



# Mini Encapsulated LINEAR REGULATED AC-DC single output PC board mounting

- Shipped Within 3 Days
- All Models U.L. Recognized
- One Year Warranty



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- Acopian power supplies last a *very long time!*
- You can email [3day@acopian.com](mailto:3day@acopian.com) anytime for 24/7 product support.
- The *Online System Builder* ([www.acopian.com/SystemBuilder](http://www.acopian.com/SystemBuilder)) is a convenient way to get your own custom power supply or power system (and they ship within 9 Days).
- You can order Acopian power supplies factory direct.
- ALL Acopian products are made in the USA.



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single output

## Mini Encapsulated - PC Board mounting

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AC-DC

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**Conserve space with mini-modules** as small as 2.3" x 1.8" x 1.0". Models with outputs ranging from 1 to 75 volts, and from 30 mA to 2.5 amps are available. All feature excellent regulation and ripple parameters, and are short circuit protected. Rugged encapsulated construction and generously derated components assure years of reliable operation. PC Board mounting mini-modules are also available with dual outputs - see page H4.

### STANDARD FEATURES

- May be used in series
- No derating or heat sinking required
- Short circuit protected
- Small, lightweight

### SPECIFICATIONS

**Input Voltage:** 105-125 VAC, 47 to 420 Hz, single phase.

**Output Voltage Setting:** Output is factory preset to within  $\pm 2\%$  (1 to 9 volt models) or  $\pm 1\%$  (10 to 75 volt models) of the nominal output voltage.

**T/C terminal (Output Voltage Trim Adjustment):** The T/C terminal can be used to trim the output more precisely to the nominal voltage rating by connecting an external resistor from the T/C terminal to either the + or - terminal.

**Polarity:** Output is floating. Either positive or negative terminal may be grounded.

**Ambient Operating Temperature:**  $-20$  to  $+71^\circ\text{C}$ . No derating required.

**Storage Temperature:**  $-55$  to  $+85^\circ\text{C}$ .

**Temperature Coefficient:** From 9 to 75 volts, typically  $0.015\%/^\circ\text{C}$ ; 1 to 8 volts,  $0.03\%/^\circ\text{C}$ .

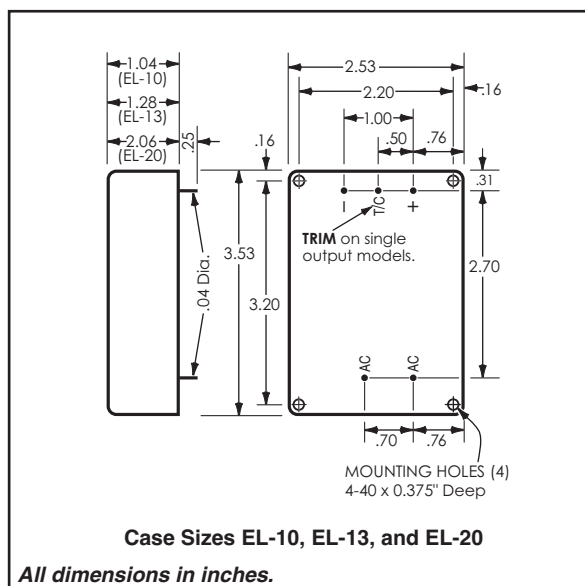
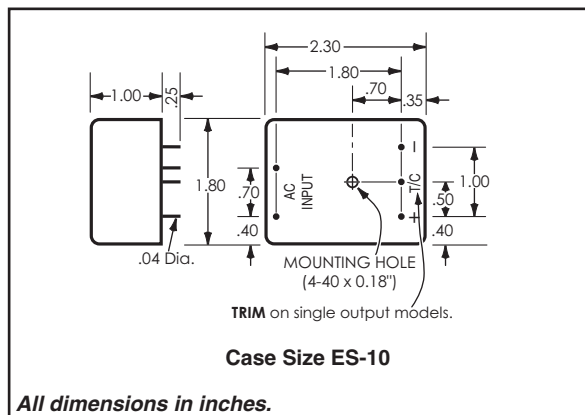
**Impedance:** 0.07 ohms at 1 kHz and 0.2 ohms at 10 kHz (approx.).

**Weight:** 7 oz. (Case size ES-10)  
13 oz. (Case size EL-10)  
1 lb. 3 oz. (Case size EL-13)  
1 lb. 15 oz. (Case size EL-20)

**Mounting:** May be mounted on printed circuit board or in socket (see page H4).

### OPTIONS

**230 Volt Input:** All models can be alternately furnished for operation on an input of 210 to 250 VAC, 47-420 Hz. To order, add suffix "-230" to model number and \$10.00 to price. Requires two additional days.



## SINGLE OUTPUT, FOR PC BOARD MOUNTING

(For Mini Encapsulated power supplies with higher wattage outputs than those shown below, see pages C1-C2.)

Nominal Output Voltage	Output Current Amps.	Regulation		Ripple mV RMS	(\$) Price	Model	Case Size
		Load ±%	Line ±%				
1	.250	.1	.05	0.5	90	1E25	ES-10
1	.500	.2	.05	1	110	1E50A	EL-10
1.5	.250	.1	.05	0.5	90	1.5E25	ES-10
1.5	.500	.2	.05	1	110	1.5E50A	EL-10
1.5	1.0	.3	.05	1	140	1.5E100	EL-13
1.5	2.5	.3	.05	1	185	1.5E250	EL-20
2	.200	.1	.05	0.5	90	2E20	ES-10
2	.400	.2	.05	1	110	2E40A	EL-10
3	.250	.1	.05	0.5	90	3E25	ES-10
3	.500	.2	.05	1	110	3E50A	EL-10
3.3	.250	.05	.05	0.5	90	3.3E25	ES-10
3.3	.500	.1	.05	1	110	3.3E50A	EL-10
3.3	1.0	.3	.05	1	140	3.3E100	EL-13
3.3	2.0	.3	.05	1	170	3.3E200	EL-20
4	.200	.05	.05	0.5	90	4E20	ES-10
4	.400	.1	.05	1	110	4E40A	EL-10
5	.250	.05	.05	0.5	90	5E25	ES-10
5	.500	.1	.05	1	105	5E50A	EL-10
5	1.0	.15	.05	1	125	5E100	EL-13
5	1.5	.15	.05	1	140	5E150	EL-13
5	2.0	.15	.05	1	170	5E200	EL-20
5	2.5	.15	.05	1	185	5E250	EL-20
6	.200	.05	.05	0.5	90	6E20	ES-10
6	.400	.1	.05	1	110	6E40A	EL-10
6	.550	.2	.05	1	130	6E55	EL-10
6	1.0	.2	.05	1	150	6E100	EL-13
6	1.75	.15	.05	1	180	6E175	EL-20
7	.170	.05	.05	0.5	90	7E17	ES-10
7	.340	.1	.05	1	110	7E34A	EL-10
7	.450	.2	.05	1	130	7E45	EL-10
7	.900	.2	.05	1	150	7E90	EL-13
7	1.15	.15	.05	1	180	7E115	EL-20
8	.150	.05	.05	0.5	90	8E15	ES-10
8	.300	.1	.05	1	110	8E30A	EL-10
8	.700	.2	.05	1	150	8E70	EL-13
8	1.1	.15	.05	1	180	8E110	EL-20
9	.130	.05	.05	0.5	90	9E13	ES-10
9	.260	.1	.05	1	110	9E26A	EL-10
9	.450	.15	.05	1	130	9E45	EL-10
9	.850	.15	.05	1	150	9E85	EL-13
9	1.5	.15	.05	1	185	9E150	EL-20
10	.120	.02	.02	0.5	80	10E12	ES-10
10	.240	.05	.05	1	110	10E24A	EL-10
10	.400	.15	.05	1	130	10E40	EL-10
10	.750	.15	.05	1	150	10E75	EL-13
10	1.2	.1	.05	1	185	10E120	EL-20
11	.110	.02	.02	0.5	90	11E11	ES-10
11	.220	.05	.05	1	110	11E22A	EL-10
11	.350	.15	.05	1	130	11E35	EL-10
11	.600	.15	.05	1	150	11E60	EL-13
11	1.0	.1	.05	1	185	11E100	EL-20
12	.100	.02	.02	0.5	80	12E10	ES-10
12	.150	.05	.05	0.5	100	12E15*	ES-10
12	.200	.05	.05	1	110	12E20A	EL-10
12	.400	.1	.05	1	130	12E40	EL-10
12	.700	.1	.05	1	155	12E70	EL-13
12	1.2	.15	.05	1	185	12E120	EL-20
13	.100	.02	.02	0.5	90	13E10	ES-10
13	.200	.05	.05	1	110	13E20A	EL-10
13	.350	.1	.05	1	130	13E35	EL-10
13	1.0	.1	.05	1	185	13E100	EL-20
14	.100	.02	.02	0.5	90	14E10	ES-10
14	.200	.05	.05	1	110	14E20A	EL-10
14	.300	.1	.05	1	130	14E30	EL-10
14	.500	.1	.05	1	150	14E50	EL-13
14	1.0	.1	.05	1	185	14E100	EL-20
15	.100	.02	.02	0.5	80	15E10	ES-10
15	.150	.05	.05	0.5	100	15E15*	ES-10
15	.200	.05	.05	1	110	15E20A	EL-10
15	.400	.1	.05	1	130	15E40	EL-10
15	.600	.1	.05	1	150	15E60	EL-13
15	1.0	.1	.05	1	185	15E100	EL-20
16	.080	.02	.02	0.5	90	16E08	ES-10
16	.160	.05	.05	1	110	16E16A	EL-10
16	.350	.1	.05	1	135	16E35	EL-10
16	.500	.1	.05	1	155	16E50	EL-13
16	.900	.1	.05	1	185	16E90	EL-20
17	.070	.02	.02	0.5	90	17E07	ES-10
17	.140	.05	.05	1	110	17E14A	EL-10
17	.450	.1	.05	1	155	17E45	EL-13
17	.750	.1	.05	1	185	17E75	EL-20

Nominal Output Voltage	Output Current Amps.	Regulation		Ripple mV RMS	(\$) Price	Model	Case Size
		Load ±%	Line ±%				
18	.060	.02	.02	0.5	80	18E06	ES-10
18	.120	.05	.05	1	110	18E12A	EL-10
18	.270	.1	.05	1	130	18E27	EL-10
18	.400	.1	.05	1	150	18E40	EL-13
18	.550	.1	.05	1	180	18E55	EL-20
19	.060	.02	.02	0.5	90	19E06	ES-10
19	.120	.05	.05	1	110	19E12A	EL-10
19	.250	.1	.05	1	130	19E25	EL-10
19	.400	.1	.05	1	150	19E40	EL-13
19	.700	.1	.05	1	185	19E70	EL-20
20	.060	.02	.02	0.5	90	20E06	ES-10
20	.120	.05	.05	1	110	20E12A	EL-10
20	.200	.1	.05	1	130	20E20	EL-10
20	.400	.1	.05	1	150	20E40	EL-13
20	.700	.1	.05	1	185	20E70	EL-20
21	.060	.02	.02	0.5	90	21E06	ES-10
21	.120	.05	.05	1	110	21E12A	EL-10
21	.175	.1	.05	1	130	21E18	EL-10
21	.375	.1	.05	1	150	21E38	EL-13
21	.600	.1	.05	1	180	21E60	EL-20
22	.050	.02	.02	0.5	90	22E05	ES-10
22	.100	.05	.05	1	110	22E10A	EL-10
22	.150	.1	.05	1	130	22E15	EL-10
22	.300	.1	.05	1	150	22E30	EL-13
22	.500	.1	.05	1	180	22E50	EL-20
23	.050	.02	.02	0.5	90	23E05	ES-10
23	.100	.05	.05	1	110	23E10A	EL-10
23	.200	.1	.05	1	130	23E20	EL-10
23	.300	.1	.05	1	150	23E30	EL-13
23	.600	.1	.05	1	185	23E60	EL-20
24	.050	.02	.02	0.5	80	24E05	ES-10
24	.100	.05	.05	1	110	24E10A	EL-10
24	.200	.1	.05	1	130	24E20	EL-10
24	.350	.1	.05	1	155	24E35	EL-13
24	.600	.1	.05	1	185	24E60	EL-20
25	.050	.02	.02	0.5	90	25E05	ES-10
25	.100	.05	.05	1	110	25E10A	EL-10
25	.190	.1	.05	1	130	25E19	EL-10
25	.325	.1	.05	1	155	25E33	EL-13
25	.550	.1	.05	1	185	25E55	EL-20
26	.040	.02	.02	0.5	90	26E04	ES-10
26	.080	.05	.05	1	110	26E08A	EL-10
26	.170	.1	.05	1	130	26E17	EL-10
26	.300	.1	.05	1	150	26E30	EL-13
26	.450	.1	.05	1	180	26E45	EL-20
27	.040	.02	.02	0.5	90	27E04	ES-10
27	.080	.05	.05	1	110	27E08A	EL-10
27	.160	.1	.05	1	130	27E16	EL-10
27	.300	.1	.05	1	150	27E30	EL-13
27	.500	.1	.05	1	185	27E50	EL-20
28	.040	.02	.02	0.5	80	28E04	ES-10
28	.080	.05	.05	1	110	28E08A	EL-10
28	.150	.1	.05	1	130	28E15	EL-10
28	.300	.1	.05	1	155	28E30	EL-13
28	.500	.1	.05	1	185	28E50	EL-20
30	.080	.02	.02	1	115	30E08A	EL-13
32	.070	.02	.02	1	115	32E07A	EL-13
34	.060	.02	.02	1	115	34E06A	EL-13
35	.050	.02	.02	1	115	35E05A	EL-13
36	.050	.02	.02	1	115	36E05A	EL-13
38	.040	.02	.02	1	115	38E04A	EL-13
40	.030	.02	.02	1	115	40E03A	EL-13
40	.060	.02	.02	1	140	40E06A	EL-13
42	.030	.02	.02	1	115	42E03A	EL-13
44	.030	.02	.02	1	115	44E03A	EL-13
45	.030	.02	.02	1	115	45E03A	EL-13
48	.030	.02	.02	1	115	48E03A	EL-13
48	.050	.02	.02	1	140	48E05A	EL-13
50	.030	.02	.02	1	115	50E03A	EL-13
50	.050	.02	.02	1	140	50E05A	EL-13
55	.040	.02	.02	1	140	55E04A	EL-13
60	.050	.02	.02	1	140	60E05A	EL-13
65	.050	.02	.02	1	140	65E05A	EL-13
70	.040	.02	.02	1	140	70E04A	EL-13
75	.030	.02	.02	1	140	75E03A	EL-13
185	.025	Unregulated		2V	80	NX-25A*	EL-10
185	.050	Unregulated		3.5V	105	NX-50*	EL-13

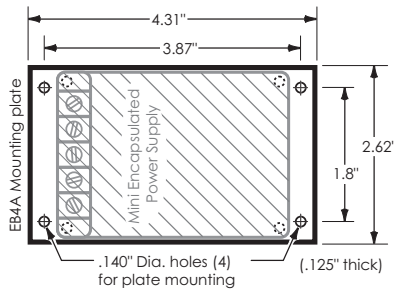
\*UL478 Certified only. Not CE certified.

## Mounting Kits for 'Mini Encapsulated - with screw terminals' power supplies:

### WALL MOUNTING

#### Model EB4A . . . . . \$10

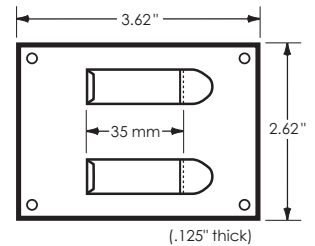
Use Mounting Kit EB4A to mount from the power supply side of the mounting surface, necessary when the other side of the mounting surface is inaccessible. This kit consists of an aluminum plate and four screws for attaching it to the power supply, effectively adding mounting flanges to any Mini Encapsulated power supply with screw terminals or any Mini DC-DC Converter with screw terminals.



### DIN RAIL MOUNTING

#### Model EB35DIN . . . . . \$15

Mounting Kit EB35DIN consists of an aluminum plate, with two DIN clips attached to it, and four screws for attaching the plate to the bottom of any Mini Encapsulated power supply with screw terminals or any Mini DC-DC Converter with screw terminals. The power supply can then be snapped onto a 35mm 'top hat' type of DIN rail.

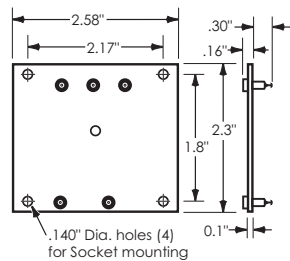


## Sockets for 'Mini Encapsulated - PC Board mounting' power supplies:

For use with PC board mounting Mini Linears and PC board mounting DC-DC Converters. Each of these sockets has a sturdy phenolic base with gold plated teflon-insulated contacts.

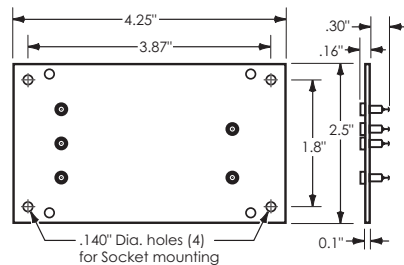
#### Model ES-1 . . . . . \$40

For case sizes ES-10 and ESC-10



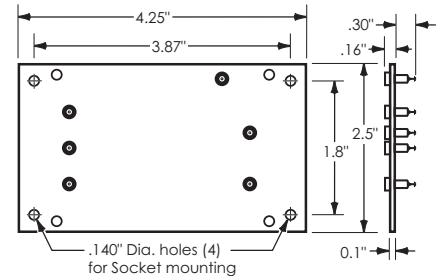
#### Model EL-1 . . . . . \$40

For case sizes EL-10, EL-13, EL-20 and ELC-10



#### Model ELW-1 . . . . . \$40

For case sizes ELW-13 and ELW-20

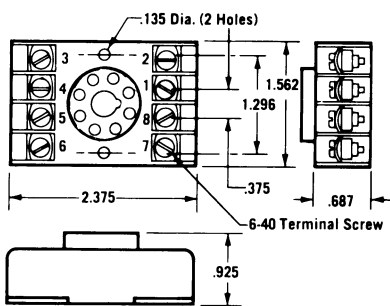


## Sockets for 'Plug-In' power supplies:

RETMA-numbered screw-type terminals simplify wiring and permit the use of wire terminals or bare wire, 12 to 20 guage. Rated at 300 volts RMS, 10 amp.

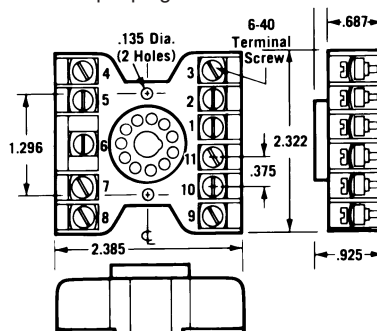
#### Model SL608 . . . . . \$20

For 8-pin plugs.



#### Model SL611 . . . . . \$20

For 11-pin plugs.





**ACOPIAN SELLS FACTORY DIRECT WORLDWIDE:** We do not use representatives or distributors. Contact Acopian for technical information or a quote.

**WARRANTY:** Acopian power supplies are warranted to be free from defects in material and workmanship for a period of five years (encapsulated devices, for one year) from date of original shipment. Acopian's obligation under this warranty is limited to repairing any power supply returned to the factory Service Department in Easton, PA or Melbourne, FL, and replacing any defective parts. Mini Encapsulated power supplies are not repairable. Authorization must be obtained from Acopian before a power supply may be returned for repair. Units must be well packed when shipping to Acopian; the repair of any damage incurred during shipment will be charged. Transportation charges are to be paid by the purchaser. A reinspection and handling charge will be applied to returned units found to have no defects. If a failure has been caused by misuse, operation in excess of specifications, or modification by the customer, repairs will be billed at cost; in such cases, a cost estimate will be submitted before work is started.

Acopian reserves the right to make changes or improvements in its products without incurring any obligation to install the same on products previously manufactured.

This warranty is in lieu of all other warranties, obligations, and liabilities, expressed or implied, and is the purchaser's exclusive remedy. Acopian makes no warranty, either express or implied, of merchantability, fitness for a particular purpose or otherwise. In no event shall Acopian be liable whether in contract, tort, or negligence, for special, indirect, incidental or consequential damages of any kind, including loss of business or profits, or any other losses incurred by the purchaser or any third party, the Customer's remedies being limited, at Acopian's option, to replacement, repair or credit at the price on the date of claim.

The validity, performance and construction of all terms and conditions and any sale made by Acopian shall be determined by the law of Pennsylvania, without regard to its conflict of law principles, and all parties to the transaction expressly consent to the jurisdiction of such courts and consent to the venue of the Court of Common Pleas for Northampton County, Pennsylvania.

**PRICES:** The prices shown are F.O.B. our factory; Easton, PA or Melbourne, FL. ('EXW Factory' if outside the 50 United States.) All prices and specifications are subject to change without notice.

**TERMS:** Net 30 days, subject to credit approval. Visa, MasterCard and American Express also accepted.

**SHIPPING:** Location permitting, small shipments are made by United Parcel Service, FedEx, DHL (international orders) or by Parcel Post; larger shipments, by insured motor freight collect. Shipments can be made by air upon request. Risk of loss shall be F.O.B. Our Factory, even in cases where freight may be prepaid or allowed to destination by Acopian. If equipment is received in damaged condition, it is the customer's responsibility to contact the carrier and file a claim for damages.

**TIME FOR DELIVERY:** The time for delivery quoted by Acopian is the time required to ship from our plants. We will not be liable for delays in delivery caused by any reason beyond our control, including but not limited to acts of God, casualty, civil disturbance, labor disputes, transportation or supply difficulties, or any interruption of our facilities, and the quoted time for delivery shall be extended during the continuance of such conditions and for a reasonable time thereafter. In no event will Acopian be liable for any premium transportation, reprourement, or similar costs incurred by the Customer as a result of conditions beyond Acopian's control resulting in Acopian's inability to deliver product in accordance with customer's requested delivery schedules.

**QUANTITY DISCOUNTS:** Discounts are available to quantity buyers and are dependent upon the order quantity and the manufacturing scheduling anticipated by the order, and apply only to the quantity and delivery ordered. Partial shipments are considered as separate orders for discounting purposes.

**EXPORT ORDERS:** A minimum export documentation charge of \$60.00 applies. (A minimum charge of \$25.00 applies on orders to certain U.S. territories requiring customs forms.)

**MOISTURE/FUNGUS PROOFING:** Power supplies can be furnished with a moisture and fungus resistant varnish applied to interior surfaces. To order, add the suffix letter F to the model number. This option requires two additional days and is not available on High Voltage, Mini Encapsulated, Rack Mounting, and Gold Box Switching models.

**TAGGING:** Add \$10.00 to price.

**TEST DATA:** Cost, \$35.00 or 2% of order, whichever is greater.

**SPECIAL MODELS/MODIFICATIONS:** Cataloged models can be altered at the factory to meet special requirements. Contact the Applications Engineering Department to discuss your needs.

**PARTS:** The designs used in Acopian power supplies utilize standard components to the greatest practical extent. When replacements are required, the types originally used, or their equivalents, can usually be obtained most quickly from a local electronic components distributor.

Special components, such as transformers, are stocked at the factory warehouses. Contact the Applications Engineering Department for information on the parts required, referencing the model number of the power supply, the circuit designation of the component, and a description.

**PURCHASE ORDER ACCEPTANCE:** Orders are accepted subject to Acopian's Terms and Conditions. Any Terms and Conditions of any Purchaser's order, agreement, or understanding which are in addition to or inconsistent with Acopian's shall not be binding upon Acopian unless made in writing and accepted over the signature of an authorized officer of Acopian. Orders shall not be considered accepted until entered into production at our plant. Acopian reserves the right to refuse any order. All typographical and clerical errors are subject to correction by Acopian.

**RETURNED GOODS:** Acopian products are built on a per-order basis, and ordinarily no credit can be extended for their return. No goods will be accepted for return unless authorized in writing by Acopian.

**CHANGES:** The customer may, by a written notice, request changes within the general scope of the order, in the drawings, designs or specifications; method of shipment; and place of delivery. If any such change causes an increase or decrease in the cost, or the time required for the processing of any part of the order, an equitable adjustment shall be made in the price or delivery schedule, or both, and the order shall be modified in writing accordingly.

**CANCELLATION:** Suspension or cancellation of orders may be made only upon our written approval and on terms that will indemnify us against all loss.

**OVERTIME:** It is anticipated that any order will be processed during regular working hours on regular working days. If for any reason the Purchaser requests Acopian to process the order, or any portion of it, outside of such regular working hours, any overtime or other additional expense occasioned thereby shall be billed to and paid by the Purchaser as an extra cost. Acopian reserves the right to decline to process the order outside regular working hours.

**CUSTOMER DELAY OF WORK:** If the performance of all or any part of the work is delayed or interrupted by Customer's failure to act within the time specified (or within a reasonable time if no time is specified) and such act is not expressed or implied by the order, an adjustment shall be made in the cost of performance of the order caused by such delay or interruption and the order modified in writing accordingly. Adjustment will also be made in the delivery or performance dates and any other contractual provisions affected by such delay or interruption.

**GOVERNMENT SPECIFICATIONS:** Pricing is based upon industrial-grade construction, marking, packing, and packaging. Exception is taken to any MIL specifications, and to any requirements for the use of special forms, documentation other than quoted, and Government Source Inspection. Acopian must decline to quote on any other basis.

**APPLICATIONS ASSISTANCE:** *Questions regarding the specifications, features, and use of any Acopian product should be directed to the Applications Engineering Department. A staff of power supply specialists will be pleased to assist you.*

**ACOPIAN IS AN ISO 9001 CERTIFIED COMPANY**