

ELAPSED TIME INDICATORS

DC SERIES: SUBMINIATURE



Models 16, D16 & D46

See the Military Cross Reference for military qualified models, page 82.

The ElectroDynamics DC meter was developed to meet the difficult requirements of most military and aerospace applications. They provide a wide range of supply voltage options and are packaged in a hermetically sealed miniature enclosure. This rugged design meets or exceeds an array of tough environmental specifications including shock, vibration, and temperature. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquiries for special requirements.

FEATURES

- Rugged design
- Low voltage models available
- Hermetically sealed

MECHANICAL SPECIFICATIONS

Case: Copper-nickel or brass, with durable black finish. E and F mounts are nickel-plated case with black face.

Max. case length: Short version: 1.094 in.
Long version: 2.082 in.

Flange: Brass

Terminals: Solder hook

Weight: 0.4 ounces maximum without mount
0.6 ounces maximum with C flange

Numerals: .035" wide, .078" high. Hour digits are white on black. Tenths are red on white.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D



ESD Susceptibility: Classified as Class 3 ESD sensitive in accordance with MIL-STD-1686

ELECTRICAL SPECIFICATIONS

Meters meet or exceed applicable requirements of MIL-DTL-7793 M7793/1, /2, /5 and MS21341 A & B. Special ratings and configurations are also available.

Transient Protection: MIL-STD-704A, 80 & 600 V (Models 16 & D16)

Ripple Protection: MIL-STD-704A, para. 5.2.2 to 5.2.2.1 & Fig. 7 (Models 16 & D16)

Dielectric: 350 VRMS @ 80,000 ft., 600 VRMS @ sea level

Insulation Resistance: MIL-STD-202, Method 302, Condition B

Accuracy: 0.1% over temperature/voltage range

Power Consumption: D16 & 16 = .085 Watts, D46=.010 Watts

Reading Allowed at time of Shipments: Meters can be delivered with +/- 1 hour upon delivery per MIL-DTL-7793

ORDERING INFORMATION

When ordering, show model number first (D), then operating voltage, case type, maximum hours (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configuration are also available. Example: D16C8CE-136

Case Length	Operating Voltage	Case Type	Maximum Hours 4 Digit / 5 Digit	Mount Type	Mount Setback	Standard Factory Code* Description	Option Examples
D = Short	16 = 10-34 VDC	B = 4 Digit Round	3 = 999.9 / N/A	A = No Mount	A = Flush	1 Rotated 90° type C, C7, V, W mount	
() Long ①	46 = 4.5-6.5 VDC②	C = 4 Digit Square	8 = 9999 / 9999.9	Others available, see page 78	B to Z See "Table A" on page 81 for "X" Dimensional Code desired	14 4-40 Clinch Nuts, for type C mount	
	Other voltages also available	D = 4 Digit Square (Side-Read)	9 = N/A / 99999			16 Tin-plate front of mount, type C mount	
		G = 5 Digit Rect.				136 Tin-plate front of mount, type C (M7793/1 & /2), C7, V & W	

① Omit "D" for long case ② 5 VDC not MIL qualified

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ELAPSED TIME INDICATORS

AC SERIES: SUBMINIATURE



Models D21, D25, D91, D92 & D95

See the Military Cross Reference for military qualified models, pages 82-84.

The AC meter was developed to meet the most difficult requirements of many military and aerospace applications. Available in 50Hz, 60Hz and 400Hz configurations, the AC series meters meet or exceed an array of tough environmental specifications including shock, vibration, and temperature. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquires for special requirements.

FEATURES

- Rugged design
- Hermetically sealed

MECHANICAL SPECIFICATIONS

Case: Copper nickel or brass, with durable black finish. E and F mounts are nickel-plated case with black face.

Max. case length: Short version: 1.094 in.
Long version: 2.082 in.

Flange: Brass

Terminals: Solder hook

Weight: 0.4 ounces maximum without mount
0.6 ounces maximum with C flange

Numerals: .035" wide, .078" high. Hour digits are white on black. Tenths are red on white.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: -65 to +125°C

Shock: MIL-STD-202, Method 213, Condition I

Vibration: MIL-STD-202, Method 204, Condition D

ORDERING INFORMATION

When ordering, show model number first (D), then operating voltage, case type, maximum hours (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configuration are also available. Example: D95C8CE-16



ESD Susceptibility: Classified as Class 3 ESD sensitive in accordance with MIL-STD-1686

ELECTRICAL SPECIFICATIONS

Meters meet or exceed applicable requirements of MIL-M-7793 M7793/3, /4, /6, /8, /9, /10 (if QPL'd) MS27650 & 27651. Special ratings and configurations are also available.

Transient Protection: As applicable, 180 VRMS up to 0.15 seconds

Dielectric: 350 VRMS @ 80,000 ft., 600 VRMS @ sea level

Insulation Resistance: MIL-STD-202, Method 302, Condition B

Accuracy: 0.1% over temperature/voltage range

Power Consumption:

D21 & D25 = .015 Watts

D91, D92, & D95 = .3 Watts

Reading Allowed at time of Shipments: Meters can be delivered with +/- 1 hour upon delivery per MIL-DTL-7793

D 95 C 8 C E - 16

Case Length	Operating Voltage	Case Type	Maximum Hours 4 Digit / 5 Digit	Mount Type	Mount Setback	Standard Factory Option Code*	Examples Description
D	21 = 20-40 VAC/ 45-70 Hz	B = 4 Digit Round	3 = 999.9 / N/A	A = No Mount	A = Flush	1	Rotated 90° type C, C7, V, W mount
D	25 = 15-40 VAC/ 380-420 Hz	C = 4 Digit Square	8 = 9999 / 9999.9	Others available, see page 78	B to Z	14	4-40 Clinch Nuts, for type C mount
D	91 = 75-150 VAC/ 50-400 Hz	D = 4 Digit Square (Side-Read)	9 = N/A / 99999		See "Table B Mount Setback Data" on page 81 for "X" Dimensional Code desired	16	Tin-plate front of mount, type C mount
D	92 = 100-130 VAC/ 50-70 Hz	G = 5 Digit Rect.				136	Tin-plate front of mount, type C (M7793/1 & /2), C7, V & W
D	95 = 100-130 VAC/ 380-420 Hz						*See "Table C Standard Options" on page 81 for all codes

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EVENT COUNTERS SUBMINIATURE



Models B16 & L16 Ruggedized

MIL-I-8974 Equivalent Part Numbers	
Mil Spec	L-3 EDI Commercial
M8974/2-003*	B16C8A-232
M8974/2-004*	B16C8CE-232

***MIL Spec numbers are no longer available**

The ElectroDynamics subminiature event counters were designed to meet the most difficult requirements of many military and aerospace applications. These rugged counters meet or exceed an array of tough environmental specifications including shock, vibration, temperature and are packaged in a hermetically sealed miniature enclosure. A variety of mounting configurations are available as shown on pages 78 and 79. We also welcome inquires for special requirements.

The ruggedized event counters are assembled and filled with a dielectric lubricant that dampens the effects of extreme vibration and thermal shock.

FEATURES

- Rugged design
- Hermetically sealed

MECHANICAL SPECIFICATIONS

Case: Copper-nickel or brass, with black face. E and F mounts are nickel-plated case with black face.

Max. case length: 1.094 in.

Flange: Brass

Terminals: Solder hook

Weight: Standard: Will not exceed 1.2 ounces with C flange
Ruggedized: Will not exceed 1.8 ounces with C flange

Numerals: .035" wide, .078" high. All digits are white on black.

ORDERING INFORMATION

When ordering, show model number first (B), then operating voltage, case type, maximum counts (4 or 5 digit), mount type, and mount setback desired. If this is a special part, a factory modification number will be added at the end of the ordering number. This order chart lists standard features. Other ratings and configurations are also available. Example: B16C8CE-1

Model Number	Operating Voltage	Case Type	Maximum Hours Maximum Event 4,5,&6 Digit	Mount Type	Mount Setback	Standard Factory Option Examples Code* Description
B = Standard	23-29 VDC	C = 4 Digit Square	8 = 9999	A = No Mount	A = Flush	1 Rotated 90° type C, C7, V, W mount
L = Ruggedized	18-32 Others available	G = 5 Digit Rect. F = 6 Digit Rect.	9 = 99999 6 = 999999	Others available, see page 78	B to Z See "Table A" on page 81 for "X" Dimensional Code desired	14 4-40 Clinch Nuts, for type C mount 136 Tin-plate front of mount, type C, C7, V & W

*See "Table C Standard Options" on page 81 for all codes



ELECTRICAL SPECIFICATIONS

Polarity: Not polarity sensitive
Dielectric: 500 VRMS @ 80,000 feet
Insulation Resistance: MIL-STD-202, Method 302, Condition B

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature Range: Standard: -65 to +125°C
Ruggedized: -55 to +125°C

STANDARD RATINGS

Count Rate: 5 Counts/Second
Minimum Impulse Time: 50ms / 150ms off
Thermal Shock: MIL-STD-202, Method 107, Condition B
Shock: MIL-STD-202, Method 213, Condition A
Vibration: MIL-STD-202, Method 204, Condition D except at 10 Gs max.
Life: One million counts @ 25°C

RUGGEDIZED RATINGS

Count Rate: 5 Counts/Second
Minimum Impulse Time: 50ms / 150ms off
Thermal Shock: MIL-STD-202, Method 107, Condition B, except temperature -55 °C to +125 C
Shock: MIL-STD-202, Method 213, Condition A
Vibration: MIL-STD-202, Method 204, Condition D
Life: 5 million counts @ 25°C

POWER CONSUMPTION (for Standard & Ruggedized):

4 digit oil filled: 3.4 Watts max. @ 28VDC
 4 digit dry: 1.5 Watts max. @ 28VDC
 5 digit oil filled: 3.4 Watts max. @ 28VDC
 5 digit dry: 2.5 Watts max. @ 28VDC
 6 digit dry: 2.5 Watts max. @ 28VDC

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ELAPSED TIME INDICATORS AND EVENT COUNTERS



Standard Cases & Mounts

Recommended mounting torque: 2 in. lbs.*

Recommended Panel Cut-Out:
.562" (9/16") X .562" (9/16"), 4 Digit

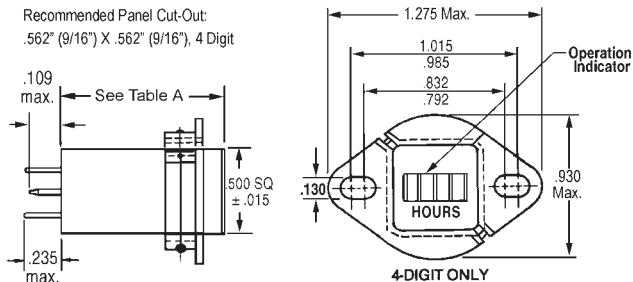


Figure 1. C2 ADJUSTABLE MOUNT

Recommended mounting torque: 3 to 5 in. lbs.*

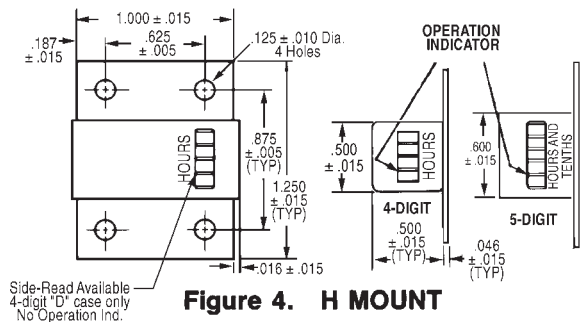


Figure 4. H MOUNT

Recommended mounting torque: 3 to 5 in. lbs.*

Recommended Panel Cut-Out: .562" (9/16") X .625" (5/8"), 5 Digit

Factory Codes
-1 Mt. Rotated 90°
-136 Tin Plate Front Mt.

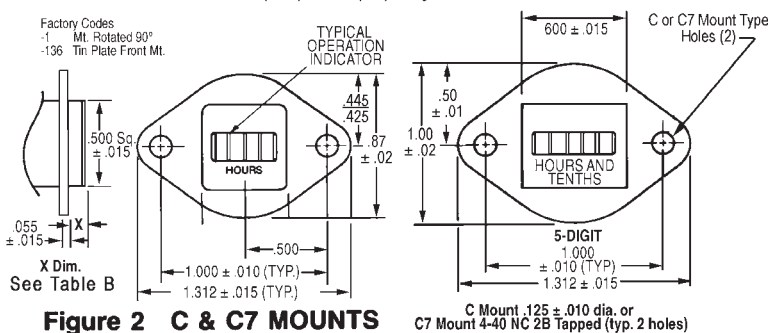


Figure 2 C & C7 MOUNTS

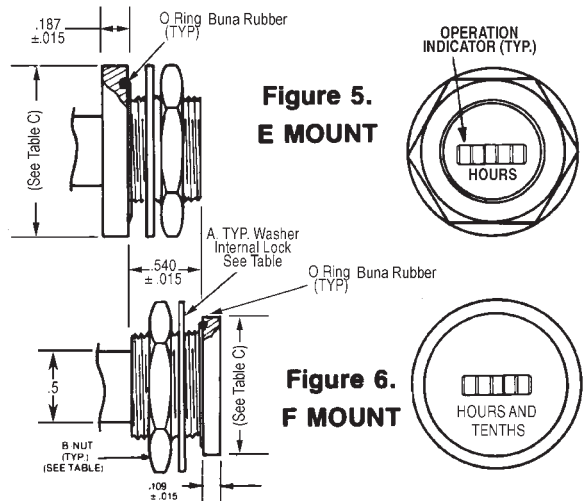


Figure 5. E MOUNT

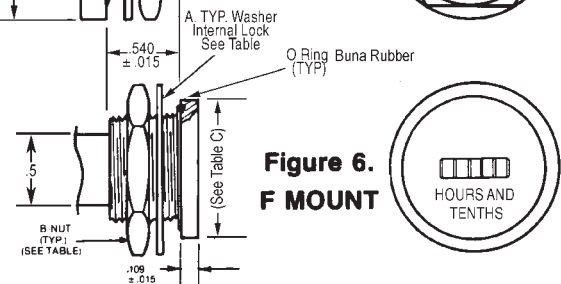


Figure 6. F MOUNT

	A Max. Dia.	B (Nut)	C ± .015 E Mount	F Mount
4 Digit	1.250	3/4"-32 UN	1.250	1.000
5 Digit	1.410	7/8"-20 UN		1.375

Recommended mounting torque, E & F mount

4 digit20 to 30 in. lbs.

5 digit60 to 70 in. lbs.

6 digit70 to 80 in. lbs.

Recommended mounting torque: 3 to 5 in. lbs.*

Factory Codes
-1 Mt. Rotated 90°
-136 Tin Plate Front Mt.

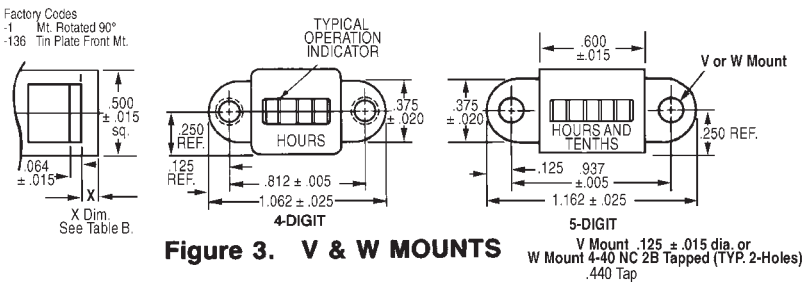


Figure 3. V & W MOUNTS

V Mount .125 ± .015 dia. or
W Mount 4-40 NC 2B Tapped (TYP. 2-Holes)
.440 Tap

Round Cases & Mounts (for ETI only)

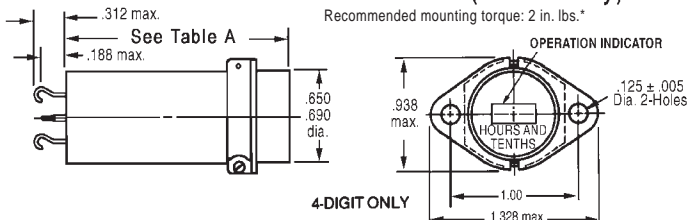


Figure 7. C2 ADJUSTABLE MOUNT

Factory Codes
-1 Mt. Rotated 90°
-136 Tin Plate Front Mt.

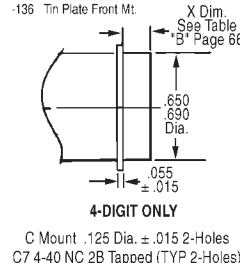


Figure 8. C & C7 MOUNTS

Recommended mounting torque: 3 to 5 in. lbs.*

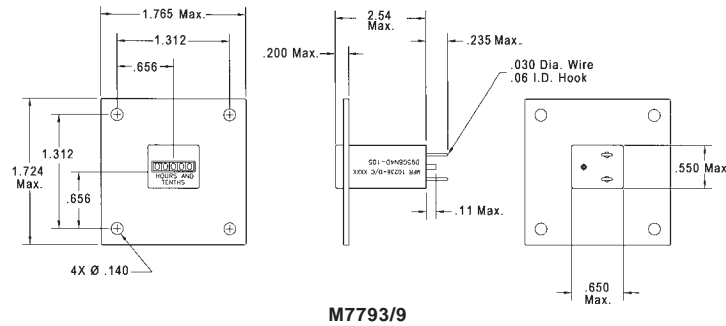
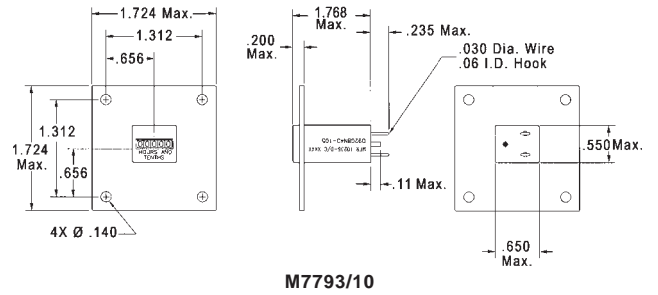
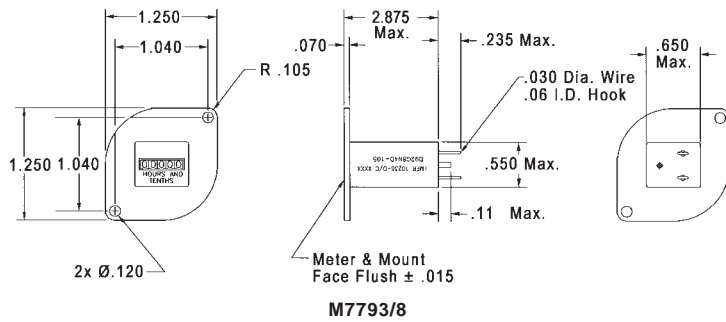
*When mounting flanged units, it is recommended to distribute the mounting torque evenly across the mounting surface. Each mounting screw should be alternately tightened about one quarter to one half turn until the recommended torque is attained on each screw. The mounting surface should be flat to avoid exerting stress on the body of the unit.

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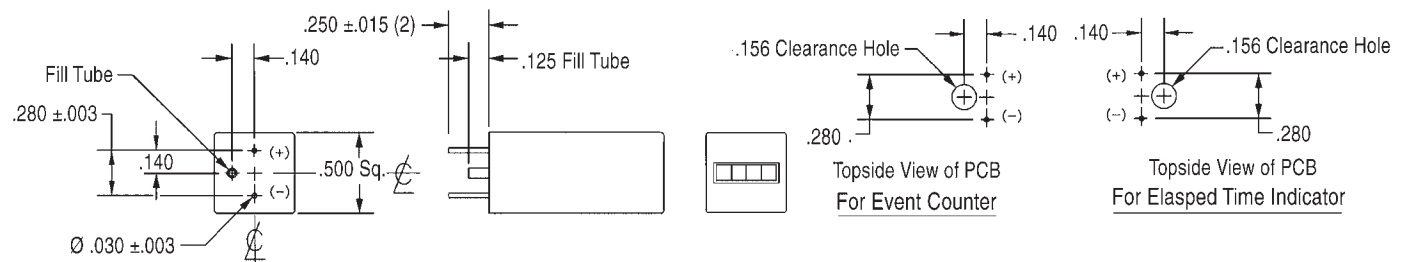
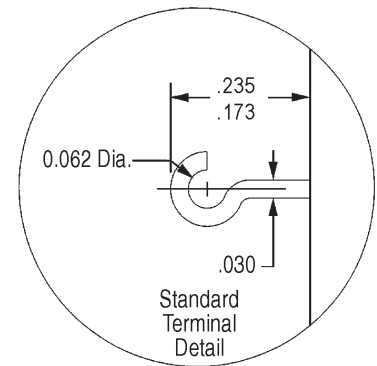
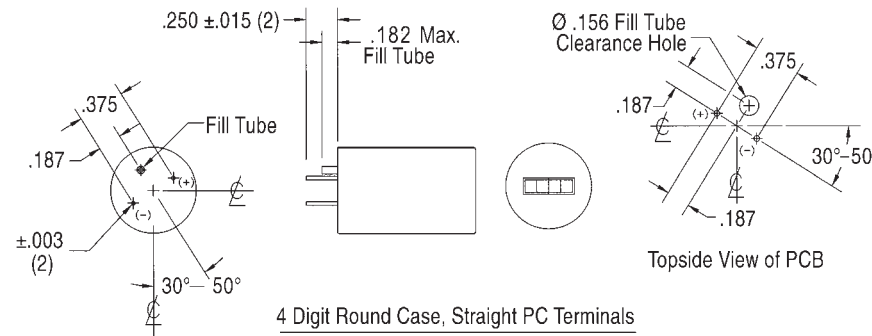
ELAPSED TIME INDICATORS AND EVENT COUNTERS



Standard Cases & Mounts



Standard and Straight Pin Headers



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ELAPSED TIME INDICATORS AND EVENT COUNTERS



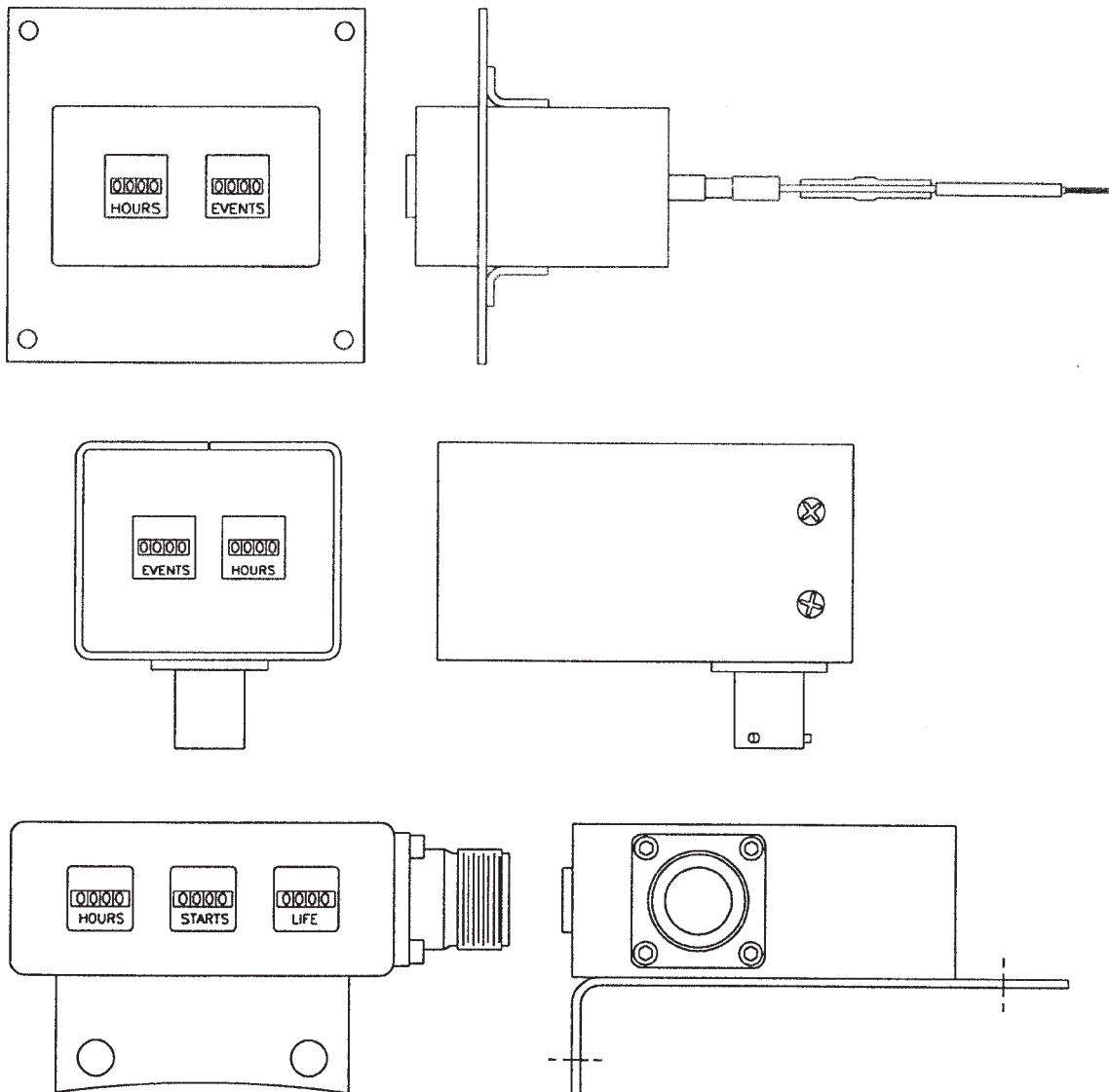
999A Series Enclosures

L-3 Electroynamics, Inc. offers customized enclosures to house a variety of Elapsed Time Indicators and Event Counters. The customized enclosures include the connectors, wire leads and mounting brackets, as required, for mounting into final assemblies. Refer to the Elapsed Time Indicator and Event Counter sections of the catalog for mechanical, electrical and environmental specifications.

DC series Elapsed Time Indicators meet or exceed requirements of MIL-M-7793-M7793/1, /2, /5 and MS21341 A & B.

AC series Elapsed Time Indicators meet or exceed applicable requirements of MIL-M-7793-M7793/3, /4, /6, /8, /9, /10 (if QPL'd), MS27650 and MS21651.

ENCLOSURE EXAMPLES



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MILITARY ELAPSED TIME INDICATOR GUIDE



Table A Specifications

Operating Voltage	Case Length Max. Inches	L-3 Electroynamics Model Number	Fig. No.	Military Number
10-34 VDC	Short	D16C8C*-16	2	M7793/1-XXX
		D16C8C2	1	M7793/1-001
		D16C8A	—	M7793/1-002
		D16C8C*-136	2	M7793/1-XXX
		D16B8C2	7	M7793/2-001
		D16B8A	—	M7793/2-002
	2.062	16B8C2	7	M7793/5-001
		16C8C2	1	M7793/5-002
		16C8C*-16	2	MS21341B-XX
		16C8C*-136	2	M7793/1-XXX
100-130 VAC 50-70Hz	1.094	D92C8C2	1	M7793/3-001
		D92C8A	—	M7793/3-002
		D92C8C*-136	2	M7793/3-XXX
	Short	D92B8C2	7	M7793/4-001
		D92B8A	—	M7793/4-002
		D92B8C*-136	8	M7793/4-XXX
100-130 VAC 380-420Hz	1.765	D95B8C2	7	M7793/6-001
	1.094	D95C8C2	1	M7793/6-002
	Short	C7*-16	2	MS27651-XXA
		C7*-1-16	2	MS27651-XXB
		D95C8 C*-16	2	MS27651-XXC
		C*-1-16	2	MS27651-XXD
		W*-16	3	MS27651-XXE
		W*-1-16	3	MS27651-XXF
	V*-16	3	MS27651-XXG	
		3	MS27651-XXH	
15-40 VAC 380-420Hz	Replace D95 above with D25 Example: D25C8CE-16 = MS27650-05C		Replace MS27651 above with MS27650	

Notes:

- All meter readouts are to 9999 Hours, maximum.
- See "Table B Mount Setback Data" to select desired "X" Dim. (* in model no.) and corresponding military dash no. (xx & xxx).
- "-136" in model number denotes tin-plated mount face; "-16" in model number is same plus USAF testing; "-1" in model number is mount rotated 90°.

Qualified products purchased to the Military Part Number comply with the latest revision of the applicable Military Specification. Commercial, Non-Qualified, and EDI versions of Military Specification products are designed in accordance with the applicable Military Specification, but may not be tested and/or qualified per said Military Specification.

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Table B Mount Setback Data

M7793/1 to /4 Dash No.	MS21341, 27650, 27651 Dash No.	Setback ± .015 In.	"X" Dim. Code
-003	-01	Flush	A
-004	-02	.031	B
-005	-03	.062	C
-006	-04	.094	D
-007	-05	.125	E
-008	-06	.156	F
-009	-07	.188	G
-010	-08	.219	H
-011	-09	.250	I
-012	-10	.281	J
-013	-11	.312	K
-014	-12	.344	L
-015	-13	.375	M
-016	-14	.406	N
-017	-15	.438	O
-018	-16	.469	P
-019	-17	.500	R
-020	-18	.531	S
-021	-19	.562	T
-022	-20	.594	T-8
-023	-21	.625	U
-024	-22	.656	U-8
-025	-23	.688	V
-026	-24	.719	V-8
-027	-25	.750	W
-028	-26	.781	W-8
		.813	X
		.875	Y
		.938	Z

Table C Standard Options

Code	Additional Standard Factory Options	AC/DC Meters	Events
1	Flange rotated 90° clockwise from standard	X	X
2	Flange rotated 180° clockwise from standard	X	X
3	Flange rotated 270° clockwise from standard	X	X
13	#4-40 self locking nylon clinch nut on backside of flange	X	X
14	#4-40 self locking stainless steel clinch nut on backside of flange	X	X
16	Front face of flange is pure tin plated and unit is tested an additional 25 hours per MS27650 / 27651 / 21341	X	
26	A flat is added to E mounts for D hole installation - .710" for 4 digit meter, .810" for 5 digit meter	X	X
28	"C/C7 type flanges, RFI gasket - Must be used with tin plated flange (-105, -136, -200) E & F mounts - RFI o-ring"	X	X
46	.150" long .030" diameter straight pins in place of hook terminals	X	X
47	.250" long .030" diameter straight pins in place of hook terminals	X	X
75	RFI conductive glass window	X	X
105	Rear face of flange is pure tin plated	X	X
136	Front face of flange is pure tin plated	X	X
200	Front & rear face of flange is pure tin plated	X	X
237	Entire unit except terminals is painted and unit is tested an additional 25 hours per MS27650 / 27651 / 21341	X	
493	A flat is added to F mounts for D hole installation- .710" for 4 digit, .810" for 5 digit	X	X

ELAPSED TIME INDICATORS & EVENT COUNTERS