

# 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.

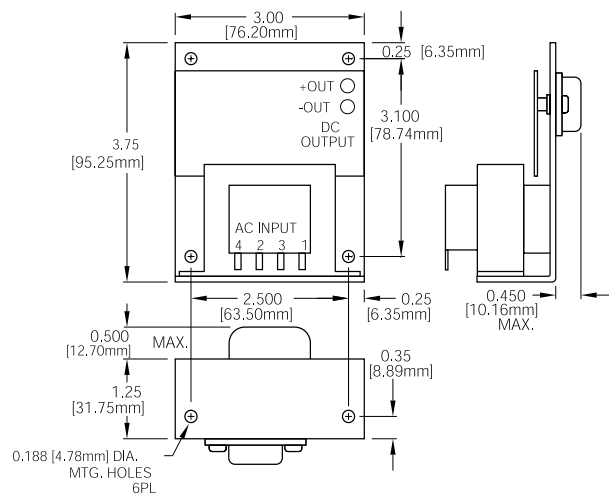
\*\*\*No. 3 output usable at -5V, rate at 1/2 of 15V current rating.

## FIXED DISK SERIES

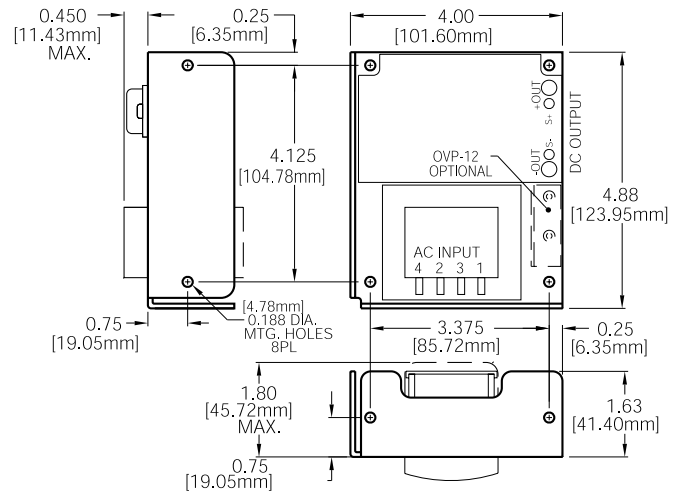
| Commercial Model | Output 1 | Output 2         | Output 3          | Case |
|------------------|----------|------------------|-------------------|------|
| CP379-A+         | +5 V@6 A | +24 V@3.5/6 A PK | -5 or -12 V@1.2 A | NBB  |
| CP498-A+         | +5 V@6 A | +12 V@5/10 A PK  | -12 V@0.5 A    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

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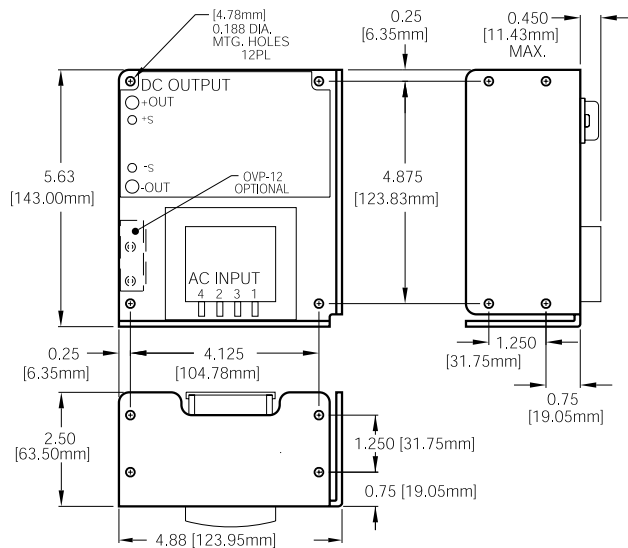
## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:



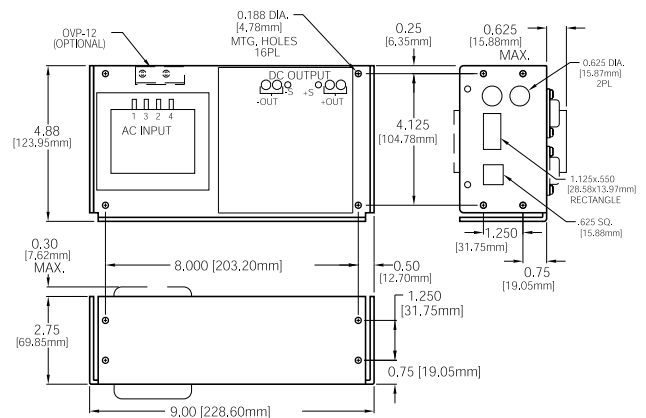
**A CASE (WT. 1 LB.)**



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



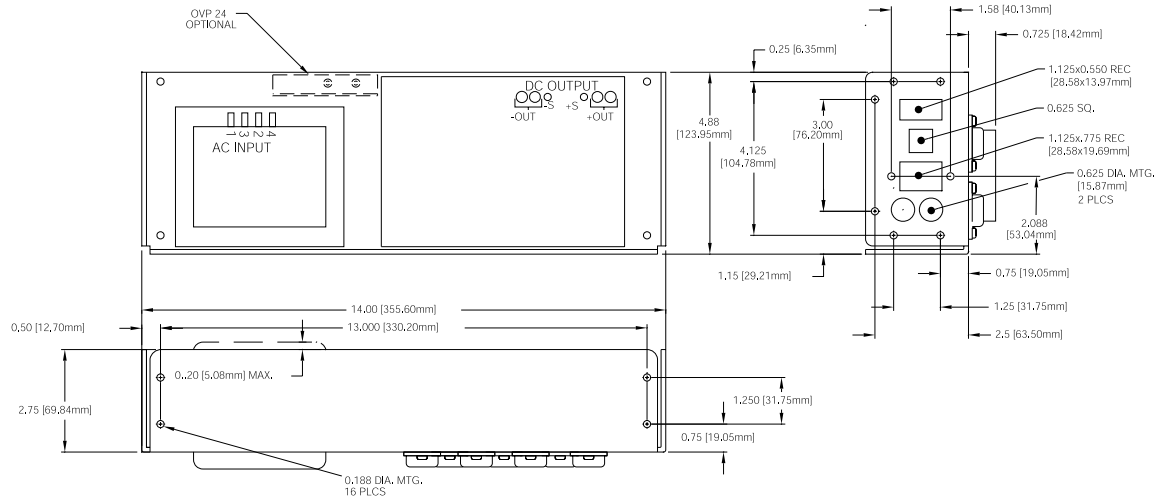
**C CASE (WT. 4 LB.)**



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

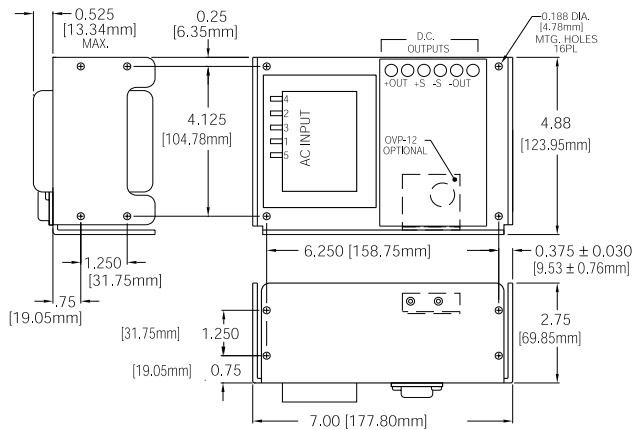
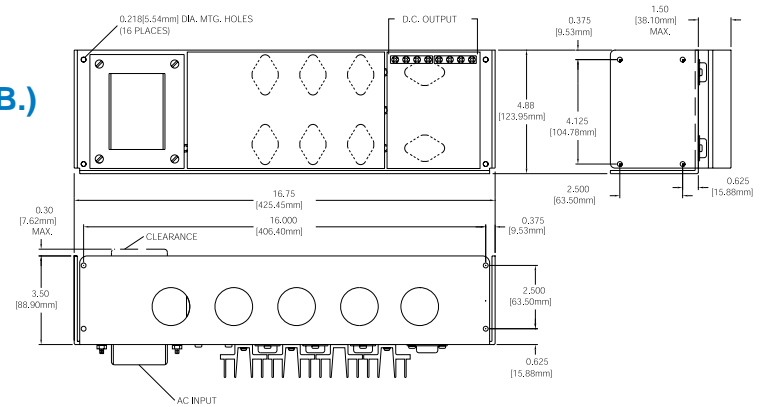
# International + Linears

## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:

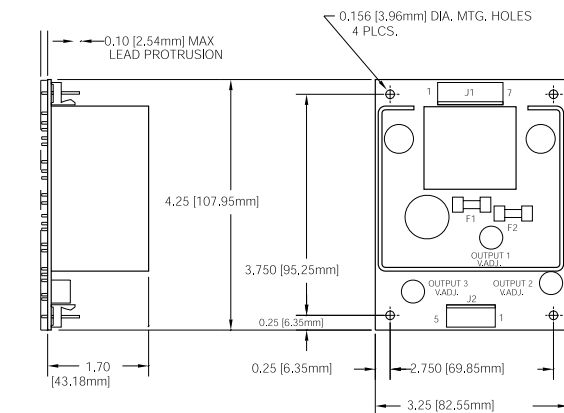


**E CASE (WT. 10 LB.)**

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



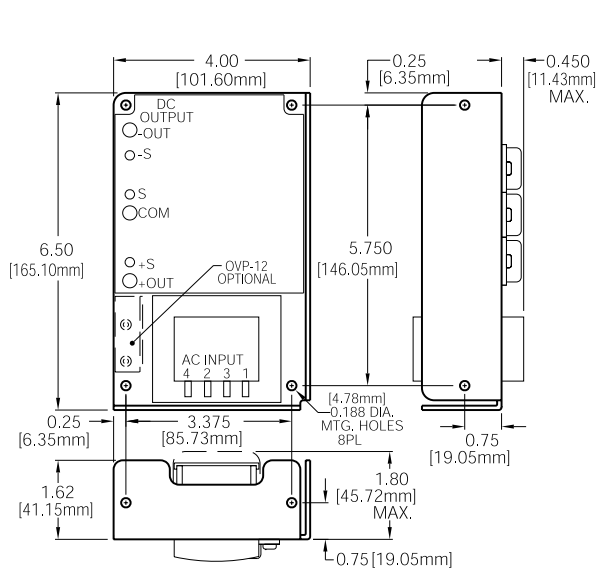
**N CASE (WT. 7 LB.)**



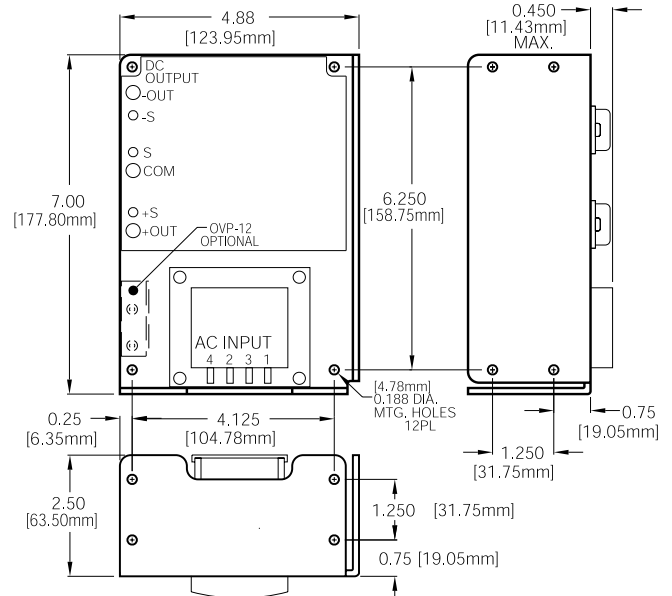
**L CASE (WT. 1 LB.)**

# International + Linears

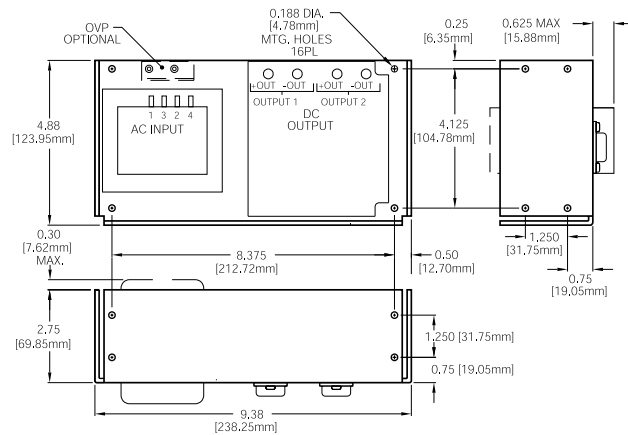
## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:



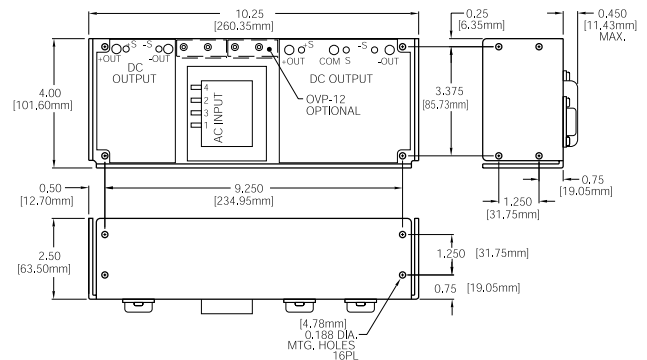
AA CASE (WT. 2 LB.)



BB CASE (WT. 4 LB.)



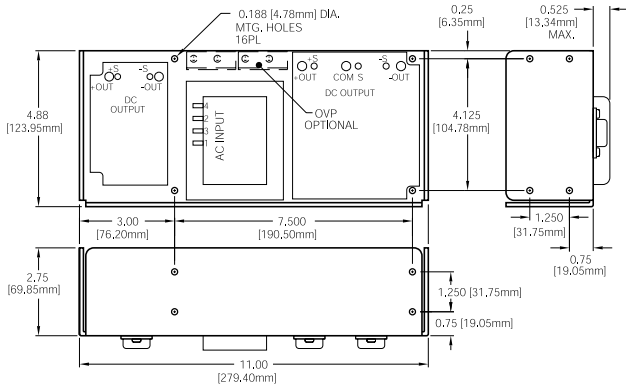
CC CASE (WT. 7 LB.)



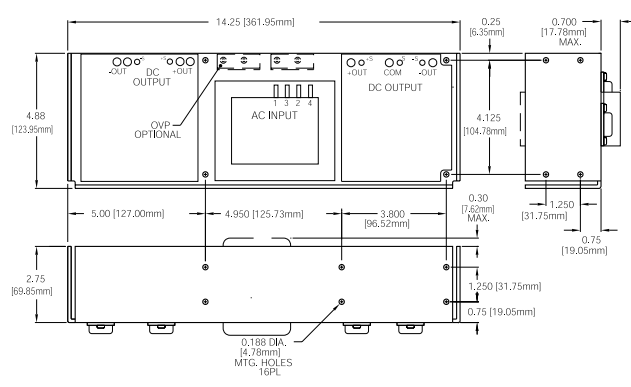
BAA CASE (WT. 5 LB.)

# International + Linears

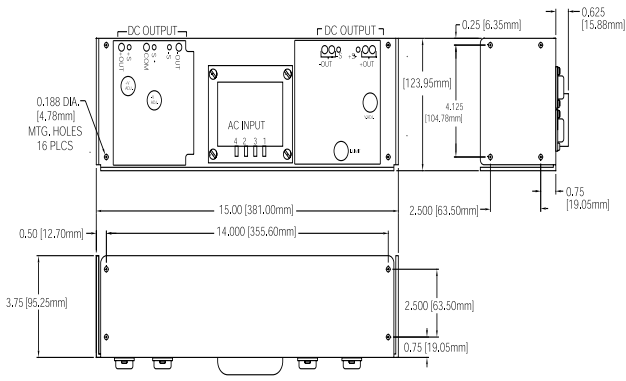
## INTERNATIONAL + LINEARS MECHANICAL SPECIFICATIONS:



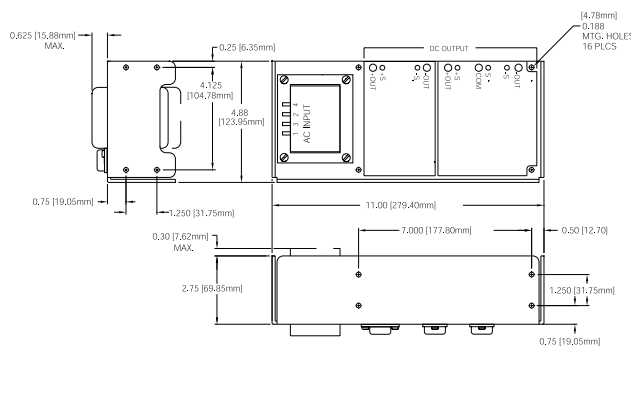
**CBB CASE (WT. 8 LBS.)**



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



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



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

# Mouser Electronics

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## SL Power:

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[HE5-18-OV-A+](#) [HN5-9-OV-A+](#) [HN15-4.5-A+](#) [HC28-2-A+](#) [HB15-1.5-A+](#) [HDD15-5-A+](#) [HCC512-A+](#) [HDBB105W-A+](#)  
[HAA24-0.6-A+](#) [HE48-4-A+](#) [HB48-0.5-A+](#) [HC24-2.4-A+](#) [F48-6-A+](#) [HC48-1-A+](#)