HDA1500 series

XP Power

1.5kW Fan cooled

AC-DC power supplies

The HDA1500 series of programmable, scalable AC-DC power supplies deliver 1.5kW of power in a high efficiency, high power density chassis mount package. HDA1500 offers users exceptional output voltage and output current programming (0–105%) via multiple digital communication protocols including PMBus, RS485, MODBUS and Ethernet.

The HDA1500 includes active current sharing, an integrated ORing diode for parallel operation, remote on/off control, remote sense functionality, and a 5VDC standby output available whenever the main supply is active.

HDA1500's programmability, scalability, high efficiency, and ITE safety approvals make it ideal for a wide range of test and measurement, factory automation, process control and other industrial technology applications.

Features

- Programmable output voltage (0-105%)
- Programmable output current (0-105%)
- High efficiency up to 93%
- Single phase input 90 to 264VAC
- Fully featured signals & controls
- Multiple digital protocols - PMBus, MODBUS, RS485 and ethernet
- ITE safety agency approvals
- Graphical user interface (GUI)
- Parallel operation
- 5VDC/1A standby supply
- Overvoltage, overload and overtemperature protection
- 3 year warranty

Applications

Robotics / Industrial Electronics

Lasers

LED Heating

Semiconductor Manufacturing

Technology

Dimensions

313.85 x 63.5 x 127mm (12.36" x 2.50" x 5.0")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number[1]	Output voltage V1	Output current		Efficiency[2]	Output power
		Min	Max		
HDA1500PS12	12.0VDC	0.0A	125.0A	89%	1.5kW
HDA1500PS15	15.0VDC	0.0A	100.0A	90%	1.5kW
HDA1500PS24	24.0VDC	0.0A	62.5A	92%	1.5kW
HDA1500PS30	30.0VDC	0.0A	50.0A	92%	1.5kW
HDA1500PS36	36.0VDC	0.0A	41.7A	92%	1.5kW
HDA1500PS48	48.0VDC	0.0A	31.3A	92%	1.5kW
HDA1500PS57	57.0VDC	0.0A	26.3A	93%	1.5kW
HDA1500PS120	120.0VDC	0.0A	12.5A	92%	1.5kW
HDA1500PS150	150.0VDC	0.0A	10.0A	92%	1.5kW
HDA1500PS250	250.0VDC	0.0A	6.0A	92%	1.5kW
HDA1500PS400	400.0VDC	0.0A	3.75A	92%	1.5kW

Notes:

1. Add suffix on model name to indicate interface cards options e.g. HDA1500PS12-PMB for PMBus, -MOD for MODBUS, -RS4 for RS485 and -ETH for Ethernet.
2. Measured with 230VAC input and full load.

HDA1500 series

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage	90		264	VAC	See derating curve
Input frequency	47		63	Hz	
Power factor		0.99/0.95			115/230VAC at full load
Input current			18/9	A	115/230VAC
Inrush current			30/45	A	115/230VAC
Earth leakage current			2.0	mA	264VAC/60Hz
Input protection	F20A/250V internal fuse				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	12		400	VDC	See models & ratings table
Output trim[1]		±5.0		%	By potentiometer
Output voltage program[2]	0		105	%	Of rated output
Output current program[2]	0		105	%	Of rated output
Voltage tolerance[3]			±2	%	Of rated output voltage
Current tolerance[3]			±3	%	Of rated output current
Minimum load	No minimum load required				
Start up delay			1.3	s	230VAC at full load
Start up rise time			100/200	ms	At full load (low voltage/high voltage models)
Hold up time	8	14		ms	230VAC at full load
Line regulation			±1	%	
Load regulation			±1	%	V1, 0 to 100% load
			±3	%	5VDC standby, 0 to 100% load
Transient response			1	%	For a 25% step load change
Ripple & noise			1	% pk-pk	1.25% for 12VDC model. Measured with 20 MHz bandwidth and using 305mm twisted pair wire terminated with 0.1µF ceramic capacitor and 47µF electrolytic.
Overvoltage protection	Tracks output voltage, recovery after AC recycle or via INH, see application notes				
Overtemperature protection	Auto recovery thermal protection				
Overload protection		105		%	Rated power, constant current
Short circuit protection	Auto recovery				
Temperature coefficient		±0.02		%/°C	0 to +50°C
Remote sense	Compensates for 0.5VDC max voltage drop If remote sense is not required, local sense must be used				
Enable	Output must be enabled. See Application notes, power supply is shipped with enable links fitted				
Current share	Available on -PMB, -MOD and -ETH models				
Standby output	5VDC at 1.0A, present whenever AC is applied				

Notes:

1. Only available for -RS4 option.
2. Manual voltage adjust and current adjust available for -RS4 option
3. Tolerance includes setup time tolerance, line regulation and load regulation.

HDA1500 series

General

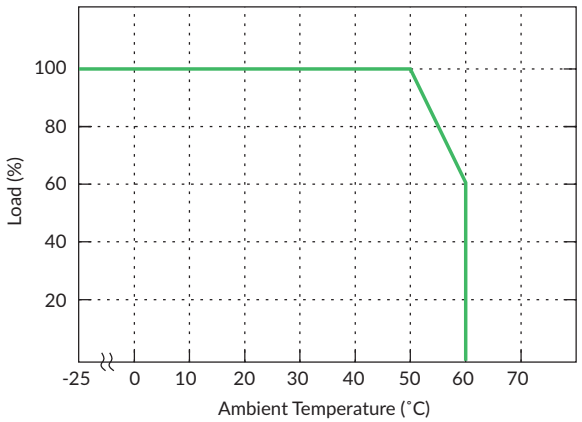
Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	89		93	%	230VAC Full load
Isolation: input to output	3000			VAC	Test is done without enclosure (top cover & U-base). With enclosure, test with DC voltage (input to output 4242VDC input to ground 2121VDC and output to ground 707VDC
input to ground	1500			VAC	
output to ground	500			VAC	
Switching frequency		40		kHz	PFC converter
	45		250		PWM, variable
Power density			9.7	W/in³	
Signals and controls					Enable, Current share, V program, I program, 5VDC standby, power OK
Mean time between failure	1000			khrs	MIL-HDBK-217F, notice 2 25°C GB
Weight		2.6 (5.7)		kg (lb)	

Environmental

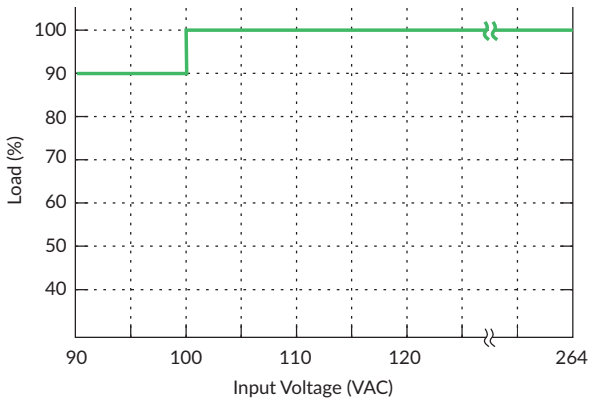
Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-25		+60	°C	Derate linearly from 100% load at 50°C to 60% load at 60°C
Storage temperature	-40		+85	°C	
Cooling	Internal fan fitted, speed increases with load and internal temperature				
Humidity	20		90	%RH	
Vibration			2	g	10-500 Hz, 10 min/cycle, 60 min period for each axis, compliant to IEC68-2-6, IEC 68-2-64

Derating curve

Thermal derating curve



Input derating curve



Signals & controls

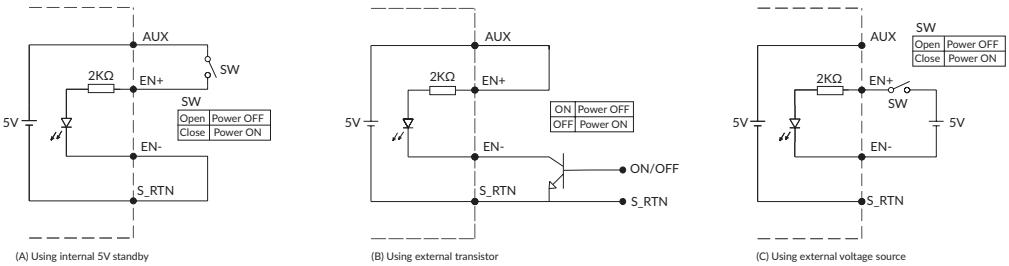
Status LED Description

Condition	LED status	LED signal	Description
DC output OK	G SOLID	G	DC output is ON/enabled in local mode
DC output OK (remote)	O SOLID	O	DC output is ON/enabled in remote mode
DC output disabled	MEDIUM FLASH		DC output is OFF/diabled (standby) in local mode
DC output disabled (remote)	MEDIUM FLASH		DC output is OFF/disabled (standby) in remote mode
Over voltage	FAST FLASH		DC output over voltage protection mode
Over load	R SOLID	R	DC output over current protection mode
Over temperature	R SLOW BLINK	R	High temperature at an internal measurement point
Fan fail	DOUBLE FLASH		Fan failure
AC failure	SLOW FLASH		AC input is below the start up voltage
Internal fault	TRIPLE FLASH		Internal failure*
Parallel connection	ALTERNATE FLASH		Establishing parallel connection

100ms

*Please contact XP Power for further details

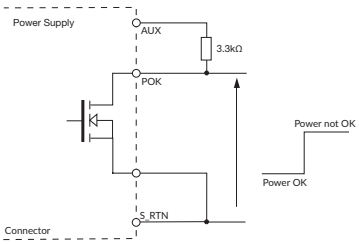
Remote enable



(A) Using internal 5V standby (B) Using external transistor (C) Using external voltage source

Refer to interface card details for corresponding pin numbers

POK signal



Open drain signal, low when PSU turns on
Maximum sink current: 20mA, Maximum drain voltage: 40V
Refer to interface card details for corresponding pin numbers

Supported interface/protocol per option:

Model	Interface	Protocol
- PMB	RS-485 I²C	XP Standard Protocol (ASCII commands) PMBUS (meet)
- MOD	RS-485 I²C	MODBUS PMBUS (meet)
- RS4	RS-485	XP Standard Protocol (ASCII commands)
- ETH	Ethernet	ARP, Device Search Utility (DSU), DHCP Client, IPv4, SNMP, TCP, UDP, IC

EMC: emissions

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A	
Radiated	EN55032	Class A	
Harmonic currents	EN61000-3-2	Class A	
Voltage flicker	EN61000-3-3		

Emissions - immunity

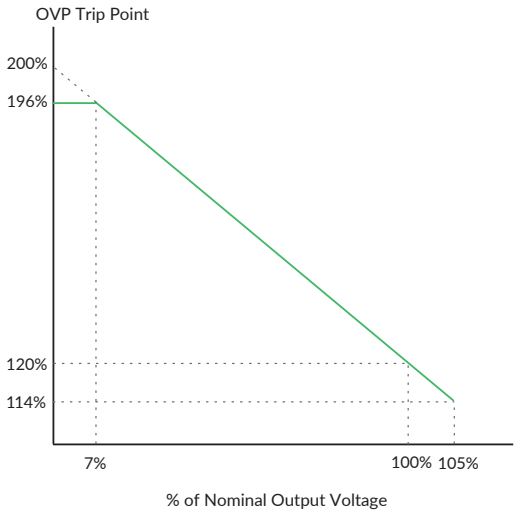
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	2/3	A	±4kV contact, ±8kV air discharge
Radiated	EN61000-4-3	3V/m	A	
EFT/burst	EN61000-4-4	2	A	±1kV (AC input), ±0.5kV (communication port)
Surges	EN61000-4-5	Installation class 3	A	±1kV line to line, ±2kV line to earth
Conducted	EN61000-4-6	3V	A	
Magnetic field	EN61000-4-8	1A/m	A	
Dips and interruptions	EN55035	Dip 30% 500ms	A/B	High line/Low line
		Int >95% 10ms	A	
		Int >95% 5000ms	B	

Safety approvals

Certification	Standard	Notes & conditions
CB	IEC62368-1	Audio/video, information and communication technology equipment
UL	UL62368-1	
EN	EN62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Application notes

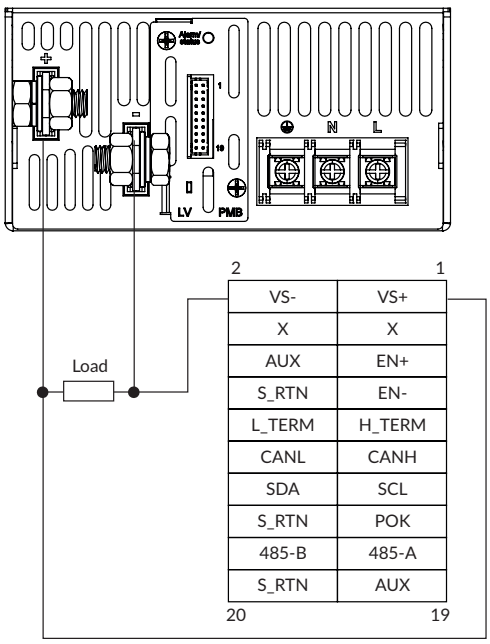
OVP setting



Application Notes

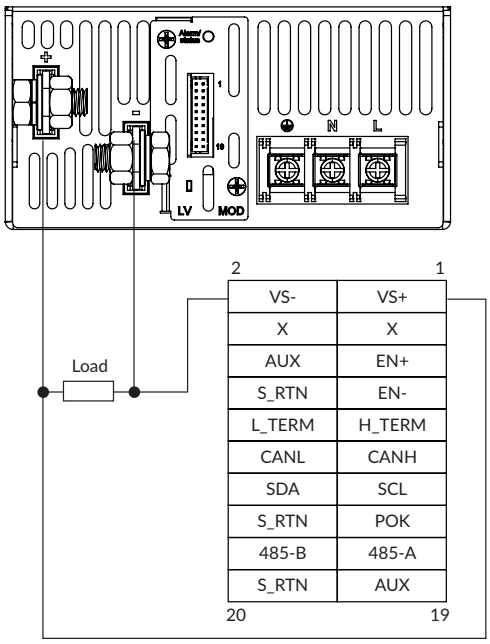
Low Voltage Models Sensing (PMB/MOD interface card options)

-PMB/Remote Sense



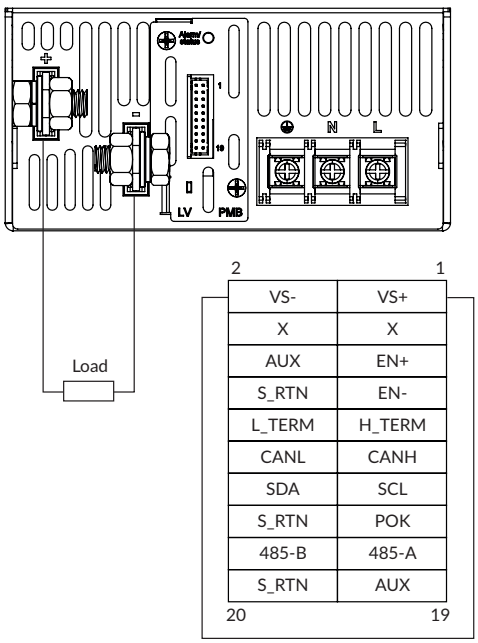
VS-	VS+
X	X
AUX	EN+
S_RTN	EN-
L_TERM	H_TERM
CANL	CANH
SDA	SCL
S_RTN	POK
485-B	485-A
S_RTN	AUX

-MOD/Remote Sense



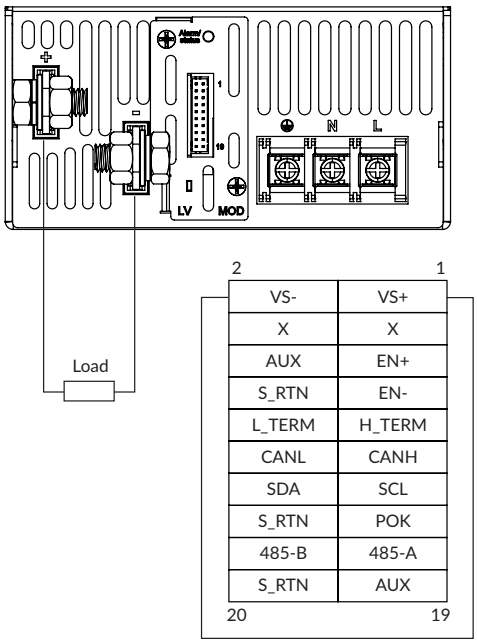
VS-	VS+
X	X
AUX	EN+
S_RTN	EN-
L_TERM	H_TERM
CANL	CANH
SDA	SCL
S_RTN	POK
485-B	485-A
S_RTN	AUX

-PMB/Local Sense



VS-	VS+
X	X
AUX	EN+
S_RTN	EN-
L_TERM	H_TERM
CANL	CANH
SDA	SCL
S_RTN	POK
485-B	485-A
S_RTN	AUX

-MOD/Local Sense

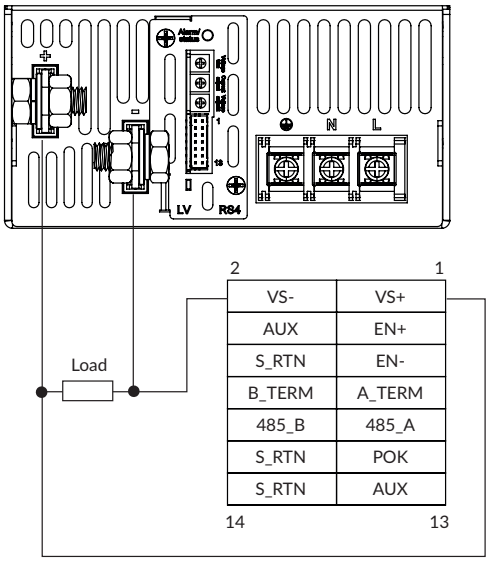


VS-	VS+
X	X
AUX	EN+
S_RTN	EN-
L_TERM	H_TERM
CANL	CANH
SDA	SCL
S_RTN	POK
485-B	485-A
S_RTN	AUX

Application Notes

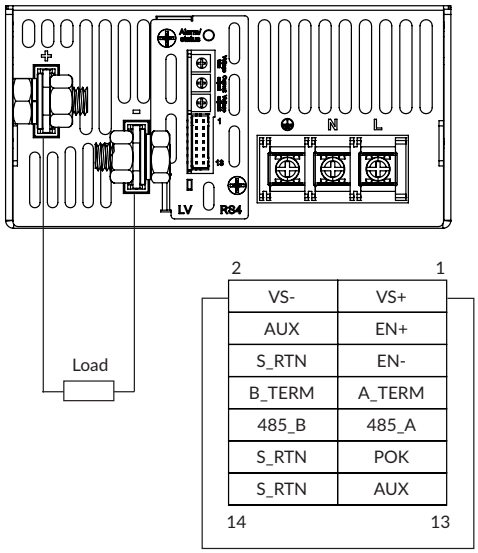
Low Voltage Models Sensing (RS4 interface card option)

-RS4/Remote Sense



2	1
VS-	VS+
AUX	EN+
S_RTN	EN-
B_TERM	A_TERM
485_B	485_A
S_RTN	POK
S_RTN	AUX
14	13

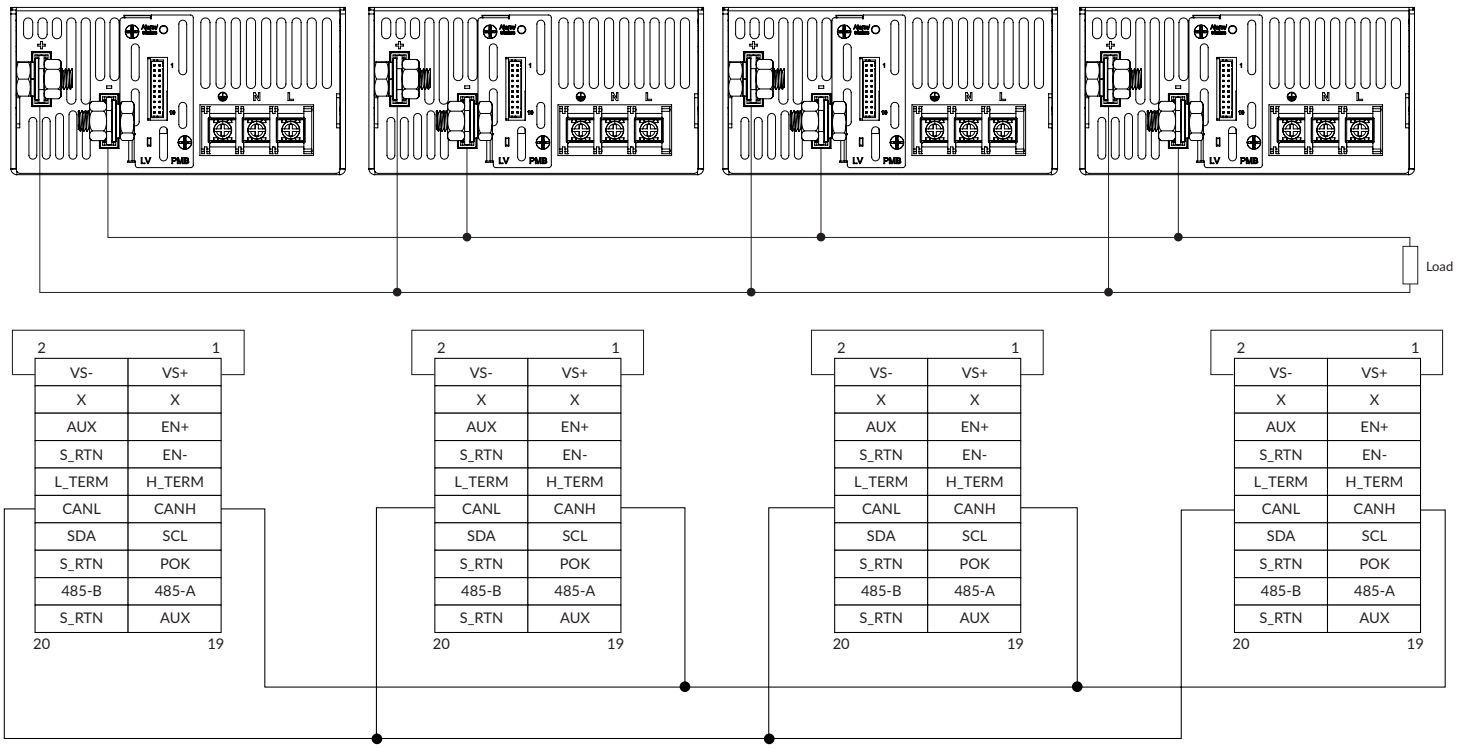
-RS4/Local Sense



2	1
VS-	VS+
AUX	EN+
S_RTN	EN-
B_TERM	A_TERM
485_B	485_A
S_RTN	POK
S_RTN	AUX
14	13

Low Voltage Models Current Sharing (PMD/MOD interface card options)

-PMB/-MOD, Current sharing with local sensing



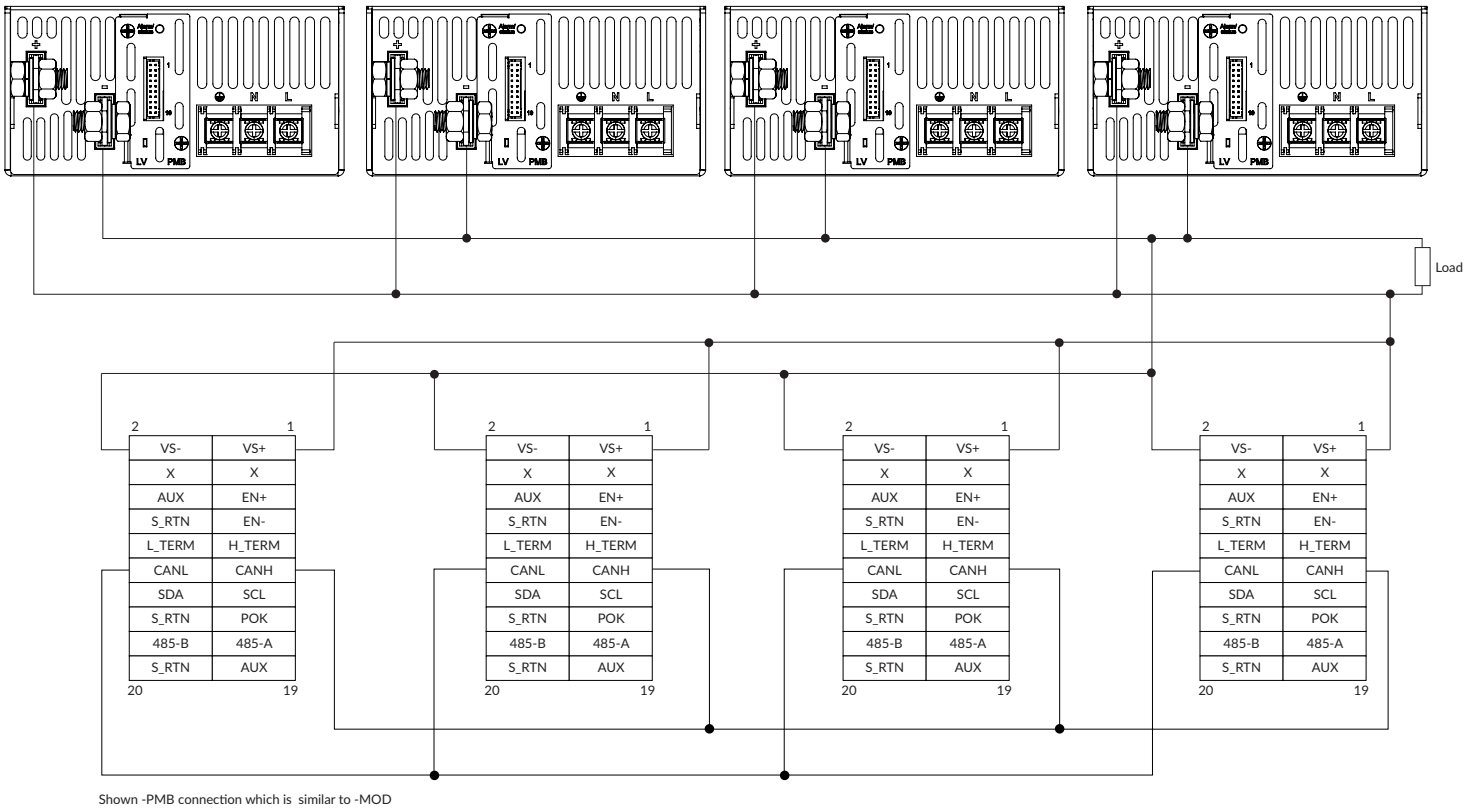
2	1
VS-	VS+
X	X
AUX	EN+
S_RTN	EN-
L_TERM	H_TERM
CANL	CANH
SDA	SCL
S_RTN	POK
485-B	485-A
S_RTN	AUX
20	19

Shown -PMB connection which is similar to -MOD

Application Notes

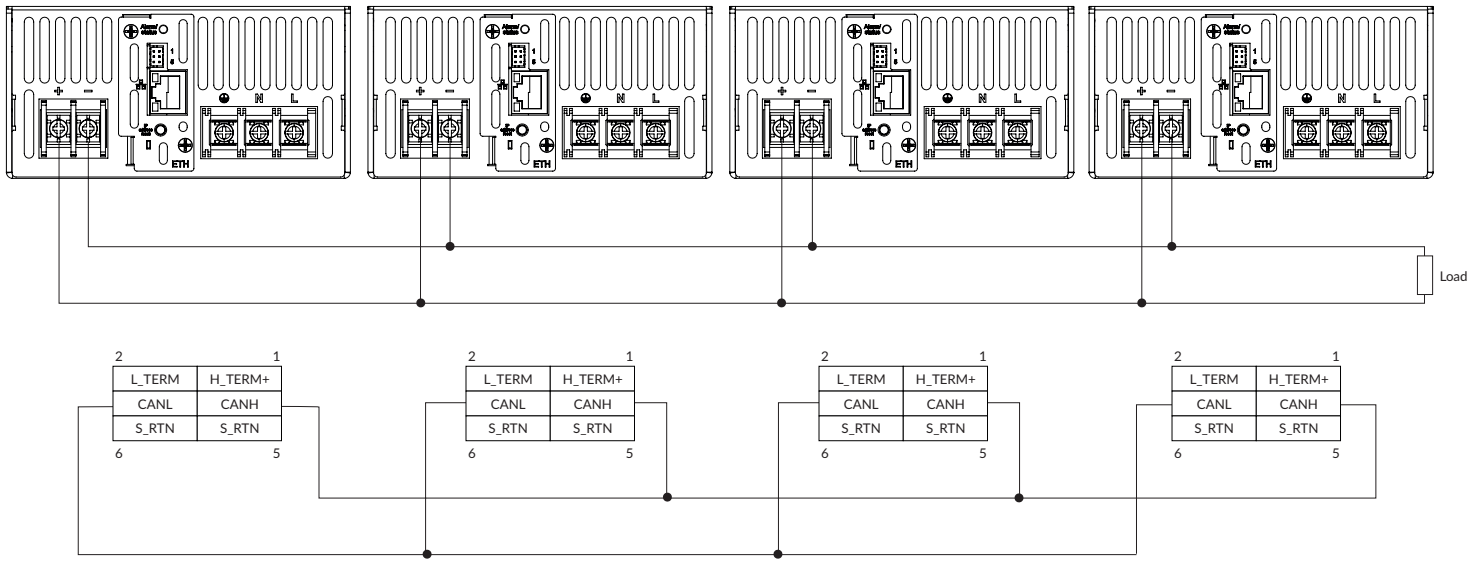
Low Voltage Models Current Sharing (PMB/MOD & ETH interface card options)

-PMB/-MOD, current sharing with remote sensing



Shown -PMB connection which is similar to -MOD

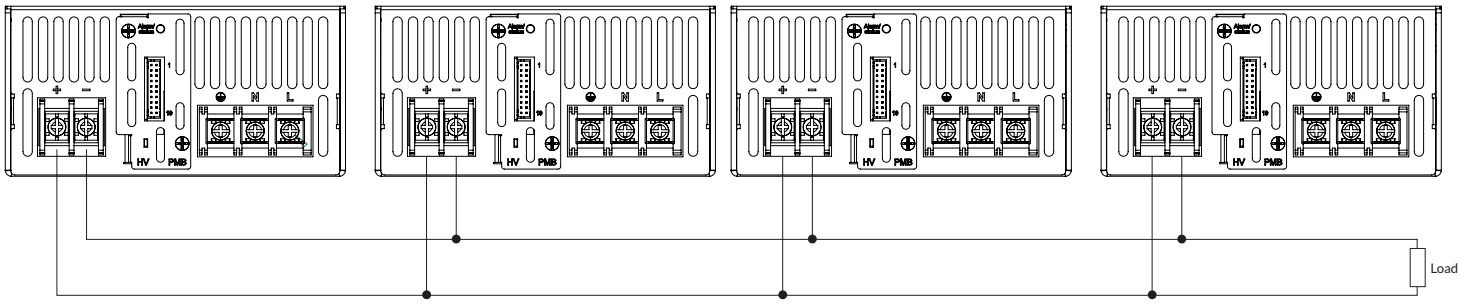
-ETH, current sharing

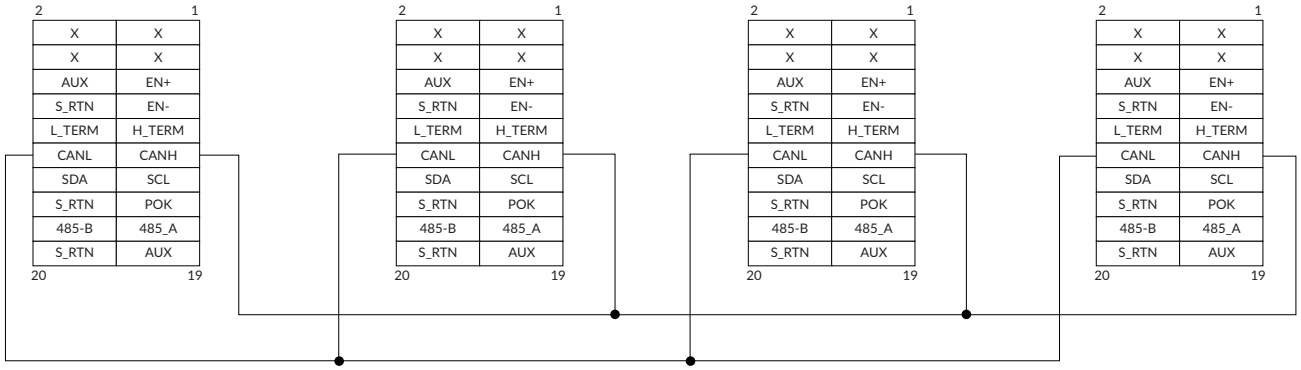


Application Notes

High Voltage Models Current Sharing (PMB/MOD and ETH interface card options)

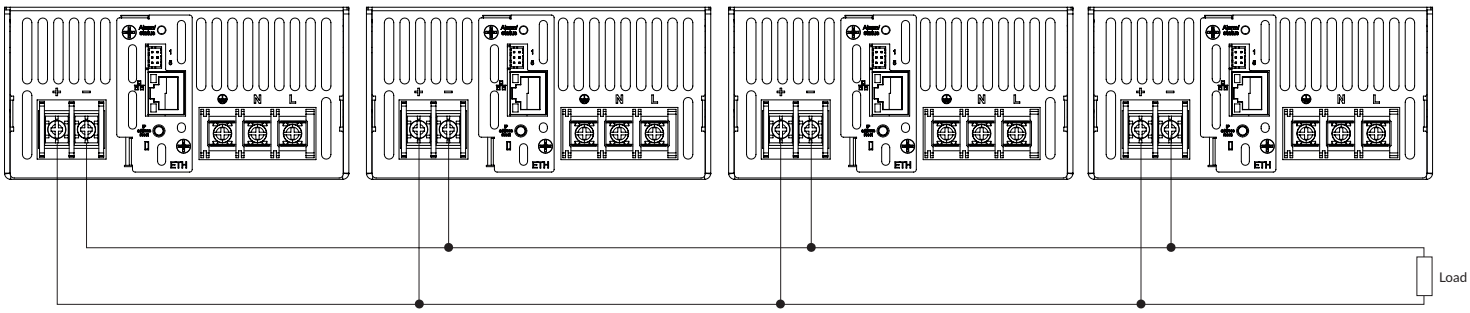
-PMB/-MOD, current sharing

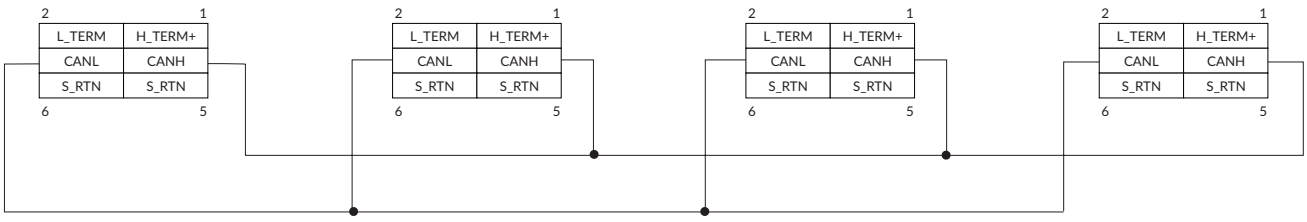




Shown -PMB connection which is similar to -MOD
Note: remote sensing is not possible for high voltage models

-ETH, current sharing

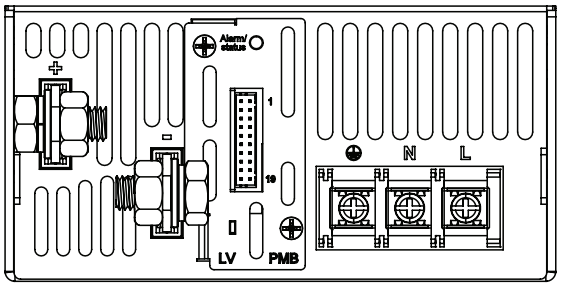




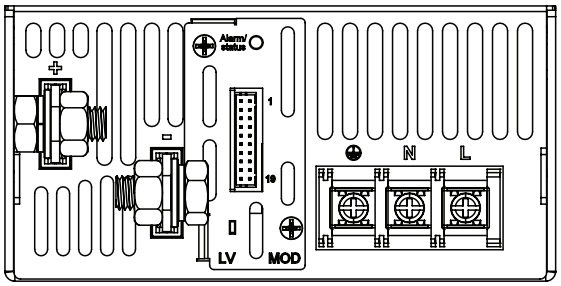
Interface cards

Low voltage models

-PMB



-MOD



Supports parallel connection

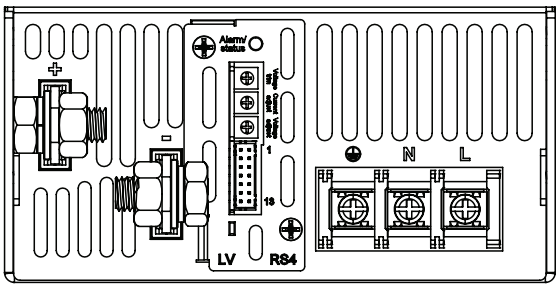
Control pin connections					
Pin	**Function**	**Description**	**Pin**	**Function**	**Description**
2	VS-	Remote sense (-)	1	VS+	Remote sense (+)
4	X	Reserved	3	X	Reserved
6	AUX	5V/1A standby power	5	EN+	Inhibit On/Off (+)
8	S_RTN	Signal ground	7	EN-	Inhibit On/Off (-)
10	L_TERM	CAN termination	9	H_TERM	CAN termination
12	CANL	Dedicated in parallel (CAN BUS low-level)	11	CANH	Dedicated in parallel (CAN BUS high-level)
14	SDA	Serial data used in the I²C interface	13	SCL	Serial clock used in the I²C interface
16	S_RTN	Signal ground	15	POK	Power OK (40V/20mA/<0.5W open collector)
18	RS485-B	Drive output/receiver input inverting	17	RS485-A	Drive output/receiver input non-inverting
20	S_RTN	Signal ground	19	AUX	5V/1A standby power

Mating part: JST housing:PHDR-20VS,
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

Interface cards

Low voltage models

-RS4 Single unit

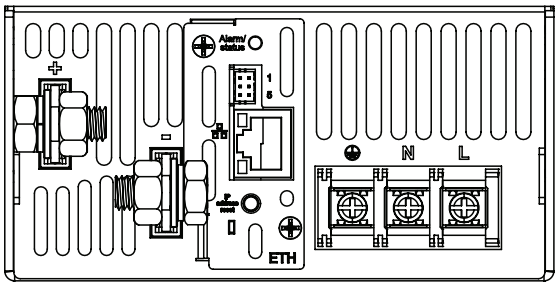


Control pin connections

Pin	Function	Description	Pin	Function	Description
2	VS-	Remote sense (-)	1	VS+	Remote sense (+)
4	AUX	5V/Standby power	3	EN+	Inhibit On/Off (+)
6	S_RTN	Signal ground	5	EN-	Inhibit On/Off (-)
8	B_TERM	RS-485 termination	7	A_TERM	RS-485 termination
10	RS485_B	Driver output/receiver input inverting	9	RS485_A	Driver output/receiver input non-inverting
12	S_RTN	Signal ground	11	POK	Power OK (40V/20mA/<0.5W open collector)
14	S_RTN	Signal ground	13	AUX	5V/1A Standby power

Mating housing: JST housing: PHDR-14VS
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

-ETH Ethernet (supports parrallel connection)



Ethernet port (RJ45)

Control pin connections

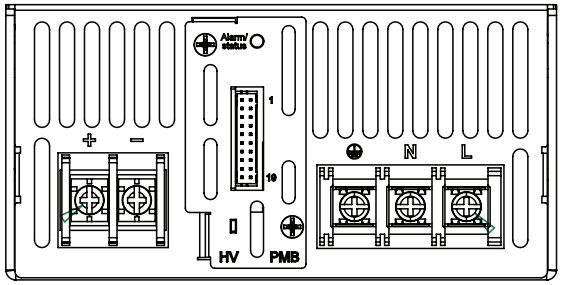
Pin	Function	Description	Pin	Function	Description
2	L_TERM	CAN termination	1	H_TERM+	CAN termination
4	CANL	CAN BUS Low-level	3	CANH	CAN BUS High-level
6	S_RTN	Signal ground	5	POK	Power OK

Mating housing: JST housing: PHDR-6VS
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

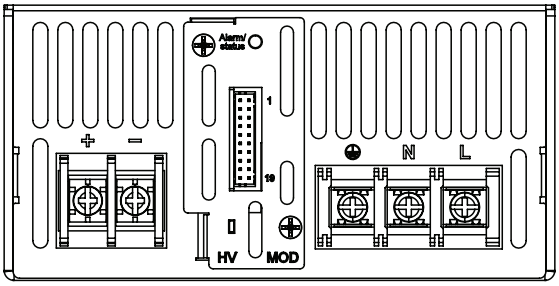
Interface cards

High voltage models

-PMB



-MOD



Supports parallel connection

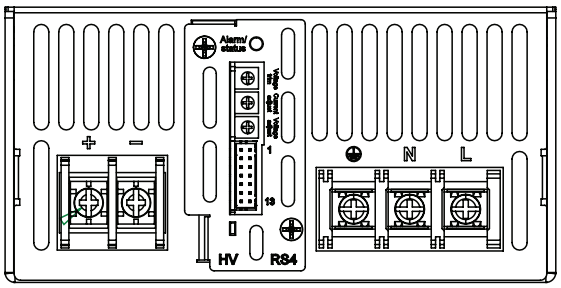
Control pin connections					
Pin	**Function**	**Description**	**Pin**	**Function**	**Description**
2	X	Reserved	1	X	Reserved
4	X	Reserved	3	X	Reserved
6	AUX	5V/1A standby power	5	EN+	Inhibit On/Off (+)
8	S_RTN	Signal ground	7	EN-	Inhibit On/Off (-)
10	L_TERM	CAN termination	9	H_TERM	CAN termination
12	CANL	Dedicated in parallel (CAN BUS low-level)	11	CANH	Dedicated in parallel (CAN BUS high-level)
14	SDA	Serial data used in the I²C interface	13	SCL	Serial clock used in the I²C interface
16	S_RTN	Signal ground	15	POK	Power OK (40V/20mA/<0.5W open collector)
18	RS485-B	Drive output/receiver input inverting	17	RS485-A	Drive output/receiver input non-inverting
20	S_RTN	Signal ground	19	AUX	5V/1A standby power

Mating housing: JST housing: PHDR-20VS
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

Interface cards

High voltage models

-RS4 single unit

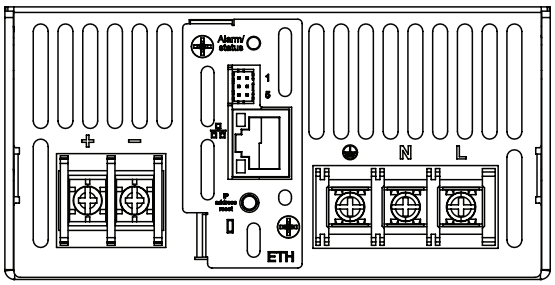


Control pin connections

Pin	Function	Description	Pin	Function	Description
2	X	Reserved	1	X	Reserved
4	AUX	5V/Standby power	3	EN+	Inhibit On/Off (+)
6	S_RTN	Signal ground	5	EN-	Inhibit On/Off (-)
8	B_TERM	RS-485 termination	7	A_TERM	RS-485 termination
10	RS485_B	Driver output/receiver input inverting	9	RS485_A	Driver output/receiver input non-inverting
12	S_RTN	Signal ground	11	POK	Power OK (40V/20mA/<0.5W open collector)
14	S_RTN	Signal ground	13	AUX	5V/1A Standby power

Mating housing: JST housing: PHDR-14VS
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

-ETH Ethernet (supports parallel connection)



Ethernet port (RJ45)

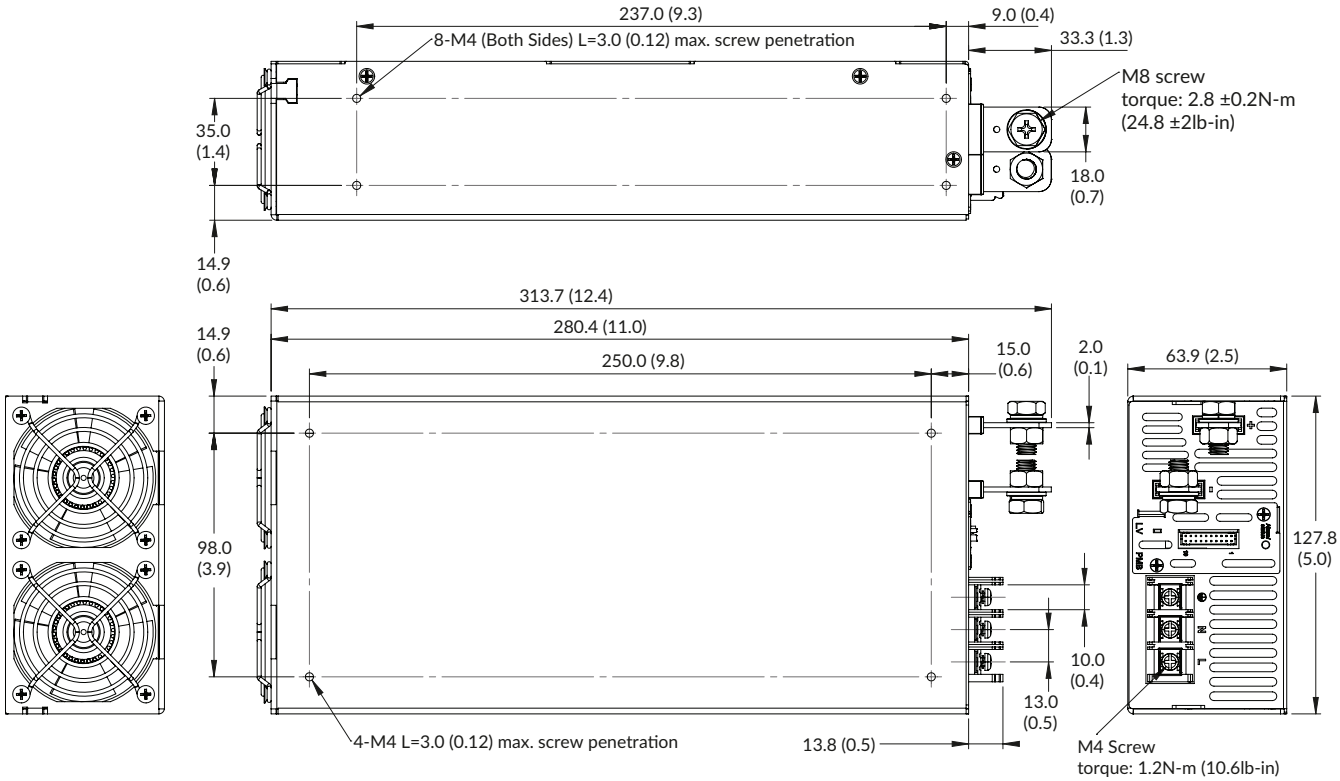
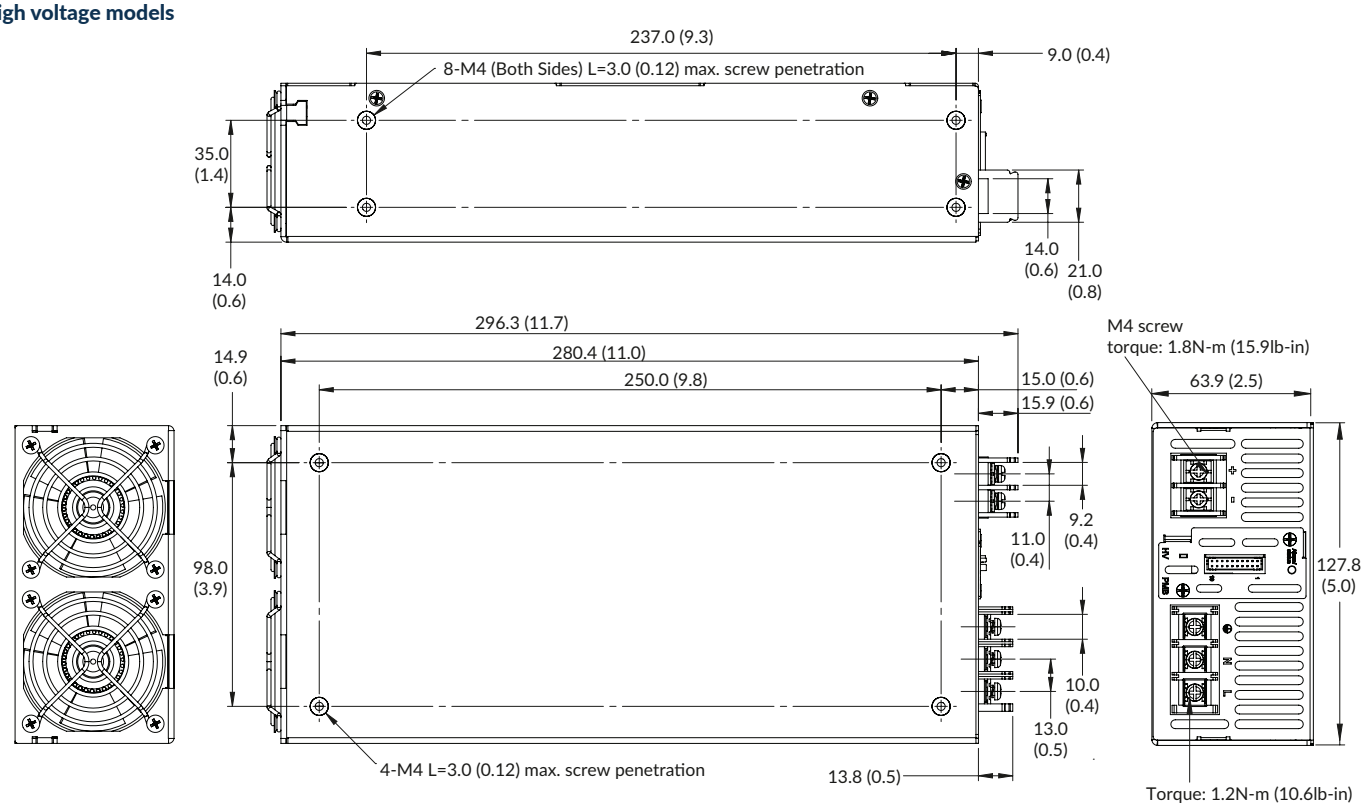
Control pin connections

Pin	Function	Description	Pin	Function	Description
2	L_TERM	CAN termination	1	H_TERM+	CAN termination
4	CANL	CAN BUS Low-level	3	CANH	CAN BUS High-level
6	S_RTN	Signal ground	5	POK	Power OK

Mating housing: JST housing: PHDR-6VS
Contacts: SPHD-002T-P0.5 contacts (28-24AWG)

Mechanical details

Low voltage models



High voltage models