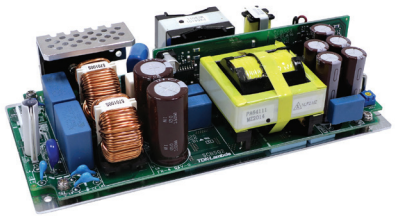
# 350 / 500W Medical Power Supplies with a 1,000W Peak Capability

https://product.tdk.com/en/power/cus350mp
www.emea.lambda.tdk.com/cus350mp

Medical Industrial Test



The CUS350MP-1000 AC-DC power supplies are rated up to 350W (1,000W peak) with convection cooling for applications requiring low audible noise, or up to 500W (1,000W peak) with external airflow. The series is certified to IEC60601-1 3rd edition (medical), IEC62368-1 and IEC62477-1 (OVCIII) with compliance to the EN60601-1-2:2015 Edition 4 immunity requirements. With efficiencies of up to 94%, waste heat is reduced allowing the power supply to operate reliably in a compact 88 x 183 x 44mm package size. A 5V 0.3A standby voltage and remote on/off are fitted as standard. The high peak power rating makes the CUS350MP-1000 suitable for use in printers and equipment utilizing DC motors.

| Features | Benefits |
|---|---|
| • Up to 350W Convection Cooled or 500W With External Airflow | • Low Audible Noise |
| • High Peak Power Rating up to 800W for 5s or 1,000W for 1s | • Size and Cost Reductions Compared to Continuously Rated Products |
| • Medical Certification (2 x MoPP) | • Suitable for B and BF Rated Equipment |
| • Class B Conducted and Radiated EMI | • Easier System Compliance |
| • Compact 88 x 183 x 44mm (3.46 x 7.2 x 1.73") Package | • Space Saving in End Equipment |
| • Five Year Warranty | • Low Cost of Ownership |

## Model Selector

| Model | Output Voltage (V) | Adjustment Range (V) | Max Current Convection (A) | Max Power Convection (W) | Max Current Forced Air (A) | Max Power Forced Air (W) | Max Peak Current (A) | Max Peak Power (W) |
|---|---|---|---|---|---|---|---|---|
| CUS350MP-1000-24 | 24 | 24 - 26.4 | 14.6 | 350.4 | 20.8 | 499.2 | 41.7 | 1000.8 |
| CUS350MP-1000-30 | 30 | 27 - 30 | 11.65 | 349.5 | 16.6 | 498.0 | 33.3 | 999.0 |
| CUS350MP-1000-36 | 36 | 36 - 42 | 9.7 | 349.2 | 13.8 | 496.8 | 27.7 | 997.2 |
| CUS350MP-1000-48 | 48 | 45 - 48 | 7.3 | 350.4 | 10.4 | 499.2 | 20.9 | 1003.2 |

| CUS350MP-1000- | 24 | / | TA |
|---|---|---|---|

Output voltage 24, 30, 36, 48

| | |
|---|---|
| blank | Dual fuses, baseplate mounted |
| /A | With cover |
| /T | Screw terminals |
| TA | With cover and screw terminals |
| /CO2 | Pcb coating |
| /SF | Single input fuse (Line) |

## Specifications

| Model | | CUS350MP-1000 |
|---|---|---|
| **Input** | | |
| Input Voltage range | Vac / Vdc | 85 - 265Vac, 120 - 370Vdc (1)(2) |
| Input Frequency | Hz | 47 - 63 |
| Input Current (115/230Vac) | A | Convection cooled: 3.6 / 1.7. Forced air: 4.9 / 1.5 |
| Inrush Current at 100/200Vac (Cold Start) | A | 15 / 30 first inrush, 30 / 30 second inrush |
| Leakage Current | uA | <300 (60Hz) |
| Power Factor (10/200Vac) | - | 0.98 / 0.93 |
| Harmonic Compliance | - | Meets IEC61000-3-2 |
| Hold Up Time | ms | Convection cooled: 20. Forced air: 15. (Typical) |
| Efficiency at 115/230Vac (Typ) | % | 91 / 94 |
| Conducted & Radiated EMI | - | EN55011 / EN55032-B, FCC Class B, VCCI-B |
| Immunity | - | See immunity section |
| Insulation Class | - | Class I |
| Safety Certifications and Markings | - | IEC/ES/EN60601-1, IEC/UL/EN62368-1, EN62477-1 (OVCIII), CE Mark and UKCA Mark |

## Immunity

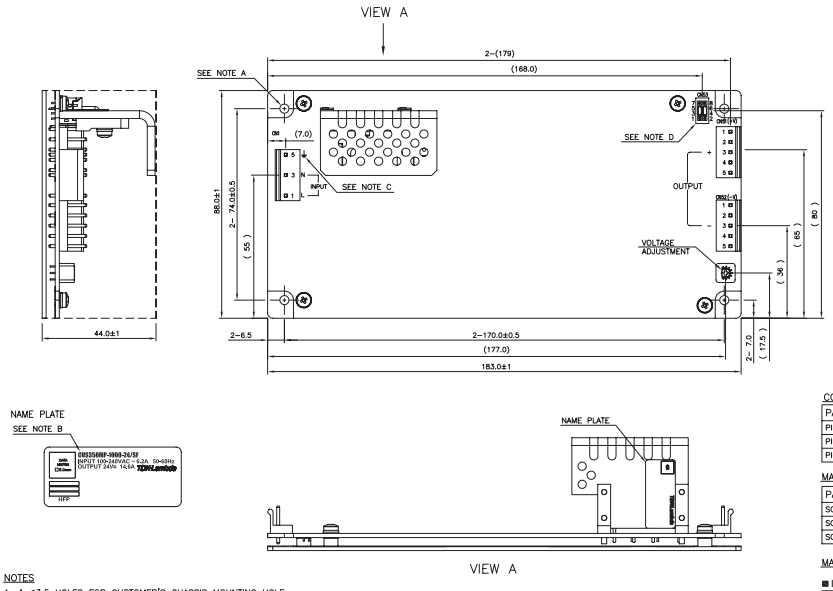
| Test | Standard | Test Level | Criteria | |
|---|---|---|---|---|
| ESD | EN61000-4-2 | 3 | A | - |
| Radiated Susceptibility | EN61000-4-3 | 3 | A | - |
| Electrical Fast Transient Burst | EN61000-4-4 | 3 | A | - |
| Surge | EN61000-4-5 | 3 (4) | A | Level 4 common mode only |
| Conducted Susceptibility | EN61000-4-6 | 3 | A | - |
| Magnetic fields | EN61000-4-8 | 4 | A | - |
| ESD | IEC60601-1-2 Ed.4 | 4 | A | - |
| Radiated Susceptibility | | 3 | A | - |
| Electrical Fast Transient Burst | | 3 | A | - |
| Voltage Dips and Input Interruptions | EN61000-4-11 | 30% dip 500ms | A | - |
| | | 60% dip 200ms | B / A | 100Vac / 230Vac |
| | | 100% dip 20ms | A | - |
| | | 100% dip 500ms | B | - |
| | IEC60601-1-2 Ed.4 | 30% dip 500ms | A | Customer to consider essential performance of end equipment |
| | | 60% dip 200ms | A | |
| | | 100% dip 20ms | A | |
| | | 100% dip 500ms | B | |
| SEMI F47 Line Dip | SEMI F47 | - | - | At input voltages > 200Vac |

## Specifications

| Model | | CUS350MP-1000 |
|---|---|---|
| **Output** | | |
| Output Voltage Tolerance | % | ±1 |
| Switching Frequency (Converter) | kHz | 75 to 120. At light or no load the CUS350MP-1000 will operate in intermittent burst mode |
| Line Regulation | % | 4 |
| Load Regulation | % | 8 |
| External Load Capacitance | uF | 24V: 10,000, 30V: 8,750, 36V: 7,500, 48V: 5,000 |
| Ripple & Noise | mV | 1% (0 to 50°C), 2% (-20 to 0°C) |
| Temperature Coefficient | %/°C | <0.02 |
| Minimum Load | - | No minimum load required |
| Overcurrent Protection | % | > 101 |
| Overvoltage Protection | V | 24V: >28.1, 30V: >31.1, 36V: 44.1, 48V: >50.1 |
| Overtemperature Protection | - | Yes, latching. Cycle AC or use remote on/off to reset |
| Remote Sense | - | No |
| Remote On/Off | - | Apply short to enable output voltage |
| DC Good / Fan Alarm | - | - |
| Standby Voltage | - | 5V 0.3A isolated (always on) |
| Indicators | - | - |
| Parallel Operation | - | Not possible |
| **Environmental** | | |
| Operating Temperature | °C | -20 to +70, derate linearly to 30% load from 50 to 70. See Note (2) for links to the specification and instruction manual. |
| Storage Temperature | °C | -30 to +75 |
| Humidity (non condensing) | %RH | Operating: 30 - 90, Storage: 30 - 90 |
| Cooling | - | Convection or ≥2.2m/s forced air directed at components C8, C9 and T1 (2) |
| Altitude | m | 5000 (IEC62368-1), 4000 (IEC60601-1), 2000 (IEC62477-1) |
| Withstand Voltage (For 1 minute) | - | Input to Ground 2kVac (1xMoPP), Input to Output 4kVac (2xMoPP), Output to Ground 1.5kVac (1xMoPP) for 1 min. |
| Isolation Resistance | MΩ | >100 at 25°C, 70%RH & 500VDC |
| Vibration (Non-operating) | - | 10 - 55Hz: 19.6m/s$^2$ (sweep 1 min) X, Y, Z for 1 hour |
| Shock | - | < 196.1 m/s$^2$ |
| **Other** | | |
| Weight (Typ) | g | Open frame: 770, With cover (/A ): 850 |
| Size (LxWxH) | mm | Open frame: 183 x 88 x 44, With cover (/A): 212 x 99.5 x 49.6 |
| Size (LxWxH) | Inches | Open frame: 7.2 x 3.46 x 1.73, With cover (/A): 8.35 x 3.92 x 1.95 |
| Connectors | - | Input and output connectors JST VHR5N Signal JST PHDR-8VS. /A models screw terminals |
| MTBF - Telcordia SR-332 issue 3* | Hours | 1,066,036 |
| Warranty | yrs | 5 |

Notes
See website for detailed specifications, test methods and installation manual
(1) Safety certified for AC input only
(2) Consult specification and instruction manual for derating and peak power characteristics
*24V output model, 25°C ambient, full load, 200Vac input

## Outline Drawing (open frame)







NOTES

A. 4-ø3.5 HOLES FOR CUSTOMER'S CHASSIS MOUNTING HOLE.
B. MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C. ⏚ IS PROTECTIVE BONDING TERMINAL
D. SIGNAL CONNECTOR INFORMATION

PIN CONFIGURATION AND FUNCTIONS OF CN53

| PIN NO. | CONFIGURATION | FUNCTION |
|---|---|---|
| 1 | -R | GND FOR REMOTE ON/OFF TERMINAL |
| 2 | +RO | REMOTE ON/OFF TERMINAL |
| 3 | -R | GND FOR REMOTE ON/OFF TERMINAL |
| 4 | +RS | REMOTE ON/OFF TERMINAL |
| 5 | -STB | GND FOR STANDBY SUPPLY |
| 6 | +STB | STANDBY SUPPLY (5V/0.3A) |
| 7 | -STB | GND FOR STANDBY SUPPLY |
| 8 | +STB | STANDBY SUPPLY (5V/0.3A) |

FOR FURTHER INFORMATION REFER TO INSTRUCTION MANUAL

* PIN2 : MUST NOT APPLY VOLTAGE EXTERNALLY. IT WILL CAUSE POWER SUPPLY DAMAGE.

CONNECTORS USED :

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| PIN HEADER (INPUT SIDE CN1) | B3P5-VH(LF)(SN) | JST | 1 |
| PIN HEADER (OUTPUT SIDE CN51 & CN52) | B5P-VH(LF)(SN) | JST | 2 |
| PIN HEADER (SIGNAL CONNECTOR CN53) | B8B-PHDSS(LF)(SN) | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| SOCKET HOUSING (CN1) | VHR-5N | JST | 1 |
| SOCKET HOUSING (CN51 & CN52) | VHR-5N | JST | 2 |
| SOCKET HOUSING (CN53) | PHDR-8VS | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

■ INPUT SIDE (CN1) AND OUTPUT SIDE (CN51 AND CN52)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SVH-41T-P1.1 | JST | 13 |
| HAND CRIMPING TOOL | YC-930R | JST | – |

■ SIGNAL CONNECTOR (CN53)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SPHD-002T-P0.5 | JST | – |
| | SPHD-001T-P0.5 | | |
| HAND CRIMPING TOOL | YRS-620, YC-610R | JST | – |

ACCESSORIES:
* SHORT PIECE ----------1
SHORTING +RS - +STB, -R - -STB (ATTACHED ON CN53 AT SHIPMENT)

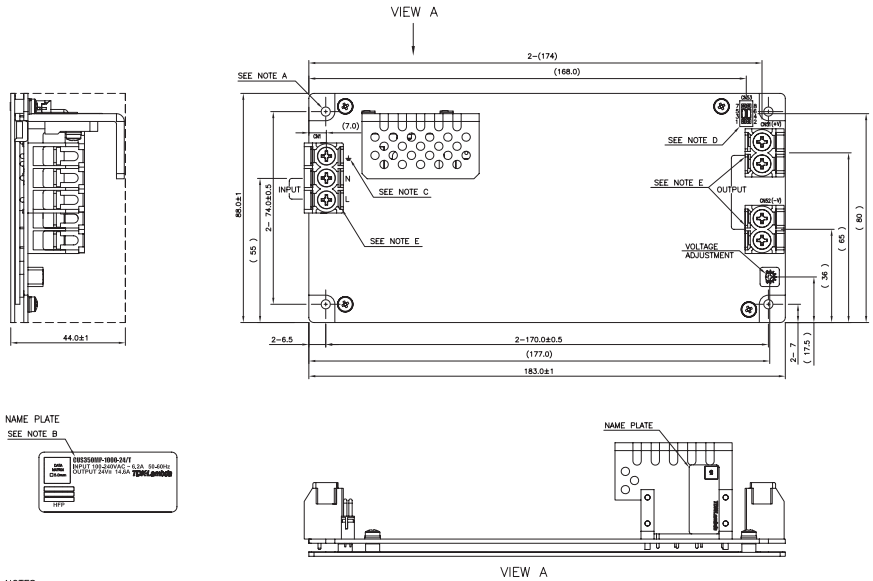
(UNIT:mm)

| MODEL | CUS350MP-1000/SF |
|---|---|

TDK-Lambda

PA644-02-01/SF

## Outline Drawing (Open frame with screw terminals /T)







NOTES

A. 4-ø3.5 HOLES FOR CUSTOMER'S CHASSIS MOUNTING HOLE.
B. MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C. ⏚ IS PROTECTIVE BONDING TERMINAL
D. SIGNAL CONNECTOR INFORMATION

PIN CONFIGURATION AND FUNCTIONS OF CN53

| PIN NO. | CONFIGURATION | FUNCTION |
|---|---|---|
| 1 | -R | GND FOR REMOTE ON/OFF TERMINAL |
| 2 | +RO | REMOTE ON/OFF TERMINAL |
| 3 | -R | GND FOR REMOTE ON/OFF TERMINAL |
| 4 | +RS | REMOTE ON/OFF TERMINAL |
| 5 | -STB | GND FOR STANDBY SUPPLY |
| 6 | +STB | STANDBY SUPPLY (5V/0.3A) |
| 7 | -STB | GND FOR STANDBY SUPPLY |
| 8 | +STB | STANDBY SUPPLY (5V/0.3A) |

FOR FURTHER INFORMATION REFER TO INSTRUCTION MANUAL

E. M3.5 SCREWS FOR INPUT AND OUTPUT TERMINAL, RECOMMENDED TORQUE: 1.0 Nm ~ 1.6 Nm.

* PIN2 : MUST NOT APPLY VOLTAGE EXTERNALLY. IT WILL CAUSE POWER SUPPLY DAMAGE.

CONNECTORS USED :

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| PIN HEADER (SIGNAL CONNECTOR CN53) | B8B-PHDSS(LF)(SN) | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| SOCKET HOUSING (CN53) | PHDR-8VS | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

■ SIGNAL CONNECTOR (CN53)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SPHD-002T-P0.5 | JST | – |
| | SPHD-001T-P0.5 | | |
| HAND CRIMPING TOOL | YRS-620, YC-610R | JST | – |

ACCESSORIES:
SHORT PIECE ----------1
SHORTING +RS - +STB, -R - -STB (ATTACHED ON CN53 AT SHIPMENT)

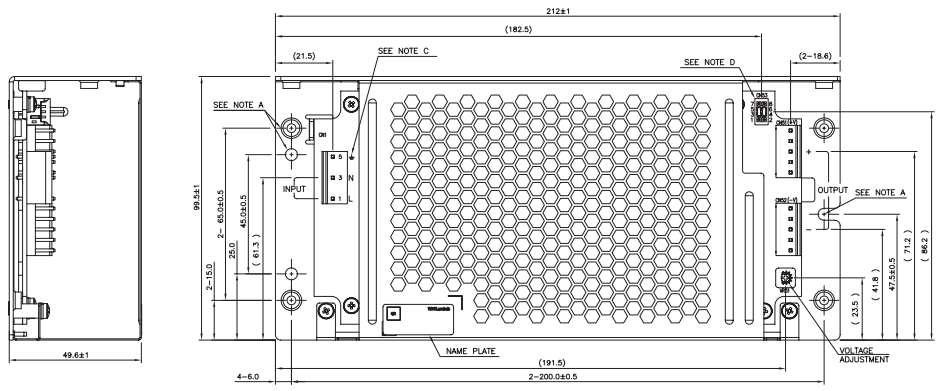
(UNIT:mm)

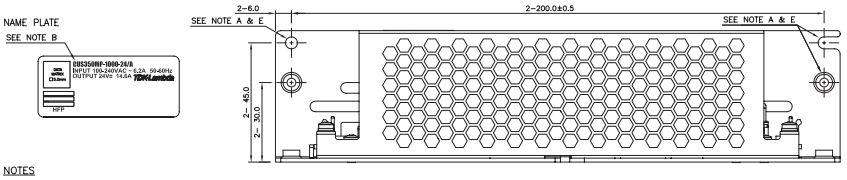
| MODEL | CUS350MP-1000/T |
|---|---|

TDK-Lambda

PA644-02-01/T

## Outline Drawing (Open frame with cover /A)




NOTES
A. 3-ø4.5 HOLES, 2-ø4.5 OPEN SLOT HOLES & 6-M4 THREADED HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLE.
A1. THE INSTALLATION BY MOUNTING HOLES AT SIDE WALL WILL NOT BE SATISFIED VIBRATION AND SHOCK SPECIFICATION.
B. MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C. ⏚ IS PROTECTIVE BONDING TERMINAL
D. SIGNAL CONNECTOR INFORMATION

PIN CONFIGURATION AND FUNCTIONS OF CN53

| PIN NO. | CONFIGURATION | FUNCTION |
|---|---|---|
| 1 | −R | GND FOR REMOTE ON/OFF TERMINAL |
| 2 | +RO | REMOTE ON/OFF TERMINAL |
| 3 | −R | GND FOR REMOTE ON/OFF TERMINAL |
| 4 | +RS | REMOTE ON/OFF TERMINAL |
| 5 | −STB | GND FOR STANDBY SUPPLY |
| 6 | +STB | STANDBY SUPPLY (5V/0.3A) |
| 7 | −STB | GND FOR STANDBY SUPPLY |
| 8 | +STB | STANDBY SUPPLY (5V/0.3A) |

* PIN2 : MUST NOT APPLY VOLTAGE EXTERNALLY. IT WILL CAUSE POWER SUPPLY DAMAGE.

FOR FURTHER INFORMATION REFER TO INSTRUCTION MANUAL
E. THE INSTALLATION BY MOUNTING HOLES AT SIDE WALL WILL NOT BE SATISFIED VIBRATION AND SHOCK SPECIFICATION.

CONNECTORS USED :

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| PIN HEADER (INPUT SIDE CN1) | B3P5-VH(LF)(SN) | JST | 1 |
| PIN HEADER (OUTPUT SIDE CN51 & CN52) | B5P-VH(LF)(SN) | JST | 2 |
| PIN HEADER (SIGNAL CONNECTOR CN53) | B8B-PHDSS(LF)(SN) | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| SOCKET HOUSING (CN1) | VHR-5N | JST | 1 |
| SOCKET HOUSING (CN51 & CN52) | VHR-5N | JST | 2 |
| SOCKET HOUSING (CN53) | PHDR-8VS | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):
■ INPUT SIDE (CN1) AND OUTPUT SIDE (CN51 AND CN52)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SVH-41T-P1.1 | JST | 13 |
| HAND CRIMPING TOOL | YC-930R | JST | – |

■ SIGNAL CONNECTOR (CN53)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SPHD-002T-P0.5 | JST | – |
| | SPHD-001T-P0.5 | | |
| HAND CRIMPING TOOL | YRS-620, YC-610R | JST | – |

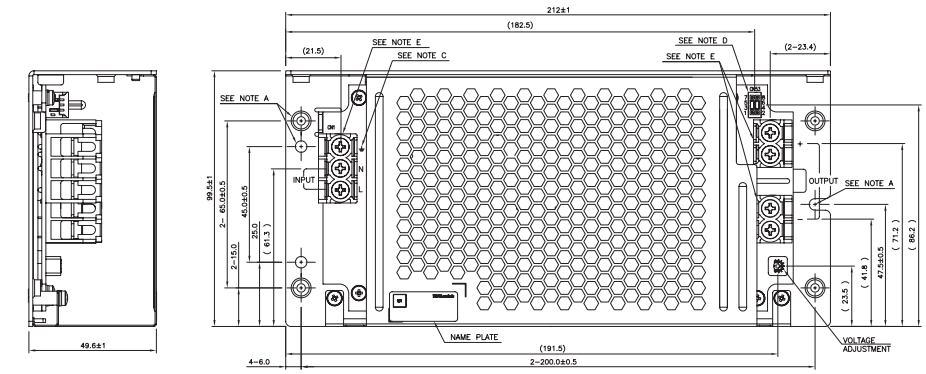
ACCESSORIES:
* SHORT PIECE ----------1
SHORTING +RS − +STB, −R − −STB (ATTACHED ON CN53 AT SHIPMENT)

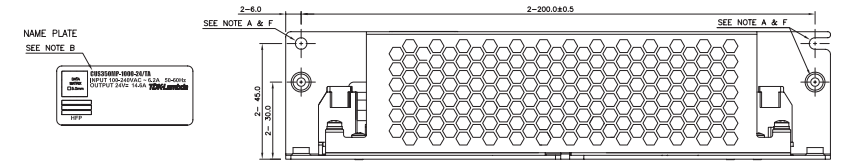
(UNIT:mm)

| MODEL | CUS350MP-1000/A |
|---|---|
| TDK-Lambda | |

PA644-02-01/A-A

## Outline Drawing (Open frame with cover and screw terminals /TA)




NOTES
A. 3-ø4.5 HOLES, 2-ø4.5 OPEN SLOT HOLES & 6-M4 THREADED HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLE.
B. MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
C. ⏚ IS PROTECTIVE BONDING TERMINAL
D. SIGNAL CONNECTOR INFORMATION

PIN CONFIGURATION AND FUNCTIONS OF CN53

| PIN NO. | CONFIGURATION | FUNCTION |
|---|---|---|
| 1 | −R | GND FOR REMOTE ON/OFF TERMINAL |
| 2 | +RO | REMOTE ON/OFF TERMINAL |
| 3 | −R | GND FOR REMOTE ON/OFF TERMINAL |
| 4 | +RS | REMOTE ON/OFF TERMINAL |
| 5 | −STB | GND FOR STANDBY SUPPLY |
| 6 | +STB | STANDBY SUPPLY (5V/0.3A) |
| 7 | −STB | GND FOR STANDBY SUPPLY |
| 8 | +STB | STANDBY SUPPLY (5V/0.3A) |

* PIN2 : MUST NOT APPLY VOLTAGE EXTERNALLY. IT WILL CAUSE POWER SUPPLY DAMAGE.

FOR FURTHER INFORMATION REFER TO INSTRUCTION MANUAL
E. M3.5 SCREWS FOR INPUT AND OUTPUT TERMINAL, RECOMMENDED TORQUE: 1.0 Nm ~ 1.6 Nm.
F. THE INSTALLATION BY MOUNTING HOLES AT SIDE WALL WILL NOT BE SATISFIED VIBRATION AND SHOCK SPECIFICATION.

CONNECTORS USED :

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| PIN HEADER (SIGNAL CONNECTOR CN53) | B8B-PHDSS(LF)(SN) | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| SOCKET HOUSING (CN53) | PHDR-8VS | JST | 1 |

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):
■ SIGNAL CONNECTOR (CN53)

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---|---|---|---|
| TERMINAL PINS | SPHD-002T-P0.5 | JST | – |
| | SPHD-001T-P0.5 | | |
| HAND CRIMPING TOOL | YRS-620, YC-610R | JST | – |

ACCESSORIES:
SHORT PIECE ----------1
SHORTING +RS − +STB, −R − −STB (ATTACHED ON CN53 AT SHIPMENT)

(UNIT:mm)

| MODEL | CUS350MP-1000/TA |
|---|---|
| TDK-Lambda | |

PA644-02-01/TA-A



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For Additional Information, please visit
https://product.tdk.com/en/power/