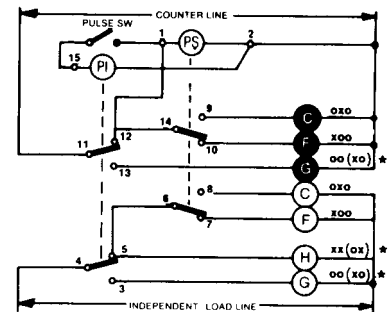
SUSTAINED START



MOMENTARY START/SUSTAINED START



COUNT, PULSE AND REPEAT CYCLE



NOTE: Minimum sw open time: 100 ms.
Minimum sw close time: 20 ms.
Output Pulse length — approx. 50 ms.

Wiring diagrams are shown for non-indicating models.

SPECIFICATIONS

MODELS

Both indicating and non-indicating models of the 356 are available. See ordering code.

CYCLE PROGRESS INDICATOR (indicating model only):

4 digit, 0.3 inch, high intensity, blue display.

RANGE

1 to 9999 counts or 10 to 99,990. presettable in 10 count increments.

REPEAT ACCURACY

100% (± 0 count)

RESET TIME

75 milliseconds minimum

MINIMUM SETTING

1 count.

COUNT INPUT CHARACTERISTICS

MAX. COUNT RATE:

2300/min with 1: 1 on-off time

4000/min with 1 ms on: 13 ms off

500/min with 20 ms on and 100 ms off

Wired for count and repeat operation.

MIN. PULSE ON TIME: 1 ms

MIN. PULSE OFF TIME: 13 ms

READY-TO-COUNT TIME: 10 ms after application of power to terminals 1 and 2.

BOUNCE IMMUNITY (max. bounce open time): 6 ms.

PULSE CONTACT REQUIREMENT: 20 mA (at line voltage)

LOAD RELAYS

NUMBER: two, one instantaneous and one delayed; both plug-in, DPDT.

OPERATE TIME: 20 ms. max.

RELEASE TIME:
instantaneous -- 20ms,
max.

delayed -- 75 ms, max.

CONTACT RATINGS: 5A at 120 VAC.

2A at 240 VAC,

0.1A at 125 VDC.

LIFE: 100 million operations (no load.)

COUNT CONTROL MODES

SINGLE CYCLE: interval or delayed

REPEAT CYCLE: pulses.

PILOT LIGHT

Indicating model only. Both leads brought out to terminal block.

TERMINALS

16 screw terminals accessible at rear; integral wiring diagram on terminal block.

HOUSING

Plug-in design; completely gasketed, dust-tight when panel-mounted.

POWER REQUIREMENTS

120V: 95-132V at 50 or 60 Hz

in rush --0.4A

running --0.08A

240V: 190-264V at 50 or 60z

inrush --0.2A

running--0.04A

TEMPERATURE RATING

32 to 140°F (0 to 60°C)

WEIGHT

NET: 1 lb., 7 oz.

SHIPPING: 2 lbs.

MOUNTING ACCESSORIES

STANDARD: Hardware is provided to mount counter so that it is dust-tight from front of panel.

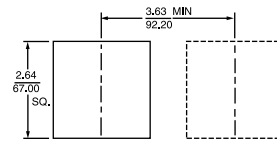
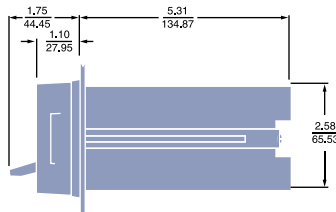
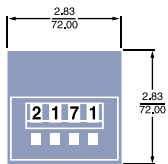
OPTIONAL: Surface mounting with front-facing terminals.

(See Accessory section of catalog)

NEMA 12 molded case (1 counter)

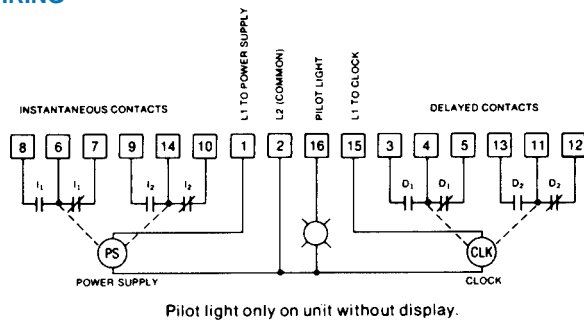
DIMENSIONS:

INCHES
MILLIMETERS

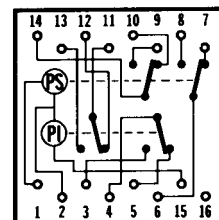


PANEL CUTOUT
SHOWING DISTANCE BETWEEN
ADJACENT CUTOUTS.

WIRING



TERMINAL WIRING

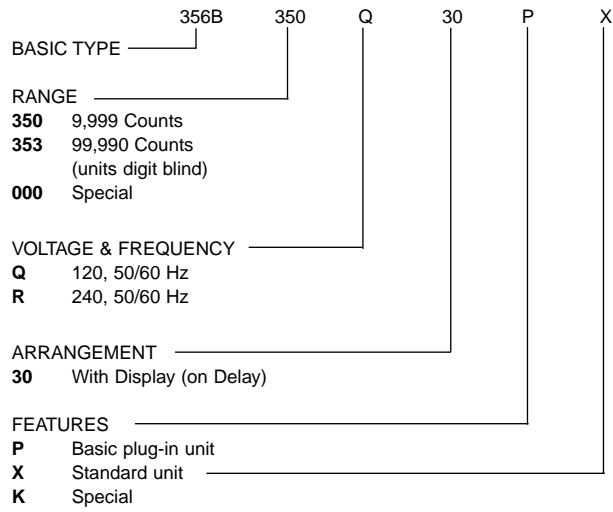


INDICATING MODEL

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

SERIES 356 DIGITAL PREDETERMINING COUNTER

ORDERING CODE



ACCESSORIES

- 0353-260-27-00** Surface mounting bracket kit
- 0305-265-61-70** Retrofit kit

For prices and further information, consult factory.

The 356B Directly Replaces 356A.