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# TDK·Lambda HWS300-1500 Series

## 300-1500W Single Output Industrial Power Supplies

https://product.tdk.com/en/power/hws
www.emea.lambda.tdk.com/hws



Industrial | Test | LED | Broadcast | COMM | Semi-Fab

The ultra reliable, conservatively rated HWS series of 300W to 1500W AC-DC power supplies has a limited lifetime warranty (1), unique to the industry. The series accepts a widerange 85 to 265Vac input with output voltages from 3.3V to 48V. The products are certified to IEC 62368-1, UL 508 (select models) and are SEMI F47 compliant . They also meet conducted and radiated emission standards without additional filtering or shielding.

| Features | Benefits |
|---|---|
| • Limited Lifetime Warranty (1) | • Low Cost of Ownership |
| • Very Conservative Electrolytic Capacitor Ratings | • Long Service Life |
| • Class B Conducted and Radiated EMI | • Easier System EMC Compliance |
| • UL 508 Certified on Select Models | • Suitable For Industrial Control Equipment |

## Model Selector

| Model | Output Voltage (V) | Adjustment Range (V) | Maximum Current (A) | Peak Current (A) (2) | Load Reg (mV) | Line Reg (mV) | Ripple Noise (mV) | Overvoltage (V) | Efficiency (115/230Vac) (%) |
|---|---|---|---|---|---|---|---|---|---|
| HWS300-3 | 3.3 | 2.64 - 3.96 | 60 | - | 30 | 20 | 120 | 4.13 - 4.95 | 74 / 77 |
| HWS600-3 | 3.3 | 2.64 - 3.96 | 120 | - | 30 | 20 | 120 | 4.13 - 4.95 | 75 / 78 |
| HWS1000-3 | 3.3 | 2.64 - 3.96 | 200 | - | 40 | 20 | 120 | 4.13 - 4.95 | 71 / 73 |
| HWS1500-3 | 3.3 | 2.64 - 3.96 | 300 | - | 60 | 36 | 150 | 4.12 - 4.95 | 72 / 75 |
| HWS300-5 | 5 | 4.0 - 6.0 | 60 | - | 30 | 20 | 120 | 6.25 - 7.25 | 79 / 82 |
| HWS600-5 | 5 | 4.0 - 6.0 | 120 | - | 30 | 20 | 120 | 6.25 - 7.25 | 80 / 83 |
| HWS1000-5 | 5 | 4.0 - 6.0 | 200 | - | 40 | 20 | 120 | 6.25 - 7.0 | 76 / 78 |
| HWS1500-5 | 5 | 4.0 - 6.0 | 300 | - | 60 | 36 | 150 | 6.25 - 7.0 | 77 / 81 |
| HWS1000-6 | 6 | 4.8 - 7.2 | 167 | - | 60 | 36 | 150 | 7.5 - 8.4 | 79 / 81 |
| HWS1500-6 | 6 | 4.8 - 7.2 | 250 | 300 | 60 | 36 | 150 | 7.5 - 8.4 | 79 / 82 |
| HWS1000-7 | 7.5 | 6.0 - 9.0 | 134 | 160 | 60 | 36 | 150 | 9.38 - 10.5 | 80 / 82 |
| HWS1500-7 | 7.5 | 6.0 - 9.0 | 200 | 240 | 60 | 40 | 150 | 9.37 - 10.5 | 81 / 83 |
| HWS300-12 | 12 | 9.6 - 14.4 | 27 | - | 96 | 48 | 120 | 15.0 - 17.4 | 80 / 83 |
| HWS600-12 | 12 | 9.6 - 14.4 | 53 | - | 96 | 48 | 120 | 15.0 - 17.4 | 80 / 83 |
| HWS1000-12 | 12 | 9.6 - 14.4 | 88 | 100 | 100 | 48 | 150 | 15.0 - 17.4 | 83 / 85 |
| HWS1500-12 | 12 | 9.6 - 14.4 | 125 | - | 72 | 48 | 150 | 15.0 - 17.4 | 82 / 85 |
| HWS300-15 | 15 | 12.0 - 18.0 | 22 | - | 120 | 60 | 150 | 18.8 - 21.8 | 82 / 85 |
| HWS600-15 | 15 | 12.0 - 18.0 | 43 | - | 120 | 60 | 150 | 18.8 - 21.8 | 82 / 85 |
| HWS1000-15 | 15 | 12.0 - 18.0 | 70 | 80 | 120 | 60 | 150 | 18.8 - 21.8 | 83 / 85 |
| HWS1500-15 | 15 | 12.0 - 18.0 | 100 | - | 90 | 60 | 150 | 18.7 - 21.8 | 83 / 87 |
| HWS300-24 | 24 | 19.2 - 28.8 | 14 | 16.5 | 192 | 96 | 150 | 30.0 - 34.8 | 82 / 85 |
| HWS600-24 | 24 | 19.2 - 28.8 | 27 | 31 | 192 | 96 | 150 | 30.0 - 34.8 | 82 / 85 |
| HWS1000-24 | 24 | 19.2 - 28.8 | 44 | 50 | 150 | 96 | 150 | 30.0 - 34.8 | 85 / 87 |
| HWS1500-24 | 24 | 19.2 - 28.8 | 65/70 (3) | 105 | 144 | 96 | 200 | 30.0 - 34.8 | 84 / 88 |
| HWS1000-36 | 36 | 28.8 - 43.2 | 29.3 | 33.3 | 150 | 144 | 200 | 45.0 - 49.7 | 85 / 88 |
| HWS1500-36 | 36 | 28.8 - 43.2 | 42/46.5 (3) | 70 | 150 | 144 | 200 | 45.0 - 49.7 | 84 / 88 |
| HWS300-48 | 48 | 38.4 - 52.8 | 7 | - | 384 | 192 | 200 | 55.2 - 64.8 | 82 / 85 |
| HWS600-48 | 48 | 38.4 - 52.8 | 13 | - | 384 | 192 | 200 | 55.2 - 64.8 | 82 / 85 |
| HWS1000-48 | 48 | 38.4 - 52.8 | 22 | 25 | 300 | 192 | 200 | 55.2 - 64.8 | 86 / 88 |
| HWS1500-48 | 48 | 38.4 - 52.8 | 32 | - | 288 | 192 | 200 | 55.2 - 64.8 | 86 / 90 |
| HWS1000-60 | 60 | 48.0 - 66.0 | 17.6 | 20 | 360 | 240 | 400 | 69.0 - 75.0 | 85 / 88 |
| HWS1500-60 | 60 | 48.0 - 66.0 | 25.6/28 (3) | 42 | 360 | 240 | 400 | 69.0 - 75.0 | 86 / 90 |

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| HWS | 300 | - | 3 | / | - |
|---|---|---|---|---|---|

- **HWS** — Series
- **300** — Nominal power level and product size
- **3** — Output voltage 3 (3.3V), 5, 6, 7 (7.5) 12, 15, 24, 36, 48, 60
- **-** —

| | |
|---|---|
| blank | No options |
| /A | Not applicable. The HWS300-1500 models have a cover fitted as standard |
| /PV | 1 to 6V output program voltage for HWS300, 600. Standard on HWS1000 & 1500 |
| /HD | See HWS/HD datasheet for details. -40°C start-up & pcb coating |
| /ME | See HWS/ME datasheet for details. IEC60601-1 medical certification |

## Specifications

| Model | | HWS300 | HWS600 | HWS1000 | HWS1500 |
|---|---|---|---|---|---|
| **Input** | | | | | |
| AC Input Voltage Range (Operating) | Vac | 85 - 265 | | | |
| Nominal Input Voltage Range | Vac | 100 - 240 (Note: Safety certified for 90-264Vac) | | | |
| Input Frequency | Hz | 47 - 63 (Note: Safety certified for 50/60Hz only) | | | |
| DC Input Voltage Range [4] | Vdc | 120 - 330 (Note: Safety certified for AC input only) | | | |
| Input Current (100/200Vac) [5] | A | 5V: 3.8/1.9; 12-48V: 4.2/2.1 | 5V: 7.5/3.6; 12-48V: 8.1/3.9 | 3.3V: 9.6/5.0; 5-60V: 13.5/7.0 | 3.3V: 15.0/8.0 5-60V: 19.5/10.0 |
| Inrush Current (100/200Vac) | A | 20 / 40 (Typical at cold start) | | | |
| Leakage Current (240Vac, 60Hz) | mA | <0.75 | <0.75 | <1.2 | <1.5 |
| Power Factor (100/200Vac) | - | 0.99 / 0.95 | 0.99 / 0.95 | 0.98 / 0.95 | 0.98 / 0.94 |
| Harmonic Compliance | - | Meets IEC61000-3-2 Class A | | | |
| Hold Up Time (typ) | ms | 20 | | | |
| Efficiency | - | See model selector table | | | |
| Conducted & Radiated EMI | - | EN55011 / EN55032-B, FCC-B, VCCI-B. (HWS1500: Class A) | | | |
| Immunity | - | See immunity table | | | |
| Safety Certifications and Markings | - | IEC/EN/UL/CSA62368-1, 60950-1, EN50178-1, (UL508 on HWS300 and HWS600 5V, 12V, 24V & 48V models only), CE Mark and UKCA Mark | | | |

## Immunity

| Test | Standard | Test Level | Criteria | Notes See IEC61000 immunity test report on website |
|---|---|---|---|---|
| ESD | EN61000-4-2 | Air ± 8kV and contact ± 4kV | A/B | HWS300, HWS600; B |
| Radiated Susceptibility | EN61000-4-3 | 80M -1GHz: 10V/m<br>1.4 - 2.0GHz: 3V/m<br>2.0 - 2.7GHz: 1V/m | A | -<br>-<br>- |
| Electrical Fast Transient Burst | EN61000-4-4 | ± 2kV | A/B | HWS300, HWS600; B |
| Surge | EN61000-4-5 | Normal ± 2kV<br>Common ± 4kV | A/B | HWS300, HWS600; B |
| Conducted Susceptibility | EN61000-4-6 | 10Vrms | A | - |
| Magnetic Fields | EN61000-4-8 | 30A/m | A | - |
| Voltage Dips | EN61000-4-11 | 30% 10ms<br>60% 100ms<br>100% 5000ms | A<br>B<br>B | -<br>-<br>- |
| SEMI F47 Line Dip | SEMI F47 | - | - | At input voltages > 200Vac |

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## Specifications

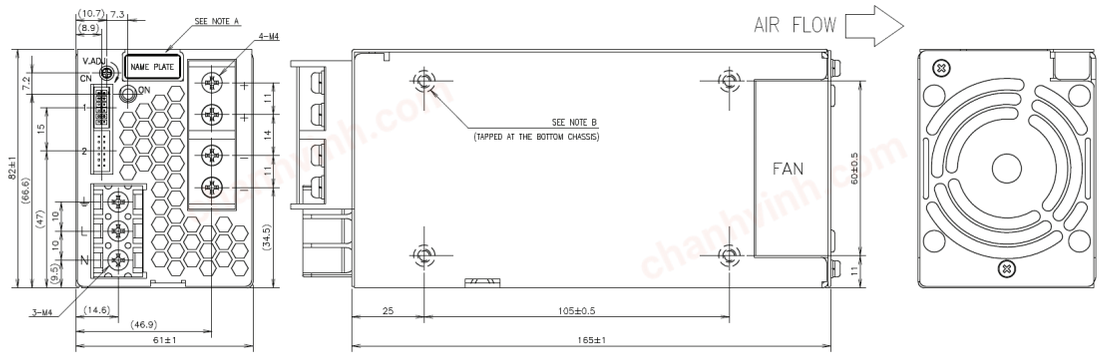
| Model | | HWS300 | HWS600 | HWS1000 | HWS1500 |
|---|---|---|---|---|---|
| **Output** | | | | | |
| Switching Frequency | kHz | 190 | 190 | 46 | 3-5V: 45, 6-7V: 55, 12-60: 70 |
| Line Regulation | - | See Model Selector Table | | | |
| Load Regulation | - | See Model Selector Table | | | |
| External Load Capacitance (Maximum) | uF | 3.3V, 5V; 10,000, 12V, 15V; up to 5,000, 24V; up to 5,000, 48V; 1,000 | | | |
| Ripple & Noise | - | See Model Selector Table | | | |
| Temperature Coefficient | %/°C | 0.02 | | | |
| Minimum Load | - | No minimum load required | | | |
| Overcurrent Protection | % | >105 (>101 of peak current for peak current capable models) | | | |
| Overvoltage Protection | - | See model selector table. Latching (unit shutdown), cycle AC input to reset | | | |
| Remote Sense | - | Yes | | | |
| Remote On/Off | - | Yes (Isolated from output) | | | |
| Indicators | - | Green LED indicates DC is OK | | | |
| Parallel Operation | - | Single wire connection (up to 5 units). See instruction manual | | | |
| **Environmental** | | | | | |
| Operating Temperature | °C | -10 to +70, derate linearly to 50% load from 50 to 70 (6) | | | |
| Storage Temperature | °C | -30 to +85 | | | |
| Humidity (non condensing) | %RH | Operating: 10 - 90, Non operating 10 - 95 | | | |
| Cooling | - | Internal fan | | | |
| Altitude | m | 2,000 | 2,000 | 3,000 | 2,000 |
| Withstand Voltage (For 1 minute) | Vac | Input to ground 2,500, Input to output 3,000, Output to ground 500 for 1 minute | | Input to ground 2,000, Input to output 3,000, Output to ground 500 for 1 minute | |
| Isolation Resistance | MΩ | >100 at 25°C, 70%RH & 500Vdc | | | |
| Vibration (Non-operating) | - | 10-55Hz (Sweep for 1min.), 19.6m/s$^2$ Constant X,Y,Z 1 hour each | | | |
| Shock (Non-operating) | - | Less than 196m/s$^2$ | | | |
| **Other** | | | | | |
| Weight (Typ) | g | 1,000 | 1,600 | 3,200 | 4,000 (<12V 3,800) |
| Size (WxHxD) | mm | 61 x 82 x 165 | 100 x 82 x 165 | 126.5 x 82 x 240 | 126.5 x 82 x 280 |
| Size (WxHxD) | Inches | 2.4 x 3.23 x 6.5 | 3.94 x 3.23 x 6.5 | 5 x 3.25 x 9.45 | 5 x 3.25 x 11 |
| Connectors | - | Screw terminals | | | |
| Case Material | - | Aluminum | | | |
| MTBF - Telcordia SR-332 issue 3* | Hours | 2,145,809 | 1,998,996 | 1,087,031 | 1,152,309 |
| Warranty | Years | Limited lifetime (1) or 5 years | | | |

Notes:
See website for detailed specifications, test methods and installation manual
(1) The Americas and EMEA regions: limited lifetime warranty. Other regions: 5 years. See applicable regional terms of sale.
(2) 200-265Vac input, 10s maximum on time with 35% duty cycle
(3) Rating at 100 / 200Vac input
(4) Safety certified for AC input only
(5) See website for input current on 3.3V models
(6) Input and output voltage dependent. See installation manuals for derating curves
* 24V output model, 25°C ambient, full load, 230Vac input

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## Outline Drawing HWS300




SIGNAL CONNECTOR INFORMATION

CN1,CN2 PIN ASSIGN

S12B-PHDSS (JST)

1. +Vm
2. +S
3. -Vm
4. -S
5. PC
6. COM
7. NC
8. NC
9. CNT
10. TOG
11. PF
12. TOG

== NOTES ==

A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

B : M4 TAPPED HOLES (8) FOR CUSTOMER CHASSIS MOUNTING. (SCREW PENETRATION DEPTH 6m/m MAX.)

== ACCESSORIES ==

* COVER FOR BARRIER TERMINAL STRIP ------1 (ATTACHED ON TERMINAL AT SHIPMENT)
* SHORT PIECE ----------1 SHORTING +Vm — +S, -Vm — -S, CNT — TOG (ATTACHED ON CN1 AT SHIPMENT)

== SIGNAL CONNECTOR USED ==

| PART DESCRIPTION | PART NAME | MANUFACT |
|---|---|---|
| PIN HEADER | S12B-PHDSS | JST |

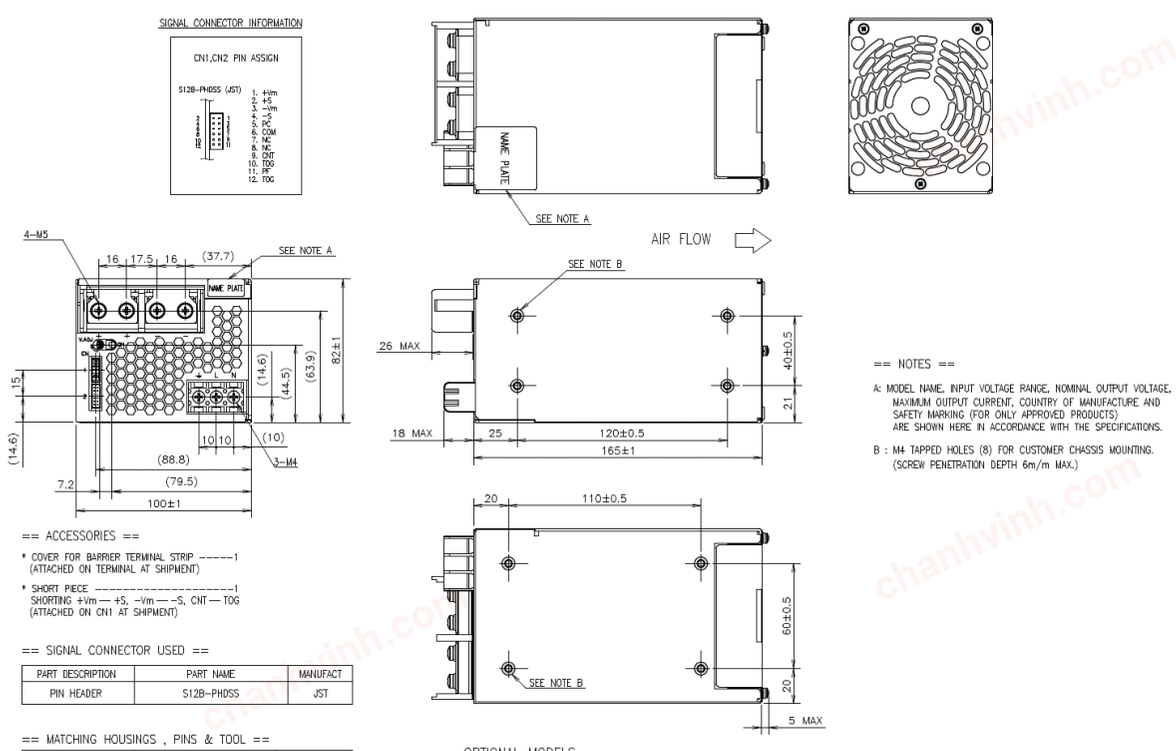
== MATCHING HOUSINGS , PINS & TOOL ==

| PART DESCRIPTION | PART NAME | MANUFACT |
|---|---|---|
| SOCKET HOUSING | PHDR-12VS | JST |
| TERMINAL PINS | SPHD-002T-P0.5(AWG28~24) SPHD-001T-P0.5(AWG26~22) | JST |
| HAND CRIMPING TOOL | YRS-620(SPHD-002T-P0.5) YC-610R(SPHD-001T-P0.5) | JST |

== OPTIONAL MODELS ==

| MODEL | COATING |
|---|---|
| HWS300-* | — |
| HWS300-* /CO | ○ |
| HWS300-* /HD | ○ |

## Outline Drawing HWS600




SIGNAL CONNECTOR INFORMATION

CN1,CN2 PIN ASSIGN

S12B-PHDSS (JST)

1. +Vm
2. +S
3. -Vm
4. -S
5. PC
6. COM
7. NC
8. NC
9. CNT
10. TOG
11. PF
12. TOG

== NOTES ==

A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

B : M4 TAPPED HOLES (8) FOR CUSTOMER CHASSIS MOUNTING. (SCREW PENETRATION DEPTH 6m/m MAX.)

== ACCESSORIES ==

* COVER FOR BARRIER TERMINAL STRIP ------1 (ATTACHED ON TERMINAL AT SHIPMENT)
* SHORT PIECE ----------1 SHORTING +Vm — +S, -Vm — -S, CNT — TOG (ATTACHED ON CN1 AT SHIPMENT)

== SIGNAL CONNECTOR USED ==

| PART DESCRIPTION | PART NAME | MANUFACT |
|---|---|---|
| PIN HEADER | S12B-PHDSS | JST |

== MATCHING HOUSINGS , PINS & TOOL ==

| PART DESCRIPTION | PART NAME | MANUFACT |
|---|---|---|
| SOCKET HOUSING | PHDR-12VS | JST |
| TERMINAL PINS | SPHD-002T-P0.5(AWG28~24) SPHD-001T-P0.5(AWG26~22) | JST |
| HAND CRIMPING TOOL | YRS-620(SPHD-002T-P0.5) YC-610R(SPHD-001T-P0.5) | JST |

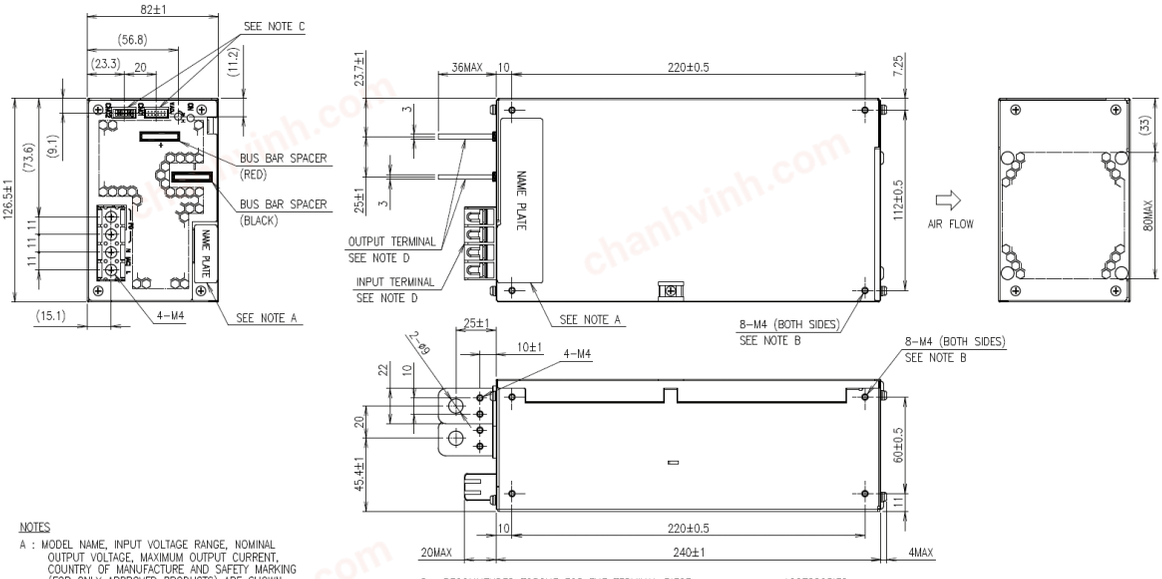
== OPTIONAL MODELS ==

| MODEL | COATING |
|---|---|
| HWS600-* | — |
| HWS600-* /CO | ○ |
| HWS600-* /HD | ○ |

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## Outline Drawing HWS1000




NOTES

A : MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

B : M4 TAPPED HOLES (16) FOR CUSTOMER CHASSIS MOUNTING.
{ SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY } MORE THAN 6m/m.
RECOMMENDED M4 SCREWS TORQUE : 1.27N·m

C : I/O SIGNAL CONNECTOR

| | | |
|---|---|---|
| CONNECTOR | : S12B-PHDSS(LF)(SN) | (JST) |
| MATCHING HOUSING | : PHDR-12VS | (JST) |
| MATCHING CONTACT | : SPHD-002T-P0.5(AWG28~24) | (JST) OR |
| | SPHD-001T-P0.5(AWG26~22) | (JST) OR |
| | BPHD-001T-P0.5(AWG26~22) | (JST) |
| HAND CRIMPING TOOL | : YRS-620(SPHD-002T-P0.5) | (JST) |
| | YC-610R(SPHD-001T-P0.5) | (JST) |
| | YC-610R(BPHD-001T-P0.5) | (JST) |

D : RECOMMENDED TORQUE FOR THE TERMINAL PIECE.

| | |
|---|---|
| INPUT TERMINAL (M4 SCREW) | : 1.27N·m |
| OUTPUT TERMINAL (M8 BOLT & NUT) | : 10.8N·m |
| OUTPUT TERMINAL (M4 SCREW) | : 1.27N·m |

SIGNAL CONNECTOR INFORMATION

CN01,CN02 PIN ASSIGN

S12B-PHDSS (JST)

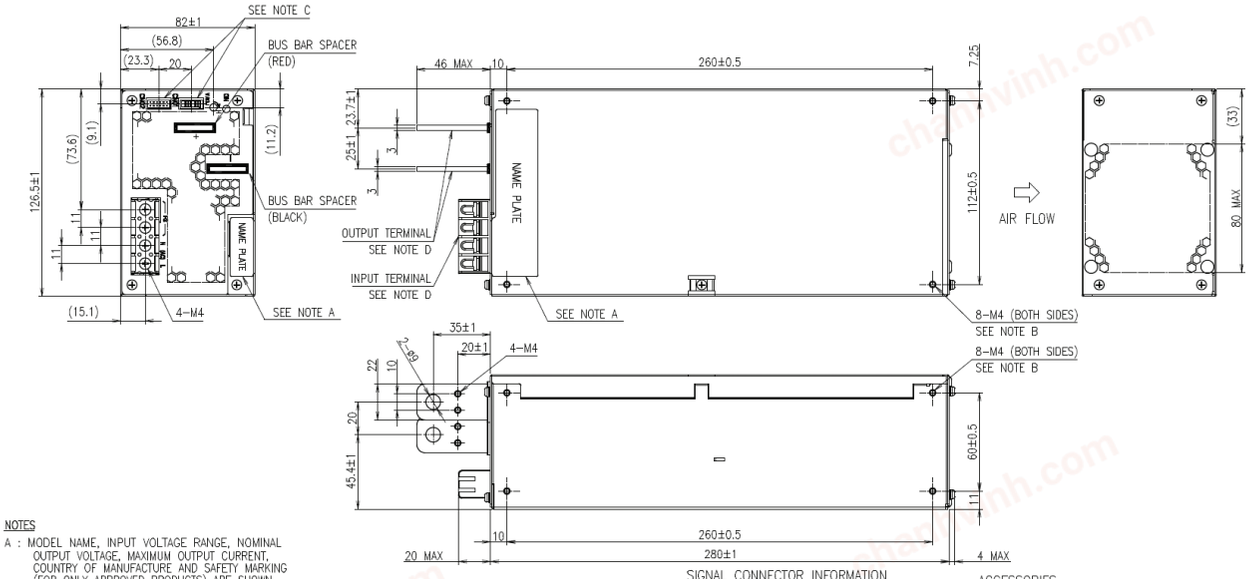



| | |
|---|---|
| 1. +V | 7. PV |
| 2. +S | 8. REF |
| 3. −V | 9. CNT |
| 4. −S | 10. TOG |
| 5. PC | 11. PF |
| 6. COM | 12. TOG |

ACCESSORIES

* ATTACHED CONNECTOR
SHORTING +S~+V, −S~−V, PV~REF & CNT~TOG
ATTACHED ON CN02 AT SHIPMENT

## Outline Drawing HWS1500




NOTES

A : MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

B : M4 TAPPED HOLES (16) FOR CUSTOMER CHASSIS MOUNTING.
{ SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY } MORE THAN 6m/m.
RECOMMENDED M4 SCREWS TORQUE : 1.27N·m

C : I/O SIGNAL CONNECTOR

| | | |
|---|---|---|
| CONNECTOR | : S12B-PHDSS(LF)(SN) | (JST) |
| MATCHING HOUSING | : PHDR-12VS | (JST) |
| MATCHING CONTACT | : SPHD-002T-P0.5(AWG28~24) | (JST) OR |
| | SPHD-001T-P0.5(AWG26~22) | (JST) OR |
| | BPHD-001T-P0.5(AWG26~22) | (JST) |
| HAND CRIMPING TOOL | : YRS-620(SPHD-002T-P0.5) | (JST) |
| | YC-610R(SPHD-001T-P0.5) | (JST) |
| | YC-610R(BPHD-001T-P0.5) | (JST) |

D : RECOMMENDED TORQUE FOR THE TERMINAL PIECE.

| | |
|---|---|
| INPUT TERMINAL (M4 SCREW) | : 1.27N·m |
| OUTPUT TERMINAL (M8 BOLT & NUT) | : 10.8N·m |
| OUTPUT TERMINAL (M4 SCREW) | : 1.27N·m |

SIGNAL CONNECTOR INFORMATION

CN01,CN02 PIN ASSIGN

S12B-PHDSS (JST)




| | |
|---|---|
| 1. +V | 7. PV |
| 2. +S | 8. REF |
| 3. −V | 9. CNT |
| 4. −S | 10. TOG |
| 5. PC | 11. PF |
| 6. COM | 12. TOG |

ACCESSORIES

* ATTACHED CONNECTOR (3~7V)
SHORTING +S~(+), −S~(−), PV~REF & CNT~TOG
ATTACHED ON CN01 AT SHIPMENT

* ATTACHED CONNECTOR (12~60V)
SHORTING +S~+V, −S~−V, PV~REF & CNT~TOG
ATTACHED ON CN01 AT SHIPMENT

OPTIONAL MODELS

| MODEL | COATING |
|---|---|
| HWS1500-* | |
| HWS1500-*/C01 | ○ |

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Trusted • Innovative • Reliable

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