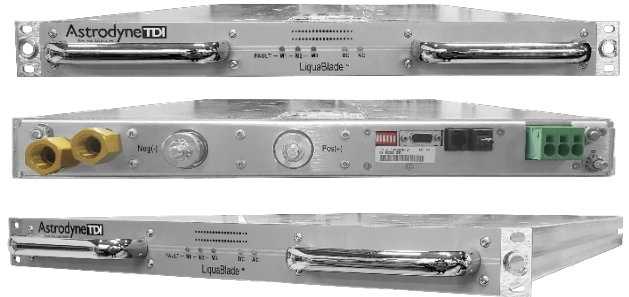




LIQUABLADE™

16.5KW LIQUID-COOLED PROGRAMMABLE POWER SUPPLY

LiquaBlade™ power supplies offer high energy efficiency and reliability in a compact 1U form. The converter is hot-swappable for quick and easy maintenance, has automatic droop load sharing, and has a universal 3-phase power input. With adjustable output ranges up to 1,000, they are ideal for high-power systems in industrial, scientific, and military applications.



MAIN CHARACTERISTICS:

- ✓ Programmable & Fixed Output Voltages
- ✓ Full Power Factor Correction & High Efficiency
- ✓ Low Input Current Total Harmonic Distortion (THD)
- ✓ SEMI F47 Criteria C compliant
- ✓ Liquid-cooled water, DI Water, WEG-compatible
- ✓ Constant Voltage / Constant Current / Constant Power Control Modes
- ✓ High Reliability: 100% HASS Tested
- ✓ 1U / 19" Rack Compatible
- ✓ Designed to NAVSO P 3641A
- ✓ Remote Monitoring & Control

BENEFITS

HIGH POWER DENSITY

Up to 16.5kW power in a 1U high, 19" rack space.

REDUCED SYSTEM COMPLEXITY AND TIME TO MARKET

Wide range of models with fully adjustable outputs. Multiple control modes provide ultimate application flexibility.

HIGH RELIABILITY FOR CRITICAL APPLICATIONS

Astrodyne TDI's comprehensive reliability assurance processes, including design to the rigorous requirements of NAVSO P3641A, HALT, DFMEA, and our unique Highly Accelerated Stress Screening (HASS) on 100% of production units, assure the ultimate in unit reliability and performance.

FEATURES

UNIVERSAL 3-PHASE AC INPUT

380-480 VAC, three-phase, 50/60Hz

WIDE RANGE OF PROGRAMMABLE OUTPUTS

0-60V, 0-120V, 0-180V, 0-500V
(for fixed voltage models, consult sales)

DIGITAL REMOTE CONTROL & MONITORING

CANBus Control Interface

SERIES, PARALLEL, AND REDUNDANT OPERATION

Automatic droop current sharing, output fault isolation, and blind-mate hot-swappable

AGENCY/COMPLIANCE:

UL/CSA/EN/IEC 62368-1 AV & IT Safety Requirements

EN61000-4-4 Electrical Fast Transient/Burst Severity Level 3

EN61000-4-5 Surge Severity Level 4

SEMI F47-0706 Criteria C

EMI: Designed to meet CISPR 11 Class A and MIL-STD-491
(with external filters, consult sales)



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INPUT SPECIFICATIONS

AC Input Range	342-528VAC, three phase
Input Frequency	47-63Hz
Input Current	31A max
Power Factor	>0.93 at full power
Inrush Current	80A max at t<1ms
Harmonics	Designed to meet IEC61000-3-4 1998 Emissions of Harmonic Currents in Systems greater than 16A per Phase I-THD below 10%
Recommended Circuit Breaker	40A min, 3-pole

OUTPUT SPECIFICATIONS

Output Voltage	(see model table)
Output Power	16.5 kW Maximum (see derating chart)
Efficiency	(see model table)
Set Point Accuracy	(see model table)
Ripple/Noise	(see model table)
Turn On Delay	(see model table)
Line Regulation	+/-1% of output voltage
Turn On Overshoot	<5% above set point with no load
Temperature Coefficient	<50ppm/°C (after 8 hours, fixed line, load and temperature after a 30 minute)
Transient Response	±2% of nominal voltage when subjected to a 50% to 100% step load.
Parallel Operation	May be paralleled with LiquaBlade™ models of the same output with droop current share (see model table)

ISOLATION

Input To Output	3000VAC, 4242VDC
Input To Earth	2164VAC, 3060VDC
Output To Earth	1000VDC

MECHANICAL

Dimensions (installed with mating shelf)	1U, 19in rack, 31.1in depth (see Outline Drawings)
Weight	46lb (21kg)
Wetted Parts Material	Anodized aluminum (consult sales for alternates)
Coolant Fittings Thread Size	3/8-19 BSPT
AC Input	Terminal Block, screw down (MFN: 1735888) Accepts 4-20AWG [0.5-25mm²]
DC Output	5/16-18 UNC-2A threaded studs
DC stud torque	18 in-lbs [2 N-m] maximum
CAN connector	RJ11 (see pin out on sheet 7)
RS232 connector	DB9 (see pin out on sheet 7)
Earth Ground Stud	1/4-20 stud (min 4AWG)



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SAFETY & COMPLIANCE

Safety Approvals	UL 62368-1, 2nd Edition CSA C22.2 No. 62368-1-14, 2nd Ed EN 62368-1 IEC 62368-1, 2nd Edition CE marked (LVD)
EMC Overall	Designed to meet CISPR11 Class A with external filter RP300-55-100-S Designed to meet MIL-STD-461 with external filter RPM8500-50-S (system test required for CE102 compliance)
Conducted and Radiated Emissions	FCC Part 15, Class B EN 55032 (CISPR32), Class B
Harmonic Current	IEC61000-3-4
Voltage Fluctuations	EN 61000-3-3
ESD Immunity	EN 61000-4-2, Level 3
RF Field Immunity	EN 61000-4-3, Level 2
EFT Burst Immunity	EN61000-4-4, Level 3
Surge Immunity	EN61000-4-5, Level 4
Semi	SEMI F47-0706 Criteria A up to 11kW, Criteria C up to full power
Vibration	IEC 60068-2-64 Spectrum A.1 MIL-STD 810G Category 7 Figure 514.6 C-5
Transport Shock	ISTA Procedure 1A

ENVIRONMENTAL

Ambient Operating Temperature	+5 to +50°C
Coolant Temperature	+5 to +35°C for full power, 55°C max (see Derating Chart)
Storage Temperature	-40 to +85°C
Operating Altitude	-200 to +10,000ft
Storage Altitude	up to 30,000ft
Relative Humidity	0% to 95% non-condensing
Coolant Flow Rate	1.5 -2.5gpm, 2gpm nominal
Compatible coolant	Water, DI Water, Ethylene or Propylene Glycol to water mixture; consult factory for alternates
Coolant pressure	60psi nom, 100psi max
MTBF	250khrs

PROTECTION FEATURES

Input Over-Voltage (OVP)	540VAC +/-5VAC, Power Supply will not latch off
Input Undervoltage	335VAC +/-5VAC, Power Supply will not latch off. Time delayed output shut down of 120mS.
Output Over Voltage Protection (OVP)	Power Supply will latch off (see model table)
Output Over Current Protection (OCP)	Power Supply will not latch off (see model table)
Output Overpower Protection (OPP)	Power Supply will not latch off (see model table)
Over Temperature Protection (OTP)	Shut down with auto-restart when below temperature limit
Hot Swap	No power down of system required. DC output must be disabled. AC input can be applied.
Visual Indicators	Front panel LED indicators
Warranty	2 Years

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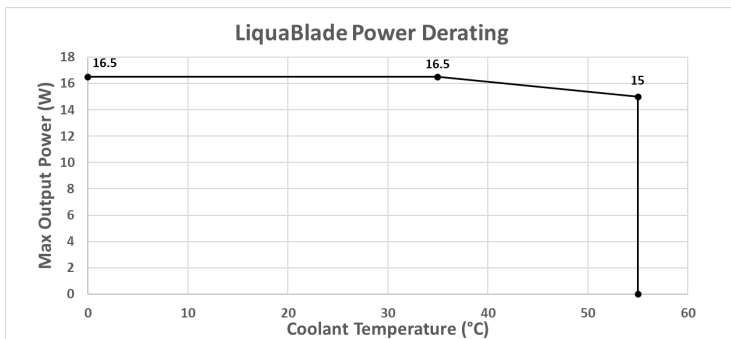
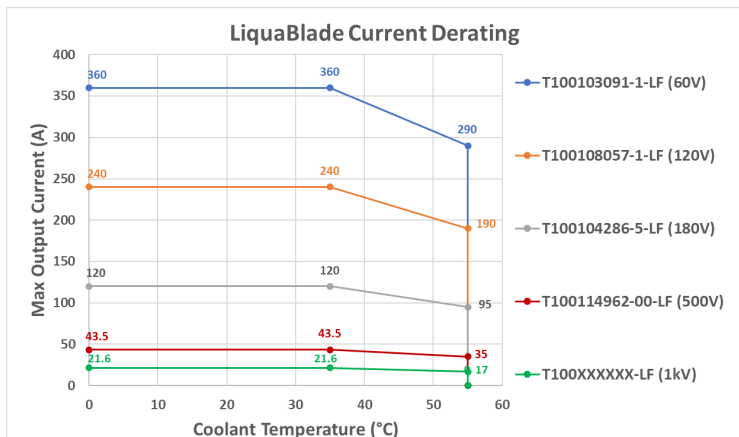
16.5KW LIQUID-COOLED PROGRAMMABLE POWER SUPPLY

PRODUCT MODEL SPECIFICATIONS

PART NUMBER	T100103091-1-LF	T100108057-1-LF	T100104286-5-LF	T100114962-00-LF	COMING SOON
Model number	SPS5930-1-LF	SPS6011-1-LF	SPS5975-5-LF	SPS6052-LF	TBD
Output Voltage ⁽¹⁾	5-60VDC	10-120VDC	5-180VDC	20-500VDC	40-1,000VDC
Output Current	0-360A	0-240A	0-120A	0-43.5A	0-21.6A
Efficiency	>91% @ 55VDC/190A	>91% @ 55VDC/190A	>91% @ 180VDC/63A	>93% @ 500VDC/ ≥17.4A	>93% @ 1000VDC, 40-100% load
CV mode	±1.5V	±0.75V	±2.75V	±0.5V	±5.0V
CC mode	0-14.99A±0.5A 15-360A±0.5%	0-14.99A±0.5A 15-240A±0.5%	±1A	0-2.99A ±0.25A 3-43.5A ±0.22A	0-1.49A±0.125A 1.5-21.6A±0.15A
CP mode	100-999W ±60W 1-16.5kW ±2.5%	100-999W ±15W 1-16.5kW ±2.5%	100-999W ±60W 1-16.5kW ±2.5%	100-999W ±30W 1-16.5kW ±2.0%	100-999W ±50W 1-16.5kW ±330W
OVP	63 ±1VDC	126 ±1VDC	189 ±3VDC	520 ±5VDC	1,050 ±20VDC
OCP	360 ±2A	240 ±2A	120 ±2A	43.5 ±0.5A	21.6A
OPP	±100W	±100W	±100W	±250W	+250W
Noise & Ripple ⁽²⁾	<300mV	<300mV	<300mV	<2.5V	<5V
Voltage droop @ max current	2.0V	0.75V	6.0V	5.0V	10.0V

Notes: 1. Can be set to 0VDC, not adjustable below minimum voltage.
2. Vpk-pk, measured with 20MHz bandwidth.

CURRENT & POWER DERATING CHARTS

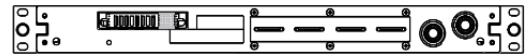
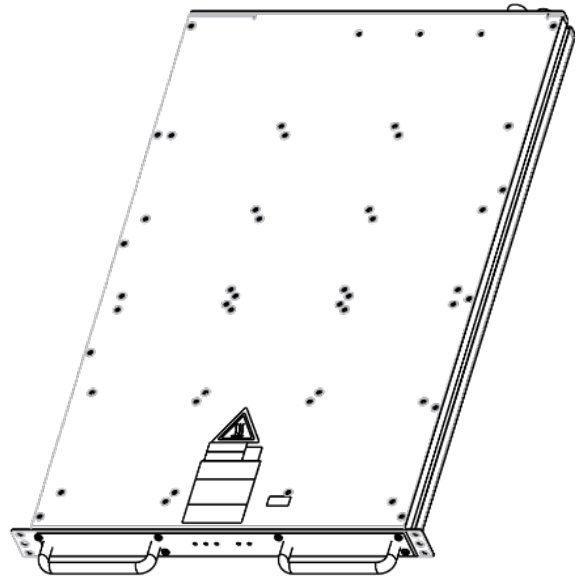
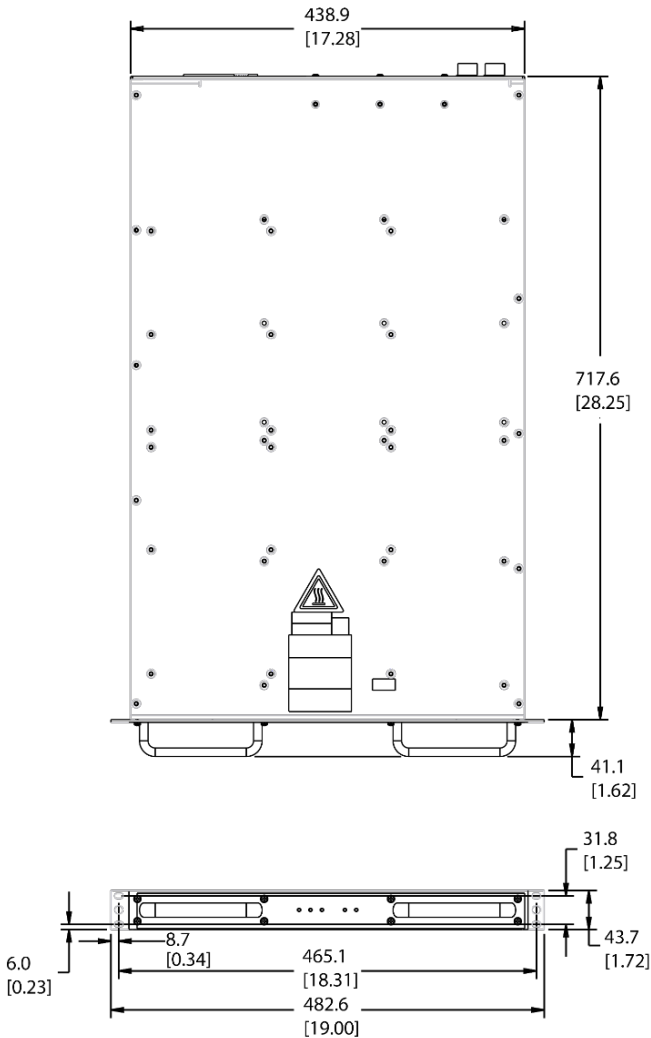




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POWER SUPPLY OUTLINE DRAWING



PART NUMBER	MODEL NUMBER	DESCRIPTION
T100103091-1-LF	SPS5930-1-LF	RECTIFIER, AC/DC, 380-480VAC, 16.5kW, 0-60V, 0-360A, Droop Current Share, 1U, LC
T100108057-1-LF	SPS6011-1-LF	RECTIFIER, AC/DC, 380-480VAC, 16.5kW, 0-120V, 0-240A, Droop Current Share, 1U, LC
T100104286-5-LF	SPS5975-5-LF	RECTIFIER, AC/DC, 380-480VAC, 16.5kW, 0-180V, 0-120A, Droop Current Share, 1U, LC
T100114962-00-LF	SPS6052-LF	RECTIFIER, AC/DC, 380-480VAC, 16.5kW, 0-500V, 0-43.5A, Droop Current Share, 1U, LC
coming soon		RECTIFIER, AC/DC, 380-480VAC, 16.5kW, 0-1000V, 0-21.6A, Droop Current Share, 1U, LC

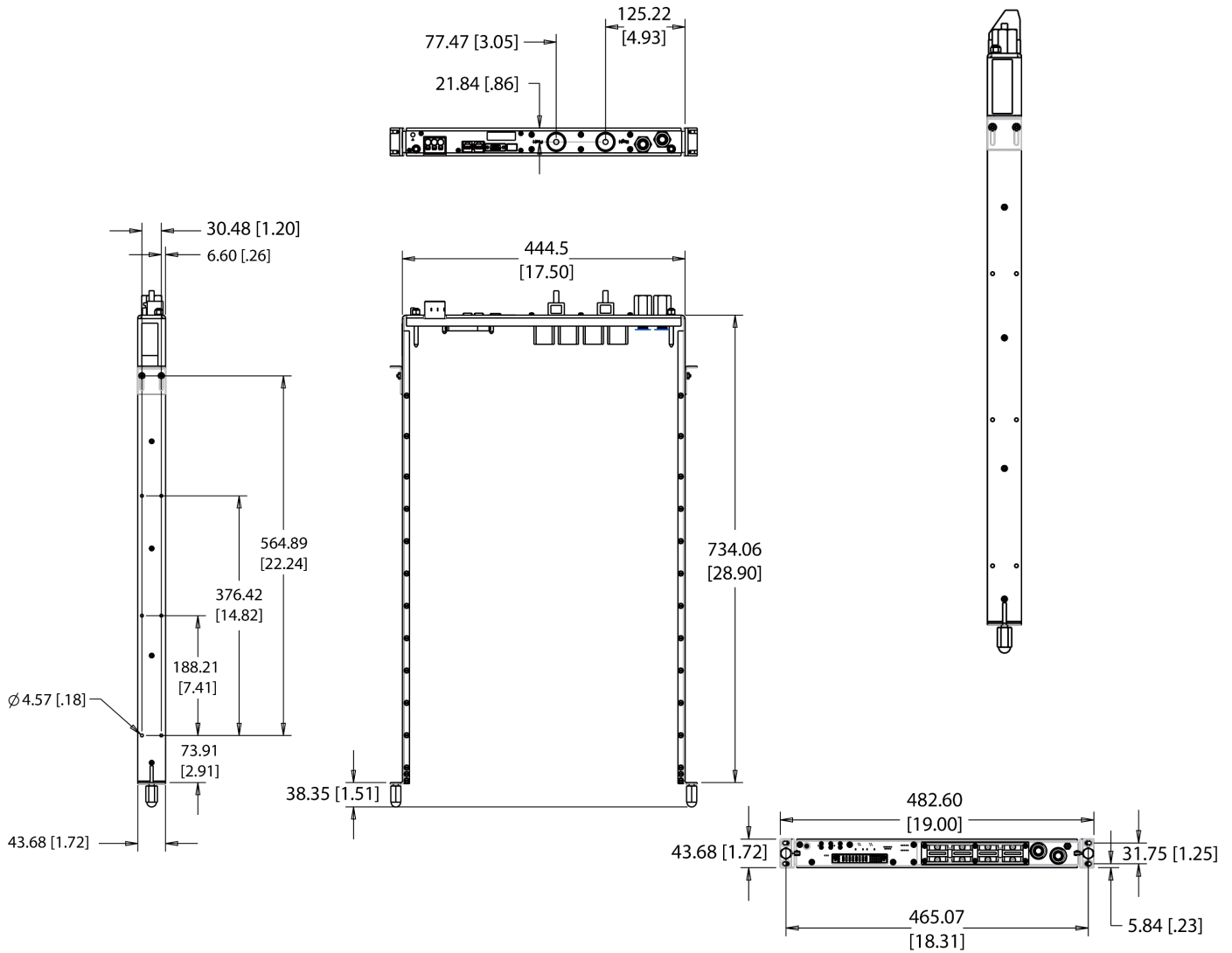
For fixed output and custom models, contact sales.



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MATING SHELF OUTLINE DRAWING



PART NUMBER	MODEL NUMBER	DESCRIPTION
T100103270-3-LF	SPS5936-3-LF	LiquaBlade Shelf Mating Kit, 1RU, for 60V/120V/180V models
T100114990-LF	SPS6133	LiquaBlade Shelf Mating Kit, 1RU, for 500V model

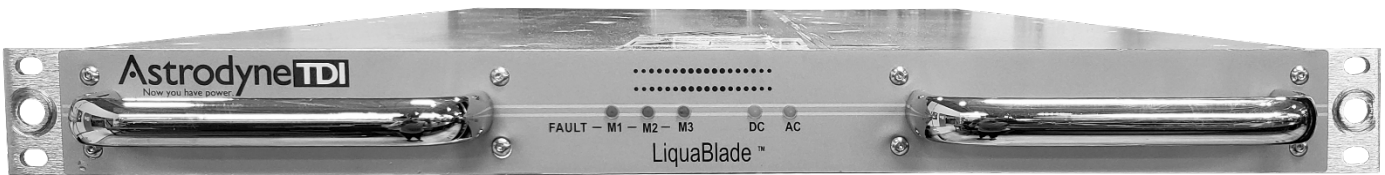


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LED & CONNECTION DIAGRAMS

Power Supply Front View



LED Indicators

- M1/2/3
OFF=OK
RED=FAULT
- DC:
OFF=No DC
GREEN=DC OK
- AC:
GREEN=AC OK
RED=FAULT

Mating Shelf Rear View

