A compact and 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.
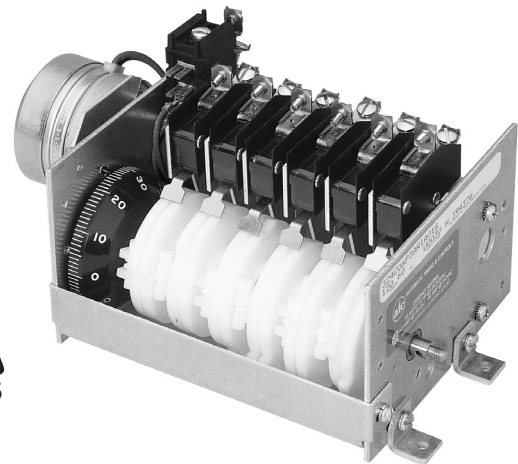
EASY AND PRECISE CAM ADJUSTMENT: With ATC's unique split-cam design, each side of the cam is separately screwdriver-adjustable in either direction: either side determines the precise instant during the cycle when the switch will actuate, the other side determines how long the switch will remain actuated. 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 variety of synchronous motors. See charts for available timing ranges. Each motor provides an adjustable range of 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 ± 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.

E24305

Precision Switch Cam Programmer

SPECIFICATIONS

CYCLE TIMES	Choice of ON-Delay or OFF-Delay operation (not field-convertible). Choose from a variety of interchangeable motors and gears. See chart for available timing ranges.
REPEAT ACCURACY	±0.25% of cycle time.
SETTING ACCURACY	±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 or 4 or 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

CYCLE TIME MOTOR SPEED

No Motor	0
5 rpm	A
150 rph	B
15 rph	E
5 rph (120 VAC only)	F
2.5 rph	G
1 rph	H
1/6 rph (120 VAC only)	L

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[1]	R
Eternal Drive by user, no motor	E
Special	K

MOTORS

1 Motor	1
2 motors	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.

CONTACT SWITCH

Switch with Bracket	324-260-82-00

[1]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.

[2] 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

5 RPM Motor—A

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
SECONDS resulting speed at 60 cycles						
30	9	A3A	12	A2A	15	A1A
36	10.8	A3B	14.4	A2B	18	A1B
40	12	A3C	16	A2C	20	A1C
45	13.5	A3D	18	A2D	22.5	A1D
50	15	A3E	20	A2E	25	A1E
55	16.5	A3F	22	A2F	27.5	A1F
60	18	A3G	24	A2G	30	A1G
SECONDS resulting speed at 50 cycles						
30	10.8	A3A	14.4	A2A	18	A1A
36	12.96	A3B	17.28	A2B	21.6	A1B
40	14.4	A3C	19.2	A2C	24	A1C
45	16.2	A3D	21.6	A2D	27	A1D
50	18	A3E	24	A2E	30	A1E
55	19.8	A3F	26.4	A2F	33	A1F
60	21.6	A3G	28.8	A2G	36	A1G

150 RPH Motor—B

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	18	B3A	24	B2A	30	B1A
36	21.6	B3B	28.8	B2B	36	B1B
40	24	B3C	32	B2C	40	B1C
45	27	B3D	36	B2D	45	B1D
50	30	B3E	40	B2E	50	B1E
55	33	B3F	44	B2F	55	B1F
60	36	B3G	48	B2G	60	B1G
at 50 cycles						
30	21.6	B3A	28.8	B2A	36	B1A
36	25.92	B3B	34.56	B2B	43.2	B1B
40	28.8	B3C	38.4	B2C	48	B1C
45	32.4	B3D	43.2	B2D	54	B1D
50	36	B3E	48	B2E	60	B1E
55	39.6	B3F	52.8	B2F	66	B1F
60	43.2	B3G	57.6	B2G	72	B1G

15 RPH Motor—E (MINUTES resulting speed)

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	180	E3A	240	E2A	300	E1A
36	216	E3B	288	E2B	360	E1B
40	240	E3C	320	E2C	400	E1C
45	270	E3D	360	E2D	450	E1D
50	300	E3E	400	E2E	500	E1E
55	330	E3F	440	E2F	550	E1F
60	360	E3G	480	E2G	600	E1G
at 50 cycles						
30	216	E3A	288	E2A	360	E1A
36	259.2	E3B	345.6	E2B	432	E1B
40	288	E3C	384	E2C	480	E1C
45	324	E3D	432	E2D	540	E1D
50	360	E3E	480	E2E	600	E1E
55	396	E3F	528	E2F	660	E1F
60	432	E3G	576	E2G	720	E1G

5 RPH Motor—F (MINUTES resulting speed)

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	9	F3A	12	F2A	15	F1A
36	10.8	F3B	14.4	F2B	18	F1B
40	12	F3C	16	F2C	20	F1C
45	13.5	F3D	18	F2D	22.5	F1D
50	15	F3E	20	F2E	25	F1E
55	16.5	F3F	22	F2F	27.5	F1F
60	18	F3G	24	F2G	30	F1G
at 50 cycles						
30	10.8	F3A	14.4	F2A	18	F1A
36	12.96	F3B	17.28	F2B	21.6	F1B
40	14.4	F3C	19.2	F2C	24	F1C
45	16.2	F3D	21.6	F2D	27	F1D
50	18	F3E	24	F2E	30	F1E
55	19.8	F3F	26.4	F2F	33	F1F
60	21.6	F3G	28.8	F2G	36	F1G

2.5 RPH Motor—G

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	18	G3A	24	G2A	30	G1A
36	21.6	G3B	28.8	G2B	36	G1B
40	24	G3C	32	G2C	40	G1C
45	27	G3D	36	G2D	45	G1D
50	30	G3E	40	G2E	50	G1E
55	33	G3F	44	G2F	55	G1F
60	36	G3G	48	G2G	60	G1G
at 50 cycles						
30	21.6	G3A	28.8	G2A	36	G1A
36	25.92	G3B	34.56	G2B	43.2	G1B
40	28.8	G3C	38.4	G2C	48	G1C
45	32.4	G3D	43.2	G2D	54	G1D
50	36	G3E	48	G2E	60	G1E
55	39.6	G3F	52.8	G2F	66	G1F
60	43.2	G3G	57.6	G2G	72	G1G

1 RPH Motor—H

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	45	H3A	60	H2A	75	H1A
36	54	H3B	72	H2B	90	H1B
40	60	H3C	80	H2C	100	H1C
45	67.5	H3D	90	H2D	112.5	H1D
50	75	H3E	100	H2E	125	H1E
55	82.5	H3F	110	H2F	137.5	H1F
60	90	H3G	120	H2G	150	H1G
at 50 cycles						
30	54	H3A	72	H2A	90	H1A
36	64.8	H3B	86.4	H2B	108	H1B
40	72	H3C	96	H2C	120	H1C
45	81	H3D	108	H2D	135	H1D
50	90	H3E	120	H2E	150	H1E
55	99	H3F	132	H2F	165	H1F
60	108	H3G	144	H2G	180	H1G

1/6 RPH Motor—L (HOURS resulting speed)

Cam Shaft Gear	Motor Pinion 3, 40 Tooth	Time	Motor Pinion 2, 30 Tooth	Time	Motor Pinion 1, 24 Tooth	Time
at 60 cycles						
30	4.5	L3A	6	L2A	7.5	L1A
36	5.4	L3B	7.2	L2B	9	L1B
40	6	L3C	8	L2C	10	L1C
45	6.75	L3D	9	L2D	11.25	L1D
50	7.5	L3E	10	L2E	12.5	L1E
55	8.25	L3F	11	L2F	13.75	L1F
60	9	L3G	12	L2G	15	L1G
at 50 cycles						
30	5.4	L3A	7.2	L2A	9	L1A
36	6.48	L3B	8.64	L2B	10.8	L1B
40	7.2	L3C	9.6	L2C	12	L1C
45	8.1	L3D	10.8	L2D	13.5	L1D
50	9	L3E	12	L2E	15	L1E
55	9.9	L3F	13.2	L2F	16.5	L1F
60	10.8	L3G	14.4	L2G	18	L1G

MAXIMUM NUMBER OF CONTACTS SWITCHING TOGETHER
Total Number of Contacts

Time Cycle (SEC) Two Motors	One Motor	1	2	3	4	5	6	7	8	9	10	11	12
–	5			1									
3	6			1	1								
3.5	7			2	2	1	1						
4	8			2	2	2	1	1					
4.5	9			3	3	3	2	2	1	1			
5	10					5	4	4	3	3	2		
7.5	15					7	6	6	5	5			
10	20							7	7	7			
12.5	25								8	7			
15	30										10		
17.5	35											11	
20	40												

THIS TABLE APPLIES TO Q MOTOR ONLY
MAXIMUM NUMBER OF CONTACTS SWITCHING TOGETHER
Total Number of Contacts

Time Cycle SEC / One Motor	1	2	3	4	5	6	7	8	9	10	11	12
3.0						6						
3.6						8	7	6	5	4	3	2
4.0						9	8	7	6	5	4	3
4.5							9	8	7	6	5	4
4.8									10			
5.0										11		

all slower cycles listed for this motor

15 RPM Motor—Q—

High torque permanent magnet.
No brake diode required on stop cycle units.

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.