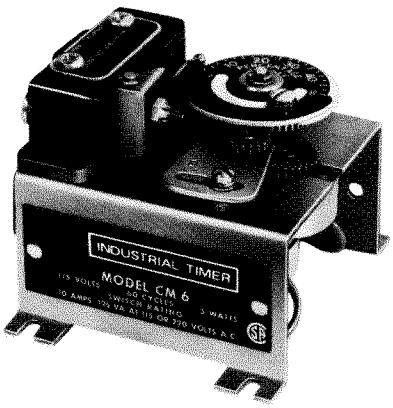
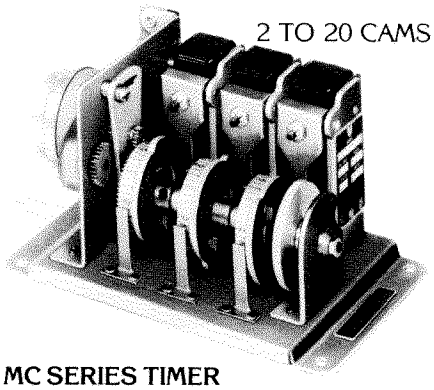
CM, MC and MCE

PROGRAMMABLE TIMERS



CM SERIES TIMER



MC SERIES TIMER

DESCRIPTION

These recycling timers repeat a continuous, adjustable on/off electrical cycle. They feature a heavy duty, synchronous motor mechanically connected to the cam shaft through a unique gear and rack arrangement which allows 50 different speeds from each of the 12 available motor speeds. All load switches are single pole, double throw. The CM model is single switch, while the MC series is available with 2 to 20 cams and switches. The MCE offers the same features as the MC plus a shaft extension on the bracket end. The adjustable split cams are calibrated in percentage for quick, accurate adjustment. All units are designed for base mounting and units with 9 or more switches are supplied with a heavy gauge aluminum base for added strength. Certain combinations of multiple switches and fast time cycles may require a special high torque motor. See page 21 for details.

APPLICATION

These heavy duty timers are designed for applications requiring high reliability, flexibility and easy adjustment. Typical applications include: programming laboratory test, flashing light control, air dryer control, and machine sequence control. The shaft extension on the MCE can be used for progress indication or as an auxiliary drive for a potentiometer, etc.

OPERATION

There is no operator involvement in the operation of this device. When power is applied to the motor, it drives the cams which in turn drive the load switches to follow the preset program.

SPECIFICATIONS

Load Switch Contacts	10 amp non-inductive SPDT
Wiring	screw terminals
Voltage	120V/60 Hz standard. Consult factory for other voltages and frequencies.
Minimum Cam Notch	approx. 2% of total time cycle
Shaft Extension (MCE)	3/16" diam., 2" long approx.
Agency Approvals	UL, CSA

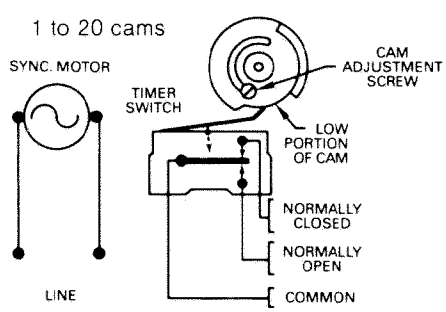
STANDARD MODELS

(see drawing above)

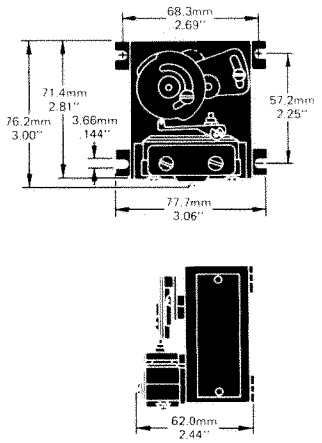
Model Number	Time Cycle	Model Number	Time Cycle
CM, MC, MCE 0	1 sec.	CM, MC, MCE 7	15 min.
CM, MC, MCE 1	6 sec.	CM, MC, MCE 8	30 min.
CM, MC, MCE 2	15 sec.	CM, MC, MCE 9	60 min.
CM, MC, MCE 3	30 sec.	CM, MC, MCE 10	3 hr.
CM, MC, MCE 4	60 sec.	CM, MC, MCE 11	5 hr.
CM, MC, MCE 5	3 min.	CM, MC, MCE 12	12 hr.
CM, MC, MCE 6	5 min.		

NOTE: Time cycles shown are with the C-12 (1:1 ratio) gear rack. For other speeds see page 21.

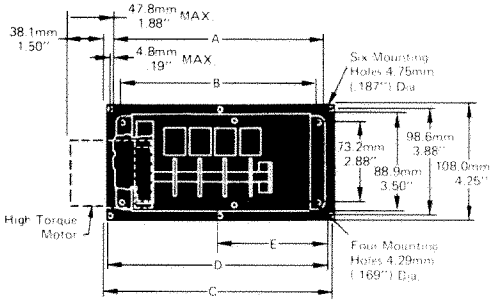
CM AND MC WIRING



CM DIMENSIONS



MC DIMENSIONS



MC & MCE DIMENSIONS

(see drawing above)

No. Switch	A	B	C	D	E	Height of Timer
2	4 5/16	3 13/16				2 13/16
3	5 1/4	4 3/4				2 13/16
4	6 3/16	5 11/16				2 13/16
5	7 1/8	6 5/8				2 13/16
6	8 1/16	7 9/16				2 13/16
7	9	8 1/2				2 13/16
8	9 15/16	9 7/16				2 13/16
9	10 7/8	10 3/8	11 5/8	11 1/4	5 5/8	3 1/16
10	11 13/16	11 5/16	12 9/16	12 3/16	6 3/32	3 1/16
11	12 3/4	12 1/4	13 1/2	13 1/8	6 9/16	3 1/16
12	13 11/16	13 3/16	14 7/16	14 1/16	7 1/32	3 1/16
13	14 5/8	14 1/8	15 3/8	15	7 1/2	3 1/16
14	15 9/16	15 1/16	16 5/16	16 15/16	7 31/32	3 1/16
15	16 1/2	16	17 1/4	16 7/8	8 7/16	3 1/16
16	17 7/16	16 15/16	18 3/16	17 13/16	8 29/32	3 1/16
17	18 3/8	17 7/8	19 1/8	18 3/4	9 3/8	3 1/16
18	19 5/16	18 13/16	20 1/16	19 11/16	9 27/32	3 1/16
19	20 1/4	19 3/4	21	20 5/8	10 5/16	3 1/16
20	21 3/16	20 11/16	21 15/16	21 9/16	10 25/32	3 1/16

NOTE: High torque motor add 1 1/8 inches to height of timer. Dimensions C-D & E are used for aluminum base.

Gear Rack Chart

MODEL DESIGNATIONS RELATE TO MOTOR SPEED ONLY.

Model	CM-0, MC-0 RA-0, RC-0	CM-1, MC-1 RA-1, RC-1	CM-2, MC-2 RA-2, RC-2	CM-3, MC-3 RA-3, RC-3	CM-4, MC-4 RA-4, RC-4	CM-5, MC-5 RA-5, RC-5	CM-6, MC-6 RA-6, RC-6	CM-7, MC-7 RA-7, RC-7	CM-8, MC-8 RA-8, RC-8	CM-9, MC-9 RA-9, RC-9	CM-10, MC-10 RA-10, RC-10	CM-11, MC-11 RA-11, RC-11	CM-12, MC-12 RA-12, RC-12	Model
Gear Rack	SEE PARA. 3													Gear Rack
E-12	40c	4 sec	10 sec	20s	40s	2m	3m20s	10m	20m	40m	2h	3h20m	8h	E-12
E-14	46.7c	4.67s	11.67s	23.33s	46.67s	2m20s	3m53s	11m40s	23m20s	46m40s	2h20m	3h53m	9h20m	E-14
D-12	48c	4.8s	12s	24s	48s	2m24s	4m	12m	24m	48m	2h24m	4h	9h36m	D-12
E-15	50c	5 sec	12.5s	25s	50s	2m30s	4m10s	12m30s	25m	50m	2h30m	4h10m	10h	E-15
E-16	53.3c	5.33s	13.33s	26.67s	53.3s	2m40s	4m27s	13m20s	26m40s	53m20s	2h40m	4h27m	10h40m	E-16
D-14	56c	5.6s	14s	28s	56s	2m48s	4m40s	14m	28m	56m	2h48m	4h40m	11h12m	D-14
C-12	1 sec	6 sec	15s	30s	60s	3m	5m	15m	30m	60m	3h	5h	12h	C-12
D-16	64c	6.4s	16s	32s	64s	3m12s	5m20s	16m	32m	64m	3h12m	5h20m	12h48m	D-16
E-20	66.7c	6.67s	16.67s	33.33s	66.67s	3m20s	5m33s	16m40s	33m20s	66m40s	3h20m	5h33m	13h20m	E-20
C-14	70c	7s	17.5s	35s	70s	3m30s	5m50s	17m30s	35m	70m	3h30m	5h50m	14h	C-14
D-18	72c	7.2s	18s	36s	72s	3m36s	6m	18m	36m	72m	3h36m	6h	14h24m	D-18
E-22	73.3c	7.33s	18.33s	36.67s	73.33s	3m40s	6m7s	18m20s	36m40s	73m20s	3h40m	6h7m	14h40m	E-22
C-15	75c	7.5s	18.75s	37.5s	75s	3m45s	6m15s	18m45s	37m30s	75m	3h45m	6h15m	15h	C-15
B-12	80c	8 sec	20s	40s	80s	4m	6m40s	20m	40m	80m	4h	6h40m	16h	B-12
E-26	86.7c	8.67s	21.67s	43.33s	86.67s	4m20s	7m13s	21m40s	43m20s	86m40s	4h20m	7h13m	17h20m	E-26
D-22	88c	8.8s	22s	44s	88s	4m24s	7m20s	22m	44m	88m	4h24m	7h20m	17h36m	D-22
C-18	90c	9 sec	22.5s	45s	90s	4m30s	7m30s	22m30s	45m	90m	4h30m	7h30m	18h	C-18
B-14	93.3c	9.33s	23.33s	46.67s	93.33s	4m40s	7m47s	23m20s	46m40s	93m20s	4h40m	7h47m	18h40m	B-14
D-24	96c	9.6s	24s	48s	96s	4m48s	8m	24m	48m	96m	4h48m	8h	19h12m	D-24
B-15	100c	10 sec	25s	50s	100s	5m	8m20s	25m	50m	100m	5h	8h20m	20h	B-15
D-26	104c	10.4s	26s	52s	104s	5m12s	8m40s	26m	52m	104m	5h12m	8h40m	20h48m	D-26
B-16	106.7c	10.67s	26.67s	53.33s	106.7s	5m20s	8m54s	26m40s	53m20s	106m40s	5h20m	8h54m	21h20m	B-16
C-22	110c	11 sec	27.5s	55s	110s	5m30s	9m10s	27m30s	55m	110m	5h30m	9h10m	22h	C-22
D-28	112c	11.2s	28s	56s	112s	5m36s	9m20s	28m	56m	112m	5h36m	9h20m	22h24m	D-28
E-34	113.3c	11.33s	28.33s	56.67s	113.3s	5m40s	9m27s	28m20s	56m40s	113m20s	5h40m	9h27m	22h40m	E-34
A-12	2 sec	12 sec	30s	60s	2m	6m	10m	30m	60m	2h	6h	10h	24h	A-12
D-32	2s8c	12.78s	32s	64s	128s	6m24s	10m40s	32m	64m	2h8m	6h24m	10h40m	25h36m	D-32
C-26	2s10c	13 sec	32.5s	65s	130s	6m30s	10m50s	32m30s	65m	2h10m	6h30m	10h50m	26h	C-26
B-20	2s12c	13.2s	33.33s	66.67s	133.3s	6m40s	11m7s	33m20s	66m40s	2h13m	6h40m	11h7m	26h40m	B-20
D-34	2s16c	13.56s	34s	68s	136c	6m48s	11m20s	34m	68m	2h16m	6h48m	11h20m	27h12m	D-34
A-14	2s20c	14 sec	35s	70s	140s	7m	11m40s	35m	70m	2h20m	7h	11h40m	28h	A-14
D-36	2s24c	14.4s	36s	72s	144s	7m12s	12m	36m	72m	2h24m	7h12m	12h	28h48m	D-36
B-22	2s27c	14.7s	36.67s	73.33s	146.7s	7m20s	12m13s	36m40s	73m20s	2h27m	7h20m	12h13m	29h20m	B-22
A-15	2s30c	15 sec	37.5s	75s	150s	7m30s	12m30s	37m30s	75m	2h30m	7h30m	12h30m	30h	A-15
A-16	2s40c	16 sec	40s	80s	160s	8m	13m20s	40m	80m	2h40m	8h	13h20m	32h	A-16
C-34	2s50c	17 sec	42.5s	85s	170s	8m30s	14m10s	42m30s	85m	2h50m	8h30m	14h10m	34h	C-34
B-26	2s52c	17.2s	43.33s	86.67s	173.3s	8m40s	14m27s	43m20s	86m40s	2h53m	8h40m	14h27m	34h40m	B-26
A-18	3 sec	18 sec	45s	90s	3m	9m	15m	45m	90m	3h	9h	15h	36h	A-18
B-28	3s7c	18.7s	46.67s	93.33s	186.7s	9m20s	15m33s	46m40s	93m20s	3h7m	9h20m	15h33m	37h20m	B-28
A-20	3s20c	20 sec	50s	100s	200s	10m	16m40s	50m	100m	3h20m	10h	16h40m	40h	A-20
B-32	3s33c	21.3s	53.33s	106.7s	213.4s	10m40s	17m47s	53m20s	106m40s	3h33m	10h40m	17h47m	42h40m	B-32
A-22	3s40c	22 sec	55s	110s	220s	11m	18m20s	55m	110m	3h40m	11h	18h20m	44h	A-22
B-34	3s47c	22.7s	56.67s	113.3s	226.7s	11m20s	18m53s	56m40s	113m20s	3h47m	11h20m	18h53m	45h20m	B-34
A-24	4 sec	24 sec	60s	2m	4m	12m	20m	60m	2h	4h	12h	20h	48h	A-24
A-26	4s20c	26 sec	65s	130s	260s	13m	21m40s	65m	2h10m	4h20m	13h	21h40m	52h	A-26
A-28	4s40c	28 sec	70s	140s	280s	14m	23m20s	70m	2h20m	4h40m	14h	23h20m	56h	A-28
A-30	5 sec	30 sec	75s	150s	5m	15m	25m	75m	2h30m	5h	15h	25h	60h	A-30
A-32	5s20c	32 sec	80s	160s	320s	16m	26m40s	80m	2h40m	5h20m	16h	26h40m	64h	A-32
A-34	5s40c	34 sec	85s	170s	340s	17m	28m20s	85m	2h50m	5h40m	17h	28h20m	68h	A-34
A-36	6 sec	36 sec	90s	3m	6m	18m	30m	90m	3h	6h	18h	30h	72h	A-36

c - CYCLES s - SECONDS m - MINUTES h - HOURS

1. MODEL SELECTION

SELECT basic type of timer required for your application, i.e., MC (recycling), RC (single), etc.

LOCATE overall time cycle required for one revolution of camshaft on the gear rack chart.

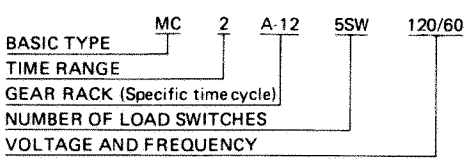
NOTE the model designated from the top of that column, i.e., MC-2, RC-4, etc.

CROSS column from time cycle for gear rack.

SPECIFY required number of load switches.

SPECIFY voltage and frequency.

2. ORDERING INFORMATION



3.

Because of the increased torque encountered with multi-switch cam timers in the rapid time cycles, the Series MC-0 and RC-0 timers require High Torque Motors (HTM). This is also true of some MC-1 and RC-1 timers. (See vertical shaded area of chart.) To determine the need of a HTM in the Series MC-1 and RC-1, multiply required time cycle in seconds by $^2/_3$. The answer will be the maximum number of switches that can be operated with a standard timing motor; e.g. time cycle 15 seconds, $^2/_3 \times 15S = 10$. 10 switches can be operated at 15 seconds with a standard timing motor, more than 10 load switches will require the use of a HTM. If there is any doubt relative to the use of a HTM, consult factory. Note that the C-12 Gear Rack (horizontal shaded area of chart) provides a cam rotation speed directly proportional to the motor output; e.g. MC-6 = 1 revolution in 5 minutes. Also, the letter C which signifies CYCLES = $^1/_{60}$th of a second.