

# Commercial/Medical International + Linears

## Commercial



## Medical



## FEATURES

- World-wide ac input ranges and safety standards
- Industry standard packages
- Commercial UL/CSA TUV/IEC approved—68 models to UL1950; CSA C22.2 No. 950 L3; TUV certified to EN60950
- Burn-in with cycling; 3-year warranty
- Capacitors have highest CV & ripple current ratings
- Medical Approved to UL2601-1, IEC60601-1 and CSA601.1

- Medical leakage current does not exceed 10  $\mu$ A
- MTBF 200,000+ hours per Mil Handbk 217D (most units)
- All electrolytic caps rated at 105°C
- Transformer insulation meets Class F (155°C)
- Exceed FCC and CISPR22, Class B conducted emissions
- $\text{CE}$  marked to LVD

## SPECIFICATIONS:

### Ac Input

100, 120 and 240 Vac: +10%, -13%; 215 Vac: +12%, -11%; 47 to 63Hz. Tolerance for 230 Vac operation is +15%, -10%. Derate output current 10% for 50 Hz operation.

### Dc Output

See voltage rating chart. Adjustment range  $\pm$ 5% minimum except HA series.

### Line Regulation

$\pm$ 0.05% for a 10% change.

### Load Regulation

$\pm$  0.05% for a 50% load change.

### Output Ripple

3 mV +0.05% of output voltage, peak to peak maximum. All "3-terminal regulator" outputs: 3 mV +0.2% peak to peak maximum.

### Transient Response

<50 microseconds for 50% load change.

### Short Circuit Protection

Automatic current limit/foldback.

### Overvoltage Protection

Built-in on all 5 V models, set at 6.2 V  $\pm$ 0.4 V. Other models use optional overvoltage protection.

### Remote Sensing

Provided on all models; open sense lead protection built-in (except HA series).

### Stability

$\pm$ 0.05% for 24 hours after warmup.

### Temperature Rating

0 to 50°C full rated, derated linearly to 40% at 70°C.

### Temperature Coefficient

$\pm$ 0.01%/°C maximum.

### Efficiency

5 V units: 45%; 12 and 15 V units: 55%; 20 and 24 V units: 60%.

### Logic Inhibit and Current-Share

F & G models.

### Medical Stock and Vibration

Per Mil-Std-810D, Method 514.3, Category 1, Procedure 1. Per Mil-Std-810D, Method 516.3, Procedure III.

### Storage

-40 to +85 °C.



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Commercial Model (Single)	Medical Model	Voltage	Current	Case
HA2-1.5-A+		2 V	1.5 A	B
HB2-3-A+		2 V	3 A	B
HC2-6-A+		2 V	6 A	C
HN2-9-A+		2 V	9 A	N
HD2-12-A+		2 V	12 A	D
HE2-18-A+*		2 V	18 A	E
	ML5-OV-A	5 V	1.0 A	L
HA5-1.5-OV-A+		5 V	1.5 A	B
HB5-3-OV-A+	MB5-3-OV-A	5 V	3 A	B
HC5-6-OV-A+	MC5-6-OV-A	5 V	6 A	C
HN5-9-OV-A+		5 V	9 A	N
HD5-12-OV-A+	MD5-12-OV-A	5 V	12 A	D
HE5-18-OV-A+*		5 V	18 A	E
F5-25-OV-A+*		5 V	25 A	F
G5-35-OV-A+*		5 V	35 A	G
CP197-A+*		5 V	50 A	G
	ML12-0.5-A	12 V	0.5 A	L
HA15-0.9-A+ (12 V)		12 V	0.9 A	B
HB12-1.7-A+	MB12-1.7-A	12 V	1.7 A	B
HC12-3.4-A+	MC12-3.4-A	12 V	3.4 A	C
HN12-5.1-A+		12 V	5.1 A	N
HD12-6.8-A+	MD12-6.8-A	12 V	6.8 A	D
HE12-10-2-A+*		12 V	10.2 A	E
F15-15-A+* (12V)		12 V	16 A	F
	ML15-0.4-A	15 V	.4 A	L
HA15-0.9-A+		15 V	0.9 A	B
HB15-1.5-A+	MB15-1.5-A	15 V	1.5 A	B
HC15-3-A+	MC15-3-A	15 V	3 A	C
HN15-4.5-A+		15 V	4.5 A	N
HD15-6-A+	MD15-6-A	15 V	6 A	D
HE15-9-A+*		15 V	9 A	E
F15-15-A+*		15 V	15 A	F
	ML24-0.28-A	24 V	.28 A	L
HA24-0.5-A+		24 V	0.5 A	B
HB24-1.2-A+	MB24-1.2-A	24 V	1.2 A	B
HC24-2.4-A+	MC24-2.4-A	24 V	2.4 A	C
HN24-3.6-A+		24 V	3.6 A	N
HD24-4.8-A+	MD-24-4.8-A	24 V	4.8 A	D
HE24-7.2-A+*		24 V	7.2 A	E
F24-12-A+*		24 V	12 A	F
HA24-0.5-A+ (28V)		28 V	0.5 A	B
HB28-1-A+	MB28-1-A	28 V	1 A	B
HC28-2-A+	MC28-2-A	28 V	2 A	C
HN28-3-A+		28 V	3 A	N
HD28-4-A+	MD28-4-A	28 V	4 A	D
HE28-6-A+*		28 V	6 A	E
F24-12-A+* (28V)		28 V	10 A	F
HB48-0.5-A+		48 V	0.5 A	B
HC48-1-A+		48 V	1 A	C
HD48-3-A+**		48 V	3 A	D
HE48-4-A+*		48 V	4 A	E
F48-6-A+*		48 V	6 A	F

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Commercial Model (Dual)	Medical Model	Output 1	Output 2	Case
HAA5-1.5-OV-A+		5 V@ 1.5 A	5 V@ 1.5 A	AA
HBB5-3-OV-A+		5 V@ 3 A	5 V@ 3 A	BB
HCC5-6-OV-A+		5 V@ 6 A	5 V@ 6 A	CC
HAA512-A+	MAA512-A	5 V@ 2 A	9-15 V@ 0.5 A	AA
HBB512-A+	MBB512-A	5 V@ 3 A	9-15 V@ 1.2 A	BB
HCC512-A+**	MCC512-A	5 V@ 6 A	9-15 V@ 2.5 A	CC
HAA524-A+**	MAA524-A	5 V@ 2 A	18-24 V@ 0.3 A	AA
HBB524-A+	MBB524-A	5 V@ 3 A	18-24 V@ 0.8 A	BB
HCC524-A+	MCC524-A	5 V@ 6 A	18-24 V@ 2 A	CC
HAD12-0.4-A+		+12 V@ 0.4 A	-12 V@ 0.4 A	B
	MLL12-0.25-A	+12 V @ 0.25 A	-12 V @ 0.25 A	L
	MLL15-0.2-A	+15 V @ 0.020 A	-15 V @ 0.020 A	L
HAD15-0.4-A+		+15 V@ 0.4 A	-15 V@ 0.4 A	B
HAA15-0.8-A+	MAA15-0.8-A	+12 to 15 V@ 1 A/0.8 A	-12 to -15 V@ 1 A/0.8 A	AA
HBB15-1.5-A+	MBB15-1.5-A	+12 to 15 V@ 1.7A/1.5 A	-12 to -15 V@ 1.7 A/1.5 A	BB
HCC15-3-A+	MCC15-3-A	+12 to 15 V@ 3.4 A/3 A	-12 to -15 V@ 3.4 A/3 A	CC
HDD15-5-A+*		+12 to 15 V@ 5 A	-12 to -15 V@ 5 A	E
HAA24-0.6-A+		+18 to 24 V@ 0.4 A/0.6 A	-18 to -24 V@ .04 A/0.6 A	A

\*\*May require fan cooling.

Commercial Model (Triple)	Medical Model	Output 1	Output 2	Output 3	Case
	MTLL-5W-A	5 V@ 5 A	+12 to 15 V@ 0.1 A	-12 to 15V@ 0.1 A***	L
HTAA-16W-A+	MTAA-16W-A	5 V@ 2 A	+12 to 15 V@ 0.4/0.4 A	-12 to 15V@ 0.4/0.4A***	AA
HBAA40W-A+	MBAA-40W-A	5 V@ 3 A	+12 to 15 V@ 1/0.8 A	-12 to 15V@ 1/0.8A***	BAA
HCBB105W-A+**		5 V@ 3 A	+12 to 15 V@ 3.4/3.0 A	-12 to 15 V@ 3.4/3 A***	CBB
HCAA60W-A+	MCAA60W-A	5 V@ 6 A	+12 to 15 V@ 1/0.8 A	-12 to 15 V@ 1/0.8 A***	D
HCBB75-W-A+	MCBB75W-A	5 V@ 6 A	+12 to 15 V@ 1.7/1.5 A	-12 to 15 V@ 1.7/1.5 A***	CBB
CP131-A+		5 V@ 8 A	+12 to 15 V@ 1.7/1.5 A	-12 to 15 V@ 1.7/1.5 A***	NBB
CP206-A+		24 V, 3 A (3.5PK)	5 V, 3 A	5 V, 1 A	CBB
CP323-A+		5 V @ 2 A	12 V @ 4 A	N/A	B
HDBB105W-A+*		5 V@ 12 A	+12 to 15 V@ 1.7/1.5 A	-12 to 15 V@ 1.7/1.5 A***	DBB
HDCC150W-A+*		5 V@ 12 A	+12 to 15 V@ 3.4/3 A	-12 to 15 V@ 3.4/3 A***	D

\*Requires fan cooling.

\*\*May require fan cooling.

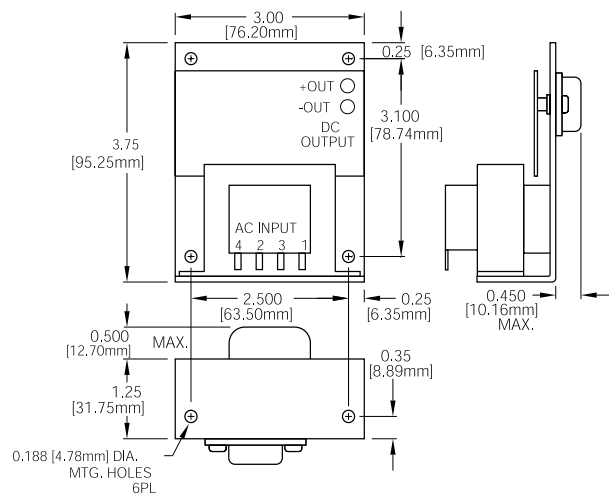
\*\*\*No. 3 output usable at -5V, rate at 1/2 of 15V current rating.

## FIXED DISK SERIES

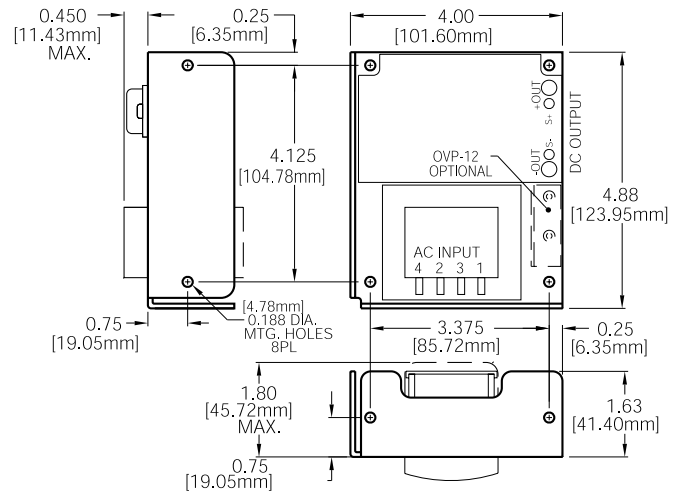
Commercial Model	Output 1	Output 2	Output 3	Case
CP379-A+	+5 V@6 A	+24 V@3.5/6 A PK	-5 or -12 V@1.2 A	NBB
CP498-A+	+5 V@6 A	+12 V@5/10 A PK	-12 V@0.5 A	NB

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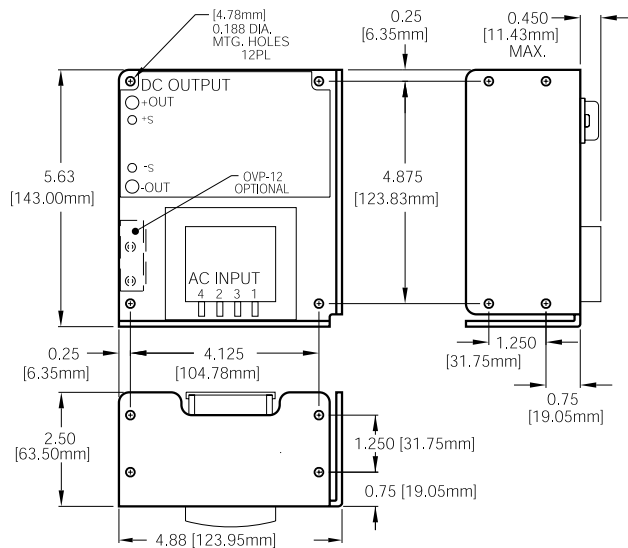
## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:



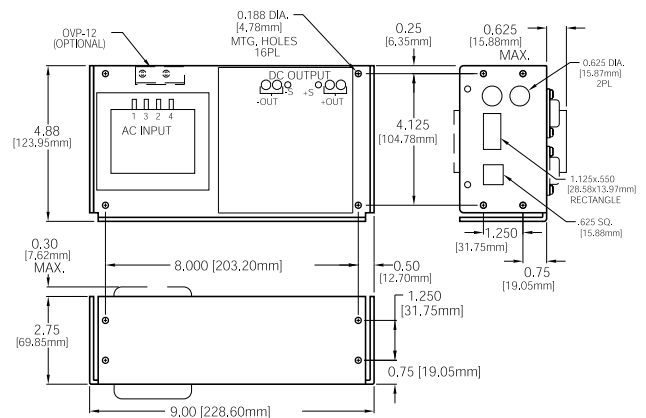
**A CASE (WT. 1 LB.)**



**B CASE (WT. 2 LB.)**



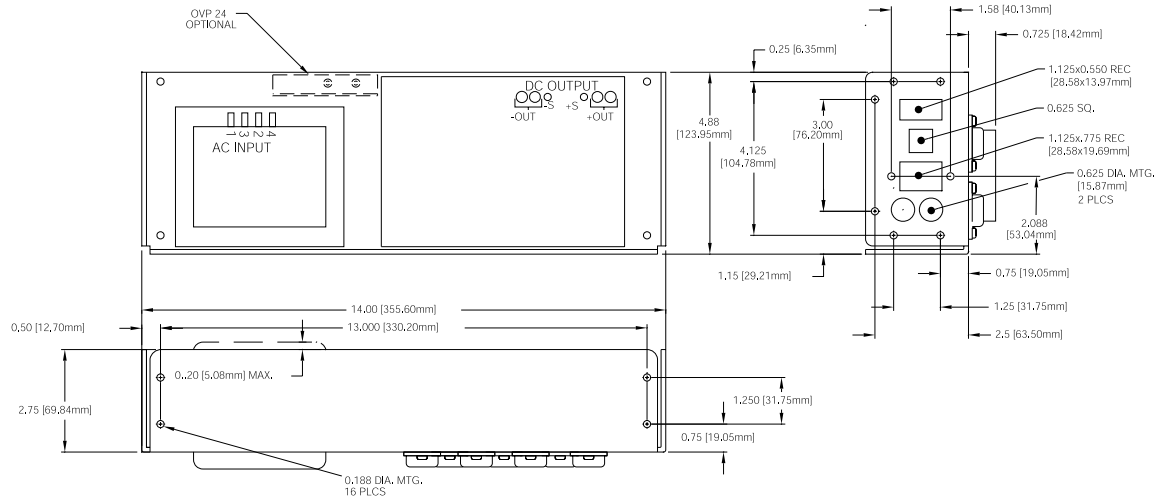
**C CASE (WT. 4 LB.)**



**D CASE (WT. 7.5 LB.)**

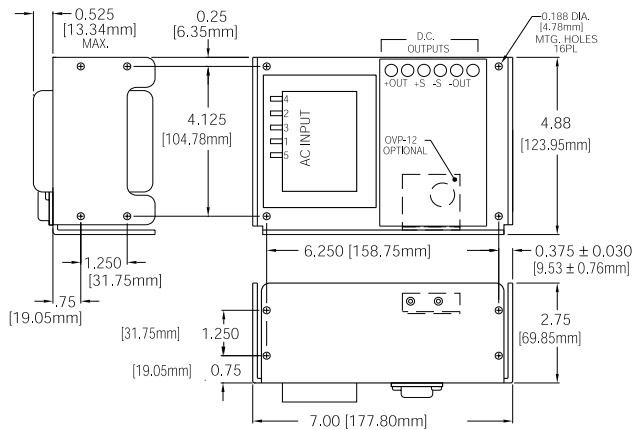
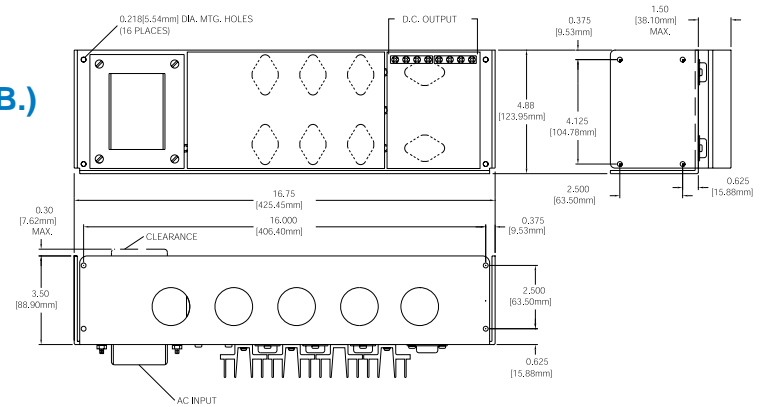
# International + Linears

## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:

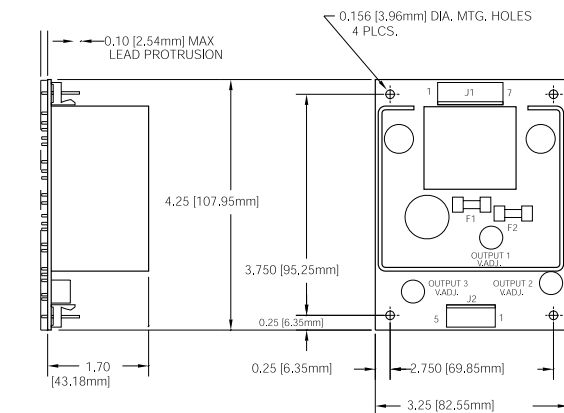


**E CASE (WT. 10 LB.)**

**F CASE (WT. F5: 14 LB.; F15, 24: 18 LB.)  
G CASE (WT. G5: 19 LB.)**



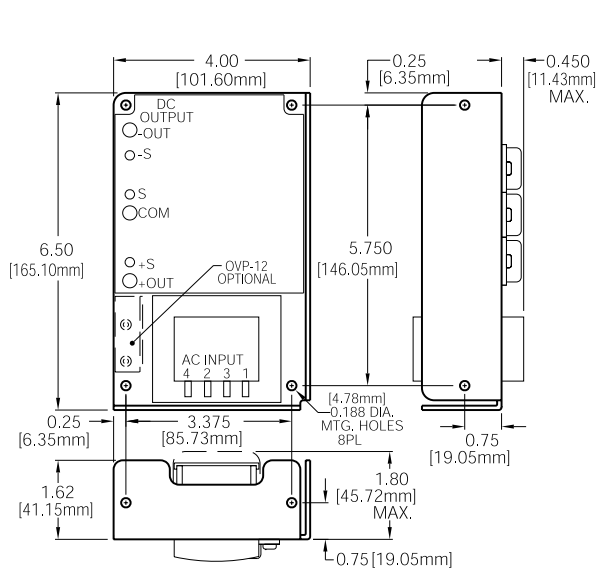
**N CASE (WT. 7 LB.)**



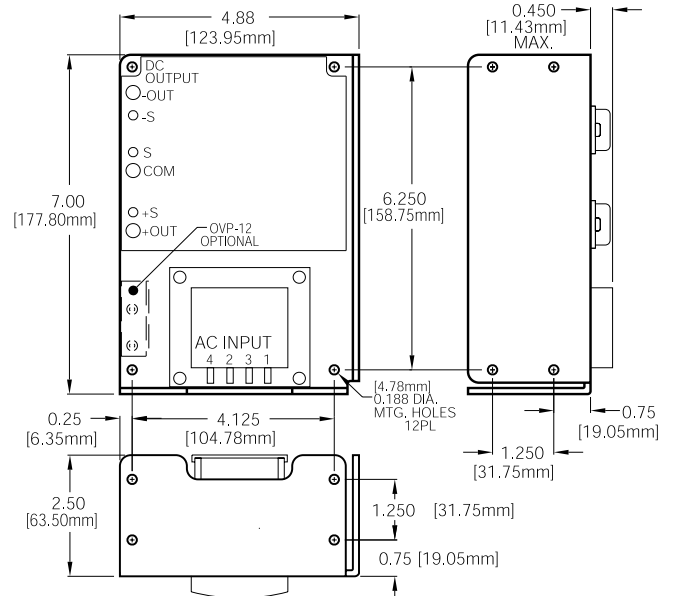
**L CASE (WT. 1 LB.)**

# International + Linears

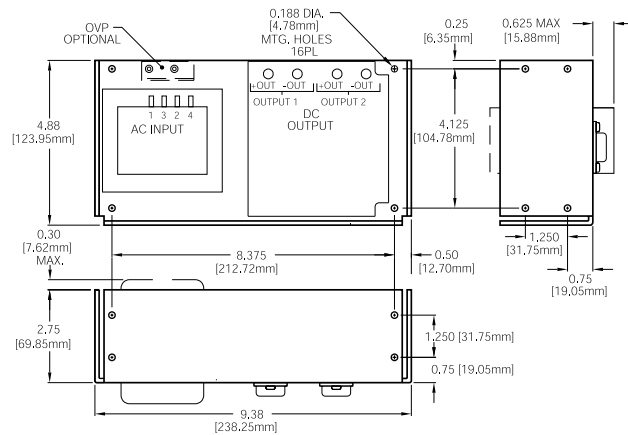
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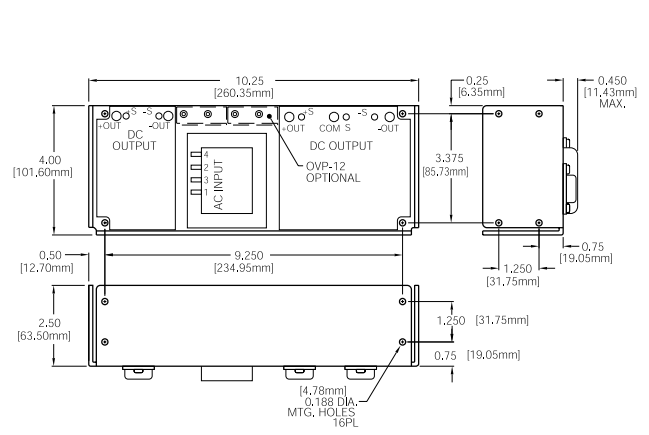
AA CASE (WT. 2 LB.)



BB CASE (WT. 4 LB.)



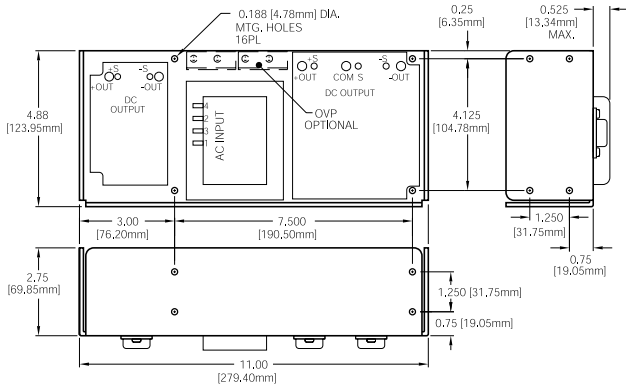
CC CASE (WT. 7 LB.)



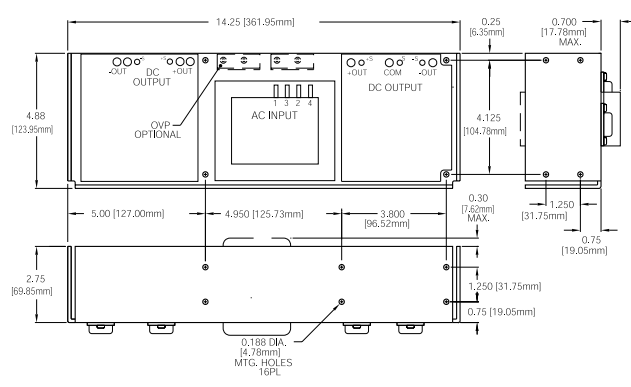
BAA CASE (WT. 5 LB.)

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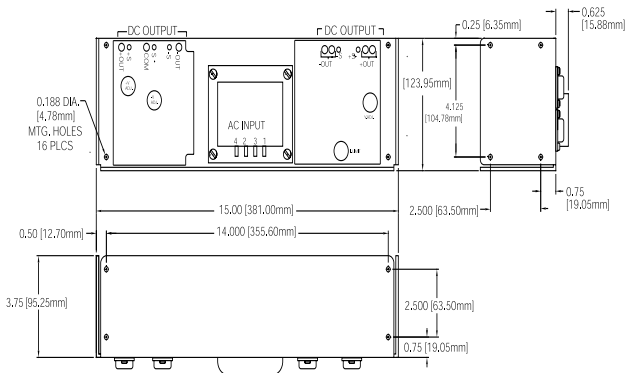
## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:



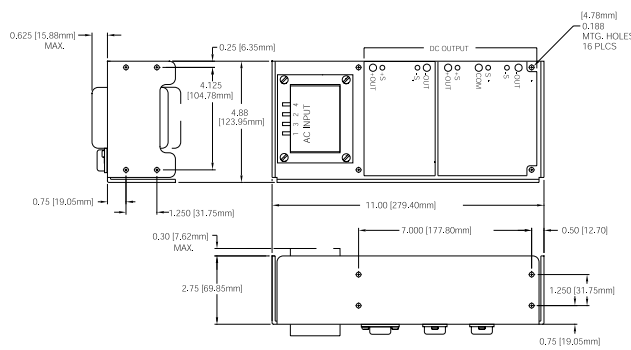
**CBB CASE (WT. 8 LBS.)**



**DBB CASE (WT. 1 LBS.)**



**DCC CASE (WT. 12 LBS.)**



**NBB CASE (WT. 12 LBS.)**