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TECHNOLOGY GROUP

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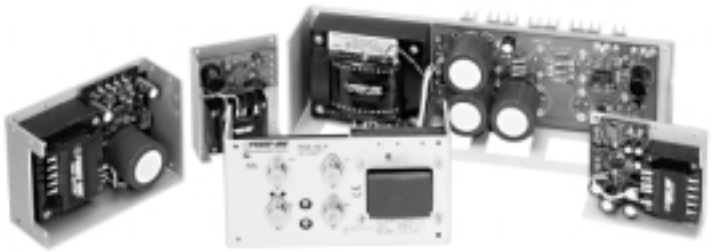
INTERNATIONAL SERIES LINEARS

Power-One produces the industry's broadest selection of linear power supplies with output voltages from 5 volts through 250 volts. Rugged technology and proven design merge to create quiet, highly regulated, dependable DC power.

The International Linear series is approved to domestic and international regulatory standards, and is CE Marked to the Low Voltage Directive (LVD).

FEATURES

- Worldwide AC Input Capabilities: 100/120/220/230/240 VAC
- ±0.05% Output Regulation
- Low Output Ripple
- UL, CSA, and TÜV Approvals
- Mean Time Before Failure (MTBF) in Excess of 300,000 Hours
- CE marked to Low Voltage Directive
- 100% Burn-In
- 2 Year Warranty
- Overvoltage Protection (OVP) Standard on 5V Single Outputs, Optional for other outputs under 48V



SINGLE OUTPUT MODELS

VOLTAGE	MODEL	VOLTAGE/ CURRENT	CASE SIZE
5V	HA5-1.5/OVP-A	5V @ 1.5A (Note 1)	B
	HB5-3/OVP-A	5V @ 3A (Note 1,5)	B
	HC5-6/OVP-A	5V @ 6A (Note 1,5)	C
	HN5-9/OVP-A	5V @ 9A (Note 1,5)	N
	HD5-12/OVP-A	5V @ 12A (Note 1,5)	D
	HE5-18/OVP-A	5V @ 18A (Note 1,5)	E
	F5-25/OVP-A	5V @ 25A (Note 1,5,6,10)	F
	G5-35/OVP-A	5V @ 35A (Note 1,5,6,10)	F
	CP197-A	5V @ 50A (Note 1,5,6)	F
12V	HA15-0.9-A	12V @ 0.9A (Note 2)	B
	HB12-1.7-A	12V @ 1.7A (Note 5)	B
	HC12-3.4-A	12V @ 3.4A (Note 5)	C
	HN12-5.1-A	12V @ 5.1A (Note 5)	N
	HD12-6.8-A	12V @ 6.8A (Note 5)	D
	HE12-10.2-A	12V @ 10.2A (Note 5)	E
	F15-15-A	12V @ 16A (Note 2,5,6,10)	F
15V	HA15-0.9-A	15V @ 0.9A (Note 2)	B
	HB15-1.5-A	15V @ 1.5A (Note 5)	B
	HC15-3-A	15V @ 3A (Note 5)	C
	HN15-4.5-A	15V @ 4.5A (Note 5)	N
	HD15-6-A	15V @ 6A (Note 5)	D
	HE15-9-A	15V @ 9A (Note 5)	E
	F15-15-A	15V @ 15A (Note 2,5,6,10)	F

VOLTAGE	MODEL	VOLTAGE/ CURRENT	CASE SIZE
24V	HA24-0.5-A	24V @ 0.5A (Note 2)	B
	HB24-1.2-A	24V @ 1.2A (Note 5)	B
	HC24-2.4-A	24V @ 2.4A (Note 5)	C
	HN24-3.6-A	24V @ 3.6A (Note 5)	N
	HD24-4.8-A	24V @ 4.8A (Note 5)	D
	HE24-7.2-A	24V @ 7.2A (Note 5)	E
	F24-12-A	24V @ 12A (Note 2,5,6,10)	F
28V	HA24-0.5-A	28V @ 0.5A (Note 2)	B
	HB28-1-A	28V @ 1A (Note 5)	B
	HC28-2-A	28V @ 2A (Note 5)	C
	HN28-3-A	28V @ 3A (Note 5)	N
	HD28-4-A	28V @ 4A (Note 5)	D
	HE28-6-A	28V @ 6A (Note 5)	E
	F24-12-A	28V @ 10A (Note 2,5,6,10)	F
48V	HB48-0.5-A	48V @ 0.5A	B
	HC48-1-A	48V @ 1A	C
	HD48-3-A	48V @ 3A (Note 5)	D
	HE48-4-A	48V @ 4A (Note 5)	E
120V	HB120-0.2-A	120V @ 0.2A	B
175-210V	HB200-0.12-A	175-210V @ 0.12A	B
250V	HB250-0.1-A	250V @ 0.1A	B

NOTES: 1) Overvoltage protection provided. Set at 6.2V ±0.4V.
2) Adjustable outputs: F15-15-A: 12-15V, F24-12-A: 24-28V, HA15-0.9-A: 12-15V, HA24-0.5-A: 24-28V.
3) Nonadjustable 3 terminal regulator.
4) Isolated outputs, can be referenced as positive (+) or negative (-).
5) Remote sense provided.
6) With output inhibit and parallel operation master/slave capability.
7) With output inhibit.
8) Adjustable 3 terminal regulator.
9) Can be made into an isolated output by removing jumper W1.
10) Model requires 100 LFM forced air cooling above 75% of rated output power.

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DUAL OUTPUT MODELS

VOLTAGE	MODEL	OUTPUT # 1	OUTPUT # 2	CASE SIZE
±5V	HAA5-1.5/OVP-A	+5V @ 1.5A (Note 1)	-5V @ 1.5A (Note 1)	AA
	HBB5-3/OVP-A	+5V @ 3A (Note 1)	-5V @ 3A (Note 1)	BB
	HCC5-6/OVP-A	5V @ 6A (Note 1,4,5)	5V @ 6A (Note 1,4,5)	CC
± 12V	HAD12-0.4-A	+12V @ 0.4A (Note 3)	-12V @ 0.4A (Note 3)	B
± 15V	HAD15-0.4-A	+15V @ 0.4A (Note 3)	-15V @ 0.4A (Note 3)	B
±12V to ±15V	HAA15-0.8-A	+12V @ 1A or +15V @ 0.8A (Note 5)	-12V @ 1A or -15V @ 0.8 or -5V @ 0.4A (Note 5)	AA
	HBB15-1.5-A	+12V @ 1.7A or +15V @ 1.5A (Note 5)	-12V @ 1.7A or -15V @ 1.5A or -5V @ 0.7A (Note 5)	BB
	HCC15-3-A	+12V @ 3.4A or +15V @ 3A (Note 5)	-12V @ 3.4A or -15V @ 3A (Note 5)	CC
	HDD15-5-A	+12V or 15V @ 5A (Note 5)	(-)12V or 15V @ 5A	E
±18V ±24V	HAA24-0.6-A	+18-20V @ 0.4A or +24V @ 0.6A	(-)18-20V @ 0.4A or -24V @ 0.6A	AA
	HBB24-1.2-A	+18-20V @ 0.9A or +24V @ 1.2A	(-)18-20V @ 0.9A or -24V @ 1.2A	BB
	HCC24-2.4-A	+18-20V @ 1.8A +24V @ 2.4A (Note 5)	(-)18-20V @ 1.8A -24V @ 2.4A (Note 5)	CC
5V and 12V-15V	HAA512-A	5V @ 2A (Note 1,4,5)	12-15V @ 0.5A (Note 4)	AA
	HBB512-A	5V @ 3A (Note 1,4,5)	12-15V @ 1.25A (Note 4,5)	BB
	HCC512-A	5V @ 6A (Note 1,4,5)	12-15V @ 2.5A (Note 4,5)	CC

TRIPLE OUTPUT MODELS

MODEL	OUTPUT # 1	OUTPUT # 2	OUTPUT # 3	CASE SIZE
HTAA-16W-A	5V @ 2A (Note 1,4)	+12 to 15V @ 0.4A	(-)12 to 15V @ 0.4A or -5V @ 0.4A	AA
HBAA-40W-A	5V @ 3A (Note 1,4,5)	+12V @ 1A or +15V @ 0.8A (Note 5)	-12V @ 1A or -15V @ 0.8A or -5V @ 0.4A (Note 5)	BAA
HCAA-60W-A	+5V @ 6A (Note 1,5)	+12 to 15V @ 1A	(-)12 to 15V @ 1A or -5V @ 0.4A	D
HCBB-75W-A	5V @ 6A (Note 1,4,5)	+12V @ 1.7A or +15V @ 1.5A (Note 5)	-12V @ 1.7A or -15V @ 1.5A or -5V @ 0.7A (Note 5)	CBB
CP131-A	5V @ 8A (Note 1,4,5)	+12V @ 1.7A or +15V @ 1.5A (Note 5)	-12V @ 1.7A or -15V @ 1.5A or -5V @ 0.7A (Note 5)	131
HDBB-105W-A	5V @ 12A (Note 1,4,5)	+12V @ 1.5A or +15V @ 1.5A (Note 5)	-12V @ 1.7A or -15V @ 1.5A or -5V 0.7A (Note 5)	DBB
HDCC-150W-A	5V @ 12A (Note 1,4,5)	+12V @ 3.4A or +15V @ 3A (Note 5)	-12V @ 3.4A or -15V @ 3A	DCC

NOTES:
1) Overvoltage protection provided. Set at 6.2V ±0.4V.
2) Adjustable outputs: F15-15-A: 12-15V, F24-12-A: 24-28V, HA15-0.9-A: 12-15V, HA24-0.5-A: 24-28V.
3) Nonadjustable 3 terminal regulator.
4) Isolated outputs, can be referenced as positive (+) or negative (-).
5) Remote sense provided.
6) With output inhibit and parallel operation master/slave capability.
7) With output inhibit.
8) Adjustable 3 terminal regulator
9) Can be made into an isolated output by removing jumper W1.

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HIGH PEAK MODELS

MODEL	OUTPUT # 1	OUTPUT # 2	OUTPUT # 3	OUTPUT #4	CASE SIZE
CP323-A*	+5V @ 2A (Note 1)	+12 @ 4A (Note 7)			N
CP205-A*	+5V @ 1A (Note 1)	-5V @ 0.5A (Note 1)	24V @ 1.5A/ or 1.7A @ PK (Note 4)		BAA
CP162-A*	+5V @ 3A (Note 1,5)	-5V @ 0.6A (Note 1)	24V @ 5A/ or 6APK (Note 4,5)		CP131
CP510-A*	+5V @ 6A (Note 1)	+12V @ 2.5A/ 7.5APK			CP510-A
CP379-A*	+5V @ 6A (Note 1,5,9)	-5V @ 1.2A or -12V @ 1.2A (Note 8)	24V @ 3.5A/ 8APK (Note 4,5)		CP131
CP498-A*	+5V @ 6A (Note 1,5)	+12V @ 5A/10APK (Note 5)	12V @ 0.5A or 5V @ 0.25A (Note 4,8)		CP131
CP503-A*	+5V @ 6A (Note 1)	+12V @ 1A	-12V @ 1A or -5V @ 0.5A	+24V @ 2.4A/ 4APK (Note 9)	CP131

NOTES: 1) Overvoltage protection provided. Set at 6.2V ±0.4V.
2) Adjustable outputs: F15-15-A: 12-15V, F24-12-A: 24-28V, HA15-0.9-A: 12-15V, HA24-0.5-A: 24-28V.
3) Nonadjustable 3 terminal regulator.
4) Isolated outputs, can be referenced as positive (+) or negative (-).
5) Remote sense provided.
6) With output inhibit and parallel operation master/slave capability.
7) With output inhibit.
8) Adjustable 3 terminal regulator
9) Can be made into an isolated output by removing jumper W1.

* Non-stocked standards

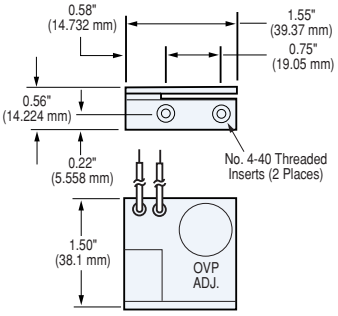
OVERVOLTAGE PROTECTION OPTIONS

OVERVOLTAGE PROTECTION OPTIONS

These optional overvoltage protection modules are offered for use with Power-One's International Series Linear power supplies. Each is user adjustable from 6.4V to 34V.

OVP-12



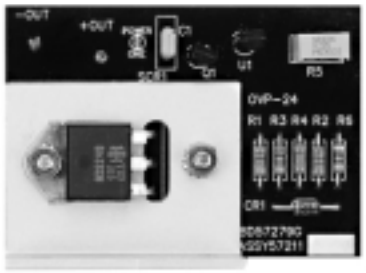


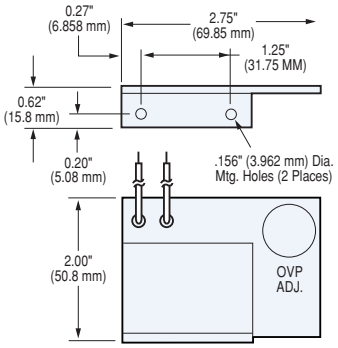
OVP SELECTION GUIDE

MODEL	CASE SIZE	OVP MODULES REQUIRED
SINGLE OUTPUT	B,C,N,D	(1) OVP-12
	E,F	(1) OVP-24
DUAL OUTPUT	AA,B,BB,CC	(1) OVP-12 protects both outputs
	E	(1) OVP-24 protects both outputs
TRIPLE OUTPUT	AA,BAA,D CBB, 131 DBB,DCC	(1) OVP-12 protects both 12V through 15V outputs
PEAK CURRENT MODELS	N,BAA,CBB 131, CP340-A CP510-A	(1) OVP-12 protects any output not provided with built-in OVP

NOTE: Outputs with factory built-in OVP are indicated in the Voltage/Current Rating Chart for each model. OVP is not available for 48V through 250V models.

OVP-24





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INPUT SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Input Voltage - AC (Note 1, 2)	Jumper selectable, shipped factory configured for 120VAC operation. All models must be correctly fused for proper operation.	100 VAC Tap 120 VAC Tap 220 VAC Tap 240 VAC Tap	87 104 191 209	100 120 220 240	110 132 242 264	VAC
Input Frequency	AC input.		47		63	Hz
Line Regulation	Output voltage charge for a 10% line change: F case models. HAD12, HAD15. Outputs with adjustable three terminal regulators. All other models.		-0.01 -1.0 -0.5 -0.05		+0.01 +1.0 +0.5 +0.05	%

NOTES: 1) Derate output current 10% for 50Hz operation.
2) Input voltage tolerance for 230VAC operation is +15%, -10%.

OUTPUT SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Output Adjustment	Minimum output adjustment range (Note 1).	-5		+5	%
Efficiency	5 volt outputs. 12 volt and 15 volt outputs. 24 volt and higher outputs.		45 55 60		%
Ripple and Noise (Note 2)	F case models. 5 volt, 12 volt, and 15 volt models. All three terminal regulator outputs. 24 volt through 250 volt models.			3.0 5.0 0.2 3.0mVPK-PK plus 0.02% of output voltage, max	mVPK-PK mVPK-PK %PK-PK
Load Regulation	Output change for a 50% load change: F case models. HAD12, HAD15. Outputs with adjustable three terminal regulators. All other models.	-0.02 -1 -0.5 -0.05		+0.02 +1 +0.5 +0.05	%
Transient Response	Recovery time, to within 1% of initial set point due to a 50% load change.			50	µS

NOTES: 1) Voltages from 3 terminal regulator outputs are not adjustable on HAD12 and HAD15.
2) Full load, 20MHz bandwidth.

SAFETY, REGULATORY, AND EMI SPECIFICATIONS

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Agency Approvals	UL1950. CSA 1402 or CSA 22.2 No. 234/950. EN60950 (TÜV).		Approved		
Dielectric Withstand Voltage	Input to output. Input to ground.	3750 3750			VRMS
Electromagnetic Interference	FCC CFR title 47 Part 15 Sub-Part B - conducted. EN55022 / CISPR 22 conducted. EN55022 / CISPR 22 radiated.		Compatible with system compliance to Level B.		
Leakage Current	Per EN60950 (264VAC)		23	50	µA

INTERFACE SIGNALS AND INTERNAL PROTECTION

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Overvoltage Protection	Provided on 5 volt output units where indicated. Other outputs may use optional overvoltage protectors OVP-12 and OVP-24.	5.8		6.6	V
Remote Sense	Total voltage compensation for cable losses with respect to the main output. Provided on models where indicated.			250	mV
Overcurrent/Short Circuit Protection	Automatic current limit/foldback. Rated as a percentage of output power.	115	120	140	%
Master/Slave Operation	For parallel operation of up to 6 units. Master/slave pin provided on F case models only. Contact factory for application notes.				

ENVIRONMENTAL SPECIFICATIONS

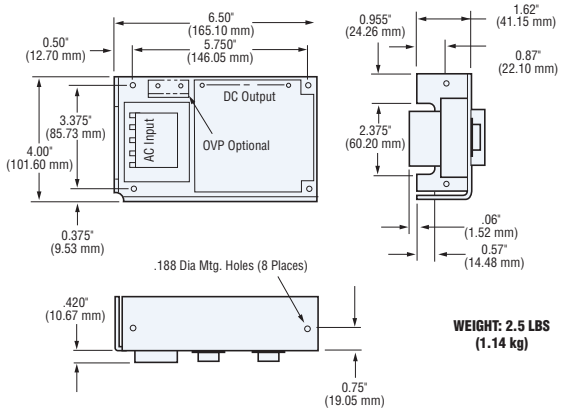
PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Operating Temperature	Derate output power linearly above 50°C by 3% per °C.	At 100% load At 40% load	0		50 70	°C °C
Storage Temperature			-40		85	°C
Temperature Coefficient	0°C to 50°C (after 15 minute warm-up). 24 hours after warm-up.		 -0.3	0.1	0.3 +0.3	%/°C %
Shock	Operating.				20	GPK
Vibration	Random vibration from 10Hz to 2kHz, 3 axis.				6.15	GRMS

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INTERNATIONAL SERIES LINEARS

AA CASE

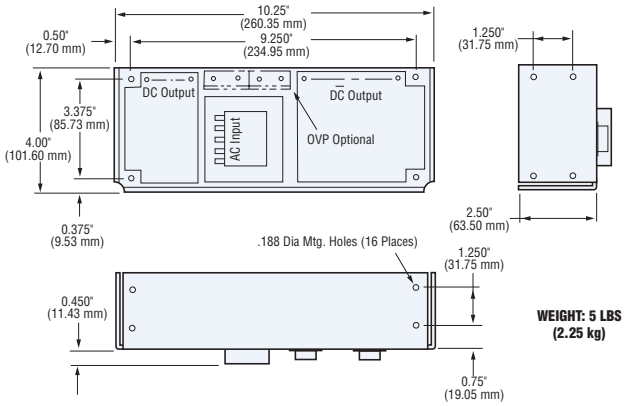
OVERALL SIZE
6.50" x 4.00" x 2.10"
(165.10 mm) x (101.60 mm) x (53.34 mm)



WEIGHT: 2.5 LBS
(1.14 kg)

BAA CASE

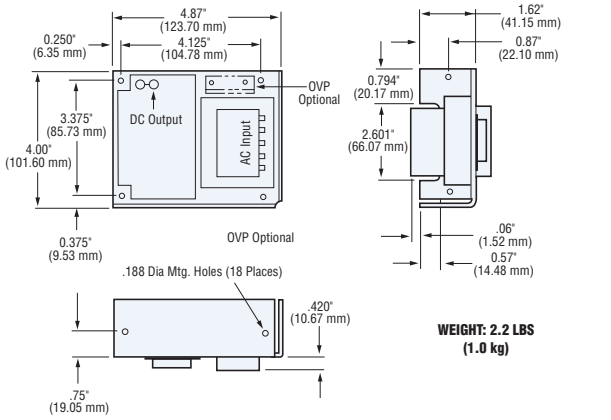
OVERALL SIZE
10.25" x 4.00" x 2.95"
(260.35 mm) x (101.60 mm) x (74.93 mm)



WEIGHT: 5 LBS
(2.25 kg)

B CASE

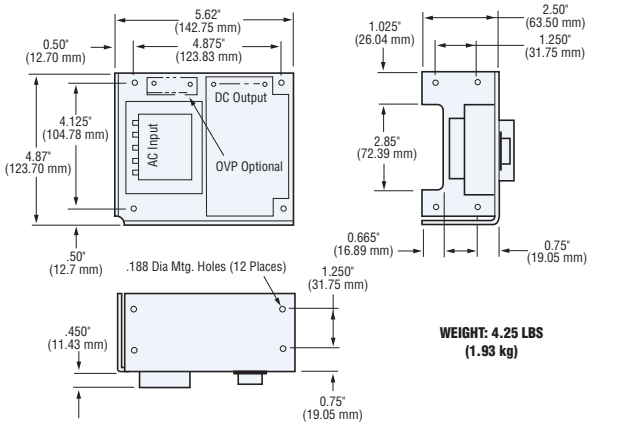
OVERALL SIZE
4.87" x 4.00" x 2.10"
(123.70 mm) x (101.60 mm) x (53.34 mm)



WEIGHT: 2.2 LBS
(1.0 kg)

C CASE

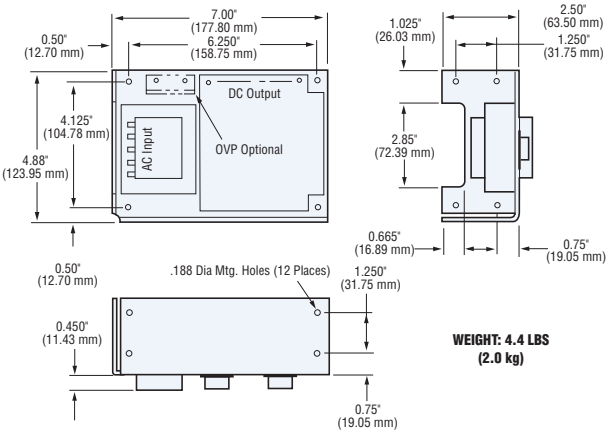
OVERALL SIZE
5.62" x 4.87" x 2.95"
(142.75 mm) x (123.70 mm) x (74.93 mm)



WEIGHT: 4.25 LBS
(1.93 kg)

BB CASE

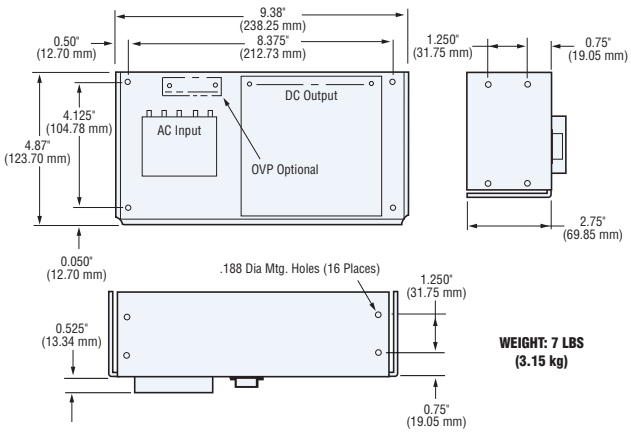
OVERALL SIZE
7.00" x 4.87" x 2.95"
(177.80 mm) x (123.70 mm) x (74.93 mm)



WEIGHT: 4.4 LBS
(2.0 kg)

CC CASE

OVERALL SIZE
9.38" x 4.87" x 3.28"
(238.25 mm) x (123.70 mm) x (83.31 mm)



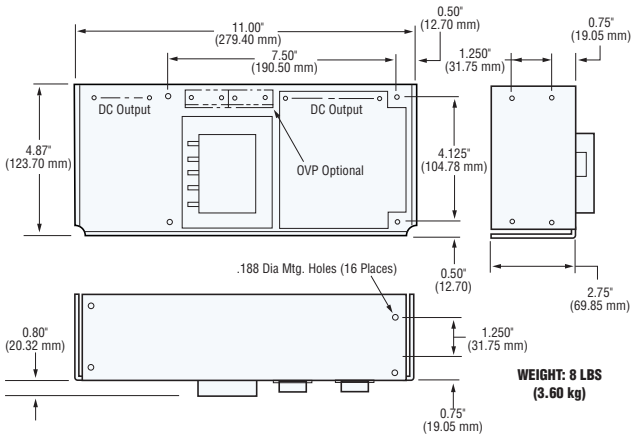
WEIGHT: 7 LBS
(3.15 kg)

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CBB CASE

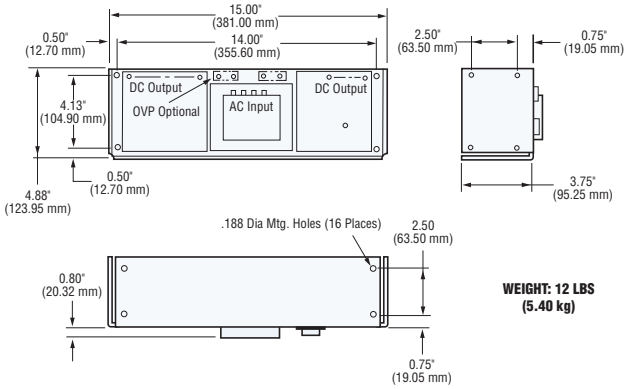
OVERALL SIZE
11.00" x 4.87" x 3.28"
(279.40 mm) x (123.70 mm) x (83.91 mm)



WEIGHT: 8 LBS
(3.60 kg)

DCC CASE

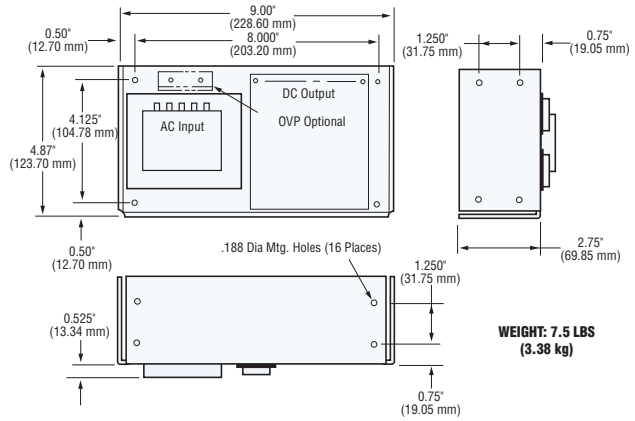
OVERALL SIZE
15.00" x 4.88" x 4.55"
(381.00 mm) x (123.95 mm) x (115.57 mm)



WEIGHT: 12 LBS
(5.40 kg)

D CASE

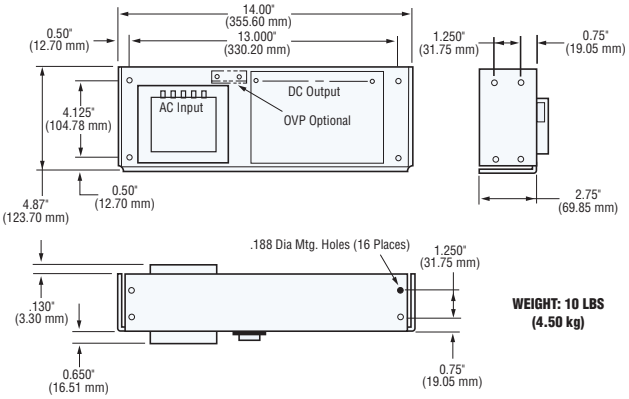
OVERALL SIZE
9.00" x 4.87" x 3.28"
(228.60 mm) x (123.70 mm) x (83.31 mm)



WEIGHT: 7.5 LBS
(3.38 kg)

E CASE

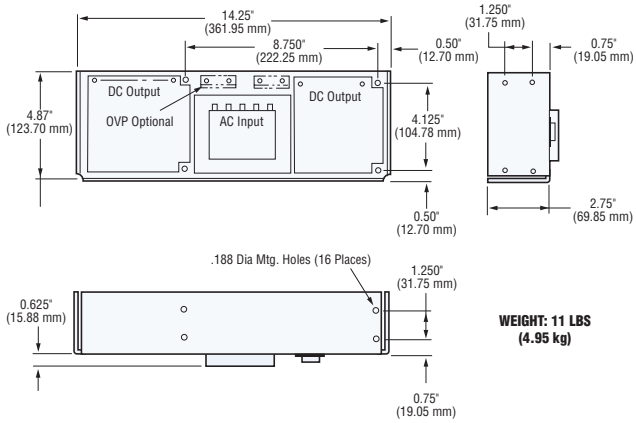
OVERALL SIZE
14.00" x 4.87" x 3.53"
(355.60 mm) x (123.70 mm) x (89.66 mm)



WEIGHT: 10 LBS
(4.50 kg)

DBB CASE

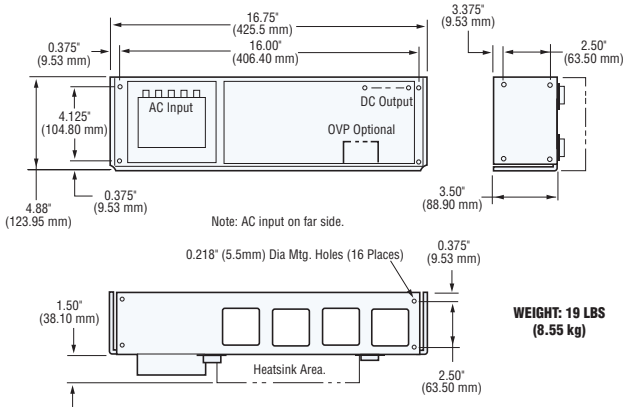
OVERALL SIZE
14.25" x 4.87" x 3.38"
(361.95 mm) x (123.70 mm) x (85.85 mm)



WEIGHT: 11 LBS
(4.95 kg)

F CASE

OVERALL SIZE
16.75" x 4.88" x 5.00"
(425.5 mm) x (123.95 mm) x (127.00 mm)



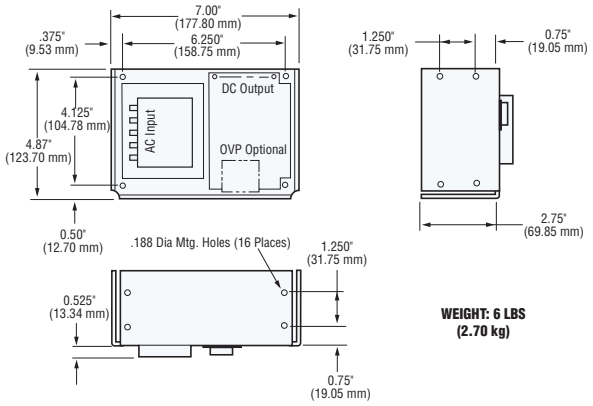
WEIGHT: 19 LBS
(8.55 kg)

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INTERNATIONAL SERIES LINEARS

N CASE

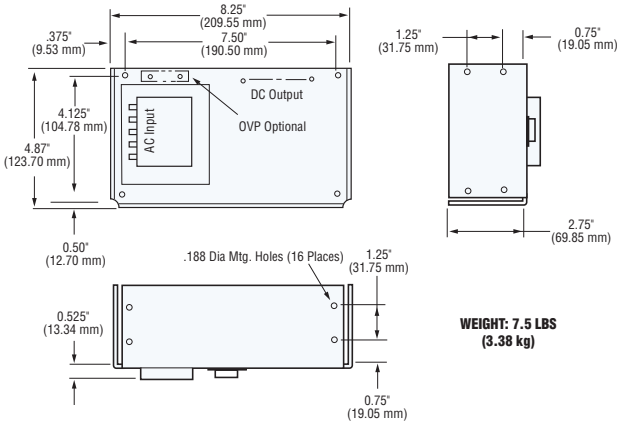
OVERALL SIZE
7.00" x 4.87" x 3.28"
(177.80 mm) x (123.70 mm) x (83.31 mm)



WEIGHT: 6 LBS
(2.70 kg)

CP510-A CASE

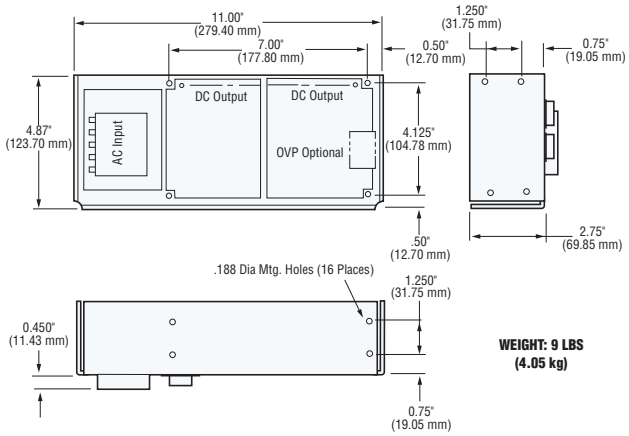
OVERALL SIZE
8.25" x 4.87" x 3.28"
(209.55 mm) x (123.70 mm) x (83.31 mm)



WEIGHT: 7.5 LBS
(3.38 kg)

CP131 CASE

OVERALL SIZE
11.00" x 4.87" x 3.20"
(279.40 mm) x (123.70 mm) x (81.28 mm)



WEIGHT: 9 LBS
(4.05 kg)

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