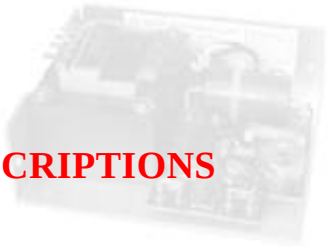
H HiTRON



DESCRIPTIONS

HiTRON'S international series linear open frame power supplies are designed to operate from the wide range of AC power sources found worldwide,can be used anywhere and for any application.

The main voltage is reduced by the main transformer,rectified,filtered and fed to the output terminals via the linear transistor.An integral voltage control with an extremely precise internal reference voltage resets the basic current of the linear transistor in such a way that the difference between output and reference voltage remains constant.

The linear open frame power supply is inherent lower conducted and radiated EMI/ RFI noise.The best low-noise version of the UA723 IC,the latest high-ripple current rating capacitors and the reliable semiconductors are used in this linear open frame power supply.

This international series linear open frame power supplies meet the most safety requirement of UL,CSA and TUV.Also each unit provides the AC input ranges needed for worldwide operation:100,115,120,220,230 and 240 Volt AC,47 to 63 Hz. This multi-range input capacity reduces customer inventory and service requirements since only one standard off-the shelf power supply is needed,regardless of product's final destination.

BAUART GEPRÜFT
TYPE APPROVED
TÜV Rheinland

H HiTRON

INTERNAL OPEN FRAME AC-DC REGULATED LINEAR POWER SUPPLIES INTERNATIONAL SINGLE, DUAL & TRIPLE SERIES

FEATURES:

- **MULTI-RANGE INPUT**
- **FULL OUTPUT RATING UP TO +50°C AMBIENT**
- **BUILT-IN OVP ON 5V MODELS**
- **FOLDBACK CURRENT LIMITING WITH AUTOMATIC RECOVERY**
- **INDUSTRIAL STANDARD OUTLINE AND MOUNTING**
- **WORLD-WIDE AC INPUT RANGE AVAILABLE**
- **WORLD-WIDE SAFETY STANDARDS**

SPECIFICATION

INPUTS SPECIFICATION

Input Voltage: Selectable by TAP CONNECTION.
Dual input option: 115Vac & 230Vac ±10%.
Multi-input option: 100/120/220/230/240Vac ±10%.
Input Frequency: 60Hz.or 50Hz.
(Typical 60Hz., 10% derated output current for 50Hz.)

Isolation:	VDE OPTION	UL OPTION
Input/Output	3,750Vac/1 MIN.	1,500Vac/1 MIN.
Input/Case	1,500Vac/1 MIN.	1,500Vac/1 MIN.
Output/Case	500Vac/1 MIN.	500Vac/1 MIN.

EMI/RFI: Inherent low conductive and radiated noise level.
Meet CISPR PUB.22 Class B & FCC part 15 Class B.
Hold-Up Time: Less than 1 m sec. at nominal input typical load.

OUTPUT SPECIFICATION

Output Voltage: See Voltage/Current Ratings Chart.
Output Current: See Voltage/Current Ratings Chart.
Line Regulation: ±0.05% for AC 10% change.
Load Regulation: ±0.05% for load 50% change.
Output Ripple: 5mV peak to peak maximum.
OVP: Built-in on all 5V main outputs, set at 6.2V ±0.4V.
It is optional for other outputs.
Adjustment: ±5% minimum.
Over Load Protection: Automatic current limit/foldback.
Remote Sensing: Provided on all models, 3 Amps and above,
Open sense lead protection built-in.
Reverse Voltage Protection: Provided on all outputs.

GENERAL SPECIFICATION

Efficiency: 45%for 5V units,
55%for 12 & 15V units.
60%for 20 & 24V units.
Transient Response:
50 micro sec. at 50% load change.

Operation Temperature: 0 to +50°C.
Storage Temperature: -20 to +85°C.
Temperature Coefficient: ±0.03%/°C. max.
Cooling: Convection.
Recommend forced air @ 20CFM.

HiTRON

I. SINGLE OUTPUT MODELS:

VOLTAGE/CURRENT RATINGS CHART

MODEL NO.	Vdc	CURRENT	ACCESSORY FUNCTION	CASE	PRIMARY FUSE (SUGGESTION)		SAFETY APPROVALS
					110-130VAC	220-250VAC	
HLS3-1.5	**3V**	1.5A	☆@	A1	0.3A/125V	0.15A/250V	
HLS3-3.7	**3V**	3.7A	☆@#	A	0.6A/125V	0.3A/250V	
HLS3-7.3	**3V**	7.3A	☆@#	B	1.6A/125V	0.8A/250V	
HLS3-11	**3V**	11.0A	☆@#	C	1.6A/125V	0.8A/250V	
HLS5-1.2/OVP	**5V**	1.2A	★@	A1	0.3A/125V	0.15A/250V	UL
HLS5-3/OVP	**5V**	3.0A	★@#	A	0.6A/125V	0.3A/250V	UL/CSA/TUV
HLS5-6/OVP	**5V**	6.0A	★@#	B	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS5-9/OVP	**5V**	9.0A	★@#	C	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS5-12/OVP	**5V**	12.0A	★@#	I	2.0A/125V	1.0A/250V	UL/CSA/TUV
HLS7-1.6	**7V**	1.6A	@#	A	0.6A/125V	0.3A/250V	
HLS8-1.7	**8V**	1.7A	@#	A	0.6A/125V	0.3A/250V	
HLS8-3/OVP	**8V**	3.0A	★@#	B	1.6A/125V	0.8A/250V	
HLS12-0.5	**12V**	0.5A	☆@	A1	0.3A/125V	0.15A/250V	UL
HLS12-1.7	**12V**	1.7A	@#	A	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLS12-3.4	**12V**	3.4A	@#	B	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLS12-4.0	**12V**	4.0A	@#	B	1.0A/125V	0.5A/250V	
HLS12-5.1	**12V**	5.1A	☆@#	C	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS12-6.8	**12V**	6.8A	@#	I	2.5A/125V	1.25A/250V	UL/CSA/TUV
HLS15-0.5	**15V**	0.5A	☆@	A1	0.5A/125V	0.25A/250V	UL
HLS15-1.5	**15V**	1.5A	@#	A	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLS15-3.0	**15V**	3.0A	@#	B	1.0A/125V	0.5A/250V	UL
HLS15-4.5	**15V**	4.5A	@#	C	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS15-6.0	**15V**	6.0A	@#	I	2.5A/125V	1.25A/250V	UL/CSA/TUV
HLS15-7.0	**15V**	7.0A	@#	I	2.0A/125V	1.5A/250V	UL/CSA/TUV
HLS18-1.2	**18V**	1.2A	@#	A	1.0A/125V	0.5A/250V	
HLS24-0.3	**24V**	0.3A	☆@	A1	0.5A/125V	0.25A/250V	UL
HLS24-1.2	**24V**	1.2A	@#	A	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLS24-2.4	**24V**	2.4A	@#	B	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS24-3.6	**24V**	3.6A	☆@ #	C	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLS24-4.8	**24V**	4.8A	@#	I	3.0A/125V	1.5A/250V	UL
HLS24-6.0	**24V**	6.0A	@#	I	3.5A/125V	1.75A/250V	
HLS27-2.4	**27V**	2.4A	@#	B	1.6A/125V	0.8A/250V	
HLS28-0.25	**28V**	0.25A	☆@	A1	0.4A/125V	0.2A/250V	UL
HLS28-1.0	**28V**	1.0A	@#	A	0.8A/125V	0.4A/250V	UL
HLS28-2.0	**28V**	2.0A	@#	B	1.6A/125V	0.8A/250V	
HLS28-3.0	**28V**	3.0A	☆@#	C	2.0A/125V	1.0A/250V	
HLS28-4.0	**28V**	4.0A	@#	I	2.5A/125V	1.25A/250V	UL/ cUL
HLS36-2.5	**36V**	2.5A	@	C	2.0A/125V	1.0A/250V	
HLS40-0.4	**40V**	0.4A	@	A	1.0A/125V	0.5A/250V	UL

Ⅱ. DUAL OUTPUT MODELS:

VOLTAGE/CURRENT RATINGS CHART

MODEL NO.	OUTPUT NO.1	OUTPUT NO.2	CASE	PRIMARY FUSE(SUGGESTION)		SAFETY APPROVALS
				110-130VAC	220-250VAC	
HLD12-1.0	+12V/1.0A @☆	-12V/1.0A ☆@	H	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLD15-0.8	+15V/0.8A @☆	-15V/0.8A ☆@	H	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLD12-1.8	+12V/1.8A @☆	-12V/1.8A ☆@	D	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLD15-1.5	+15V/1.5A @☆	-15V/1.5A ☆@	D	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLD12-3.4	12V/3.4A @#◇	+12V/3.4A #@◇	I	2.5A/125V	1.25A/250V	UL/CSA/TUV
HLD15-3.0	15V/3.0A ◇#@	+15V/3.0A #@◇	I	2.5A/125V	1.25A/250V	UL/CSA/TUV
HLD30W	5V/3.0A ★◇#@	+12V/1.5A ☆@◇	C	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLD60W	5V/4.0A ★◇#@	+12V/3.4A #◇@	I	2.5A/125V	1.25A/250V	UL
HLD78W	5V/6.0A ★◇#@	+24V/2.0A #◇@	I	2.5A/125V	1.25A/250V	
HLD80W	5V/6.0A ★◇#@	+12V/3.4A #◇@	I	2.5A/125V	1.25A/250V	UL/CSA/TUV

Ⅲ. TRIPLE OUTPUT MODELS:

VOLTAGE/CURRENT RATING CHART

MODEL NO.	OUTPUT NO.1	OUTPUT NO.2	OUTPUT NO.3	CASE	PRIMARY FUSE (SUGGESTION)		SAFETY APPROVALS
					110-130VAC	220-250VAC	
HLT20W	5V/2A★#@◇	+12V/0.4A ☆@◇	+12V/0.4A ☆@◇	H	0.8A/125V	0.4A/250V	UL/CSA/TUV
HLT29W	5V/3A★#@◇	+5V/0.5A ☆@◇	+12V/0.5A ☆@◇	C	1.0A/125V	0.5A/250V	
HLT30W	5V/3A★#@◇	+12V/0.5A ☆◇	+12V/0.5A ☆◇	C	1.0A/125V	0.5A/250V	UL/CSA/TUV
HLT40W	5V/3A★#@◇	+12V/1.0A ☆@	-12V/1.0A ☆@	F	1.6A/125V	0.8A/250V	UL/CSA/TUV
HLT60W	5V/6A★#@	+12V/1.0A ☆@#	-12V/1.0A ☆@#	I	2.0A/125V	1.0A/250V	UL/CSA/TUV
HLT75W	5V/6A★@◇	+12V/1.8A ☆@#	-12V/1.8A ☆@	G	2.0A/125V	1.0A/250V	UL/CSA/TUV
HLT80W	5V/9A ★ #@◇	+12V/1.8A ☆@#	-12V/1.8A ☆@	G1	2.5A/125V	1.25A/250V	UL/CSA/TUV
HLT90W	5V/3A★@	-5V/0.5A ☆@	+24V/3.0A @◇	G	3.0A/125V	1.6A/250V	UL/CSA/TUV

Remark:★ With built-in OVP.
☆ OVP option.
＃ With Remote Sense.
@ Adjustable.
◇ Floating(or isolated) Output.

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Ⅳ. OVERVOLTAGE PROTECTOR

OVP MODULES :OVP-12, OVP-24

MAXIMUM CURRENT RATING		
MODEL	INTERMITTENT	CONTINUOUS
OVP-12	12A	8A
OVP-24	30A	20A

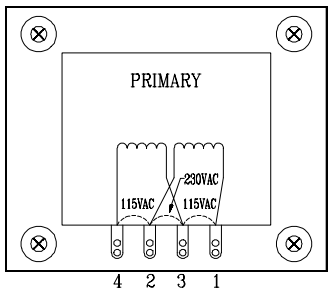
Remarks:
These optional overvoltage protection modules are available for use with any power supply NOT supplied with built-in OVP or OVP option. Each is adjustable from 6.4V to 34V.Mounting holes are provided on all power supplies to accommodate these modules.

POWER SUPPLY OUTPUT VOLTAGE	SUGGESTED OVP TRIGGER VOLTAGE
5	6.2 ± 0.4
6	7
12	14
15	17
18	21
20	23
24	27
DUAL +12	27
DUAL +15	33

AC INPUT OPTIONS:

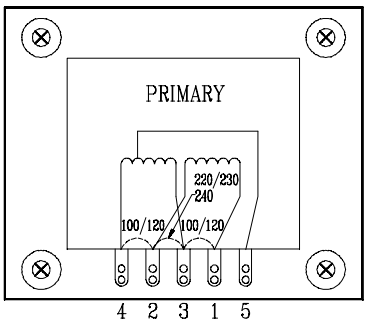
DUAL TAP AC INPUT OPTION: Four wire input provides two input range: 115VAC and 230VAC, See chart DUAL TAP AC CONNECTION table for the requirement.

DUAL TAP AC CONNECTION		
FOR USE AT	CONNECT	APPLY POWER TO
115Vac	1-3, 2-4	1 & 4
230Vac	2-3	1 & 4

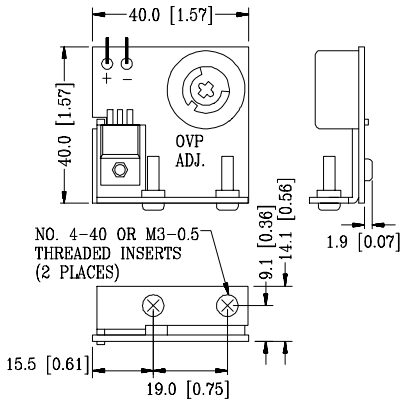


MULTIPLE TAP AC INPUT OPTION: Five wire input provides five input ranges: 100Vac/120Vac/220Vac/230Vac & 240Vac.See Chart MULTI-TAP AC CONNECTION table for the jumpering requirement.

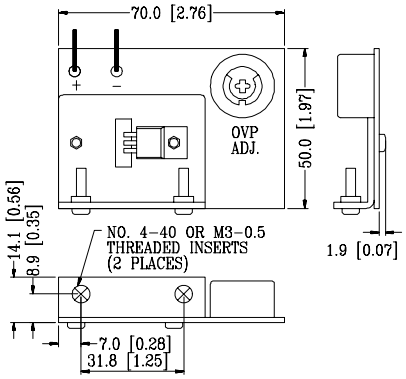
MULTI-TAP AC CONNECTION		
FOR USE AT	CONNECT	APPLY POWER TO
100Vac	1-3, 2-4	1 & 5
120Vac	1-3, 2-4	1 & 4
220Vac	2-3	1 & 5
230Vac	2-3	1 & 4
240Vac	2-3	1 & 4



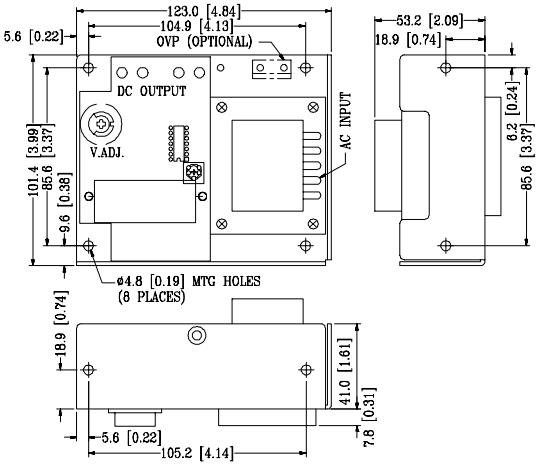
MECHANICAL DIMENSION: MM [INCHES]



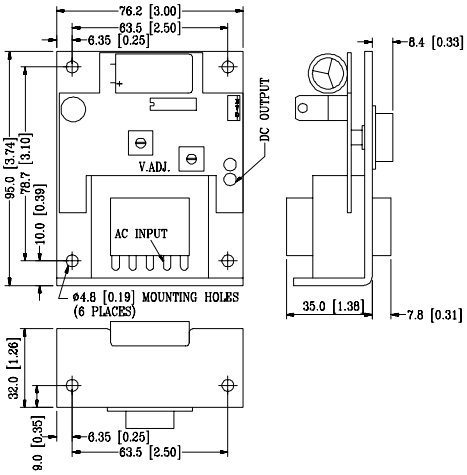
OVP-12 WEIGHT: **22.5 g.**
(0.79 Oz)



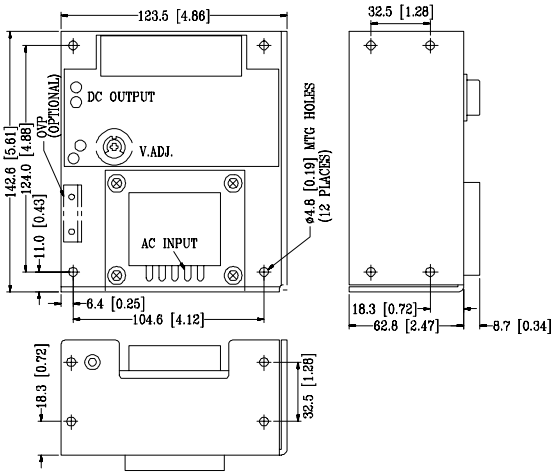
OVP-24 WEIGHT: **38.0 g.**
(1.34 Oz)



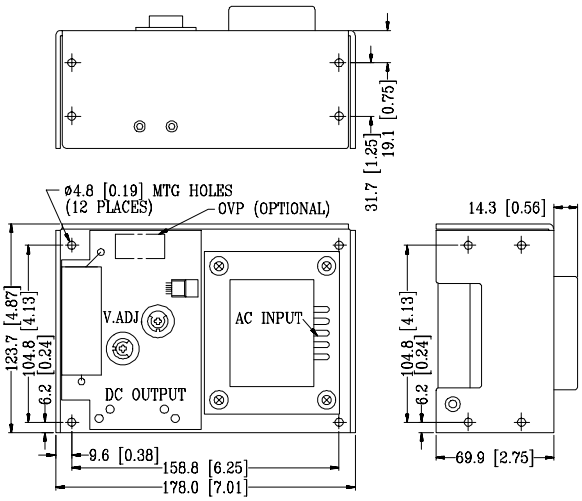
A CASE WEIGHT: **1.10** KG.
(38.79 Oz)



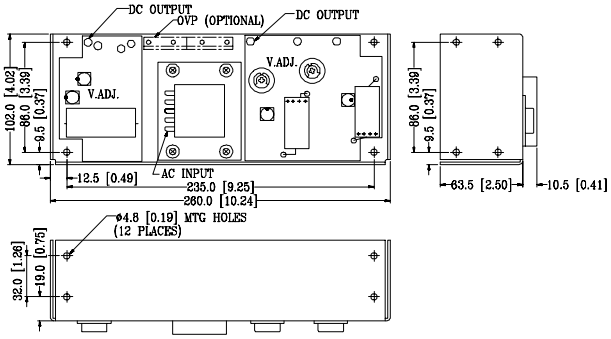
A1 CASE WEIGHT:**0.42** KG.
(14.81 Oz)



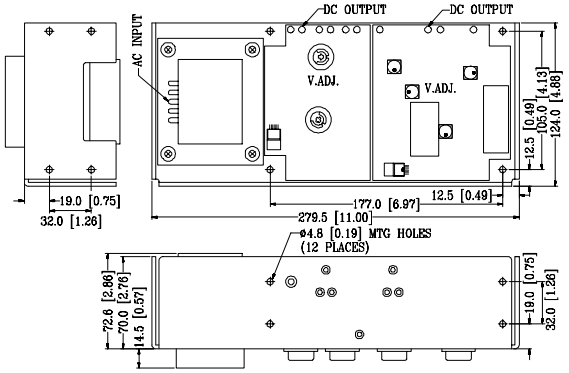
B CASE WEIGHT: **1.85** KG.
(65.25 Oz)



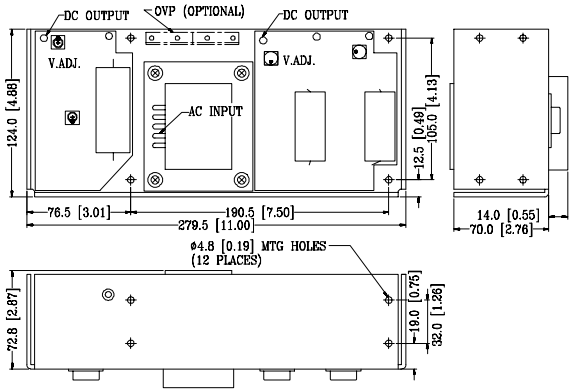
C CASE WEIGHT: **3.05** KG.
(107.57 Oz)



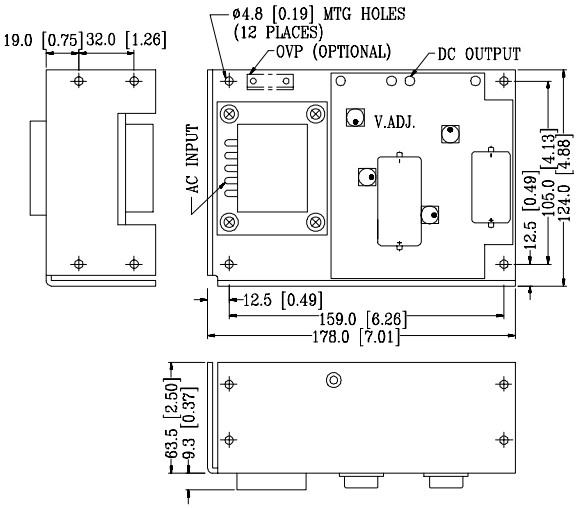
F CASE WEIGHT: **1.95**KG.
(68.77 Oz)



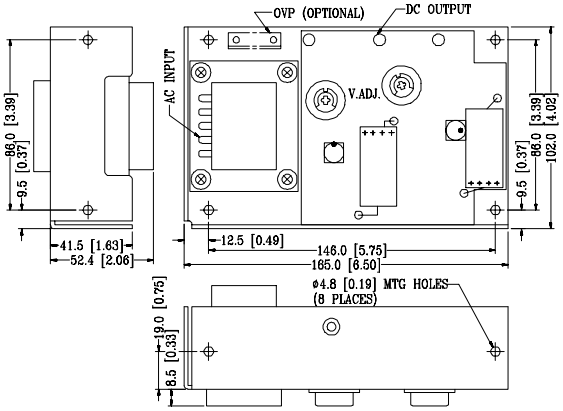
G1 CASE WEIGHT: **3.55** KG.
(125.2 Oz)



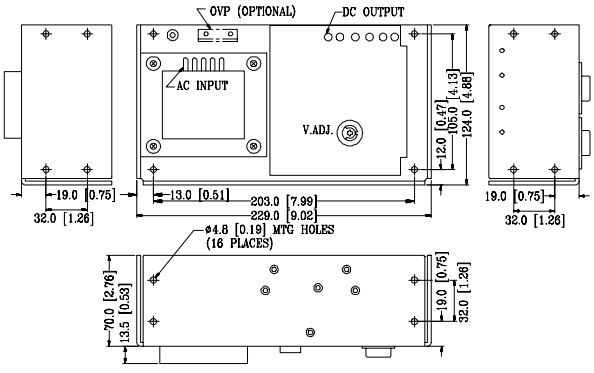
G CASE WEIGHT: **3.4** KG.
(119.91 Oz)



D CASE WEIGHT: **1.85** KG.
(65.25 Oz.)



H CASE WEIGHT: **1.2** KG.
(42.32 Oz)



I CASE WEIGHT: **3.35** KG.
(118.15 Oz)

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APPLICATION NOTES:

1.AC Input consideration:

Almost all power supplies use a capacitive input filter that draws current only at peaks of the AC input voltage. The peak to RMS ratio can be very high, typically 3 to 1.When a supply is turned on, the input capacitor has a very low impedance and draws an initially high surge current until it charges to nominal voltage. The input surge current can be as high as 20 times the rated input current and lasts for several circles of the AC input.

2.Fusing:

No fuse is installed in the linear power supply. Input must be fused externally.
Please refer to the SUGGESTION PRIMARY FUSE in the VOLTAGE/CURRENT RATING CHART.

3.Overload and short circuit protection:

The overload is set at about 125% to 150% of the VOLTAGE/CURRENT typical rating load. When the load exceeds this maximum setting or short circuit, the output current is heavily reduced via a foldback current-voltage characteristic. This provided the unit with permanent protection against short circuit and overload.

4.Over-voltage protection (OVP)

All 5V linear regulators have OVP at the output terminals as standard. A thyristor becomes conductive and short-circuits the output terminals. The OVP feature will usually function again if the power is switched off for a short period and the cause of the over-voltage has been rectified.

5.Remote sense

Remote sense terminals may be used to compensate for output line losses and provide for a remote point of regulation. Use of a twisted pair or shield wires pair for the sense lines are recommended.

6.Series operation

Several units can be operated in series to increase the output voltage.

7.Parallel operation

It is not recommended to operate the units in parallel as a result of the current foldback characteristics where there is a critical overload behavior.

8.Load lead wires & size:

Load wires must be sized to prevent an excessive voltage drop from the output to the load. Since the point of regulation is at the load, the power supply must compensate for wire losses. Excessive load line losses may affect current limiting, AC line dropout and also OVP margin. Lead wires should be sized to drop no more than 0.5V,the less the better.

9.Grounding:

Grounding considerations in designing a power distribution system are often overlooked but can have a significant impact on overall system performance. A single point system ground should be employed where possible to eliminate ground loops and improve regulation.