



P-DUKE POWER

TAH450 Series

3 X 5 Inch AC-DC POWER SUPPLIES
Up to 450 Watts

3
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT

+85°C
-40°C
AMBIENT TEMP.



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

UL US CB CE UK CA



3000
VAC
Reinforced
Insulation

ADJ.
Output
Voltage

Internal
EN55032
Class
Filter **B**

LOW
Leakage
Current

LOW
Standby
Power

Operating
Altitude
5000
meter

**POWER
GOOD**

Protection
Class I
Class II

REMOTE
**ON
OFF**

OCP

OTP

OVP

SCP

PART NUMBER STRUCTURE

T	A	H	450	U	S	12	□	-	F2	□
Application	Package Code	Dimension Code	Output Power (W)	Input Voltage (VAC)	Output Quantity	Output Voltage (VDC)	Protection Type		Fan Options	Conformal Coating Options
Industry Application	A: Open type E: Enclosed type			U: Universal 85 ~ 264	S: Single	12:12 15:15 24:24 28:28 36:36 48:48 53:53	□: CLASS I B: CLASS II		□: Fan connector with fixed fan speed control Y: Fan connector with variable fan speed control For TEH450 only: Fixed fan speed F1: Fan 1, fan on the top F2: Fan 2, fan on the side Variable fan speed Y1: Fan 1, fan on the top Y2: Fan 2, fan on the side	□: None R: Conformal Coating

TECHNICAL SPECIFICATION All specifications are typical at 230VAC input, full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current @ 230VAC				Input Power @No Load	Efficiency	Maximum Capacitor Load
			Natural Convection	Conduction Cooling	Forced Air Cooling				
					21 CFM External Fan	Internal Fan			
VAC	VDC	A	A	A	A	W	%	µF	
TAH450US12(-Y)	85 ~ 264	12	20.8	23.3	37.5	---	0.3	91	31250
TEH450US12(-Y)	85 ~ 264	12	20.8	23.3	37.5	---	0.3	91	31250
TEH450US12-F1(Y1)	85 ~ 264	12	---	---	---	37.5	0.5	91	31250
TEH450US12-F2(Y2)	85 ~ 264	12	---	---	---	37.5	0.5	91	31250
TAH450US15(-Y)	85 ~ 264	15	16.6	18.6	30.0	---	0.5	92	20000
TEH450US15(-Y)	85 ~ 264	15	16.6	18.6	30.0	---	0.5	92	20000
TEH450US15-F1(Y1)	85 ~ 264	15	---	---	---	30.0	0.8	92	20000
TEH450US15-F2(Y2)	85 ~ 264	15	---	---	---	30.0	0.8	92	20000
TAH450US24(-Y)	85 ~ 264	24	13.3	14.55	18.75	---	0.5	93	7820
TEH450US24(-Y)	85 ~ 264	24	13.3	14.55	18.75	---	0.5	93	7820
TEH450US24-F1(Y1)	85 ~ 264	24	---	---	---	18.75	0.8	93	7820
TEH450US24-F2(Y2)	85 ~ 264	24	---	---	---	18.75	0.8	93	7820
TAH450US28(-Y)	85 ~ 264	28	11.4	12.5	16.1	---	0.5	93	5750
TEH450US28(-Y)	85 ~ 264	28	11.4	12.5	16.1	---	0.5	93	5750
TEH450US28-F1(Y1)	85 ~ 264	28	---	---	---	16.1	0.8	93	5750
TEH450US28-F2(Y2)	85 ~ 264	28	---	---	---	16.1	0.8	93	5750
TAH450US36(-Y)	85 ~ 264	36	8.9	9.72	12.5	---	0.5	93	3500
TEH450US36(-Y)	85 ~ 264	36	8.9	9.72	12.5	---	0.5	93	3500
TEH450US36-F1(Y1)	85 ~ 264	36	---	---	---	12.5	0.8	93	3500
TEH450US36-F2(Y2)	85 ~ 264	36	---	---	---	12.5	0.8	93	3500
TAH450US48(-Y)	85 ~ 264	48	6.65	7.3	9.4	---	0.5	94	1960
TEH450US48(-Y)	85 ~ 264	48	6.65	7.3	9.4	---	0.5	94	1960
TEH450US48-F1(Y1)	85 ~ 264	48	---	---	---	9.4	0.8	94	1960
TEH450US48-F2(Y2)	85 ~ 264	48	---	---	---	9.4	0.8	94	1960
TAH450US53(-Y)	85 ~ 264	53	6.05	6.6	8.55	---	0.5	94	1600
TEH450US53(-Y)	85 ~ 264	53	6.05	6.6	8.55	---	0.5	94	1600
TEH450US53-F1(Y1)	85 ~ 264	53	---	---	---	8.55	0.8	94	1600
TEH450US53-F2(Y2)	85 ~ 264	53	---	---	---	8.55	0.8	94	1600

INPUT SPECIFICATIONS						
Parameter	Conditions			Min.	Typ.	Max. Unit
Operating input voltage range	AC input			85		264 VAC
	DC input			120		370 VDC
Input frequency	AC input			47		63 Hz
Input current	100VAC and Full Load					
	240VAC and Full Load			5.8 A		
No load input power	230VAC	TAH(-Y), TEH(-Y)	12Vout others	0.3 Watts		
		TEH -F□(Y□)	12Vout others	0.5		
			others	0.8		
Leakage current	264VAC			300 µA		
Power Factor				0.95		
Start up time				2000 ms		
Rise time				30 ms		
Hold up time	115VAC and Full Load			14 ms		
Input inrush current	230VAC			100 A		
Input protection	Internal fuse			T6.3A/250VAC		
Main output remote control	Positive Logic Referenced to "-Control"		Main power ON	Open or 3 ~ 12 VDC		
			Main power OFF	Short or 0 ~ 1.2VDC		
	*Standby power always present		Input current of Control	-0.5	1	mA

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Output power	Forced air cooling	All			450	Watts
	Conduction cooling @ 230VAC	12Vout, 15Vout			280	
		others			350	
	Natural convection @ 230VAC	12Vout, 15Vout			250	
		others			320	
	*Please refer to the derating curve for detailed rating.					
Initial set voltage accuracy	230VAC and Full Load		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load		-0.2		+0.2	%
Load regulation	No Load to Full Load		-0.5		+0.5	%
	10% Load to 90% Load		-0.4		+0.4	
Voltage adjustability	Maximum output deviation is inclusive of remote sense		-8		+8	%
Minimum load				0		%
Ripple and noise	Measured by 20MHz bandwidth					mVp-p
	With a 1μF/25V 1206 X7R MLCC	12Vout			250	
		15Vout			300	
	With a 1μF/50V 1206 X7R MLCC	24Vout			240	
		28Vout			280	
		36Vout			360	
48Vout				480		
With a 0.1μF/100V 1206 X7R MLCC	53Vout			530		
Temperature coefficient			-0.02		+0.02	%/°C
Transient response	Load step from 50 ~ 75% change at 2.5A/μs	Peak deviation		3		% Vout
		Recovery time		600		μs
Over voltage protection	% of Vout(nom); Latch mode		110		135	%
Over load protection	% of maximum lout rated; Hiccup mode		115		155	%
Short circuit protection	Protection level 1 (nominal) Protection level 2 (instantaneous high current)		Continuous, automatic recovery			Latch
Standby power supply	Always present when AC supplied					5V / 200mA
Fan power supply	Fixed fan speed function					12V / 500mA
Main output Power Good signal	Referenced to "GND"		Power good Power off		Low Open collector	

GENERAL SPECIFICATIONS

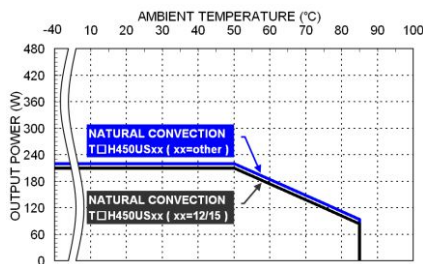
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (Reinforced insulation)	Input to Output Input (Output) to F.G.	3000 2000			VAC
Isolation resistance	500VDC		0.1			GΩ
Switching frequency	230VAC, Full load		15Vout		75	kHz
			Other		65	
Safety approvals	IEC/ EN/ UL 62368-1		UL:E193009 CB:UL(Demko)			
Weight	TAH(-Y)		462g(16.29oz)			
	TEH(-Y)		504g(17.77oz)			
	TEH -F1(Y1)		524g(18.48oz)			
	TEH -F2(Y2)		552g(19.47oz)			
MTBF	MIL-HDBK-217F Ta=25°C, Full load		4.093 x 10 ⁵ hrs			

ENVIRONMENTAL SPECIFICATIONS

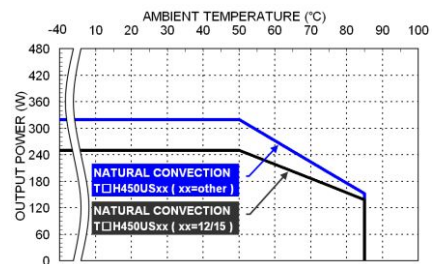
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	TAH(-Y), TEH(-Y)	-40		+85	°C
		TEH -F□(Y□)	-40		+80	
Storage temperature range			TAH(-Y), TEH(-Y)		+85	°C
			TEH -F□(Y□)		+80	
Over temperature protection	Internal thermistor ; Latch mode		110		125	°C
Operating altitude	With derating		5000			m
Shock						IEC60068-2-27
Vibration						IEC60068-2-6
Relative humidity	Non-condensing					5% to 95% RH

EMC SPECIFICATIONS

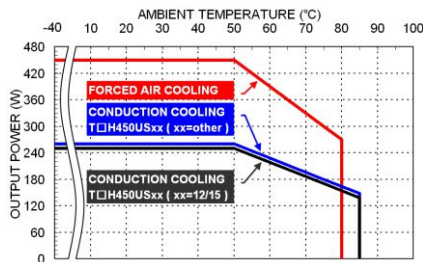
Parameter	Conditions	Level
EMI	EN55032 and FCC Part 15 For optimum EMI performance, the power supply should be mounted to a metal plate grounded to all 4 mounting holes of the power supply. To comply with safety standards, this plate must be properly grounded to protective earth.	Conducted Class B Radiated Class A
Harmonic currents	EN61000-3-2 Full Load	Class A and D
Voltage flicker	EN61000-3-3	
EMS	EN55035	
ESD	EN61000-4-2	Perf. Criteria A
Radiated immunity	EN61000-4-3 3 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2 kV	Perf. Criteria A
Surge	EN61000-4-5 DM ± 1 kV and CM ± 2 kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 20 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 30 A/m	Perf. Criteria A
Dip and interruptions	EN61000-4-11	

CHARACTERISTIC CURVE


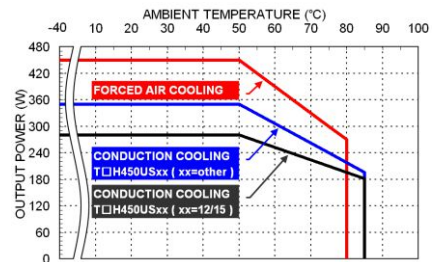
Derating Curve vs. Ambient Temperature
Vin=115VAC and Natural convection



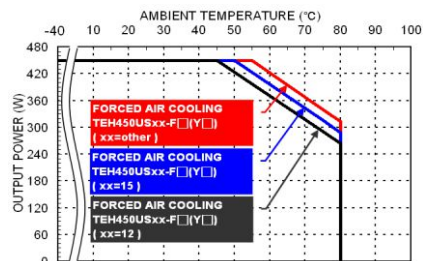
Derating Curve vs. Ambient Temperature
Vin=230VAC and Natural convection



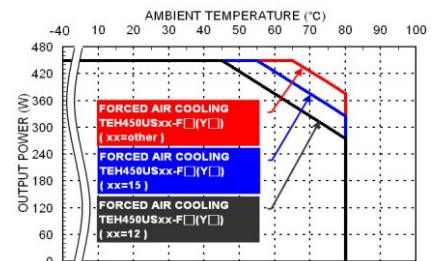
Derating Curve vs. Ambient Temperature
Vin=115VAC and Conduction cooling tested by 43x24.8x0.12cm plate
Forced air cooling with 21CFM (External Fan)



Derating Curve vs. Ambient Temperature
Vin=230VAC and Conduction cooling tested by 43x24.8x0.12cm plate
Forced air cooling with 21CFM (External Fan)

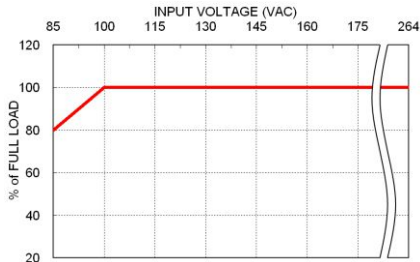


Derating Curve vs. Ambient Temperature
Vin=115VAC and Forced air cooling (Internal Fan)

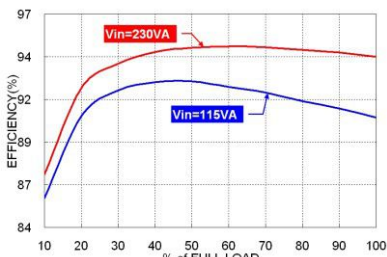


Derating Curve vs. Ambient Temperature
Vin=230VAC and Forced air cooling (Internal Fan)

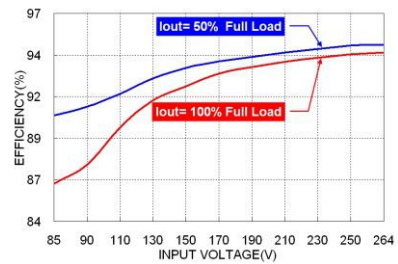
CHARACTERISTIC CURVE (CONTINUED)



Derating Curve vs. Input Voltage
TAH450



Efficiency vs. Output Load
TAH450US24 with Forced air cooling



Efficiency vs. Input Voltage
TAH450US24 with Forced air cooling

OUTPUT SENSING

Output sensing function can be applied via connecting wires on CON3. Initially, Pin 7 and Pin 8 are shorted by a jumper set as default, shown as Fig. 1.

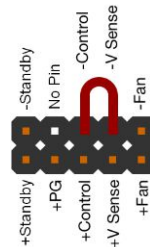
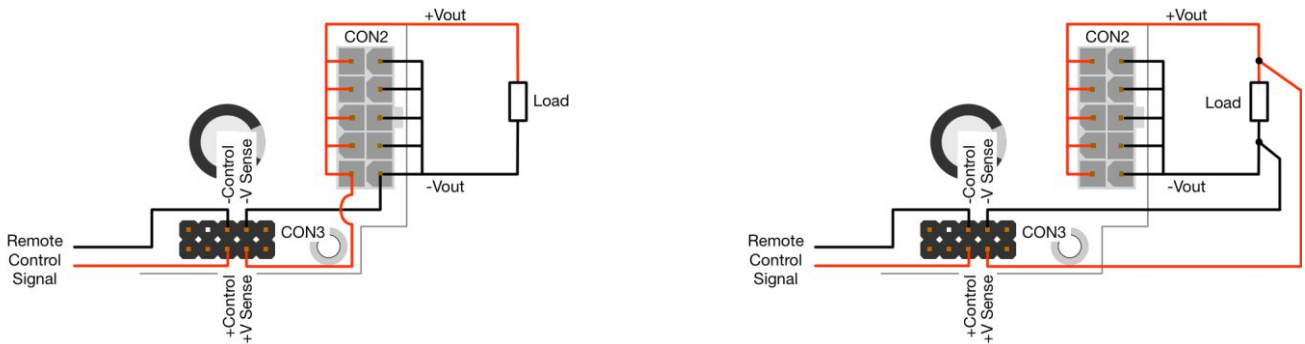


Fig. 1 Default connection

But if remote control function is to be used, the jumper on Pin 7 and Pin 8 should be removed. Since sense pins should not be left open for module stability, please follow the connections as below (Fig. 2).



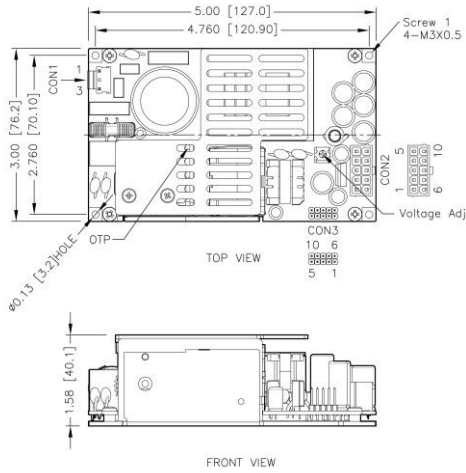
(a) Sense pins connect to corresponding polarity of Vout pin

(b) Sense pins connect to corresponding polarity terminal of load.

Fig. 2 Recommended output sensing connections

MECHANICAL DRAWING

TAH450USXX (-Y)



*Either one of four screw holes can be considered as PE connection for CLASS I application.

1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Screw 1 locked torque : MAX 5.2Kgf-cm/0.51N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

Mates with
Molex housing : **09-50-8031**
Molex crimp terminals : **2478,6838,45570**

CON2 – Output Connector

Pin 1,2,3,4,5	+Vout
Pin 6,7,8,9,10	-Vout

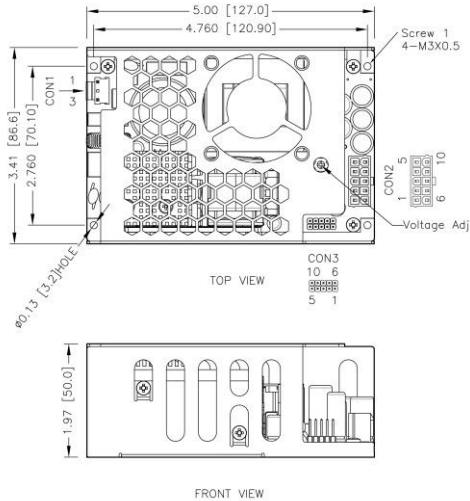
Mates with
Molex housing : **39-01-2105**
Molex crimp terminals : **5556,45750**

CON3 – Aux Connector

Pin 1	+Fan	Pin 6	-Fan (GND)
Pin 2	+V Sense	Pin 7	-V Sense
Pin 3	+Control	Pin 8	-Control (GND)
Pin 4	+PG	Pin 9	No Pin
Pin 5	+Standby	Pin10	-Standby (GND)

Mates with
Molex housing : **90143-0008**
Molex crimp terminals : **90119**

TEH450USXX (-Y)



*Either one of four screw holes can be considered as PE connection for CLASS I application.

1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Screw 1 locked torque : MAX 5.2Kgf-cm/0.51N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

Mates with
Molex housing : **09-50-8031**
Molex crimp terminals : **2478,6838,45570**

CON2 – Output Connector

Pin 1,2,3,4,5	+Vout
Pin 6,7,8,9,10	-Vout

Mates with
Molex housing : **39-01-2105**
Molex crimp terminals : **5556,45750**

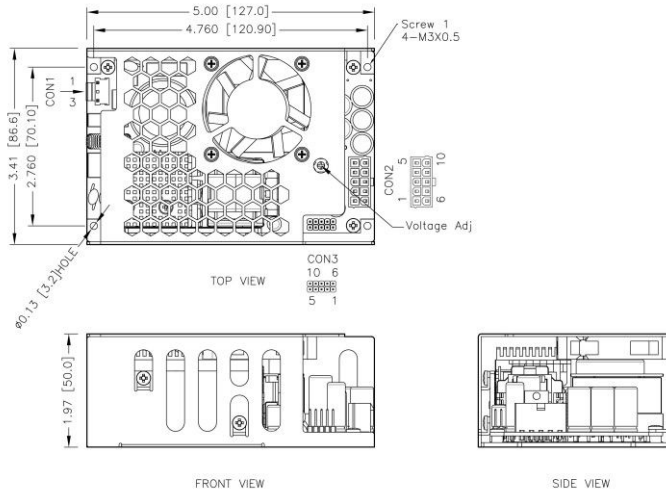
CON3 – Aux Connector

Pin 1	+Fan	Pin 6	-Fan (GND)
Pin 2	+V Sense	Pin 7	-V Sense
Pin 3	+Control	Pin 8	-Control (GND)
Pin 4	+PG	Pin 9	No Pin
Pin 5	+Standby	Pin10	-Standby (GND)

Mates with
Molex housing : **90143-0008**
Molex crimp terminals : **90119**

MECHANICAL DRAWING (CONTINUED)

TEH450USXX-F1 (Y1) FAN dimension: 50x50x10mm Air flow: 11.4 CFM
The fan's life is shorter than power supply and has only 2 years warranty.



*Either one of four screw holes can be considered as PE connection for CLASS I application.

1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Screw 1 locked torque : MAX 5.2Kgf-cm/0.51N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

Mates with
Molex housing : **09-50-8031**
Molex crimp terminals : **2478,6838,45570**

CON2 – Output Connector

Pin 1,2,3,4,5	+Vout
Pin 6,7,8,9,10	-Vout

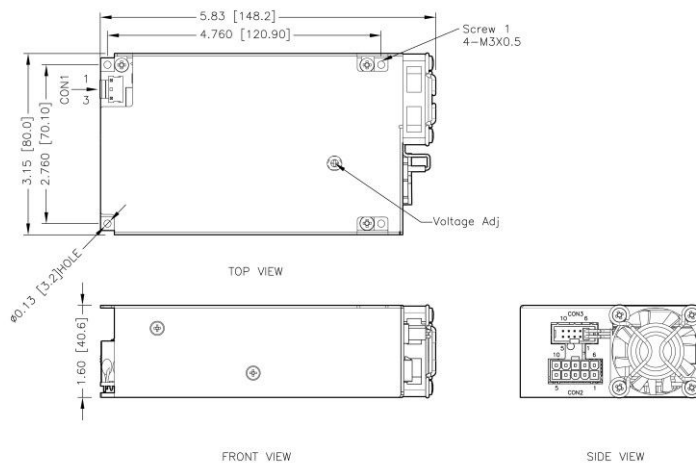
Mates with
Molex housing : **39-01-2105**
Molex crimp terminals : **5556,45750**

CON3 – Aux Connector

Pin 1	+Fan	Pin 6	-Fan (GND)
Pin 2	+V Sense	Pin 7	-V Sense
Pin 3	+Control	Pin 8	-Control (GND)
Pin 4	+PG	Pin 9	No Pin
Pin 5	+Standby	Pin10	-Standby (GND)

Mates with
Molex housing : **90143-0008**
Molex crimp terminals : **90119**

TEH450USXX-F2 (Y2) FAN dimension: 40x40x10mm Air flow: 9.5 CFM
The fan's life is shorter than power supply and has only 2 years warranty.



*Either one of four screw holes can be considered as PE connection for CLASS I application.

1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
3. Screw 1 locked torque : MAX 5.2Kgf-cm/0.51N.m

CONNECTORS CONNECTIONS

CON1 – Input Connector

Pin 1	Line
Pin 3	Neutral

Mates with
Molex housing : **09-50-8031**
Molex crimp terminals : **2478,6838,45570**

CON2 – Output Connector

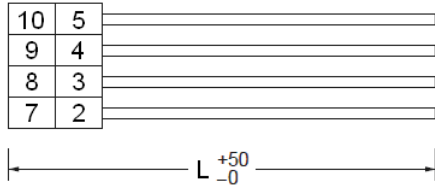
Pin 1,2,3,4,5	-Vout
Pin 6,7,8,9,10	+Vout

Mates with
Molex housing : **39-01-2105**
Molex crimp terminals : **5556,45750**

CON3 – Aux Connector

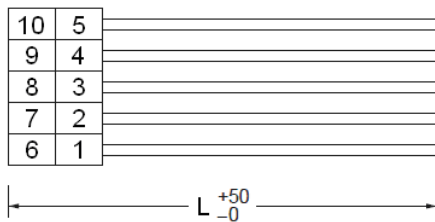
Pin 1	+Fan	Pin 6	-Fan (GND)
Pin 2	+V Sense	Pin 7	-V Sense
Pin 3	+Control	Pin 8	-Control (GND)
Pin 4	+PG	Pin 9	No Pin
Pin 5	+Standby	Pin10	-Standby (GND)

Mates with
Molex housing : **90143-0008**
Molex crimp terminals : **90119**

OPTIONAL PARTS
7N-0265-F :

CON3 housing

Pin 2	+V Sense	gray	26AWG
Pin 3	+Control	orange	26AWG
Pin 4	+PG	blue	26AWG
Pin 5	+Standby	red	22AWG
Pin 7	-V Sense	green	26AWG
Pin 8	-Control (GND)	brown	26AWG
Pin 9	No wire	---	---
Pin10	-Standby (GND)	black	22AWG

Length (L) : 500mm typical

7N-0266-F :

CON3 housing

Pin 1	+Fan	yellow	26AWG
Pin 2	+V Sense	gray	26AWG
Pin 3	+Control	orange	26AWG
Pin 4	+PG	blue	26AWG
Pin 5	+Standby	red	22AWG
Pin 6	-Fan (GND)	brown	26AWG
Pin 7	-V Sense	green	26AWG
Pin 8	-Control (GND)	brown	26AWG
Pin 9	No wire	---	---
Pin10	-Standby (GND)	black	22AWG

Length (L) : 500mm typical