



## Precision Switch Cam Programmer



A compact and economical motor-driven cam timer, the 324 precisely controls one to twelve load circuits through easily-set screwdriver adjustable cams. Each timer provides a wide range of cycle times through a set of interchangeable gears.

**EASY AND PRECISE CAM ADJUSTMENT:** With ATC's unique split-cam design, each side of the cam is separately screwdriver-adjustable in either direction: either side determines the precise instant during the cycle when the switch will actuate, the other side determines how long the switch will remain actuated. Adjustments are easy and precise: 1/4 turn of the adjusting screw equals 0.5% of cycle time. A setting disc, calibrated in 1% increments, facilitates program set-up and indicates cycle progress.

**ONE TO TWELVE PRECISION SWITCHES:** Whether used as a time or sequence programmer, the 324 can be ordered with any number of cam-operated switches from one to twelve. Each SPDT precision switch is rated at 10 amps, 120 VAC and is 1/3 hp rated at 120 or 240 VAC.

**WIDE RANGE OF CYCLE TIMES:** The 324 is available with a choice of 12 synchronous motors that provide more than 270 cycle times between 9 SEC and 60 HRS. Each motor provides an adjustable range of 21 cycle times, with a ratio of over 2.5:1, through a set of interchangeable gears. Changing gears is a simple operation that takes only a few minutes.

**ACCURACY:** The repeat accuracy and setting accuracy of the 324 are both within  $\pm 0.25\%$ . Follower fingers precisely track the contour of the cams, accurately operating the precision switches with quick-break action.

**SEQUENCE CONTROL:** The 324 can be ordered without a motor and with a 1 inch long shaft extension on either or both ends, for use as a rotary cam limit switch.

### SPECIFICATIONS

**CYCLE TIMES** Choice of ON-Delay or OFF-Delay operation (not field-convertible). More than 270 cycle times, from 9 SEC to 60 HRS., from a choice of interchangeable motors and gears; each motor provides more than 20 cycle times.

**REPEAT ACCURACY**  $\pm 0.25\%$  of cycle time.

**SETTING ACCURACY**  $\pm 0.25\%$  of cycle time.

**FRAME SIZES** 3, 6, 9 and 12 cam frame sizes are provided

**CAMS**

**NUMBER:** 1 to 12 (or multiples up to 12, by combining timer assemblies); cams may be factory-set.

**CUT:** Standard or 50% cut, as specified (standard cams allow contact closure adjustment of 1 to 45% or 55 to 99%, 50% cut cams allow contact closure adjustment of 12 to 52% or 48 to 88%; custom cams available with 2, 3, 4 or more cuts.

**CONSTRUCTION:**  
Two-inch diameter split type;  
made of Delrin

**LIFE EXPECTANCY** **MECHANICAL:** over 10,000,000 operations  
**CONTACTS:** over 1,000,000 operations at less than 1 amp

**LOAD SWITCHES**

**TYPE:** Precision switches; one for each cam

**CONTACT ACTION:** SPDT (Form C)

**CONTACT RATING:** 10 A at 120 VAC (non-inductive).  
1/3 HP at 125/250 VAC

**MINIMUM CONTACT ACTUATION TIME:** 1% of cycle time

**DRIVE MOTORS**

**SPEED:** choice of 12

**TYPE:** Synchronous; permanently lubricated; integral slip clutch for manual advance; anti-backup to prevent damage to switches

**VOLTAGE:** 120 VAC, 50 or 60 cycles;  
240 VAC, 50 or 60 cycles.

**POWER CONSUMPTION:** 12 watts max

**DUAL DRIVE:** two motors may be used, special applications

**TORQUE-SPEED CAPABILITIES:** At cycle times of 30 SEC or longer, the 324 can drive and switch 12 contacts simultaneously; below 30 SEC, the motor may be limited in its ability to drive or switch a number of contacts simultaneously.

**TEMPERATURE RATING** 32 to 140°F (0 to 60°C)

**WEIGHT** NET: from 1-1/2 lbs. for the 3 cam unit up to 3-1/2 lbs. for the 12 cam unit

**ENCLOSURES** NEMA 12 molded case for one model 324 with maximum of 3 cams. (See Accessories) (Optional)

**MODEL NUMBER****MODEL NUMBER** 324C**NUMBER OF SWITCHES**

1 Switch , 3 Cams	01
2 Switches, 3 Cams	02
3 Switches, 3 Cams	03
4 Switches, 6 Cams	04
5 Switches, 6 Cams	05
6 Switches, 6 Cams	06
7 Switches, 9 Cams	07
8 Switches, 9 Cams	08
9 Switches, 9 Cams	09
10 Switches, 12 Cams	10
11 Switches, 12 Cams	11
12 Switches, 12 Cams	12

**CYCLE TIME MOTOR SPEED**

No Motor	0
5 rpm	A
150 rph	B
1/2 rpm	D
15 rph	E
5 rph	F
2.5 rph	G
1 rph	H
1/2 rph	J
1/6 rph	L
1/24 rph	N

**CYCLE TIME MOTOR PINION**

No Motor	0
24 Teeth (300-495-01-00)	1
30 Teeth (300-495-02-00)	2
40 Teeth (300-495-03-00)	3

**CYCLE TIME CAM SHAFT GEAR**

No Motor	0
30 Teeth (300-495-11-00)	A
36 Teeth (300-495-12-00)	B
40 Teeth (300-495-13-00)	C
45 Teeth (300-495-14-00)	D
50 Teeth (300-495-17-00)	E
55 Teeth (300-495-15-00)	F
60 Teeth (300-495-16-00)	G

**OPERATION**

Repeat Cycle/Stop Cycle Dynamic Brake <sup>1</sup>	R
Eternal Drive by user, no motor	E
Special	K

**MOTORS**

1 Motor (add \$12 for 15 RPM motor Type Q. \$2 for motors J thru N)	1
2 motors (add \$5 for motor codes J thru N)	2
No motor	3
Special	0

**VOLTAGE & FREQUENCY**

120/60	A
240/60*	B
120/50	C
240/50*	D
No motor	X

**OPTIONS**

None	01
1/4" dia. x 1" long shaft extension right end (Units with one or no motor)	02
1/4" dia. x 1" long shaft extension left end (Units with one or no motor)	03
1/4" dia. x 1" long shaft extension both ends (On motorless units only)	04
Special	00

**FEATURES**

Standard (other than cam settings) (Blades)	X
Special	K

**NOTES****CAMS**

Factory setting cams to 0.25% tolerance, 50% cams allow 12 to 52% or 48 to 88% adjustment of switch actuation. 2, 3, or 4 cuts equally spaced. Have limited adjustability. (Does not include 50% cams with multiple cuts) Multiple cuts, unequally spaced. Multiple cuts over 4. Specially cut or specially molded cams.

**LUGS**

Bag of 50 push-on terminal lugs uninsulated  
Part No. 300-260-59-00

**BRAKE**

Diode brake assembly Part. No. 300-260-56-00

**CONTACT SWITCH**

Switch with Bracket 324-260-82-00

<sup>1</sup>For Stop Cycle, or Brake operation, specify a 324 with one more switch than you need for your load circuits. (Do not exceed 12 switches total!) You interwire this switch to the motor according to the installation instruction for the unit.

<sup>2</sup> Be sure to specify shaft extension under OPTIONS

For prices and further information, consult factory.

**TIME CYCLE ORDERING CODES**

Select Time Cycle from table; if it is available with more than one motor and gearing combination, pick the combination which would best accommodate potential future speed changes. 3 Digit Speed Code identifies motor.

\* 240 V option limited to availability

Time Cycle (SEC)	5 RPM Motor-A												150 RPM Motor-B												
	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time			
30	9	A3A	12	A2A	15	A1A	18	B3A	24	B2A	30	B1A	30	9	F3A	12	F2A	15	F1A	18	G3A	24	G2A	30	G1A
36	10.8	A3B	14.4	A2B	18	A1B	21.6	B3B	28.8	B2B	36	B1B	36	10.8	F3B	14.4	F2B	18	F1B	21.6	G3B	28.8	G2B	36	G1B
40	12	A3C	16	A2C	20	A1C	24	B3C	32	B2C	40	B1C	40	12	F3C	16	F2C	20	F1C	24	G3C	32	G2C	40	G1C
45	13.5	A3D	18	A2D	22.5	A1D	27	B3D	36	B2D	45	B1D	45	13.5	F3D	18	F2D	22.5	F1D	27	G3D	36	G2D	45	G1D
50	15	A3E	20	A2E	25	A1E	30	B3E	40	B2E	50	B1E	50	15	F3E	20	F2E	25	F1E	30	G3E	40	G2E	50	G1E
55	16.5	A3F	22	A2F	27.5	A1F	33	B3F	44	B2F	55	B1F	55	16.5	F3F	22	F2F	27.5	F1F	33	G3F	44	G2F	55	G1F
60	18	A3G	24	A2G	30	A1G	36	B3G	48	B2G	60	B1G	60	18	F3G	24	F2G	30	F1G	36	G3G	48	G2G	60	G1G
30	10.8	A3A	14.4	A2A	18	A1A	21.6	B3A	28.8	B2A	36	B1A	30	10.8	F3A	14.4	F2A	18	F1A	21.6	G3A	28.8	G2A	36	G1A
36	12.96	A3B	17.28	A2B	21.6	A1B	25.92	B3B	34.56	B2B	43.2	B1B	36	12.96	F3B	17.28	F2B	21.6	F1B	25.92	G3B	34.56	G2B	43.2	G1B
40	14.4	A3C	19.2	A2C	24	A1C	28.8	B3C	38.4	B2C	48	B1C	40	14.4	F3C	19.2	F2C	24	F1C	28.8	G3C	38.4	G2C	48	G1C
45	16.2	A3D	21.6	A2D	27	A1D	32.4	B3D	43.2	B2D	54	B1D	45	16.2	F3D	21.6	F2D	27	F1D	32.4	G3D	43.2	G2D	54	G1D
50	18	A3E	24	A2E	30	A1E	36	B3E	48	B2E	60	B1E	50	18	F3E	24	F2E	30	F1E	36	G3E	48	G2E	60	G1E
55	19.8	A3F	26.4	A2F	33	A1F	39.6	B3F	52.8	B2F	66	B1F	55	19.8	F3F	26.4	F2F	33	F1F	39.6	G3F	52.8	G2F	66	G1F
60	21.6	A3G	28.8	A2G	36	A1G	43.2	B3G	57.6	B2G	72	B1G	60	21.6	F3G	28.8	F2G	36	F1G	43.2	G3G	57.6	G2G	72	G1G

Time Cycle (SEC)	5 RPM Motor-F												2.5 RPM Motor-G												1 RPM Motor-H												1/2 RPM Motor-I											
	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time													
30	9	F3A	12	F2A	15	F1A	18	G3A	24	G2A	30	G1A	90	D3A	120	D2A	150	D1A	180	E3A	240	E2A	300	E1A	18	N3A	24	N2A	30	N1A	21.6	N3B	28.8	N2B	36	N1B												
36	10.8	F3B	14.4	F2B	18	F1B	21.6	G3B	28.8	G2B	36	G1B	108	D3B	144	D2B	180	D1B	216	E3B	288	E2B	360	E1B	21.6	N3B	28.8	N2B	36	N1B	25.92	N3B	34.56	N2B	43.2	N1B												
40	12	F3C	16	F2C	20	F1C	24	G3C	32	G2C	40	G1C	120	D3C	160	D2C	200	D1C	240	E3C	320	E2C	400	E1C	24	N3C	32	N2C	40	N1C	28.8	N3C	38.4	N2C	48	N1C												
45	13.5	F3D	18	F2D	22.5	F1D	27	G3D	36	G2D	45	G1D	135	D3D	180	D2D	225	D1D	270	E3D	360	E2D	450	E1D	27	N3D	36	N2D	45	N1D	32.4	N3D	43.2	N2D	54	N1D												
50	15	F3E	20	F2E	25	F1E	30	G3E	40	G2E	50	G1E	150	D3E	200	D2E	250	D1E	300	E3E	400	E2E	500	E1E	30	N3E	40	N2E	50	N1E	36	N3E	48	N2E	60	N1E												
55	16.5	F3F	22	F2F	27.5	F1F	33	G3F	44	G2F	55	G1F	165	D3F	220	D2F	275	D1F	330	E3F	440	E2F	550	E1F	33	N3F	44	N2F	55	N1F	39.6	N3F	52.8	N2F	66	N1F												
60	18	F3G	24	F2G	30	F1G	36	G3G	48	G2G	60	G1G	180	D3G	240	D2G	300	D1G	360	E3G	480	E2G	600	E1G	36	N3G	48	N2G	60	N1G	43.2	N3G	57.6	N2G	72	N1G												

Time Cycle (SEC)	MAXIMUM NUMBER OF CONTACTS SWITCHING TOGETHER												
	1	2	3	4	5	6	7	8	9	10	11	12	
3.0									6	5	4	3	2
3.6									8	7	6	5	
4.0									9	8	7	6	5
4.5												10	10
4.8													11
5.0													

**TORQUE—SPEED CAPABILITIES**

The ability of the 324C to trip a number of load contacts simultaneously is determined in the chart below. Pick the vertical column that corresponds to the total number of contacts you need and proceed down the column that corresponds to the fastest time cycle you intend to use. If the intersection of the two columns is in the gray, there is no limitation to the 324's ability to trip contacts simultaneously; if not, the limit is noted in the intersected square.

HOURS resulting speed at 60 cycles	1/6 RPM Motor-L												1/24 RPM Motor-N											
	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time	Time		
30	4.5	L3A	6	L2A	7.5	L1A	18	N3A	24	N2A	30	N1A	21.6	N3B	28.8	N2B	36	N1B						
36	5.4	L3B	7.2	L2B	9	L1B	21.6	N3B	28.8	N2B	36	N1B	25.92	N3B	34.56	N2B	43.2	N1B						
40	6	L3C	8	L2C	10	L1C	24	N3C	32	N2C	40	N1C	28.8	N3C	38.4	N2C	48	N1C						
45	6.75	L3D	9	L2D	11.25	L1D	27	N3D	36	N2D	45	N1D	32.4	N3D	43.2	N2D	54	N1D						
50	7.5	L3E	10	L2E	12.5	L1E	30	N3E	40	N2E	50	N1E	36	N3E	48	N2E	60	N1E						
55	8.25	L3F	11	L2F	13.75	L1F	33	N3F	44	N2F	55	N1F	39.6	N3F	52.8	N2F	66	N1F						
60	9	L3G	12	L2G	15	L1G	36	N3G	48	N2G	60	N1G	43.2	N3G	57.6	N2G	72	N1G						