

A compact and economical motor-driven cam timer, the 324C 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.

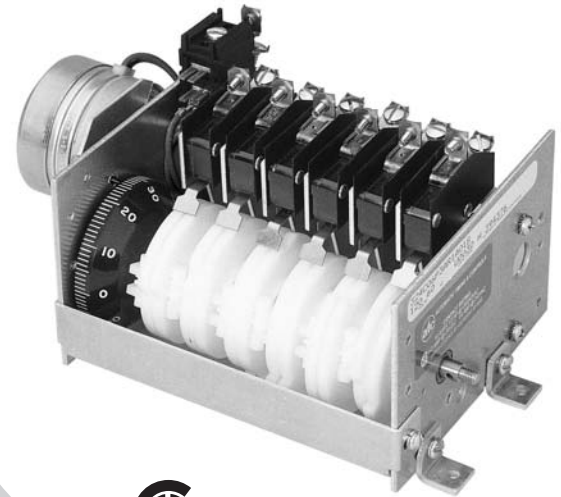
**ONE TO TWELVE PRECISION SWITCHES:** Whether used as a time or sequence programmer, the 324C can be ordered with any number of cam-operated switches from one to twelve. Each SPDT precision switch is rated at 10 amps, 120 VAC and is 1/3 hp rated at 120 or 240 VAC.

**WIDE RANGE OF CYCLE TIMES:** The 324C is available with a choice of 14 synchronous motors that provide more than 270 cycle times between 3 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 324C 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 324C 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.

**APPROVALS:** File No. E24305, LR26970



Precision Switch Cam Programmer

## SPECIFICATIONS

CYCLE TIMES	Choice of ON-Delay or OFF-Delay operation (not field-convertible). More than 270 cycle times, from 3 SEC to 60 HRS., from a choice of interchangeable motors and gears; each motor provides more than 20 cycle times.	LOAD SWITCHES	TYPE: Precision switches; one for each cam
	REPEAT ACCURACY		$\pm 0.25\%$ of cycle time.
SETTING ACCURACY	$\pm 0.25\%$ of cycle time	CONTACT RATING: 10 A at 120 VAC (non-inductive). 1/3 HP at 125/250 VAC	MINIMUM CONTACT ACTUATION TIME: 1% of cycle time
FRAME SIZES	3, 6, 9 and 12 cam frame sizes are provided	DRIVE MOTORS	SPEED: choice of 14
CAMS	NUMBER: 1 to 12 (or multiples up to 12, by combining timer assemblies); cams may be factory-set.	TEMPERATURE RATING	TYPE: Synchronous; permanently lubricated; integral slip clutch for manual advance; anti-backup to prevent damage to switches
	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.		VOLTAGE: 120 VAC, 50 or 60 cycles; optional: 24 or 240 VAC, 50 or 60 cycles.
LIFE EXPECTANCY	CONSTRUCTION: Two-inch diameter split type; made of Delrin	WEIGHT	POWER CONSUMPTION: 12 watts max. DUAL DRIVE: two motors may be used, for dual-speed and special applications
	MECHANICAL: over 10,000,000 operations	ENCLOSURES (Optional)	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.
	CONTACTS: over 1,000,000 operations at less than 1 amp		



Time Cycle (SEC)	15 RPM Motor-P			5 RPM Motor-A			150 RPM Motor-B			1 RPM Motor-C			1/2 RPM Motor-D			15 RPM Motor-E																											
	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion																											
SECONDS resulting speed at 60 cycles	30	3.6	P3A	4	P2A	5	P1A	3	Q3A	4	Q2A	5	Q1A	9	A3A	12	A2A	15	A1A	18	B3A	24	B2A	30	B1A	45	C3A	60	C2A	75	C1A	90	D3A	120	D2A	150	D1A	180	E3A	240	E2A	300	E1A
SECONDS resulting speed at 50 cycles	36	4.3	P3B	4.8	P2B	6	P1B	4.3	Q3B	4.8	Q2B	6	Q1B	10.8	A3B	14.4	A2B	18	A1B	21.6	B3B	28.8	B2B	36	B1B	54	C3B	72	C2B	90	C1B	108	D3B	144	D2B	180	D1B	216	E3B	288	E2B	360	E1B
SECONDS resulting speed at 50 cycles	40	4.8	P3C	5.33	P2C	6.66	P1C	4	Q3C	5.33	Q2C	6.66	Q1C	12	A3C	16	A2C	20	A1C	24	B3C	32	B2C	40	B1C	60	C3C	80	C2C	100	C1C	120	D3C	160	D2C	200	D1C	240	E3C	320	E2C	400	E1C
SECONDS resulting speed at 50 cycles	45	5.4	P3D	7.2	P2D	9	P1D	5.4	Q3D	7.2	Q2D	9	Q1D	13.5	A3D	18	A2D	22.5	A1D	27	B3D	36	B2D	45	B1D	67.5	C3D	90	C2D	112.5	C1D	135	D3D	180	D2D	225	D1D	270	E3D	360	E2D	450	E1D
SECONDS resulting speed at 50 cycles	50	6	P3E	8	P2E	10	P1E	6	Q3E	8	Q2E	10	Q1E	15	A3E	20	A2E	25	A1E	30	B3E	40	B2E	50	B1E	75	C3E	100	C2E	125	C1E	150	D3E	200	D2E	250	D1E	300	E3E	400	E2E	500	E1E
SECONDS resulting speed at 50 cycles	55	6.6	P3F	8.8	P2F	11	P1F	6.6	Q3F	8.8	Q2F	11	Q1F	16.5	A3F	22	A2F	27.5	A1F	33	B3F	44	B2F	55	B1F	82.5	C3F	110	C2F	137.5	C1F	165	D3F	220	D2F	275	D1F	330	E3F	440	E2F	550	E1F
SECONDS resulting speed at 50 cycles	60	7.2	P3G	9.6	P2G	12	P1G	7.2	Q3G	9.6	Q2G	12	Q1G	18	A3G	24	A2G	30	A1G	36	B3G	48	B2G	60	B1G	90	C3G	120	C2G	150	C1G	180	D3G	240	D2G	300	D1G	360	E3G	480	E2G	600	E1G
SECONDS resulting speed at 50 cycles	60	7.2	P3G	9.6	P2G	12	P1G	7.2	Q3G	9.6	Q2G	12	Q1G	18	A3G	24	A2G	30	A1G	36	B3G	48	B2G	60	B1G	90	C3G	120	C2G	150	C1G	180	D3G	240	D2G	300	D1G	360	E3G	480	E2G	600	E1G

Time Cycle (SEC)	5 RPM Motor-F			2.5 RPM Motor-G			1 RPM Motor-H			1/2 RPM Motor-I			1 RPM Motor-J												
	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion	Time Motor Pinion C Pinion											
MINUTES resulting speed at 60 cycles	30	9	F3A	12	F2A	15	F1A	18	G3A	24	G2A	30	G1A	45	H3A	60	H2A	75	H1A	90	J3A	120	J2A	150	J1A
MINUTES resulting speed at 50 cycles	36	10.8	F3B	14.4	F2B	18	F1B	21.6	G3B	28.8	G2B	36	G1B	54	H3B	72	H2B	90	H1B	108	J3B	144	J2B	180	J1B
MINUTES resulting speed at 50 cycles	40	12	F3C	16	F2C	20	F1C	24	G3C	32	G2C	40	G1C	60	H3C	80	H2C	100	H1C	120	J3C	160	J2C	200	J1C
MINUTES resulting speed at 50 cycles	45	13.5	F3D	18	F2D	22.5	F1D	27	G3D	36	G2D	45	G1D	67.5	H3D	90	H2D	112.5	H1D	135	J3D	180	J2D	225	J1D
MINUTES resulting speed at 50 cycles	50	15	F3E	20	F2E	25	F1E	30	G3E	40	G2E	50	G1E	75	H3E	100	H2E	125	H1E	150	J3E	200	J2E	250	J1E
MINUTES resulting speed at 50 cycles	55	16.5	F3F	22	F2F	27.5	F1F	33	G3F	44	G2F	55	G1F	82.5	H3F	110	H2F	137.5	H1F	165	J3F	220	J2F	275	J1F
MINUTES resulting speed at 50 cycles	60	18	F3G	24	F2G	30	F1G	36	G3G	48	G2G	60	G1G	90	H3G	120	H2G	150	H1G	180	J3G	240	J2G	300	J1G
MINUTES resulting speed at 50 cycles	30	10.8	F3A	14.4	F2A	18	F1A	21.6	G3A	28.8	G2A	36	G1A	54	H3A	72	H2A	90	H1A	108	J3A	144	J2A	180	J1A
MINUTES resulting speed at 50 cycles	36	12.96	F3B	17.28	F2B	21.6	F1B	25.92	G3B	34.56	G2B	43.2	G1B	64.8	H3B	86.4	H2B	108	H1B	129.6	J3B	172.8	J2B	216	J1B
MINUTES resulting speed at 50 cycles	40	14.4	F3C	19.2	F2C	24	F1C	28.8	G3C	38.4	G2C	48	G1C	72	H3C	96	H2C	120	H1C	144	J3C	192	J2C	240	J1C
MINUTES resulting speed at 50 cycles	45	15.12	F3D	21.6	F2D	27	F1D	32.4	G3D	43.2	G2D	54	G1D	81	H3D	108	H2D	135	H1D	162	J3D	216	J2D	270	J1D
MINUTES resulting speed at 50 cycles	50	18	F3E	24	F2E	30	F1E	36	G3E	48	G2E	60	G1E	90	H3E	120	H2E	150	H1E	180	J3E	240	J2E	300	J1E
MINUTES resulting speed at 50 cycles	55	19.8	F3F	26.4	F2F	33	F1F	39.6	G3F	52.8	G2F	66	G1F	99	H3F	132	H2F	165	H1F	198	J3F	264	J2F	330	J1F
MINUTES resulting speed at 50 cycles	60	21.6	F3G	28.8	F2G	36	F1G	43.2	G3G	57.6	G2G	72	G1G	108	H3G	144	H2G	180	H1G	216	J3G	288	J2G	360	J1G

**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.

Time Cycle (SEC)	MAXIMUM NUMBER OF CONTACTS SWITCHING TOGETHER											
	1	2	3	4	5	6	7	8	9	10	11	12
Two Motors	1	2	3	4	5	6	7	8	9	10	11	12
One Motor	1	2	3	4	5	6	7	8	9	10	11	12
3	1	1	1	1	1	1	1	1	1	1	1	1
3.5	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2
4.5	3	2	2	2	2	2	2	2	2	2	2	2
5	3	3	3	3	3	3	3	3	3	3	3	3
5.10	5	4	4	4	4	4	4	4	4	4	4	4
10	7	6	6	6	6	6	6	6	6	6	6	6
12.5	8	7	7	7	7	7	7	7	7	7	7	7
15	10	8	8	8	8	8	8	8	8	8	8	8
17.5	10	9	9	9	9	9	9	9	9	9	9	9
20	11	10	10	10	10	10	10	10	10	10	10	10
all slower cycles	11	11	11	11	11	11	11	11	11	11	11	11

Time Cycle (SEC)	THIS TABLE APPLIES TO Q MOTOR ONLY											
	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	9	8	7	6	5						
4.8	11	10	9	8	7	6	5					
5.0												
all slower cycles listed for this motor												

15 RPM Motor-Q—High torque permanent magnet. No brake diode required on stop cycle units.