PICO ELECTRONICS

Series AC1

Power Factor Corrected
Hi Reliability Isolated Regulated
Fixed Operating Frequency: 100Khz
AC-DC Converter

Meets EN/IEC 61000-3-2 Requirements
Universal Input Voltage: 85 to 265 VAC
Power Factor Corrected, 0.99 (50 - 100% Full Load)
Space Saving Design: One module replaces two
Special Output Voltages Available
Regulated Output Voltage
Made in the USA, Fully Encapsulated

Typical Features/Electrical Characteristics

AC Line Input Voltage: 85 to 265 VAC 47-440 Hz
Output Power: 150 to 300 watts, see chart

85 - 95 VAC Input, 200w maximum (5V, 150w

max.)

Output Voltage Ripple: 75-480 mV, See chart

Operating Temperature: 0 to 85° C, case temperature. See application notes for proper thermal considerations. **Availabe with -20°C and -40°C operating temperature range** - Consult Factory

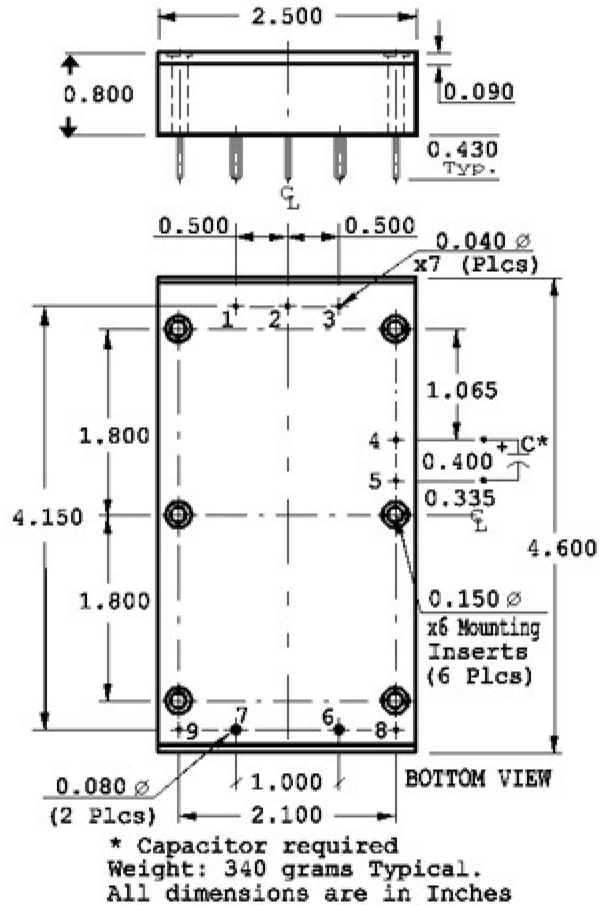
Isolation:

From Input to DC Output: 4242 VDC
From Input or DC output to Case: 2121 VDC
From AC Input to Auxiliary 380 VDC Output: Non-Isolated

Capacitor Requirement: External at Auxiliary 380 VDC Pins: 220uf, 450 Volt Electrolytic
* MUST BE INSTALLED

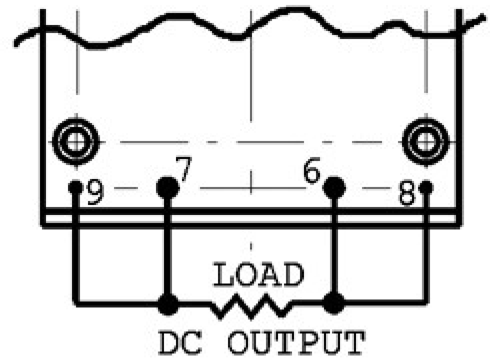
Current Limit Setpoint: 130 % of full load rating (Typical)

Operating Frequency: 100Khz: Fixed



PIN No.	FUNCTION
1	AC IN
2	AC IN
3	N/C

4	+380 V BUS
5	-V BUS
6	-V OUT
7	+ V OUT
8	- SENSE
9	+ SENSE



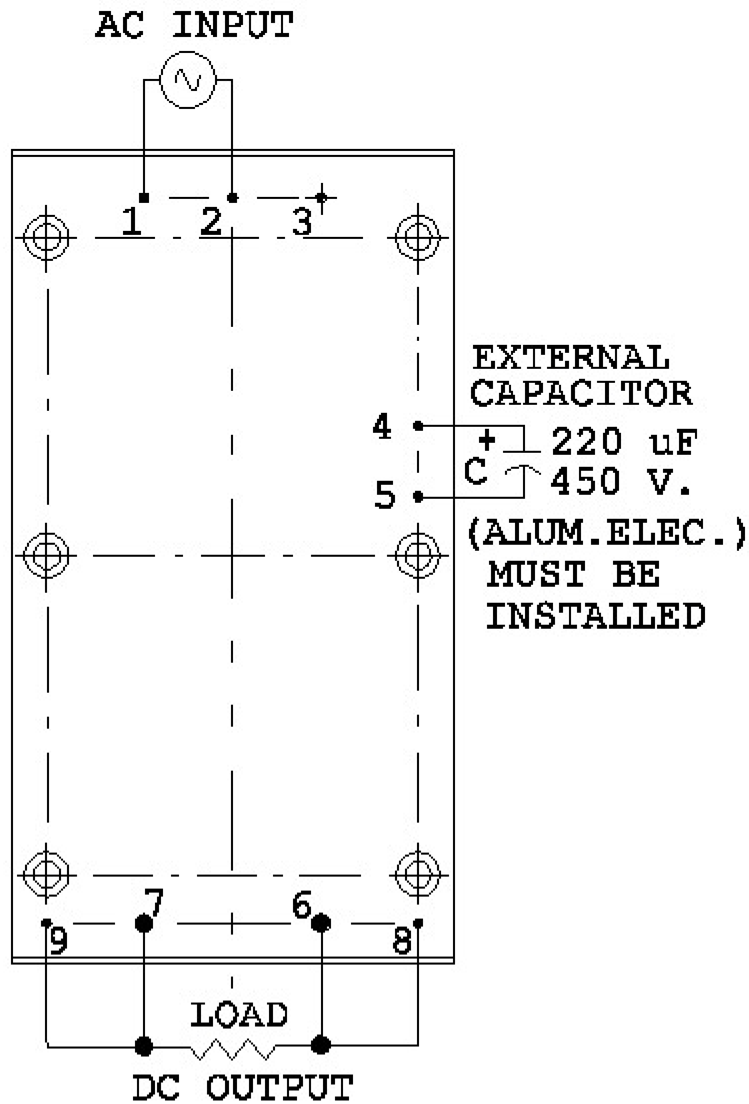
Pins 8 and 9 for sense must be connected.

Pico Part No.	Output Voltage VDC	Max. Load Current (A) **	Max. Output Power (watts) **	EFF @ Full Load (%)*	Output Ripple Full Load 1-1 MHz BW mv p-p*	Out Volt Toler-ance (±%)*	V Ld. Reg 10-100% Load (±%)*	Line Regu-lation (±%)*	Price
AC1-5S	5	30	150	76	100	1.0	1.5	0.2	295.00
AC1-9S	9	27.8	250	78	100	1.0	1.5	0.2	295.00
AC1-12S	12	25	300	80	150	0.5	1.5	0.2	295.00
AC1-15S	15	20	300	80	150	0.5	1.5	0.2	295.00
AC1-24S	24	12.5	300	81	250	0.5	1	0.2	295.00
AC1-28S	28	10.71	300	82	300	0.5	1	0.2	295.00
AC1-48S	48	6.25	300	82	500	0.5	1	0.2	325.00

External Capacitor Required: 220µF, 450 V Aluminum Electrolytic Capacitor

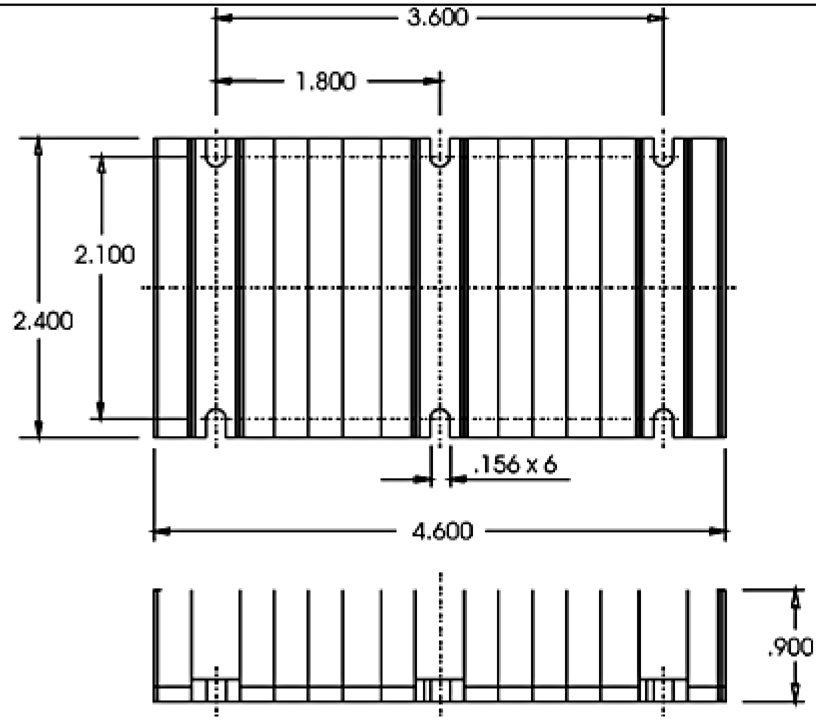
*All specifications are typical at nominal (115 VAC, 60 Hz) input, full load and 25° baseplate temperature unless otherwise stated.

** Using proper thermal considerations as outlined in the application notes.



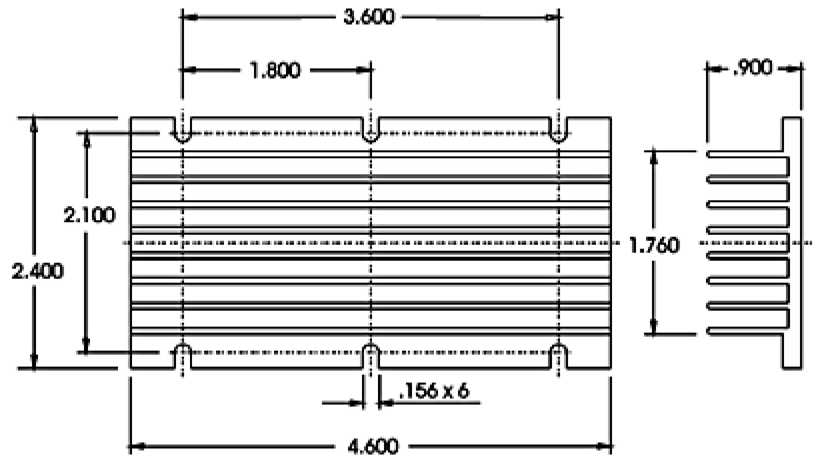
C=220uF,450V
Aluminum Electrolytic Capacitor

CH HEATSINK



All dimensions are in inches ()=mm
Approx. weight = 145 grams

CV HEATSINK



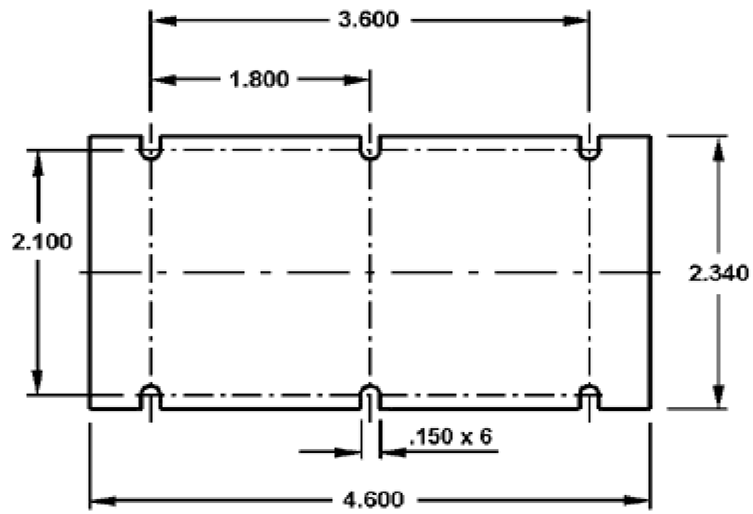
NOTE: Additional Heatsink options, consult factory
Approx. Weight = 145 grams

TYPE CH	$19.75
TYPE CV	$19.75
TYPE TI	$2.50

THERMAL INTERFACE
PART TI

Alloy Aluminum Substrate

Thermal Conductivity, (BTU-in/hr ft² ºF) ----1530
Coefficient of Thermal Expansion (25-100ºC, 10^{-6} in./in. ºF ---13.1
Hardness, Brinnell B ----23
Endurance Limit, psi. ----5000
Standard Thickness (inches) ---.002



Thermal Considerations

	AC1 Series		
.	**Baseplate**	**Heatsink CV**	**Heatsink CH**
Free Air	4.8	3.3	2.8

200 LFM	2.6	1.6	0.9
400 LFM	1.6	1.0	0.6
600 LFM	1.3	0.7	0.5
800 LFM	1.1	0.6	0.4
1000 LFM	0.9	0.5	0.35

EXAMPLE 1:

An AC1-24S module has an efficiency of 81%. What is themaximum ambient temperature if 100 Watts of power is needed?

EXAMPLE 2:

What would be the maximum output power
for an AC1-24S module at an ambient temperature of 50°C with an efficiency of 81%?

EXAMPLE 3:

At a maximum ambient temperature of 50°C and an efficiency of 81%, how could an AC1-24S module be used if 200 Watts of output power is required?

A) In free air:

From Table 1: $T_{rca} = 4.8$

Using relation (2)

$$\Delta T = 4.8\,(100)\left[\frac{1}{.81} - 1\right] = 112.6^{\circ}C$$

$$T_a = 85 - 112.6 = -27^{\circ}C$$

B) In free air with heatsink (CV):

$T_{rca} = 3.3$

$$\Delta T = 3.3\,(100)\left[\frac{1}{.81} - 1\right] = 77.4^{\circ}C$$

$$T_a = 85 - 77.4 = 7.6^{\circ}C$$

C) With 400 LFM of air flow:

$T_{rca} = 1.6$

$$\Delta T = 1.6\,(100)\left[\frac{1}{.81} - 1\right] = 37.5^{\circ}C$$

$$T_a = 85 - 37.5 = 47.5^{\circ}C$$

A) If the module is used in free air.

From Table 1: $T_{rca} = 4.8$

Using Relation (2):

$$85 - 50 = 4.8\,P_{out}\left[\frac{1}{.81} - 1\right]$$

$$P_{out} = \frac{35}{4.8\,[.23]} = 31.1 \text{ Watts}$$

B) If the module is used in an area with forced air at 200 LFM with no heatsink.

$T_{rca} = 2.6$

$$P_{out} = \frac{35}{2.6\,[2.3]} = 58.5 \text{ Watts}$$

C) If the module with heatsink (CV) is used in free air.

$T_{rca} = 3.3$

$$P_{out} = \frac{35}{3.3\,[.23]} = 46.1 \text{ Watts}$$

Using relation (2), we first find the maximum thermal resistance from case to air.

$$\Delta T = T_{rca}\,(200)\left[\frac{1}{.81} - 1\right]$$

$$85 - 50 = T_{rca}\,(46)$$

$$T_{rca} = .76$$

A) If no heatsink is used:

From Table 1, more than 1,000 LFM of airflow is required.

B) If a (CV) heatsink is used:

600 LFM of airflow is required.

C) If a (CH) heatsink is used:

400 LFM of airflow is required.

143 Sparks Ave. Pelham, NY 10803-1837
Tel: 914-738-1400
Fax: 914-738-8225