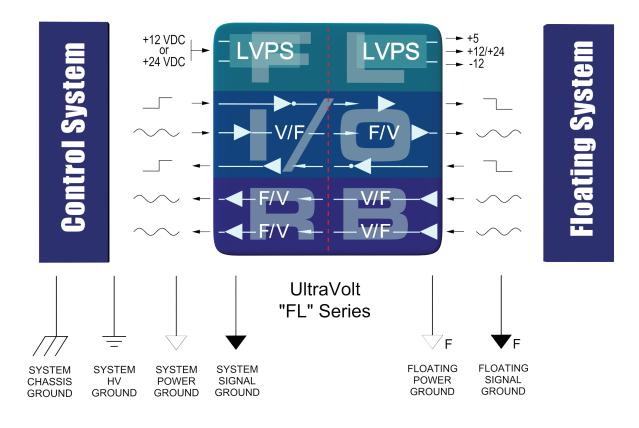
FL SERIES Floating Hot Deck LVPS With Isolated Digital and Analog I/O

The FL Series of floating-hot-deck, low-voltage power supplies offers an integrated solution for systems requiring LV power & controls with high-voltage isolation. Combining a highly isolated, DC-to-DC, multi-output low-voltage power supply (LVPS) with an advanced isolated digital & analog I/O topology, the FL sub-system provides both power and controls to floating-hot-deck circuitry. This solution, when combined with one or more UV HVPS or other circuitry, can provide high-performance solutions for applications such as:

Floating/Stacked Ion or E-Beam Biases Floating Pulsers & Gated Grids Floating High Side Current Monitors Floating Filament Bias Floating Capacitance Meters Floating Leakage Testers

Please contact UltraVolt's customer service department for an analysis of your requirements.

- Isolated up to 15kV
- DC leakage current of <10nA
- AC leakage capacitance of <40pF
- 3 regulated floating LV power outputs
- Isolated digital I/O to and from floating hot deck
- Isolated analog I/O to and from floating hot deck
- UL/cUL Recognized Component; CE Mark (LVD & RoHS)





Specifications subject to change without notice.

High Voltage Products. High Voltage Experts.

Floating Hot Deck LVPS With Isolated Digital and Analog I/O

Voltage Range Dera Current Stai Current No Current Max AC Ripple Current Non LOCAL CONTROLS: REFEREN Output Voltage T = Output Impedance T = Stability Ove LOCAL CONTROLS: LVPS EN/ Power supply on Ope Power supply off Groot INPUT / OUTPUT ISOLATION Isolation Voltage Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Line Regulation Non Output #1 Line Regulation Non Output #1 Load Regulation No Output #2 Voltage Non	+25°C, Initial value +25°C r full temperature range ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	$\begin{array}{c c} 12V \text{ MODELS} \\ \hline +12 \pm 5\% \\ \hline +10.8 \text{ to } +16 \\ \hline <90 \\ \hline <0.15 \\ \hline <1.60 \\ \hline <80 \\ \hline \\ \hline \\ 1000000000000000000000000000$	± 1% 1%	VDC VDC mA A A mA p-p VDC
Voltage Range Dera Current Stai Current No Current Max AC Ripple Current Non LOCAL CONTROLS: REFEREN Output Voltage Output Voltage T = Output Impedance T = Stability Ove LOCAL CONTROLS: LVPS EN Power supply on Ope Power supply on Ope Power supply off Groot INPUT / OUTPUT ISOLATION Isolation Voltage Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Voltage Non Output #1 Line Regulation Non Output #1 Line Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	ated Power Range hdby (Disabled) .oad : Load inial Input, Full Load CE +25°C, Initial value +25°C r full temperature range ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	+10.8 to +16 < 90 < 0.15 < 1.60 < 80 ALL T +5.1 ± 464 ± 0.2 ALL T +2.4 t	+21.6 to +30 < 50 < 0.15 < 1.40 < 100 YPES = 1%	VDC mA A M mA p-p VDC
Voltage RangeDerCurrentStatCurrentNoCurrentMaxAC Ripple CurrentNonLOCAL CONTROLS: REFEEROutput VoltageT =Output ImpedanceT =StabilityOveLOCAL CONTROLS: LVPSEN/Power supply onOpePower supply offGrowINPUT / OUTPUT ISOLATIONIsolation VoltageConLeakage CurrentAll itLeakage CapacitanceAll itISOLATED POWER OUTPUTSolutput #1 PowerOutput #1 VoltageNonOutput #1 Line RegulationNonOutput #1 Line RegulationNonOutput #1 RippleFullOutput #2 VoltageNonOutput #2 VoltageNonOutput #2 CurrentMin	hdby (Disabled) .oad Load inal Input, Full Load CE +25°C, Initial value +25°C r full temperature range ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	<pre>< 90 </pre> < 0.15 < 1.60 < 80 ALL T +5.1 ± 464 ± 0.2 ALL T +2.4 t	< 50 < 0.15 < 1.40 < 100 YPES = 1% 1%	MA A A MA p-p VDC
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AC Ripple Current Non LOCAL CONTROLS: REFERENT Output Voltage T = Output Unpedance T = Output Impedance T = Stability Ove LOCAL CONTROLS: LVPS EN/ Power supply on Ope Power supply off Growth INPUT / OUTPUT ISOLATION Isolation Voltage Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Line Regulation Non Output #1 Ripple Full Output #2 Voltage Non	ninal Input, Full Load CE +25°C, Initial value +25°C r full temperature range ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	< 80 ALL T +5.1 ± 464 ± 0.2 ALL T +2.4 t	< 100 YPES ± 1% ± 1%	MA p-p VDC
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Output Voltage T = Output Impedance T = Stability Ove IOCAL CONTROLS: LVPS ENA Power supply on Ope Power supply off Groutput ISOLATION INPUT / OUTPUT ISOLATION Interface Isolation Voltage Control Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Power Nontrol Output #1 Current Mintrol Output #1 Line Regulation Nontrol Output #1 Line Regulation Nontrol Output #1 Ripple Full Output #2 Voltage Nontrol Output #2 Current Mintrol	+25°C, Initial value +25°C r full temperature range ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	+5.1 ± 464 ± 0.2 ALL T +2.4 t	± 1% 1%	
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LOCAL CONTROLS: LVPSEN/ Power supply onOpePower supply offGrowINPUT / OUTPUT ISOLATIONIsolation VoltageConLeakage CurrentAll isLeakage CapacitanceAll isISOLATED POWER OUTPUTSolutput #1 PowerOutput #1 PowerNonOutput #1 CurrentMinOutput #1 Line RegulationNonOutput #1 Load RegulationNonOutput #1 RippleFullOutput #2 VoltageNonOutput #2 CurrentMin	ABLE / DISABLE n, or a voltage above TTL high unded, or a voltage below TTL low	ALL T` +2.4 t		mV/°C
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Power supply off Grou INPUT / OUTPUT ISOLATION Isolation Voltage Con Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Power Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Line Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	unded, or a voltage below TTL low			
INPUT / OUTPUT ISOLATION Isolation Voltage Con Leakage Current All i Leakage Capacitance All i Isolation Voltage Non Output #1 Power Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min				VDC
Isolation Voltage Con Leakage Current All it Leakage Capacitance All it Isolation Voltage All it Isolation Voltage All it ISOLATED POWER OUTPUTS Output #1 Power Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	:	0 to + 0.7 ± 0.2 (Isi		VDC
Leakage Current All it Leakage Capacitance All it ISOLATED POWER OUTPUTS Output #1 Power Non Output #1 Voltage Non Output #1 Current Min Output #1 Lone Regulation Non Output #1 Load Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min		12V MODELS	24V MODELS	
Leakage Capacitance All if ISOLATED POWER OUTPUTS Output #1 Power Non Output #1 Voltage Non Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	tinuous	15	15	kV
ISOLATED POWER OUTPUTS Output #1 Power Non Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation Non Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	nputs to all outputs	< 10 std, < 100 "-E"	< 10 std, < 100 "-E"	nA
Output #1 Power Non Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation No Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	nputs to all outputs	< 40 std, < 50 "-E"	< 50 std or "-E"	pF
Output #1 Voltage Non Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation No Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	:	15FL12-12W	15FL24-24W	
Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation No Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	ninal input, max lout	12	24	W
Output #1 Current Min Output #1 Line Regulation Non Output #1 Load Regulation No Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	ninal input voltage range	+12 ± 2%	+24 ± 2%	VDC
Output #1 Load Regulation No I Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	imum to Maximum	0 to 1	0 to 1	A
Output #1 Load Regulation No I Output #1 Ripple Full Output #2 Voltage Non Output #2 Current Min	ninal input range, full load	< 0.1%	< 0.1%	VDC
Output #2 Voltage Non Output #2 Current Min	oad to full load	< 0.1%	< 0.1%	VDC
Output #2 Voltage Non Output #2 Current Min	load	< 2%	< 1%	V p-р
Output #2 Current Min	ninal input voltage range	-15 ± 1	-15 ± 1	VDC
	imum > Maximum	0 to 10	0 to 10	mA
	ninal input range, full load	< 0.1%	< 0.1%	VDC
Output #2 Load Regulation No I	oad to full load	< 2%	< 2%	VDC
	load	< 2%	< 2%	V p-р
Output #3 Voltage Non	ninal input voltage range	$+5.6 \pm 6\%$	+5.6 ± 6%	VDC
	imum > Maximum	0 to 10	0 to 10	mA
Output #3 Line Regulation Non	ninal input range, full load	< 1 %	<1%	VDC
	oad to full load	< 1 %	<1%	VDC
	load	< 1 %	<1%	V р-р
ISOLATED CONTROLS: TTL C	CHANNEL "UP"	ALL TYPES WITH	"-I/O" OPTION	
		10MΩ internal p		1
Local input Sou	rce voltage, sink current	<1V low, >2		VDC
		Open collector with inter		1/20
Isolated output Inve	erted & buffered TTL	Can sink 10		VDC
Baud Rate Van	ving duty cycle	DC to >300		kHz
ISOLATED CONTROLS: ANAL		ALL TYPES WITH	"-I/O" OPTION	
Local input voltage Ran		0 to -		VDC
Local input impedance	50	10 M		Ω
Isolated output voltage Ran	φe	0 to -	0	VDC
Isolated output impedance	۵۷	Buffered low		-
Initial offset error		Suffered 10W		mV
Gain error Full		<±		VDC
		<±1 <±1		
			1 /2	VDC
	full scale			VDC
Bandwidth Sym		<pre>< ±</pre>	< 0.02%	VDC VDC ppm/°C





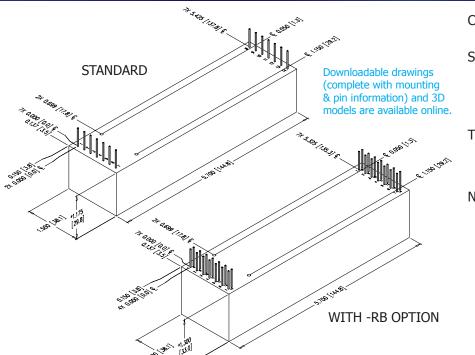
FL SERIES Floating Hot Deck LVPS With Isolated Digital and Analog I/O

'-RB' ISOLATED CONT	ROLS: TTL CHANNEL "DOWN"			
PARAMETER	CONDITIONS	ALL TYPES WITH	"-I/O-R/B" OPTION	UNITS
Isolated 'Hot Deck' Input	Source voltage, sink current	10MΩ internal pull up to +15V <1V low, >2.5V high		VDC
Local output	Inverted & Buffered TTL	Open collector with internal $1k\Omega$ pull up to +5V Can sink 10mA max		VDC
Bandwidth	Varying duty cycle	DC to >300		kHz
ISOLATED CONTROLS	S: ANALOG CHANNELS #1 & #2 "DOV	VN″		
PARAMETER	CONDITIONS	ALL TYPES WITH	"-I/O-R/B" OPTION	UNITS
Isolated 'Hot Deck' +Input	Range	0 to +5, 0 to +10 with	h >+15VDC input power	VDC
Isolated 'Hot Deck' -Input	Range	0 to -5 , 0 to -10 with $>+15$ VDC input power		VDC
lsolated 'Hot Deck' + or - Input impedance	Signal source	> 10 Meg		Ω
Local output +voltage	Range	0 to +5, 0 to +10 with >+15VDC input power		VDC
Local output -voltage	Range	0 to -5 , 0 to -10 with $>+15$ VDC input power		VDC
Local output impedance	Signal source	Buffered low impedance		Ω
Initial offset error	Signal source	< ± 5		mVDC
Gain error	Full scale	< ± 1%		VDC
Linearity error	0 to full scale	< ± 1%		VDC
Stability	30 min. warm-up, per 8 hrs / per day	< 0.01% / < 0.02%		VDC
Temperature Coefficient	-20 °C to +55 °C	< ± 50		ppm/°C
Bandwidth	Symmetric or asymmetric signal	DC to 30 (-3d	DC to 30 (-3dB point is 47Hz)	
TEMPERATURE:	CONDITIONS	ALL 1	ALL TYPES	
Operating	Full load, case measurement	-20 to +55		°C
Storage	Non-operating, case measurement	-55 to +85		°C
Thermal shock	Mil-Std-810, Method 503-4, Proc. II	-20 to +55		°C
ALTITUDE:		ALL TYPES		
Operating	All operating conditions	Sea level to Vacuum		
Storage	Non-operating	Sea level to Vacuum		
SHOCK & VIBRATION	:	STANDARD	- R/B OPTION	
Shock	Mil-Std-810, Method 516.5, Proc IV	20	20	G's
Vibration	Mil-Std-810, Method 514.5, Fig. 514.5C-3	10	10	G's





FL SERIES Floating Hot Deck LVPS With Isolated Digital and Analog I/O



CONSTRUCTION

Epoxy-filled DAP box certified to ASTM-D-5948

SIZE

Volume: Standard: 10 in³ (163.9cc) -R/B Option: 11.1 in³ (182cc) Weight: Standard: 12.0 oz (340.2g) -R/B Option: 13.3 oz (377.1g)

TOLERANCE

Overall $\pm 0.050''$ (1.27) Pin to Pin $\pm 0.015''$ (0.38) Mounting hole locations $\pm 0.025''$ (0.64)

NOTES

24-watt versions are an additional 0.062'' (1.57) in height. -M equipped units are an additional 0.030'' (0.76) in height. Contact UV Customer Service for drawings of models

ROHS

Non-RoHS compliant units are available. Please contact the factory for more information.

	LOCAL CONNECTIONS			
F	UNCTION		PIN	FL
Ir	nput Power Ground Return		8	Flo
Positive Power Input			9	Flo
LVPS Enable/Disable Input			10	Flo
TTL Up/HVPS Enable/Disable (-I/O Only)			11	Flo
Signal Ground Return			12	Flo
A	nalog Up/ HVPS Remote Programming Input (-I/O Only)		13	Flo
+	5V Reference Output		14	Flo
IT	TONAL LOCAL CONNECTIONS (-R/B OPTION)		ADE	DIT
	FUNCTION		PIN	FU
	+Iout monitor output (Analog Down Channel 1)		1	Flo
	-Iout monitor output (Analog Down Channel 1)		2	Flo

9	-Iout monitor output (Analog Down Channel 1)
10	+Eout monitor output (Analog Down Channel 2)
11	-Eout monitor output (Analog Down Channel 2)
12 & 13	N/C (reserved for future use)
14	TTL output (Digital Down Channel 1)

	ORDERING INFORMATION	
Туре	15kV Isolation	15FL
Input	12VDC Nominal	12
Voltage	24VDC Nominal	24
Power	Watts Output (12 V Only)	-12W
	Watts Output (24 V Only)	-24W
Options	(1) Digital Up Channel & (1) Analog Up Channel	-I/O
	(1) Digital Down Channel & (2) Analog Down Channels	-RB
	Partial Mu-Metal Shield	-M
Case	Plastic Case - Diallyl Phthalate	Standard
	'Eared' Chassis Mounting Plate	-E

PIN	FUNCTION	
8	Floating PWR Ground Return	
9	Floating +12VDC or +24VDC Output	
10	Floating -15VDC Output	
11	Floating TTL Up/HVPS Enable/Disable (-I/O Only)	
12	Floating Signal Ground Return	
13	Floating Analog Up/HVPS Remote Programming Input (-I/O Only)	
14	Floating +5.6V Reference Output	
ADDITIONAL ISOLATED CONNECTIONS (-R/B ONLY)		
PIN	FUNCTION	
1	Floating +Iout monitor input (Analog Down Channel 1)	
2	Floating -Iout monitor input (Analog Down Channel 1)	
3	Floating +Eout monitor input (Analog Down Channel 2)	
4	Floating -Eout monitor input (Analog Down Channel 2)	

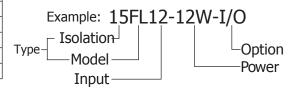
ISOLATED/FLOATING CONNECTIONS

5 & 6 N/C (reserved for future use)

INCTION

7 Floating TTL input (Digital Down Channel 1)

Manufactured in USA





PIN Fl

2 Po 3 LV

4 |TT

5 Sig

6

7

ADDITI PIN 8

HVP High Voltage Products GmbH Bunsenstr. 5 82152 Martinsried/Planegg +49 89 8646 677-0