XTL30 fleXPower Series

AC-DC POWER SUPPLIES

3kW FAN COOLED

The 3 phase XTL30 fleXPower series is a modular power supply which can be configured into a bespoke solution for quick delivery of samples, prototypes and low volume production with up to 3000 Watts of output power. Configurations may comprise of up to 7 modules chosen from 44 single output modules and 16 dual output modules ranging from 3.3V at 66W to 60V at 750W. Modules may be combined in series or parallel to create a single output at the chassis power rating. Modules of unlike power can be paralleled and will current share within 10%.

Opto-isolation of control and monitoring signals provides further configuration flexibility, including a global Inhibit/Enable function. A continuous 5V/2A housekeeping output is present when the AC supply is active. The XTL30 fleXPower consists of a chassis in which there are 20 slots, allowing for up to 10 individual modules A single phase input version is available, see fleXPower datasheet for details.

Features

- Configurable for fast time to market
- Flexible series and parallel capability
- EN62368-1 and UL62368 safety approvals
- 3 phase input 180 to 264VAC
- 1-20 outputs
- Variable speed fan (optional)
- Fully featured signals and controls
- SEMI F47 compliant
- -20°C to +70°C operating temperature
- 3 year warranty

Applications

3 Phase Power Supplies

Industrial Printing

Process Control

Robotics/ Industrial Electronics

Dimensions

317.5 x 127.0 x 127.0 mm (12.50 x 5.00 x 5.00")

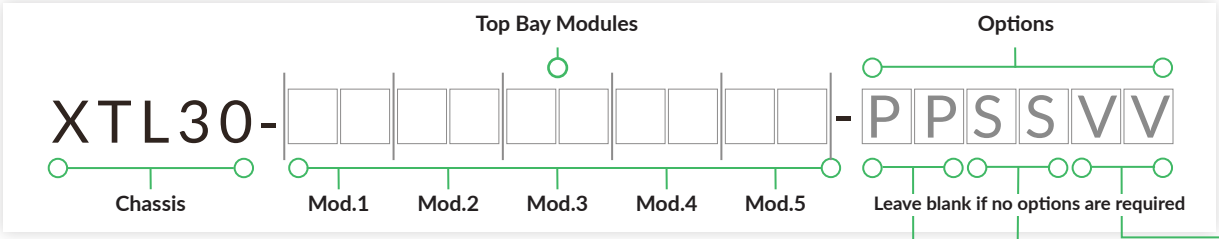
Summary

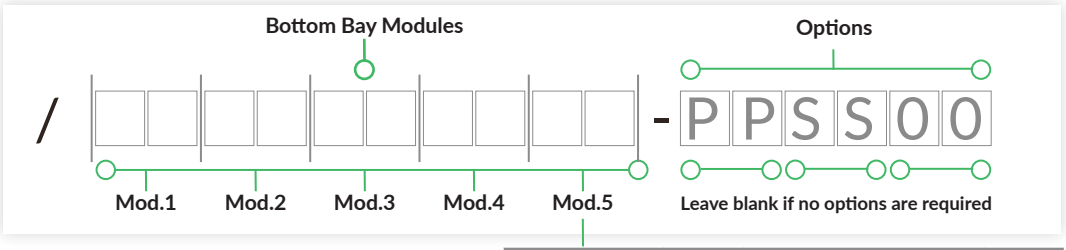
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Power Rating			3000	W	
Power Factor	0.93			Hz	
Efficiency		88		%	
Operating Temperature	-20		+70	°C	
Output Ripple & Noise		1		% pk-pk	
Hold Up Time	20			ms	
Housekeeping/Standby		5/2		V/A	

XTL30 fleXPower Series

Configuration

The XTL30 fleXPower range allows for simple configuration of a custom modular power supply with up to ten outputs. The chassis consists of twenty slots, and modules are either two, three or four slots wide.





Step 1

XTL30 can accommodate up to ten modules, resulting in an extensive range of output combinations. However, as all modules are designed to fit across either 2, 3 or 4 slots in the chassis, configuration is very simple. Select the appropriate modules for your output requirements, ensuring that all modules will fit in the chassis. First, insert 7 or 4 series modules, ordered lowest voltage to highest. Next in order, insert 3 series modules, ordered lowest voltage to highest. Follow with 2 series, then 5 series dual output, ordered alphabetically A-Z. Then 1 series, ordered lowest voltage to highest.

Step 2

Add any required options. These are grouped into three types; parallel options, series options and other options. The standard signal set for each chassis includes Global Inhibit, Global DC OK and Global AC OK, each having logic 0 operation. Optionally a logic 1 operating version of each is available along with reverse air flow.

Dual Output - Module Voltage/Current Rating

Output 1		Output 2		Slots	Code
Voltage	Current	Voltage	Current		
5.0V	10.0A	5.0V	10.0A	2	5A
5.0V	10.0A	3.3V	10.0A	2	5B
12.0V	10.0A	12.0V	8.0A	2	5D
15.0V	8.0A	15.0V	6.0A	2	5E
15.0V	8.0A	15.0V	6.0A	2	6E*
15.0V	8.0A	12.0V	8.0A	2	5F
12.0V	10.0A	5.0V	10.0A	2	5G
12.0V	10.0A	3.3V	10.0A	2	5H
12.0V	10.0A	2.0V	10.0A	2	5J
15.0V	10.0A	5.0V	10.0A	2	5K
15.0V	10.0A	3.3V	10.0A	2	5L
15.0V	10.0A	2.0V	10.0A	2	5M
24.0V	6.0A	5.0V	10.0A	2	5N
24.0V	6.0A	5.0V	10.0A	2	6N*
24.0V	6.0A	3.3V	10.0A	2	5P
24.0V	6.0A	2.0V	10.0A	2	5Q

Total power for dual output module must not exceed 175W max. 5 series modules require 10% load on output 1 to meet specified regulation on output 2.

*No minimum load needed on output 1 for regulation.

Single Output - Module Voltage/Current Rating

Voltage	Current	Ipk	Power	Ppk	Slots	Code
3.3V	20.0A	n/a	66W	n/a	2	1C
3.3V	40.0A	n/a	132W	n/a	2	2C
3.3V	60.0A	n/a	198W	n/a	3	3C
5.0V	20.0A	n/a	100W	n/a	2	1D
5.0V	40.0A	n/a	200W	n/a	2	2D
5.0V	60.0A	n/a	300W	n/a	3	3D
8.0V	25.0A	n/a	200W	n/a	2	2H
10.0V	20.0A	n/a	200W	n/a	2	2I
10.0V	30.0A	n/a	300W	n/a	3	3I
12.0V	8.50A	n/a	102W	n/a	2	1J
12.0V	17.0A	n/a	204W	n/a	2	2J
12.0V	25.0A	n/a	300W	n/a	3	3J
12.0V	62.5A	n/a	750W	n/a	4	4J(2)
15.0V	7.00A	n/a	105W	n/a	2	1L
15.0V	14.0A	n/a	210W	n/a	2	2L
15.0V	20.0A	n/a	300W	n/a	3	3L
15.0V	50.0A	n/a	750W	n/a	4	4L(2)
15.0V	50.0A	n/a	750W	n/a	4	7L
18.0V	16.7A	n/a	300W	n/a	3	3N
24.0V	5.00A	n/a	120W	n/a	2	1P
24.0V	10.5A	n/a	252W	n/a	2	2P
24.0V	17.0A	n/a	408W	n/a	3	3P
24.0V	31.5A	n/a	750W	n/a	4	4P(2)
24.0V	31.5A	n/a	750W	n/a	4	7P
24.0V	5.00A	10.0A	120W	240W	2	1R(1)
24.0V	10.5A	21.0A	252W	504W	2	2R(1)
24.0V	17.0A	34.0A	408W	816W	3	3R(1)
28.0V	4.50A	n/a	126W	n/a	2	1Q
28.0V	9.00A	n/a	252W	n/a	2	2Q
28.0V	14.0A	n/a	392W	n/a	3	3Q
28.0V	26.8A	n/a	750W	n/a	4	4Q(2)
28.0V	26.8A	n/a	750W	n/a	4	7Q
30.0V	8.4A	n/a	252W	n/a	2	2S
30.0V	13.5A	n/a	405W	n/a	3	3S
36.0V	3.50A	n/a	126W	n/a	2	1U
36.0V	7.00A	n/a	252W	n/a	2	2U
36.0V	11.0A	n/a	396W	n/a	3	3U
36.0V	21.0A	n/a	750W	n/a	4	4U(2)
36.0V	21.0A	n/a	750W	n/a	4	7U
42.0V	9.05A	n/a	400W	n/a	3	3V
48.0V	2.50A	n/a	120W	n/a	2	1W
48.0V	5.20A	n/a	249W	n/a	2	2W
48.0V	8.50A	n/a	408W	n/a	3	3W
48.0V	15.7A	n/a	750W	n/a	4	4W(2)
48.0V	15.7A	n/a	750W	n/a	4	7W
60.0V	2.00A	n/a	120W	n/a	2	1Y
60.0V	4.20A	n/a	252W	n/a	2	2Y
60.0V	7.00A	n/a	420W	n/a	3	3Y
60.0V	12.5A	n/a	750W	n/a	4	4Y(2)
60.0V	12.5A	n/a	750W	n/a	4	7Y

1. Peak power available for 10 seconds with 35% duty cycle, if peak power rating is exceeded output may latch, recycle input to reset.
2. '4' series modules not recommended for new designs.

Parallel Option Codes "P"

Code	Description
00	No parallel required
12	Modules 1 & 2
13	Modules 1 to 3
14	Modules 1 to 4
23	Modules 2 & 3
24	Modules 2 to 4
25	Modules 2 to 5
34	Modules 3 & 4
35	Modules 3 to 5
40	Modules 1 & 2, 3 & 4

Series Option Codes "S"

Code	Description
00	No series required
12	Modules 1 & 2
13	Modules 1 to 3
23	Modules 2 & 3
24	Modules 2 to 4
40	Modules 1 & 2, 3 & 4

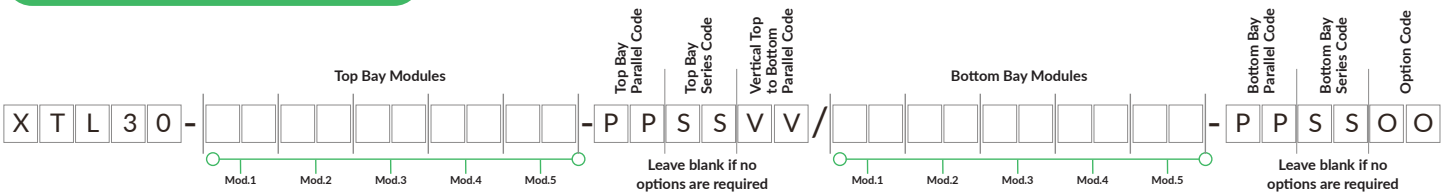
Other Option Codes "O"

Code	Description
01	Reverse Air
02	Global Enable - Logic 1
03	Option 01 & 02
04	Global DC OK - Logic 1
05	Option 01 & 04
06	Option 02 & 04
07	Option 01, 02 & 04
08	AC OK - Logic 1
09	Option 01 & 08
10	Option 02 & 08
11	Option 01, 02 & 08
12	Option 04 & 08
13	Option 01, 04 & 08
14	Option 02, 04 & 08
15	Option 01, 02, 04 & 08
16	Fan Speed Control
17	Option 01 & 16
18	Option 02 & 16
19	Option 04 & 16
20	Option 08 & 16
21	Option 01, 02 & 16
22	Option 01, 04 & 16
23	Option 01, 08 & 16
24	Option 02, 04 & 16
25	Option 02, 08 & 16
26	Option 04, 08 & 16
27	Option 01, 02, 04 & 16
28	Option 01, 02, 08 & 16
29	Option 02, 04, 08 & 16
30	Option 01, 02, 04, 08 & 16

1. Fancard options 16-30 will occupy 2 slots. See mechanical drawing, page 8.

XTL30 fleXPower Series

Configuration Examples



- Configuration for XTL30 is Chassis - Top Bay - Options
  Bottom Bay - Options
- Maximum 1500W for each bay, power to be evenly distributed between top and bottom bays.
- Option codes within each bay are listed in the modules table.
- The fan control card is mounted in the bottom bay, as standard. Contact sales for alternative location.
- 1st and 2nd digits = parallel like modules (both voltage and power), including vertical parallel.
- 3rd and 4th digits = series option designation.
- 5th and 6th digits = other option codes. (5th and 6th digits fan card options 16 to 30 is called out for one bay only, either top or bottom).

Vertical Parallel Option Codes "V"	
Code	Description
61	Parallel module 1 to module 1 top & bottom
62	Parallel module 2 to module 2 top & bottom
63	Parallel module 3 to module 3 top & bottom
64	Parallel module 4 to module 4 top & bottom
65	Parallel module 5 to module 5 top & bottom

Examples

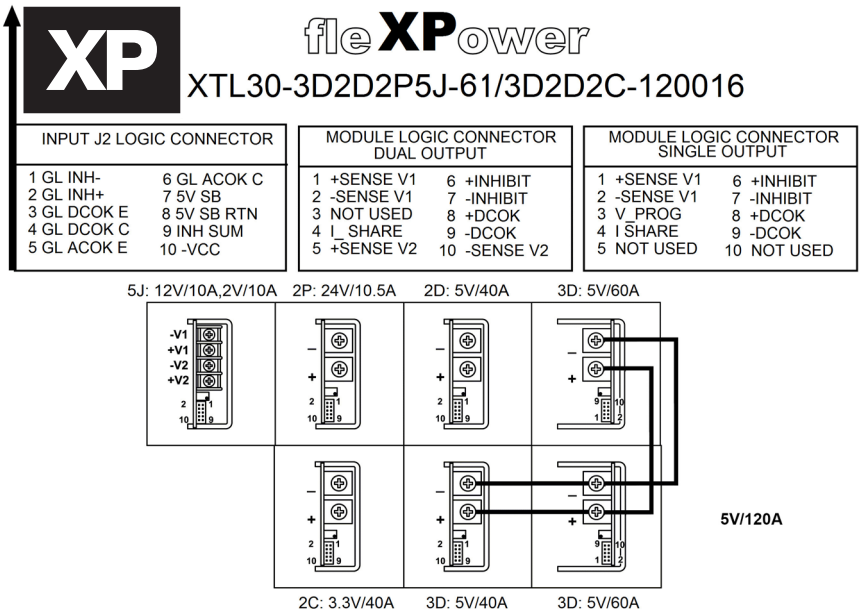
5V at 180A, 24V at 10.5A, 5V at 40A, 12V at 10A, 2V at 10A, 3.3V at 40A, with fan speed control

XTL30 - 3000W industrial 3ø chassis, 20 module slots available.

XTL30-3D2D2P5J-61/3D3D2C-120016

3D - 5 V @ 60.0 A. Three slot width module.
2D - 5 V @ 40.0 A. Two slot width module.
2P - 24 V @ 10.5 A. Two slot width module.
5J - 12 V @ 10.0 A. Two slot width module.
61 - Vertical parallel module 1 top bay to module 1 bottom bay.

3D - 5 V @ 60.0 A. Three slot width module.
2D - 5 V @ 40.0 A. Two slot width module.
2W - 48 V @ 5.2 A. Two slot width module.
12 - Parallel modules 1 and 2, bottom bay.
00 - No series option.
16 - Fan speed control card.



Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage - Operating	180		264	VAC	4 wire 3 phase (no neutral), 300VAC, 5s
Input Frequency	47		63	Hz	
Power Factor	0.93				
Input Current - per phase		12		A	180VAC
		9			264VAC
Inrush Current			60	A	Cold start 25°C at 264VAC
Earth Leakage Current			1	mA	at 264VAC, 60Hz/<3.5mA single fault
Input Protection	T30A/250V internal fuse fitted in line				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		60	VDC	See Modules table
Output Voltage Adjustment				%	See Modules table
Minimum Load	No minimum load required for 2 slot, 3 slot or 4 slot single output or 6 x dual output modules. 5x dual outputs require 10% load on V1 to meet specified regulation on V2				
Start Up Delay		1.5	2.0	s	
Hold Up Time	20	30		ms	With full output load
Line Regulation			<0.1	%	
Load Regulation			<1	%	
Ripple & Noise			50/1	mV/% pk-pk	At 20MHz bandwidth whichever is the greater. 6E module has 1.5% max on V1 and V2. 6N modules has 1.5% max on V1 and 3% max on V2
Overvoltage Protection	115		130	% V nom	
Overtemperature Protection			115	°C	Measured internally, auto reset
Overload Protection	110		140	% I nom	
Short Circuit Protection	Continuous trip and restart (hiccup mode)				
Temperature Coefficient			0.03	%/°C	
Remote Sense			0.5	V	Compensates for maximum voltage drop for 0.5V
Enable & Inhibit	See signals page				
Current Share	See signals page				
Standby		5V/2A			Isolation classed as functional, between this and all other circuits

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	Configuration dependent
Isolation: Input to Output	3000			VAC	
Input to Ground	1500			VAC	
Output to Ground	250			VDC	
Switching Frequency		65		kHz	PFC converter
		200			For modules
Mean Time Between Failure		225		khrs	MIL-STD-217F at 25°C GB

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-20		+70	°C	For operation above +50°C, derate linearly to 50% load at +70°C
Storage Temperature	-40		+85	°C	
Humidity	5		95	%RH	Non-condensing
Operating Altitude			3000	m	
Cooling	Forced air cooling (via field-replaceable internal fan). Fan speed control optional				
Shock	MIL STD-810 Method 516.4 Procedure 1, 30g, half sine, 6 axes				
Vibration	MIL STD-810 Method 514.4 Procedure 1, 1g rms, 5-500Hz, 3 axes				

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class A	
Radiated	EN55032	Class A	
Harmonic Emissions	EN61000-3-2		

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Low Voltage PSU EMC	EN61204-3	High severity level	As below	
ESD	EN61000-4-2	4	A	
Radiated	EN61000-4-3	10V/m	A	
EFT	EN61000-4-4	3	A	
Surge	EN61000-4-5	Installation class 3	A	
Conducted	EN61000-4-6	10V/m	A	
Magnetic Fields	EN61000-4-8	3A/m	A	
Dips and Interruptions	EN55024 (180VAC)	Int >100% (0VAC) 8.4ms	A	
		Int 100% (0VAC) 16.7ms	A	
		Dip 60% (72 VAC) 200ms	A	
		Dip 30% (126 VAC) 500ms	A	
		Dip 20% (144 VAC) 5000ms	A	
	EN55024 (208VAC)	Int >100% (0 VAC) 8.4ms	A	
		Int 100% (0 VAC) 16.7ms	A	
		Dip 60% (83 VAC) 200ms	A	
		Dip 30% (145 VAC) 500ms	A	
		Dip 20% (166 VAC) 5000ms	A	
	SEMI F47-0706	208VAC nominal	A	

Safety Approvals

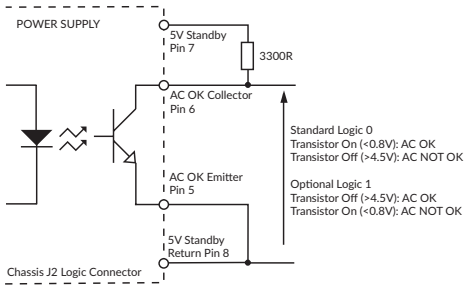
Certification	Standard	Notes & Conditions
CB	IEC60950-1 / IEC62368-1	Information Technology
UL	UL62368-1	Information Technology
EN	EN62368-1	Information Technology
Equipment Protection Class	Class I	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Signals

Global AC OK/Power Fail

Global AC OK is an isolated transistor of an optocoupler providing a minimum of 5ms warning of loss of output regulation. The signal is fully isolated and the collector and emitter must be connected externally.

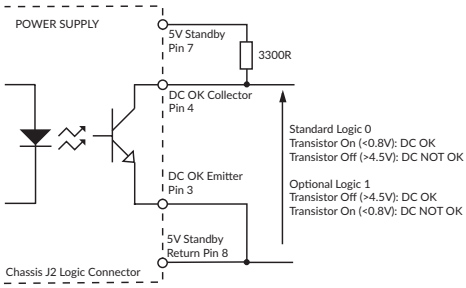
Maximum sink current 2mA, maximum voltage 20V.



Global DC OK

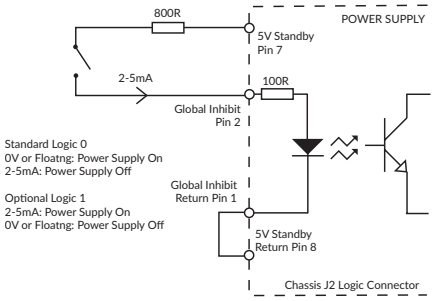
Global DC OK is an isolated transistor of an optocoupler providing warning that the output voltage has fallen below 90% of nominal. The signal is fully isolated and the collector and emitter must be connected externally.

Maximum sink current 2mA, maximum voltage 20V.
On Dual output module, DC OK monitors V1 output only.



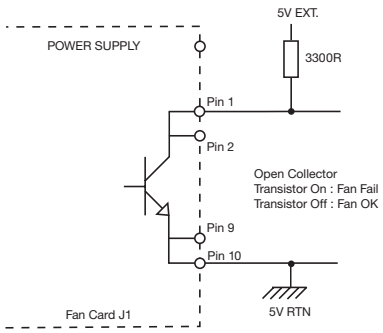
Global Inhibit

Global Inhibit is an isolated control signal input which turns the power supply off by supplying 2 to 5mA into the pin. Global Enable option available, see 'Other Option Codes' table.



Fan Fail

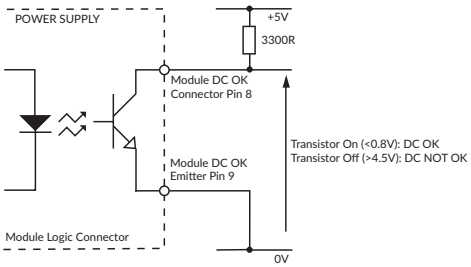
When fan speed control fitted (option 16)
Open connector signal warns of any fan failure.
Note: Can use 5V standby for 5V EXT.



Module DC OK

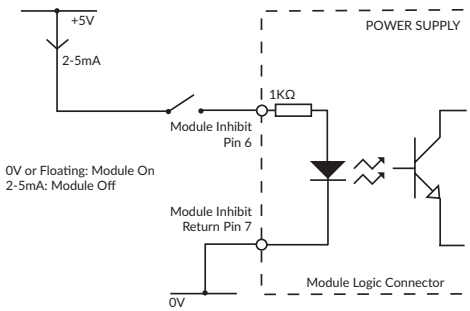
Module DC OK is a nominal "ON" isolated transistor of an optocoupler which provides a warning of the loss of output regulation on the main output of the module.

Maximum sink current 2mA, maximum voltage 20V.



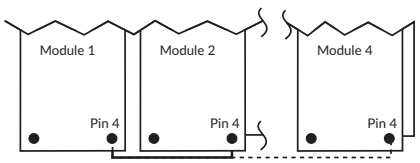
Module Inhibit

Module Inhibit signal is an isolated control signal which turns the module off by supplying 2 to 5mA into the pin. '4' series modules have a 100R internal series resistor. Add resistance as necessary to maintain drive current at 2 to 5mA.



Current Share

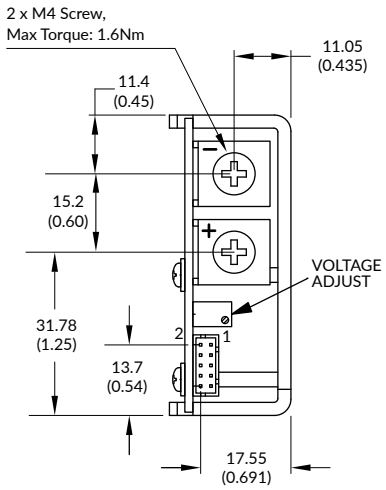
Connecting pin 4 of like voltage and power modules (4 maximum) within the same chassis or separate chassis will force the current to share between the outputs.



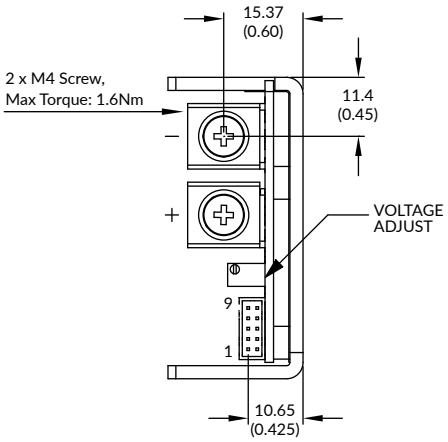
Module Mechanical Details

Single Output

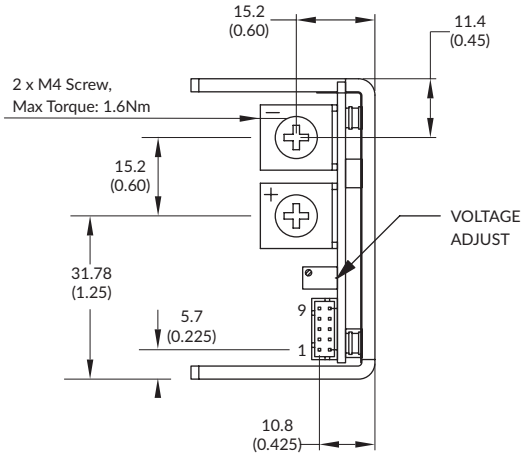
2 Slot Modules



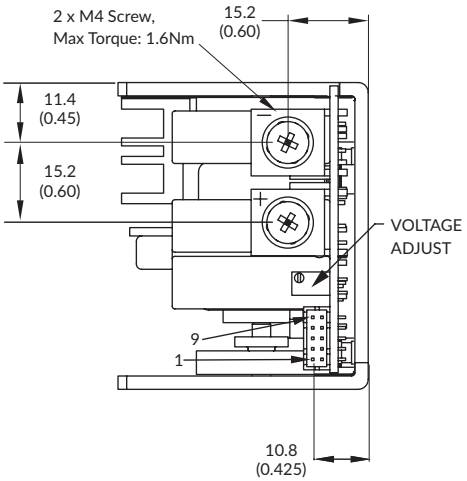
2 Slot Modules
(1R/2R Peak)



3 Slot Modules
(3R Peak)



4 Slot Modules



Single Output: Module Logic Connector Pinouts			
Pin	**Function**	**Pin**	**Function**
1	Sense +	6	Inhibit
2	Sense -	7	Module Inhibit Return
3	V Prog	8	DC OK Collector
4	I Share	9	DC OK Emitter
5	Not Used	10	Not Used

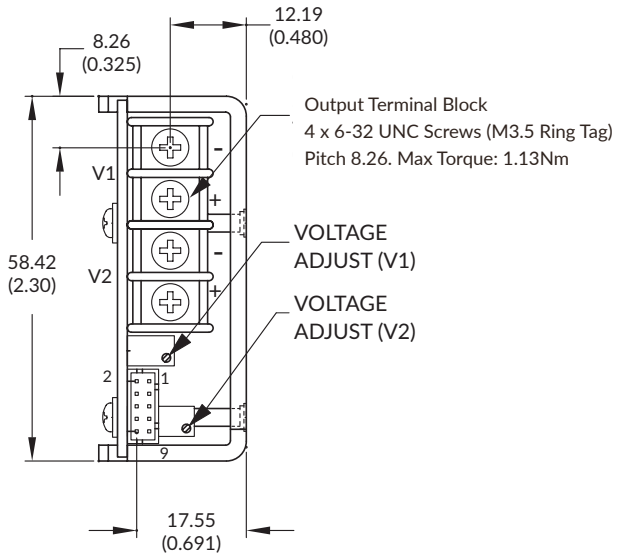
Notes:

1. All dimensions in mm (inches). Tolerance: .xx = ±0.50 (±0.02) .xxx = ±0.25 (±0.01)
2. Weight: 2/2R Slot: 218g (0.48lb) approx, 3 Slot: 335g (0.74lb) approx.
   4 Slot: 431g (0.95lb) approx.
3. Mating plug: JST part no. PHDR-10VS.
4. Contact: 26-22 AWG JST part no. SPHD-001T-P0.5.
5. Connector kit available order part no. fleXPower CONKIT.

Module Mechanical Details

Dual Output

2 Slot Modules



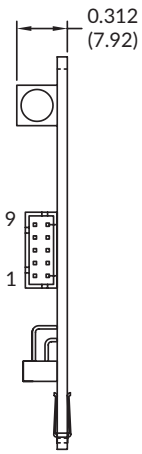
Dual Output: Module Logic Connector Pinouts			
Pin	Function	Pin	Function
1	V1 Sense +	6	Inhibit
2	V1 Sense -	7	Module Inhibit Return
3	Not used	8	DC OK Collector
4	Not used	9	DC OK Emitter
5	V2 Sense +	10	V2 Sense -

Notes:

1. All dimensions in mm (inches). Tolerance: .xx = ±0.50 (±0.02); .xxx = ±0.25 (±0.01).
2. Weight: 218g (0.48lb) approx.
3. Mating plug: JST part no. PHDR-10VS.
4. Contact: 26-22 AWG JST part no. SPHD-001T-P0.5.
5. Connector kit available order part no. fleXPower CONKIT.

Fan Speed Control Module

2 Slot Modules



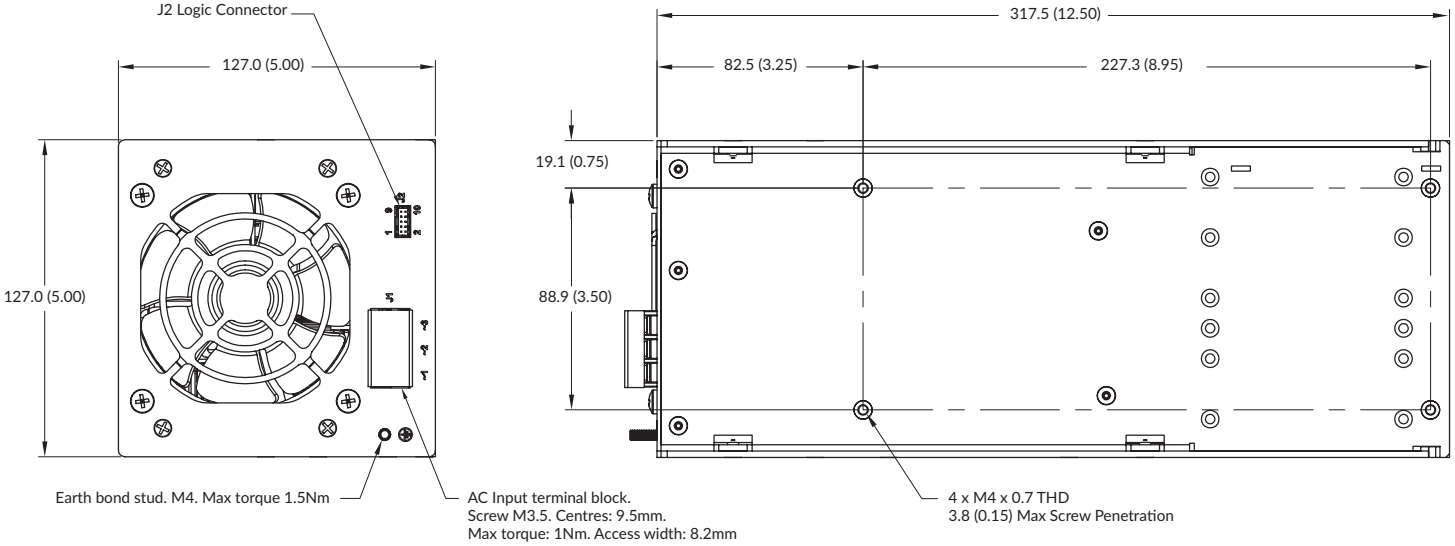
Fan Speed Control Module Connector Pinouts			
Pin	Function	Pin	Function
1	Fan Fail	6	Not used
2	Fan Fail	7	Not used
3	Not used	8	Not used
4	Not used	9	Ground
5	Not used	10	Ground

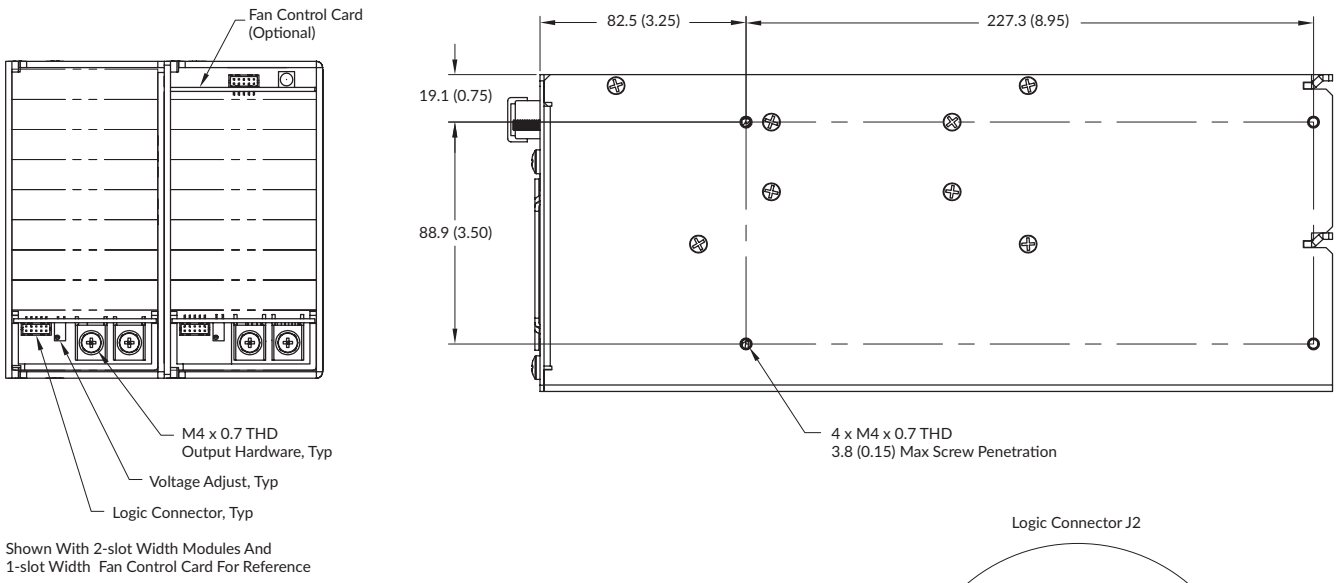
Notes:

1. All dimensions in mm (inches). Tolerance: .xx = ±0.50 (±0.02); .xxx = ±0.25 (±0.01).
2. Weight: 45g (0.10lb) approx.
3. Mating plug: JST part no. PHDR-10VS.
4. Contact: 26-22 AWG JST part no. SPHD-001T-P0.5.
5. Connector kit available order part no. fleXPower CONKIT.

Mechanical Details

XTL30 Chassis

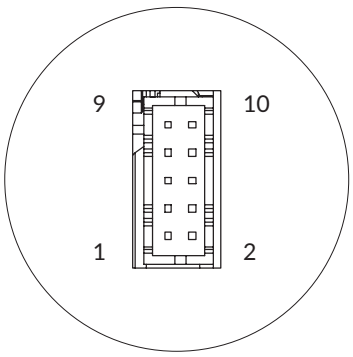




Shown With 2-slot Width Modules And
1-slot Width Fan Control Card For Reference

J2 Logic Connector JST Part no. S10B-PHDSS(LF)			
Pin	**Function**	**Pin**	**Function**
1	Global Inhibit Return	6	Global AC OK Collector
2	Global Inhibit	7	5V Standby
3	Global DC OK Emitter	8	5V Standby Return
4	Global DC OK Collector	9	Manufacturer Use Only
5	Global AC OK Emitter	10	Manufacturer Use Only

Logic Connector J2



Notes:

1. All dimensions in mm (inches).
   Tolerance: .xx = ±0.50 (±0.02); .xxx = ±0.25 (±0.01).
2. Weight: 2.80kg (6.15lb) approx.
3. Logic Connector: Mating plug: JST part no. PHDR-10VS.
   Contact: 26-22 AWG JST part no. SPHD-001T-P0.5.