

3-PHASE WYE (Y) or DELTA (Δ), or SINGLE PHASE or HVDC INPUT

36 kW, 48~58 VDC OUTPUT

AC / DC-DC POWER SHELF SPSTET6V3-xx



The SPSTET6V3-xx power shelf solution provides rectification, system management, and power distribution functions while maintaining high reliability and offering flexibility for future expansion.

The power shelf can be configured with up to six hot-swap capable TET4000-48-069RAS510 / TET4000-48-069RAH

series or TET4800-48-069RA series or TET6000-48-069RA series AC/DC-DC power modules that convert AC or HVDC input to 48~58 VDC output for powering IT racks, OCP racks and data centers.

The shelf has an optional slot for a Network Attached Controller, providing control functions and monitoring through a 10/100/1000 MB base Ethernet port. It can be connected directly to the data center management network.



FEATURES

- Two inputs, each input supports 3 power modules
- Input configurations: 3-phase WYE (Y) or Delta (Δ) or single phase or HVDC input
- Power modules are hot-swap capable
- Power shelf and power modules support CAN bus communication for control, programming & monitoring
- The main output with programmable voltage set point of 48-58 VDC, with a default output of 50.5 V
- Parallel operation with active digital current sharing through CAN bus
- Power modules implement the following protections: over temperature, output over voltage & output over current
- Dimensions (L x W x H): 786.2 x 537.0 x 46.5 mm (30.95 x 21.14 x 1.83 in)

APPLICATIONS

- IT racks
- OCP racks
- Data centers



1. POWER SHELF REFERENCE TABLE

			INPUT			
			AC (Y) 200-277 / 346-480 VAC	AC (Δ) 200-277 VAC	Single Phase 200-277 VAC	HVDC 240-380 VDC
OUTPUT	+48 - 58 VDC	Open Rack V3 connector ¹	SPSTET6V3-01; SPSTET6V3-01C			
			INPUT			
			AC (Y) 200-250 / 346-433 VAC	AC (Δ) 200-250 VAC	Single Phase 200-250 VAC	HVDC 240-350 VDC
OUTPUT	+48 - 58 VDC	Open Rack V3 connector ¹	SPSTET6V3-03; SPSTET6V3-03C SPSTET6V3-04; SPSTET6V3-04C			

¹ Mates with V3 rack

Notes:

Refer to Figure 2 for power supply connection at end use system.

For data sheets with alternative shelf configurations, check factory for availability.

2. ORDERING INFORMATION

MODEL	DC OUTPUT	OUTPUT CONNECTOR	AUXILIARY OUTPUT	CONTROLLER
SPSTET6V3-01	48~58 VDC	Open Rack V3 connector	Anderson 2006G1	No
SPSTET6V3-01C	48~58 VDC	Open Rack V3 connector	Anderson 2006G1	Yes
SPSTET6V3-03	48~58 VDC	Open Rack V3 connector	C39	No
SPSTET6V3-03C	48~58 VDC	Open Rack V3 connector	C39	Yes
SPSTET6V3-04	48~58 VDC	Open Rack V3 connector	C19	No
SPSTET6V3-04C	48~58 VDC	Open Rack V3 connector	C19	Yes

Note:

The default output voltage of 50.5 V each time they are powered on. The output voltage can be set within the range of 48 V~58 V through CAN Bus or NAC. The changed voltage is only valid when SHELFS power supply is maintained. After power on again, the output voltage will return to the default value.

3. TECHNICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS
Input ¹	3-Phase four wire Delta or 3-Phase five wire Wye or Single-Phase or HVDC input (Figure 2. Input Connection Diagram)
Inlet Configuration	2 Inlets (J1107 and J1108) (Table 1)
Auxiliary Outlet	2 pcs low power outlet (J1206 and J1207) with max. 16 A load (Table 1). Protected by 20 A Fuse (serviceable) When TA: +45 °C to +55 °C, the output load current must be linearly derated from full load to 75% full load.
Redundant Configuration	6+0 / 5+1 / 3+3 configuration
Rated Output Power	24060 W ² 28848 W ³ 36060 W ⁴ When TA: +45 °C to +55 °C, the output load current must be linearly derated from full load to 75% full load.
Output Connection	Open Rack V3 Power Shelf Output Connector for +48 ~ 58 VDC output (Default output 50.5 V)
Standby Output	60 W (Standby output 12 V / 5 A) ⁵ 48 W (Standby output 12 V / 4 A) ⁶ Protected by POLY-FUSE® Resettable PPTC 9 A/16 V Trip Current 15.3 A / 23 °C (serviceable)
Communication	CANBus
NAC Controller	Network Attached Controller (optional accessory)

¹ Setup at end use system.

² Max total power with 6 PSU on shelf at 45°C, rated power is reduced as per current share accuracy characteristic. See TET4000-48-069RAH/S510 datasheet.

³ Max total power with 6 PSU on shelf at 45°C, rated power is as per current share accuracy characteristic. See TET4800-48-069RA datasheet.

⁴ Max total power with 6 PSU on shelf at 45°C, rated power is as per current share accuracy characteristic. See TET6000-48-069RA datasheet.

⁵ The Standby output rated power of a single TET4000-48-069RAH / S510 or a single TET6000-48-069RA is 60 W.

⁶ The Standby output rated power of a single TET4800-48-069RA is 48 W.



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WYE Input				Delta Input				Single Input				HVDC Input			
J1107 and J1108			Auxiliary Outlet	J1107 and J1108			Auxiliary Outlet	J1107 and J1108			Auxiliary Outlet	J1107 and J1108			Auxiliary Outlet
PIN No	Signal	Function		PIN No	Signal	Function		PIN No	Signal	Function		PIN No	Signal	Function	
1	L1	AC line 1	AC line 1 (J1206)	1	L1	AC line 1	AC line 1 (J1206)	1	L	AC line	AC line (J1206)	1	(+ HVDC)	DC positive	DC positive (J1206)
2	N	Neutral	Neutral (J1206)	2	L2	AC line 2	AC line 2 (J1206)	2	N	Neutral	Neutral (J1206)	2	(- HVDC)	DC return	DC return (J1206)
3	L2	AC line 2		3	L2	AC line 2		3	L	AC line		3	(+ HVDC)	DC positive	
4	PE	Protective earth		4	PE	Protective earth		4	PE	Protective earth		4	PE	Protective earth	
5	N	Neutral		5	L3	AC line 3		5	N	Neutral		5	(- HVDC)	DC return	
6	L3	AC line 3	AC line 3 (J1207)	6	L3	AC line 3	AC line 3 (J1207)	6	L	AC line	AC line (J1207)	6	(+ HVDC)	DC positive	DC positive (J1207)
7	N	Neutral	Neutral (J1207)	7	L1	AC line 1	AC line 1 (J1207)	7	N	Neutral	Neutral (J1207)	7	(- HVDC)	DC return	DC return (J1207)

Table 1. Connection Options

4. SAFETY WARNING

Please refer to the installation instructions for detailed safety warnings.

The user assumes all responsibility and liability for proper and safe handling of the goods.
Further, the user indemnifies Bel Power Solutions Inc. from all claims arising from the handling or use of the goods.
Persons handling the product(s) must have electronics training and observe good engineering practice standards.

CAUTION: Power shelf with installed PSU modules has high leakage current. Protective Earthing connection is essential.
Multiple power sources. Disconnect all power cords before servicing.
Double pole/ neutral fusing. Disconnect the mains before servicing.
Connect the equipment to earth, before connecting it to the supply.
A power shelf equipped with PSUs is heavy. Do not lift or move it alone.

5. REFERENCE DOCUMENTS

PARAMETER	DESCRIPTION / CONDITIONS
BCD.01051	TET4000-48-069RAH Datasheet
BCM.00498	TET4000-48-069RAH Installation Instruction
BCA.00231.0	TET4000-48-069RAH CAN Communication Manual
BCD.20219	Network Attached Controller Datasheet
BCA.00257.0	SPSTET4-xx CAN Communication Manual
BCD.20170	TET4800-48-069RA Datasheet
BCM.20054	TET4800-48-069RA Installation Instruction
BCD.20346	TET6000-48-069RA Datasheet
BCM.20166	TET6000-48-069RA Installation Instruction
BCD.20345	SPSTET6V3-XX Datasheet
BCM.20167	SPSTET6V3-03 Installation Instruction
BCM.20168	SPSTET6V3-04 Installation Instruction
BCM.20169	SPSTET6V3-01 Installation Instruction



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6. OVERVIEW

The SPSTET6V3-xx is a 10U high power shelf. It can be configured with up to six hot-swap capable TET4000-48-069RAS510 / TET4000-48-069RAH Series or TET4800-48-069RA Series or TET6000-48-069RA Series AC/DC-DC power modules that convert standard AC input to DC output.

The power shelf and power module support CANBus communication for control, programming, and monitoring. The power shelf and power module are connected to the same CANBus interface. Refer to the respective CAN Communication Manual for additional information.

The power shelf has a slot for a Network Attached Controller (NAC) for providing control functions and monitoring through a 10/100/1000 MB base Ethernet port. It is hot-pluggable and supplied via the 12 V standby output of the power modules. The NAC can be configured through a web interface; the monitoring and control functions are accessed through SNMPv3

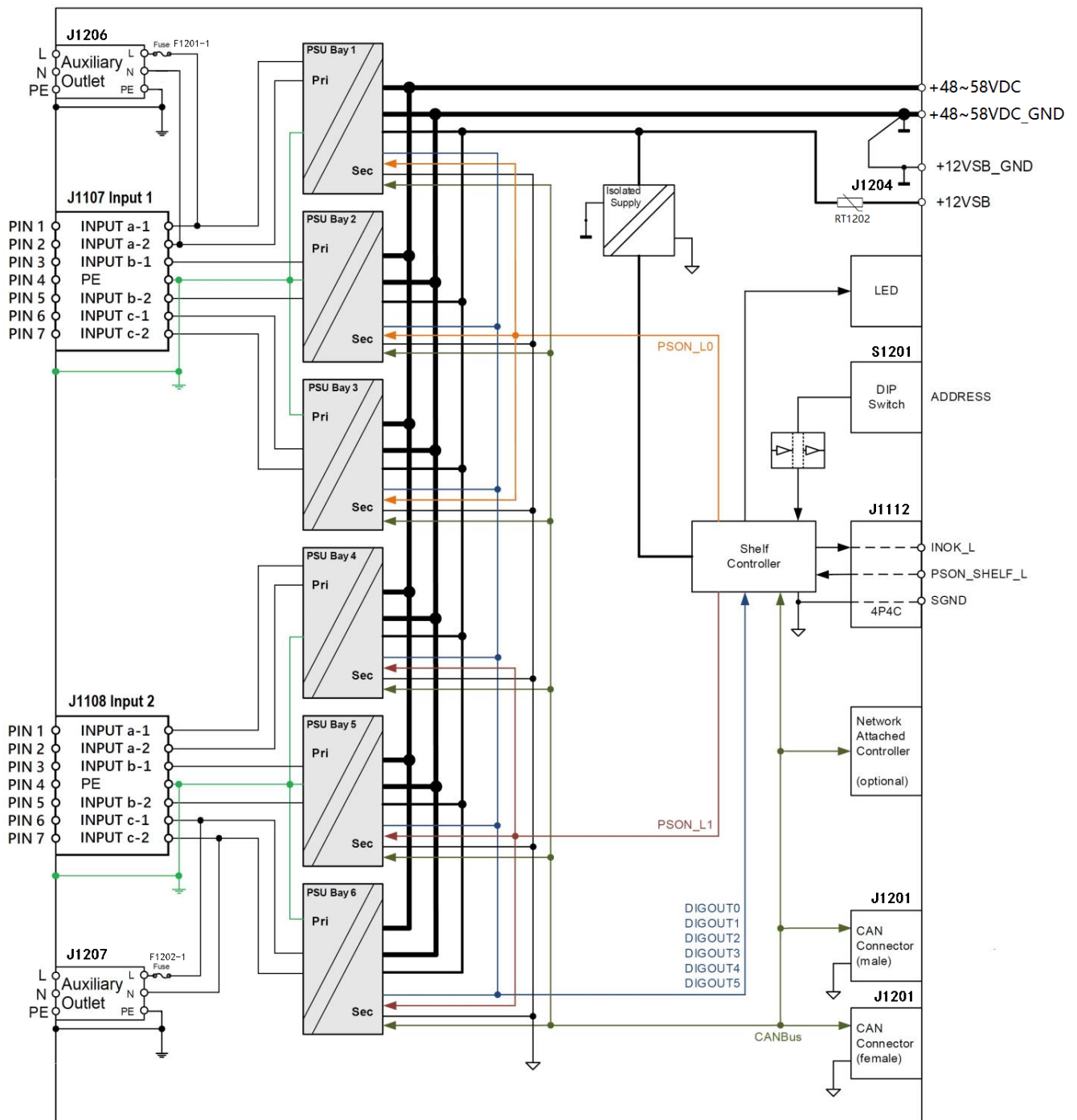


Figure 1. SPSTET6V3-xx Block Diagram



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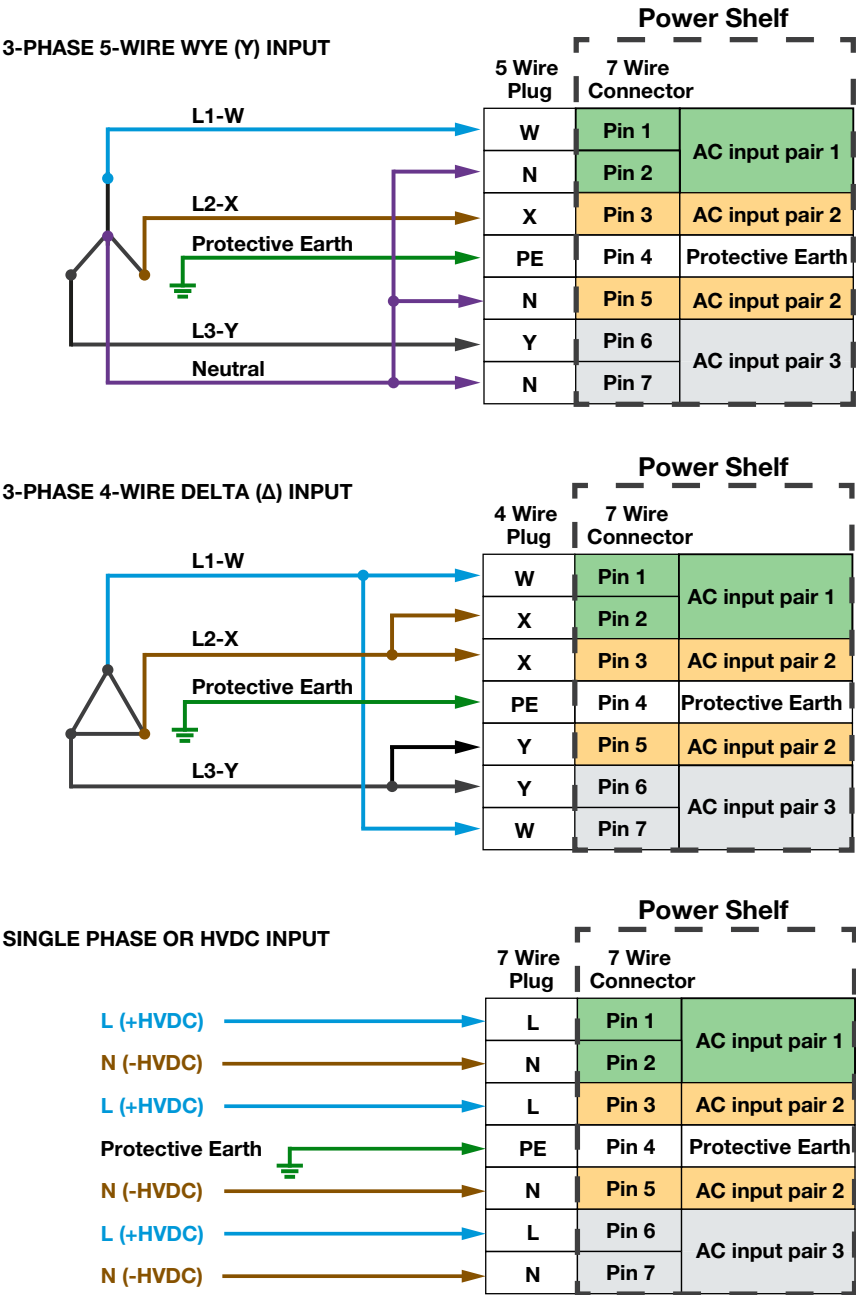


Figure 2. Input Connection Diagram

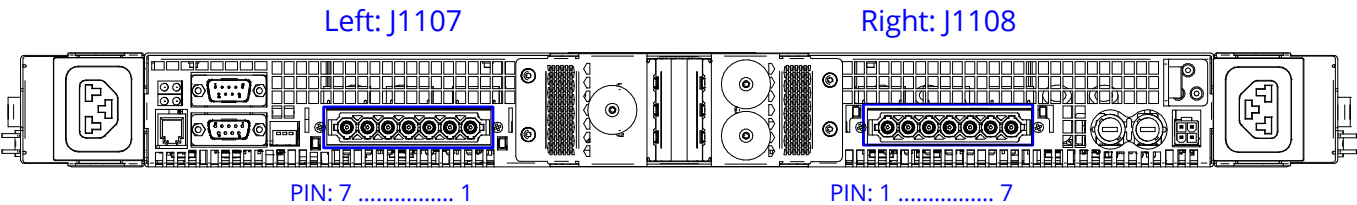


Figure 3. Position of Input Connectors (Rear view)



7. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	NOM	MAX	UNIT
<i>Input Connector (J1107, J1108)</i>					
Input Voltage Ranges (SPSTET6V3-01)	AC input	180	200~277	305	VAC
	HVDC input	192	240~380	400	VDC
Input Voltage Ranges (SPSTET6V3-03/04)	AC input	180	200~250	275	VAC
	HVDC input	192	240~350	350	VDC
Max Input Current	Per Line			52	Arms
Input Frequency		47	50 / 60	63	Hz

8. OUTPUT SPECIFICATIONS

TET4000-48-069RAH /S510

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
<i>Auxiliary Outlet (J1206 and J1207)</i>					
Output Voltage (2006G1 or SAF-D-GRID)	When J1107 and J1108 are AC inputs	180	200~277	305	VAC
	When J1107 and J1108 are HVDC inputs	192	240~380	400	VDC
Output Voltage (C39 and C19)	When J1107 and J1108 are AC inputs	180	200~250	275	VAC
	When J1107 and J1108 are HVDC inputs	192	240~350	350	VDC
Output Current				16	Arms
Fuse Protection per Line (F1201-1 & F1202-1)	Serviceable (20 A fuse)				

TET4000-48-069RAH /S510

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
<i>Main Output V1 (Output Bus Bar)</i>					
Nominal Output Voltage	When installing the PSU in SHELF, the default output will be 50.5 V when starting up, and the output voltage can be modified through NAC or CANBus.		48~58		VDC
Voltage Regulation	Programmable PSU module	-2		+2	% Vout nom
Nominal Output Power	6+0 / 5+1 / 3+3 configuration, T _A ≤ 45 °C			24000	W
Derated Output Power	6+0 / 5+1 / 3+3 configuration, T _A = 55 °C			18000	W
Nominal Output Current	6+0 / 5+1 / 3+3 configuration, T _A ≤ 45 °C			500	ADC
Derated Output Current	6+0 / 5+1 / 3+3 configuration, T _A = 55 °C			375	ADC
<i>Standby Output VSB (J1204)</i>					
Output Voltage			12		VDC
Voltage Regulation		-5		+5	% Vout nom
Output Power				60	W
Output Current				5	ADC

TET4800-48-069RA

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
<i>Main Output V1 (Output Bus Bar)</i>					
Nominal Output Voltage	When installing the PSU in SHELF, the default output will be 50.5 V when starting up, and the output voltage can be modified through NAC or CANBus.		48~58		VDC
Voltage Regulation	Programmable PSU module	-2		+2	% Vout nom
Nominal Output Power	6+0 / 5+1 / 3+3 configuration, T _A ≤ 45 °C			28800	W
Derated Output Power	6+0 / 5+1 / 3+3 configuration, T _A = 55 °C			21600	W
Nominal Output Current	6+0 / 5+1 / 3+3 configuration, T _A ≤ 45 °C			600	ADC
Derated Output Current	6+0 / 5+1 / 3+3 configuration, T _A = 55 °C			450	ADC



Standby Output VSB (J1204)

Output Voltage	12	VDC
Voltage Regulation	-5	+5 % Vout nom
Output Power	48	W
Output Current	4	ADC

TET6000-48-069RA

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Main Output V1 (Output Bus Bar)					
Nominal Output Voltage	When installing the PSU in SHELF, the default output will be 50.5 V when starting up, and the output voltage can be modified through NAC or CANBus.		48~58		VDC
Voltage Regulation	Programmable PSU module	-2		+2	% Vout nom
Nominal Output Power	6+0 / 5+1 / 3+3 configuration, $T_A \leq 45^\circ\text{C}$			36000	W
Derated Output Power	6+0 / 5+1 / 3+3 configuration, $T_A = 55^\circ\text{C}$			27000	W
Nominal Output Current	6+0 / 5+1 / 3+3 configuration, $T_A \leq 45^\circ\text{C}$			700	ADC
Derated Output Current	6+0 / 5+1 / 3+3 configuration, $T_A = 55^\circ\text{C}$			535	ADC

Standby Output VSB (J1204)

Output Voltage	12	VDC
Voltage Regulation	-5	+5 % Vout nom
Output Power	60	W
Output Current	5	ADC

Note: When T_A : $+45^\circ\text{C}$ to $+55^\circ\text{C}$, the output load current must be linearly derated from full load to 75% full load.



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8.1 PROTECTION (PER POWER MODULE)

TET4000-48-069RAH / S510

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Input Fuses (L+N)	Not user accessible, fast-acting (F)		30		A
OV Threshold V_1	Hardware protection	64	66	68	VDC
OV Latch Off Time V_1				1	ms
Nominal Power Limitation	$V_{in} > 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ VDC}$ $V_{in} > 180 \text{ VAC}$, $T_A = 55^\circ\text{C}$, $V_1 \geq 48 \text{ VDC}$	4000 3000	4100 3100		W
Nominal Current Limitation	$V_{in} > 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ VDC}$ $V_{in} > 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 42 \dots 48 \text{ VDC}$ $V_{in} > 180 \text{ VAC}$, $T_A = 55^\circ\text{C}$, $V_1 = 50.5 \text{ VDC}$	83	82 86 62		A
Power Limit Blanking Time	Time until power limit is reduced to nominal value	10			ms
Power Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ V}$. Max. duration 5 ms	4400	4500		W
Current Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ V}$. Max. duration 5 ms	81	83		A
Max Short Circuit Current V_1	$V_1 < 10 \text{ VDC}$, excluding output capacitor discharging current			83	A
Short Circuit Latch Off Time	Time to latch off when in short circuit or output under voltage ($V_1 < V_{1 \text{ UV}}$)		100		ms
Output Under Voltage Protection	$V_1 \text{ UV}$	39	40	41	VDC
Output Under Voltage Protection Delay Time V_1	$V_1 < V_{1 \text{ UV}}$		250		ms
Over Temperature on Critical Points	Inlet Ambient Temperature PFC Primary Heatsink Temperature DC/DC Primary Heatsink Temperature Secondary Sync Mosfet Temperature		60 90 90 100		$^\circ\text{C}$
OV Threshold V_{SB}	Output under voltage protection standby	13.0	13.6	14.4	VDC
UV Threshold V_{SB}	Output under voltage protection standby	9.9	10.0	10.1	VDC
Current Limitation V_{SB}	Standby over current limit	5.0	5.5		A

TET4800-48-069RA

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Input Fuses (L)	Not user accessible, fast-acting (F)		60		A
OV Threshold V_1	Hardware protection	64	66	68	VDC
OV Latch Off Time V_1				1	ms
Nominal Power Limitation	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ V}$ $V_{in} \geq 180 \text{ VAC}$, $T_A = 55^\circ\text{C}$, $V_1 \geq 48 \text{ V}$	4800 4000	4909 4349		W
Nominal Current Limitation	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ V}$ $V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 42 \dots 48 \text{ V}$ $V_{in} \geq 180 \text{ VAC}$, $T_A = 55^\circ\text{C}$, $V_1 = 50.5 \text{ V}$	100	98 102 84		ADC
Power Limit Blanking Time	Time until power limit is reduced to nominal value	10			ms
Power Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ V}$. Max. duration 5 ms	5340	5450		W
Current Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ V}$. Max. duration 5 ms	98	100		A
Max Short Circuit Current V_1	$V_1 < 10 \text{ VDC}$, excluding output capacitor discharging current			100	ADC
Short Circuit Latch off Time	Time to latch off when in short circuit or output under voltage ($V_1 < V_{1 \text{ UV}}$)		100		ms
Output Under Voltage Protection	$V_1 \text{ UV}$	39	40	41	VDC
Output Under Voltage Protection Delay Time	$V_1 < V_{1 \text{ UV}}$		250		ms
Over Temperature on Critical Points	Inlet Ambient Temperature PFC Primary Heatsink Temperature DC/DC Primary Heatsink Temperature Secondary Sync MOSFET Temperature		60 95 95 115		$^\circ\text{C}$
Output Over Voltage Protection Standby		13.0	13.6	14.4	VDC
Output Under Voltage Protection Standby		9.9	10.0	10.1	VDC
Standby Over Current Limit			4.7		ADC



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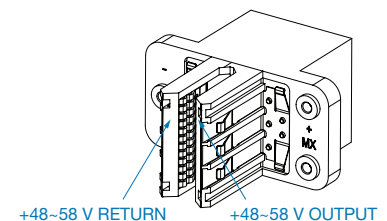
TET6000-48-069RA

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Input Fuses (L)	Not user accessible, fast-acting (F)		50		A
OV Threshold V_1	Hardware protection		64		VDC
OV Latch Off Time V_1				1	ms
Nominal Power Limitation	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ V}$	6000	6100		W
	$V_{in} \geq 180 \text{ VAC}$, $T_A = 55^\circ\text{C}$, $V_1 \geq 48 \text{ V}$	4800	5000		
	$V_{in} \geq 180 \text{ VAC}$, $T_A = 65^\circ\text{C}$, $V_1 \geq 48 \text{ V}$	3600	3900		
Nominal Current Limitation	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ V}$		119		ADC
	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 55^\circ\text{C}$, $V_1 = 50.5 \text{ V}$		95		
	$V_{in} \geq 180 \text{ VAC}$, $T_A = 65^\circ\text{C}$, $V_1 = 50.5 \text{ V}$		71.5		
Power Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 \geq 48 \text{ V}$. Max. duration 5 ms		6600		W
Current Limit during Over Subscription V_1	$V_{in} \geq 180 \text{ VAC}$, $T_A \leq 45^\circ\text{C}$, $V_1 = 50.5 \text{ V}$. Max. duration 5 ms		130		A
Output Under Voltage Protection	$V_1 \text{ UV}$	39	40	41	VDC
Output Under Voltage Protection Delay Time	$V_1 < V_1 \text{ UV}$		250		ms
Output Over Voltage Protection Standby		13.0		14.5	VDC
Output Under Voltage Protection Standby			10.0		VDC
Standby Over Current Limit			5.5		ADC

8.2 MAIN OUTPUT CONNECTOR (V_1)

The main output uses an Open Rack V3 Power Shelf Output Connector. The default output voltage of 50.5 V each time they are powered on. The output voltage can be set within the range of 48 V~58 V through CANBus or NAC. The changed voltage is only valid when SHELf's power supply is maintained. After power on again, the output voltage will return to the default value.

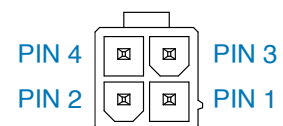
PIN OUTS (V_1)	FUNCTION	DESCRIPTION
1 (Left)	Main output _GND	+48 ~ 58 V return
2 (Right)	Main output	+48 ~ 58 V output

Figure 4. Main Output Connector V_1 8.3 +12 V_{SB} CONNECTOR (J1204)

The Standby output rated power of a single TET4000-48-069RAH/ S510 or a single TET6000-48-069RA is 60 W (12 V/5 A) while the standby output rated power of a single TET4800-48-069RA is 48 W (12 V/4 A).

Protected by POLY-FUSE(RT1202)® Resettable PPTC 9 A/16 V Trip Current 15.3 A / 23 °C (serviceable)

PIN OUTS (J1204)	FUNCTION	DESCRIPTION
1, 3	V _{SB} _GND	+12 V _{SB} return
2, 4	V _{SB}	+12 V _{SB} output

Figure 5. +12 V_{SB} Connector (J1204)

8.4 LOGIC SIGNALS

PIN OUTS (J1112)	FUNCTION	DESCRIPTION
1	DNC	Do Not Connect
2	INOK_L	Active-low output Low = At least 1 power module has input in range High = Otherwise
3	PSON_SHELF_L	Active-low input Low = Turn-on main output V _I of power modules High = Turn-off main output V _I of power modules
4	SGND	Signal ground

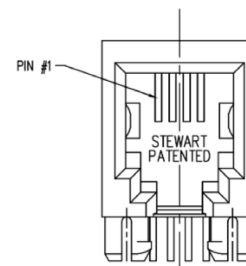


Figure 6. Signal Connector Pin Out
(4P4C Modular Jack)

MAXIMUM RATINGS

SYMBOL	DESCRIPTION	MIN	NOM	MAX	UNIT
V _{I/O}	I/O Voltage	0		24	V
I _{I/OI}	I/O Sink Current			20	mA

I/O CHARACTERISTICS

SYMBOL	DESCRIPTION	MIN	NOM	MAX	UNIT
V _{IL}	High-level input voltage	1.5			V
V _{IH}	Low-level input voltage			0.8	V
V _{OL}	High-level output voltage		3.1 ⁷		V
V _{OH}	Low-level output voltage, @ 10 mA Sink Current	0.2			V
V _{OH}	Low-level output voltage, @ 20 mA Sink Current	0.4			V

⁷ Without external pull-up.

SHELF I/O CIRCUITRY

All I/O are implemented as open collector with a weak pull-up. The I/O are internally pulled up to 3.3 V via a 10 k Ω resistor. The schematic drawing represents the internal circuit of the shelf. External pullup resistors to higher voltages may be added. When selecting external pullups, please consider the maximum ratings.

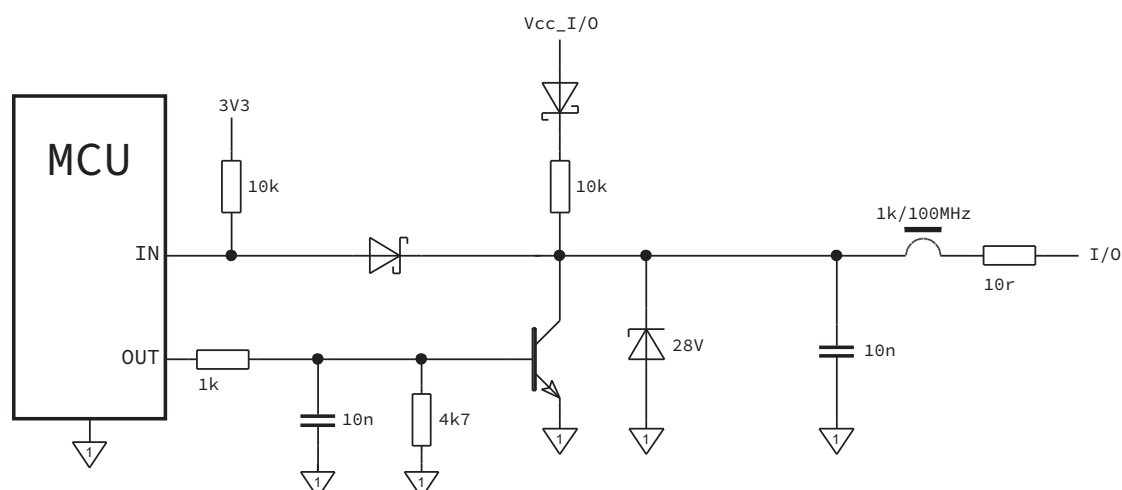


Figure 7. I/O Circuitry



8.5 PSON_SHELF_L SWITCH (OPTIONAL)

The PSON_SHELF_L Switch is a switch to enable/disable the main output V1 of the front-end. With ON = Turn-on main output V1 of power modules, OFF = Turn-off main output V1 of power modules. This switch is connected to pin3 and pin4 of J1112 (4P4C Modular Jack), so they cannot be used simultaneously.

Note: The PSON_SHELF_L switch is not equipped by default. Please contact the factory if needed.

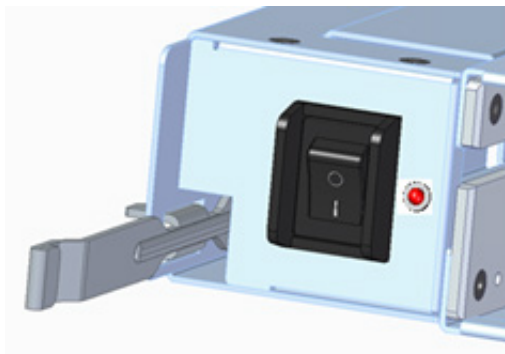


Figure 8. PSON_L Switch (Front View)

9. COMMUNICATION

Communication to the power shelf and the power modules is via CANBus. The power modules also use CANBus for its active current-share function. For further information please refer to the CAN Communication Manual documents (BCA.00257.0 and BCA.00231.0).

9.1 CAN BUS INTERFACE (J1201 PINOUT)

The CAN bus interface serves for information exchange between paralleled power supplies (e.g., for current share) and for communication with a system controller (e.g., voltage setting, monitoring). The CAN bus operates at 1000 kbit/s with a Bel defined protocol. System wiring requires only interconnection of CAN_H and CAN_L lines, in addition a 120 Ohm termination resistor is required at each end of the CAN bus to prevent signal reflections. If the Network Attached Controller (NAC) is installed, there is no need to install a termination resistor on the lower port of J1201 because NAC contains a 120 Ohm resistor inside.

Note: To enable active current share between paralleled power supplies, their CAN bus interface must be interconnected.

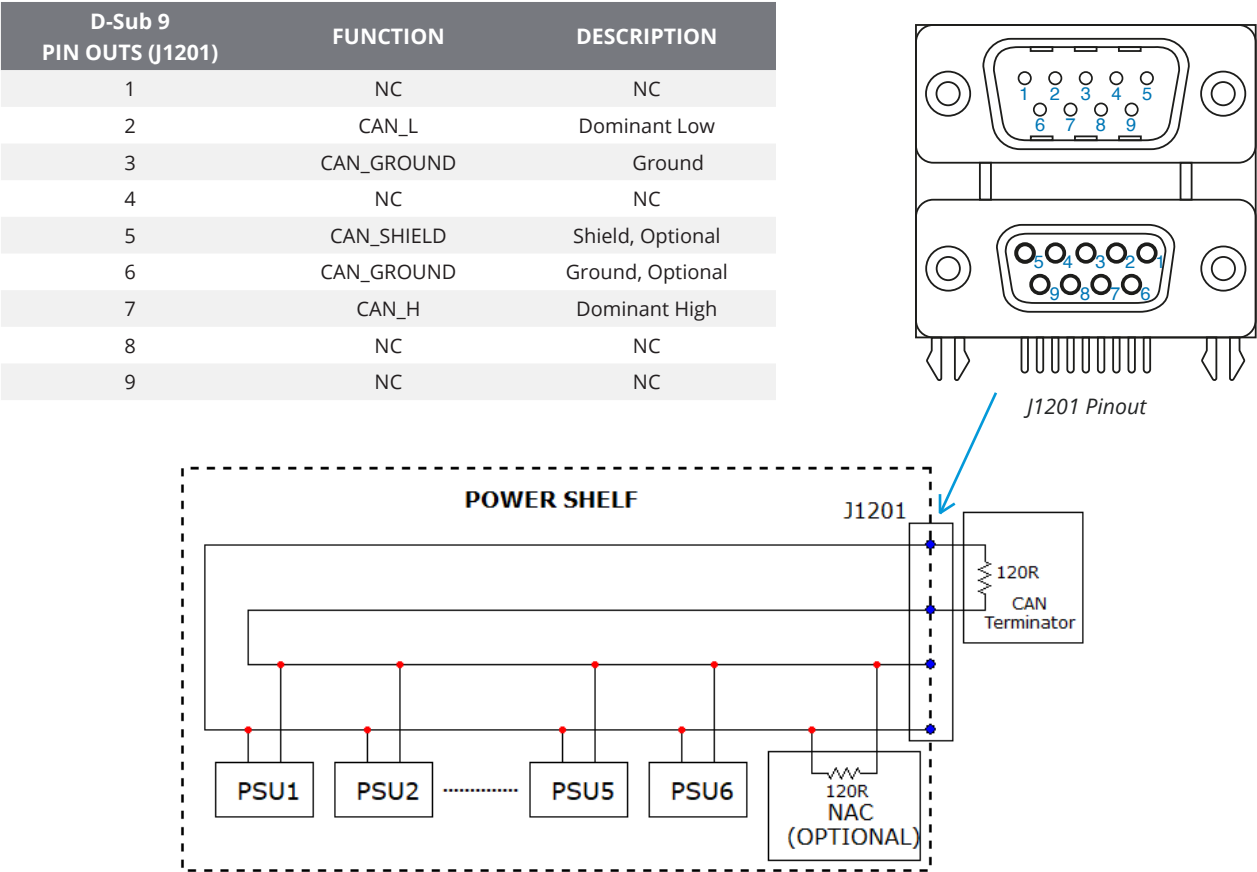


Figure 9. CAN BUS INTERFACE (J1201 Pinout)

9.2 ADDRESSING

The power shelf and the power modules are individually addressed. The individual addresses are configured via DIP Switch (S1201) according to the table below.

DIP SWITCH			ADDRESS			
POSITION 1	POSITION 2	POSITION 3	PSU1	PSU2	PSU6	Backplane
OFF	OFF	OFF	0x01	0x02	0x06	0x0F
OFF	OFF	ON	0x11	0x12	0x16	0x1F
OFF	ON	OFF	0x21	0x22	0x26	0x2F
OFF	ON	ON	0x31	0x32	0x36	0x3F
ON	OFF	OFF	0x41	0x42	0x46	0x4F
ON	OFF	ON	0x51	0x52	0x56	0x5F
ON	ON	OFF	0x61	0x62	0x66	0x6F
ON	ON	ON	0x71	0x72	0x76	0x7F



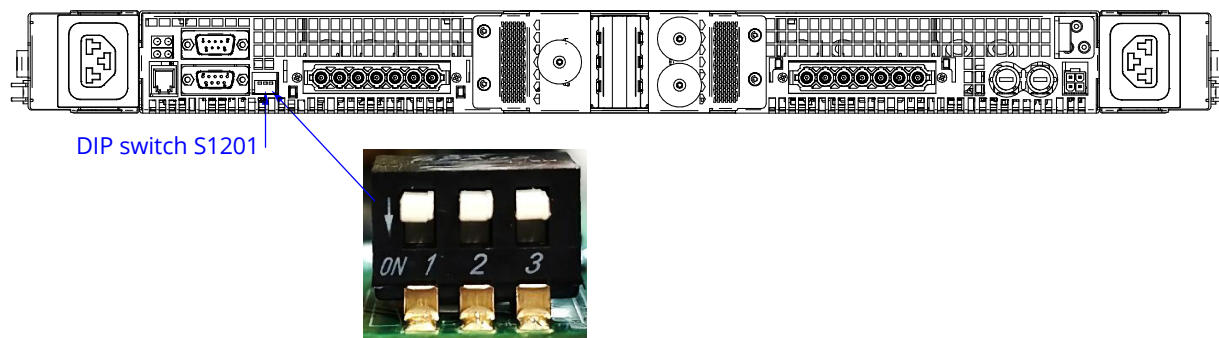


Figure 10. DIP Switch Connector S1201 (Rear view)

9.3 NETWORK ATTACHED CONTROLLER (OPTIONAL)

The Network Attached Controller is a shelf level controller providing monitoring and control functions through a 10/100/1000 MB base Ethernet port. It is hot-pluggable and supplied via the 12 V standby output of the power modules. The controller can be configured through a web interface; the monitoring and control functions are accessed through SNMP. See BCA.20048 for Network Attached Controller Software Documentation.

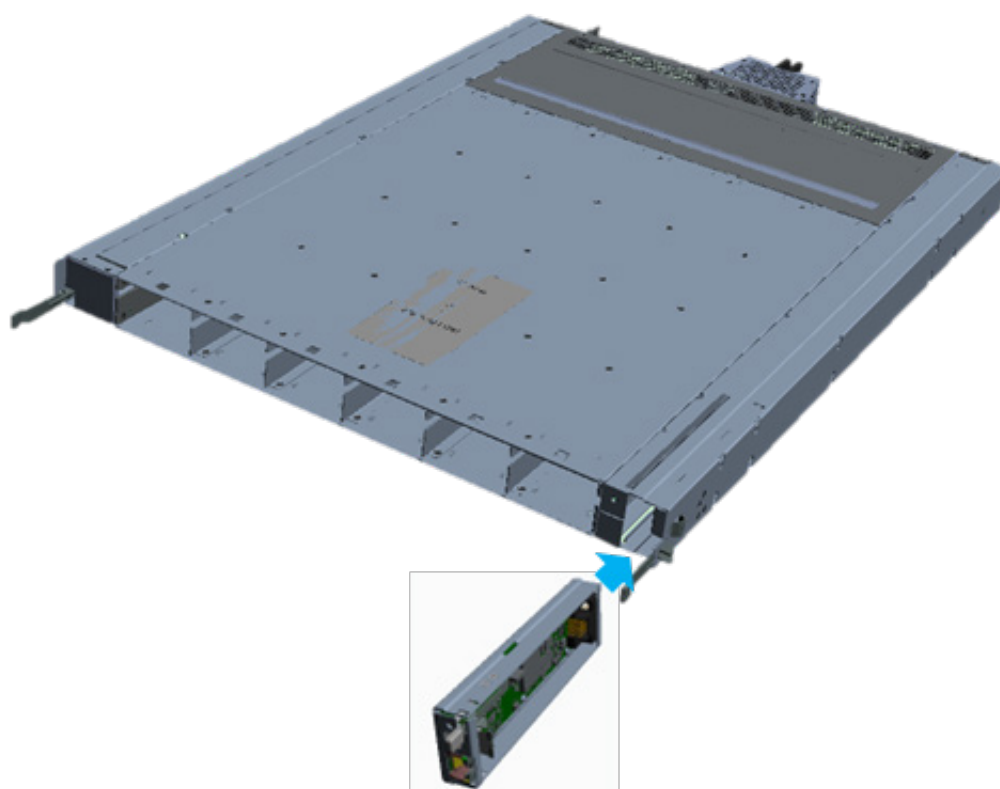


Figure 11. Network Attached Controller (Isometric View)

10. PARALLEL OPERATION

Up to 8 SPSTET6V3-xx power-shelves can be configured for parallel operation.

For parallel operation:

- Connect the following:
 - V_I Main Output
 - V_{SB} Standby Output
 - CANBus
- NAC
 - Per power-zone, install only 1 NAC.
 - If a NAC is used, then install it either on the top-shelf or the bottom-shelf.
 - If a NAC is installed, a CAN Terminator on that shelf is not required. The NAC has termination assembled internally.
- CANBus connection and termination
 - Use CANBus cables (see Accessories) to connect the CAN ports between shelves.
 - Connect a CAN Terminator (see Accessories) to the top-shelf and bottom-shelf.
 - Set the power-shelf address via the DIP Switches
- Set the power-shelf address via the DIP Switches

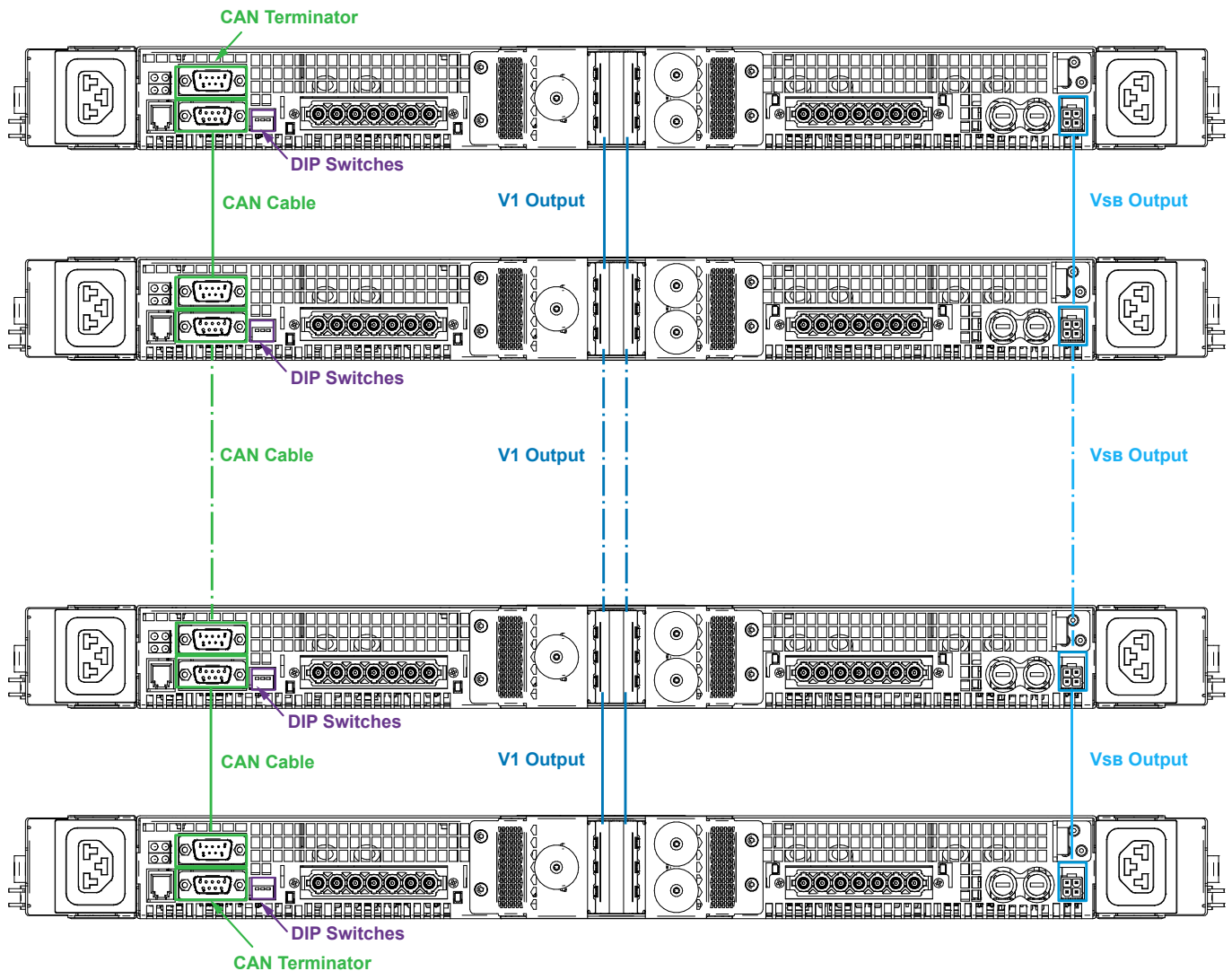


Figure 12. Parallel Operation

11. LEDs

11.1 POWER MODULE LEDS (FRONT SIDE)

Each power module has 2 LEDs to indicate status condition. LED number one is green and indicates AC power is on or off, while LED number two is bi-colored: green and yellow to indicate DC power presence or fault conditions.

OPERATING CONDITION	LED SIGNALING
AC LED	
AC Line within range	Solid Green
AC Line out of range	Off
DC LED ⁸	
V ₁ or V _{SB} out of regulation	
Over temperature shutdown	
Output over voltage shutdown (V ₁ or V _{SB})	Solid Yellow
Output under voltage shutdown (V ₁ or V _{SB})	
Output over current shutdown (V ₁ or V _{SB})	
Invalid CANBus Node-Id	Blinking Yellow
Main output disabled by application	Blinking Green
Normal Operation	Solid Green
Power module is back supplied & AC Line out of range	Blinking Yellow
Otherwise	Off

⁸ The order of the criteria in the table corresponds to the testing precedence in the controller. LEDs are only available if sufficient input voltage is applied for operation of the internal supply circuits.

11.2 POWER SHELF LEDS (REAR SIDE)

LED	FUNCTION	DESCRIPTION
LED 1	INOK_L	On if INOK_L is low. See “Logic Signals”
LED 2	PSON_SHELF_L	On if PSON_SHELF_L is low. See “Logic Signals”
LED 3	-	Reserved
LED 4	WATCHDOG	Blink 1 Hz if the Shelf Controller is alive.

NOTE: All 4 LEDs will blink during the FW bootload.



Figure 13. LEDs Layout

12. AUXILIARY OUTLET

The 2 connectors are used to provide power to the Network Switch Devices. Each connector is connected to a set of the line terminals from input connector (J1107 and J1108). These are protected by a 20 A fuse on the line terminal. See Safety Warning when servicing the fuse.

When a power shelf is operated at ambient temperature of +45 °C to +55 °C, the Output load current must be linearly derating from full load to 75% full load.

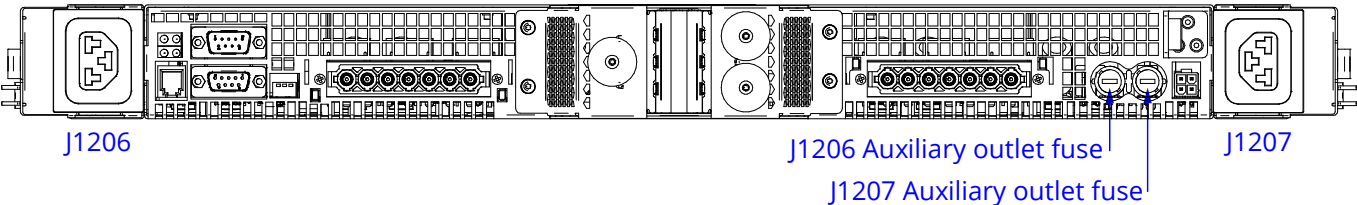


Figure 14. Auxiliary outlet connectors position (Rear view)



13. SAFETY, REGULATORY AND EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	CRITERION
Agency Approvals	Approved to the latest revisions / amendments of the following standards: UL/CSA 62368-1, EN 62368-1 and IEC 62368-1	Approved
Insulation	Input (L/N) to case (PE) Input (L/N) to output Output to case (PE)	Basic Reinforced Functional
Electrical Strength Test	Input to case Input to output (tested by manufacturer only)	Min. 2500 VDC Min. 5000 VDC
Conducted Emission	EN 55032 / CISPR 22: 0.15 ... 30 MHz, QP and AVG	Class A
Radiated Emission	EN 55032 / CISPR 22: 30 MHz ... 1 GHz, QP	Class A
ESD Contact Discharge	IEC / EN 61000-4-2, ± 8 kV	A
ESD Air Discharge	IEC / EN 61000-4-2, ± 15 kV	A
Radiated Electromagnetic Field	IEC / EN 61000-4-3, 10 V/m	A
Burst	IEC / EN 61000-4-4, level 3 AC port ± 2 kV, 1 minute	A
Surge	IEC / EN 61000-4-5, level 3 Line to earth: ± 2 kV Line to line: ± 2 kV	A
RF Conducted Immunity	IEC/EN 61000-4-6, Level 3, 10 Vrms	A

14. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Operating Temperature	Vi min to Vi max, I1 nom, ISB nom at 4000 m Vi min to Vi max, I1 nom, ISB nom at 1800 m	0 0		+35 +45	°C
Extended Temp. Range	Derated output	+45		+55	
Non-Operating Temperature		-40		+70	°C
Altitude	Operating: Operational, above Sea Level (see derating)			4000	m
Shock	Operating: 11 ms half-sine shocks in 6 axis 5 per each direction Non-Operating: 11 ms half-sine shocks in 6 axis 10 per each direction		6 12		g
Vibration	Operating: 0.5 g Sinusoidal in 3 axis (x, y, z) 10 sweep cycles for each direction (2 hours 13 minutes) Non-Operating: 1 g Sinusoidal in 3 axis (x, y, z) 10 sweep cycles for each direction (2 hours 13 minutes)	5 5		500 500	Hz



15. CONNECTORS

DESCRIPTION	REFERENCE DESIGNATOR	TYPE	MANUFACTURER	MPN
Input Connector	J1107 J1108	/	Positronic Industries Positronic Industries BIZLINK	SP10RSSS48RM220A1/AA-2269 SP10RSSS48M220A1/AA-2269 747-G3-07B
Logic Signal Connector	J1112	4P4C Modular Jack	Bel Fuse Inc.	SS-6444-NF
+12 V _{SB} Output Connector	J1204	/	Amtek	5W4200L1-202T0BAUK01
CAN Connector	J1201	Dual port D-SUB 9	Norcomp	189-009-413R571
V _I Output Connector	/	Open Rack V3 Power Shelf Output Connector	BIZLINK	747-BL01B
Aux. outlet (SPSTET6V3-01)	J1206, J1207	/	ANDERSON	2006G1 or SAF-D-GRID
Aux. outlet (SPSTET6V3-03)	J1206, J1207	C39 type	Shenzhen B-Star Technology Co., Ltd	BS-C39-3AB-1844B
Aux. outlet (SPSTET6V3-04)	J1206, J1207	C19 type	RONG FENG INDUSTRIAL CO LTD	SS-3D-1.0-4.8V

Note: Equivalent connectors might be used without notice.

15.1 CONNECTOR PIN ASSIGNMENT

Input Connector (J1107, J1108)

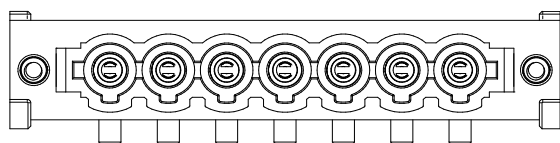
J1107: Positronic: SP10RSSS48RM220A1/AA-2269 or equivalent

J1108: Positronic: SP10RSSS48M220A1/AA-2269 or equivalent

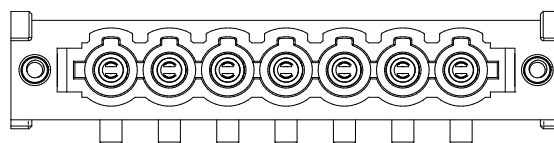
Mating Part for J1107 and J1108:

Connector: Positronic: SP10RSSS1F0W01/AA-2268 or equivalent

Terminal: Positronic: FC4008DS/AA-2272 or equivalent



J1107 PINs: 71



J1108 PINs: 17

Figure 15. Input Connectors (J1107, J1108)

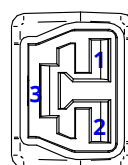
Auxiliary Outlet (J1206, J1207)

MPN: 2006G1 or SAF-D-GRID (SPSTET6V3-01)

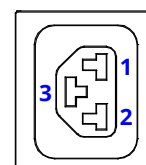
BS-C39 (SPSTET6V3-03)

SS-3D (C19 type) (SPSTET6V3-04)

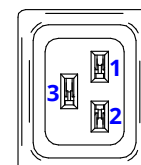
PIN	FUNCTION	DESCRIPTION
1	Positive or Line	Pin 1 is as Positive / Line for DC input / 3-phase input
2	Negative or Neutral or Line	Pin 2 is as Negative for DC input, and as Neutral / Line for Wye / Delta input
3	Ground	Protective bonding earth



2006G1 or SAF-D-GRID
(SPSTET6V3-01)



BS-C39
(SPSTET6V3-03)



SS-3D (C19 type)
(SPSTET6V3-04)

Figure 16. Auxiliary Outlet (J1206, J1207)

16.MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Dimensions	(W x H x D)	537.0 x 46.5 x 786.2			mm
		21.14 x 1.83 x 30.95			in
Weight	Shelf only	9			kg
	With 6 PSU installed	25			kg

SPSTET6V3-01 /-03 /-04 MECHANICAL DATA

Note: Finished good may look different from images.

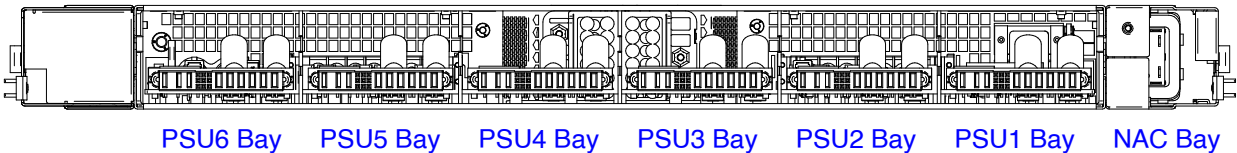


Figure 17. SPSTET6V3-01/-03/-04 PSUs Bay Arrangement (Front View)

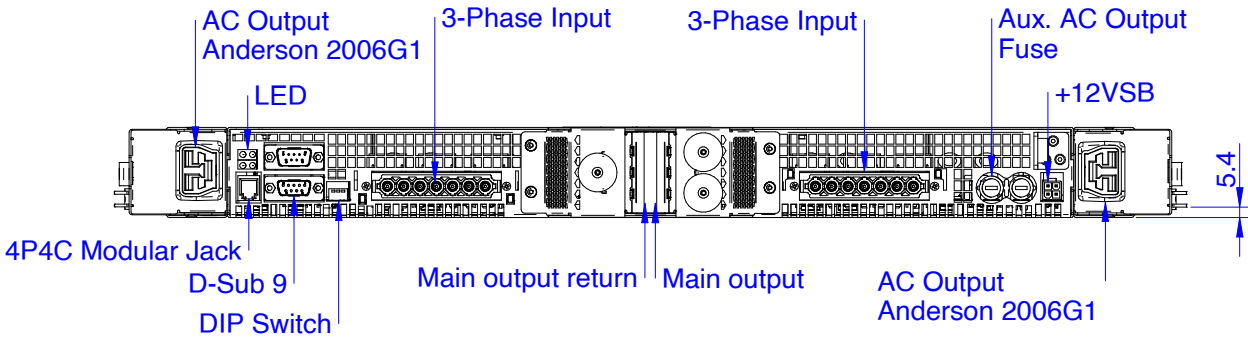


Figure 18. SPSTET6V3-01 Connector Positions (Rear View)

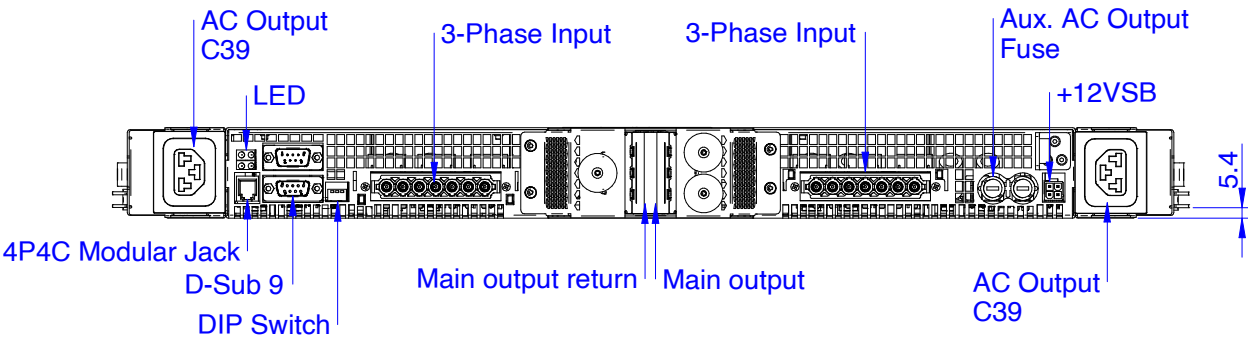


Figure 19. SPSTET6V3-03 Connector Positions (Rear View)

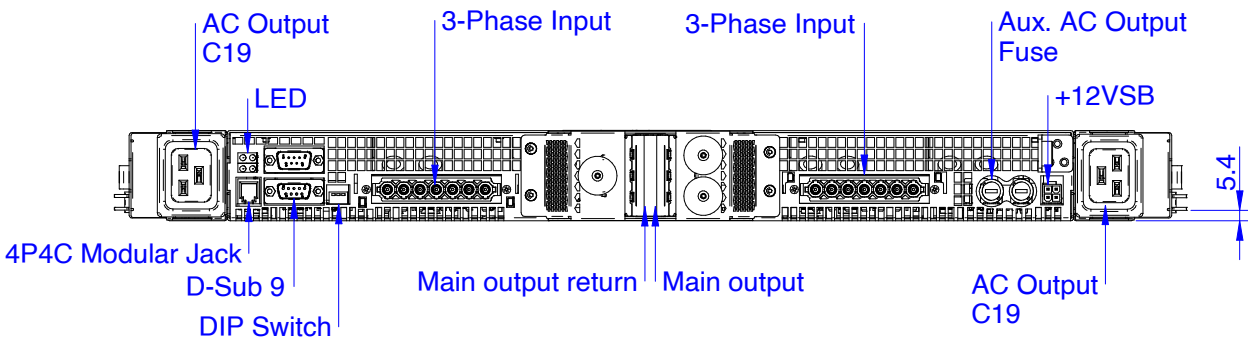


Figure 20. SPSTET6V3-04 Connector Positions (Rear View)



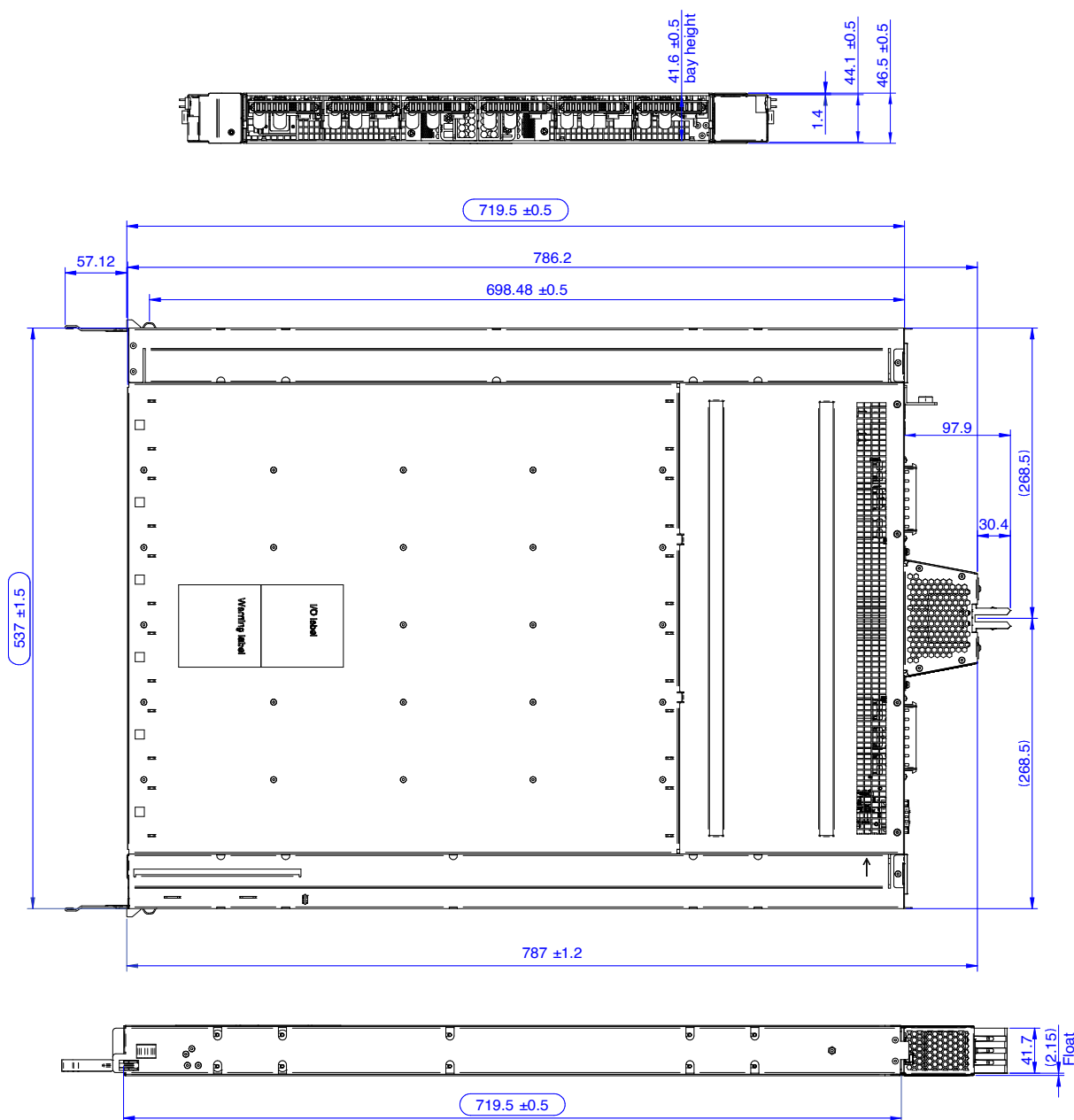


Figure 21. SPSTET6V3-xx Mechanical Drawing with Dimensions (Front, Top, Side View)



Figure 22. SPSTET6V3-xx (Isometric View)



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17. ACCESSORIES

ITEM	DESCRIPTION	ORDERING PN
Network Attached Controller	The Network Attached Controller provides easy access to monitoring and control functions through SNMP.	NAC3006-02
Blanking Panel	Power Rack Blanking Panel	SPSPFE3-BP01G
CANBus Terminator (female)	D-SUB 9; Pinout the same as J1201; 120 Ohm resistor between CAN_H and CAN_L	SPSTET4-CAN-KIT
CANBus Terminator (male)	D-SUB 9; Pinout the same as J1201; 120 Ohm resistor between CAN_H and CAN_L	
CANBus Cable	D-SUB 9; Pinout the same as J1201; Cable length = 110 mm	

18. REVISION HISTORY

REV	DESCRIPTION	PRODUCT VERSION	DATE	AUTHOR
1	Initial Draft	Preliminary	01-04-2026	Eisen Xu
2	Add the following file numbers: IN "5. REFERENCE DOCUMENTS:" BCD.20346 TET6000-48-069RA Datasheet BCM.20167 SPSTET6V3-03 Installation Instruction BCM.20168 SPSTET6V3-04 Installation Instruction BCM.20169 SPSTET6V3-01 Installation Instruction	1-0	04-20-2026	Eisen Xu
A	Replace the image in Figure 22.	A-0	08-17-2026	Eisen Xu

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.



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