



(Terminal Type)



(Wiring Type)



Features

- Power or charger mode switchable by SBP-001(Terminal type)
- High efficiency up to 96%
- Aluminum case fanless design and filling with heat-conducted glue and able to withstand 10G vibration test
- Wide operating temperature range -40 ~ +70°C
- Charger for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese)
- Built-in default 2/3 stage charging curves and programmable curve
- Built-in PMBus protocol / CANBus protocol (optional )
- Output voltage and constant current level programmable
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Built-in remote ON-OFF control (Terminal type)
- DC OK active signal and 12V Auxiliary power available
- LED indicator for power on (Terminal type)
- IP67 design for indoor or outdoor installation (Wiring type)
- 6 years warranty

Applications

- Industrial automation machinery
- Industrial control system at harsh environment
- Mechanical and electrical equipment
- Electronic instruments, equipments
- 5G telecom equipments
- Robotic lawn mower/AMR/AGV
- Equipments or instruments with back-up battery

GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

Description

HEP-1000 is a 1000W industrial AC/DC power supply featuring the outstanding capability to operate under highly humid, dusty, oily, and high-vibration harsh environment. The entire series is housed with the aluminum case and fully potted with heat-conducted glue. Adopting the full range 90~305VAC input, the entire series provides an output voltage line of 24V, 48V and 100V. In addition to the high efficiency up to 96%, that the whole series operates from -40°C ~ 70°C under air convection without fan. HEP-1000 has the complete protection functions and 10G anti-vibration capability ; It is complied with the international safety regulations such as TUV BS EN/EN62368-1 UL62368-1, and the design refers to BS EN/EN61558-1 and BS EN/EN60335-1HEP-1000 series serves as a high performance power supply solution for various industrial and charger applications.

Model Encoding

HEP - 1000 - 24 W

- Function option: Blank/PM/CAN/CPM/CCAN
- { Blank : Terminal type
  - { W : Wiring type with IP67
- Output voltage(24/48/100V)
- Rated wattage
- Series name

| I/O Type | Function type | Communication Protocol        | Note       |
|----------|---------------|-------------------------------|------------|
| Terminal | Blank         | PMBus and PV/PC programmable  | In Stock   |
|          | CAN           | CANBus and PV/PC programmable | By request |
| Wiring   | Blank         | PV/PC programmable            | By request |
|          | PM            | PMBus                         | By request |
|          | CAN           | CANBus                        | By request |
|          | CPM           | Charger with PMBus            | By request |
|          | CCAN          | Charger with CANBus           | By request |

Note: Terminal type with charger function by programmer or PMBus/CANBus setting

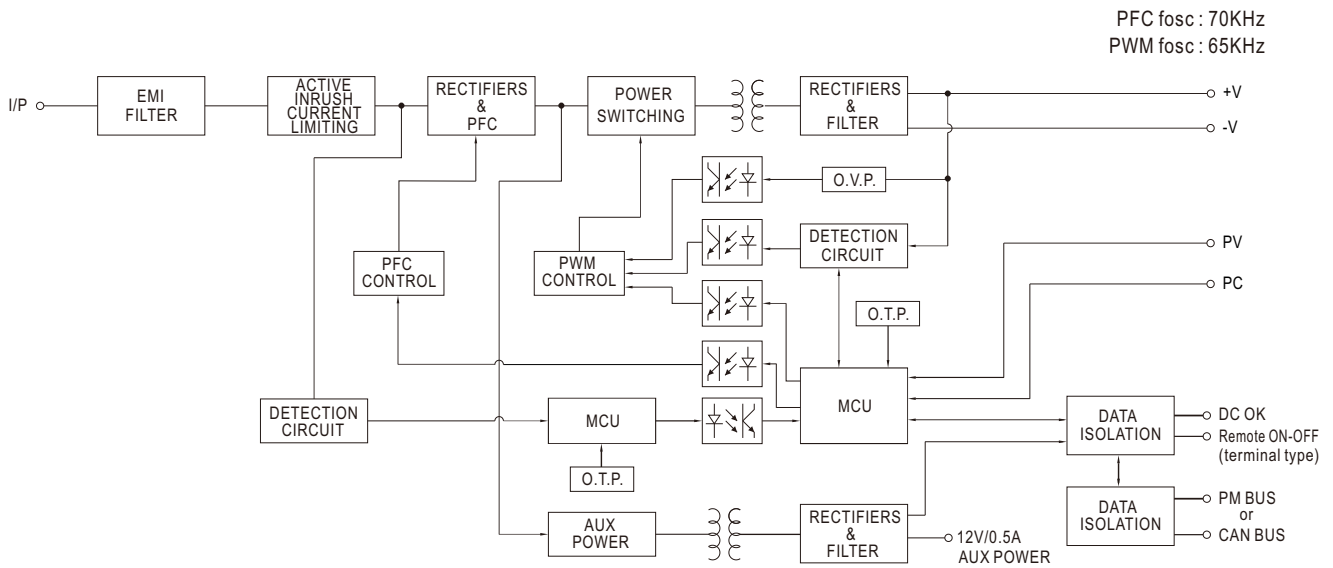
## SPECIFICATION FOR POWER SUPPLY (Default Setting)

| MODEL                    |                                                       | HEP-1000-24 <span>□□</span>                                                                                                                                             |                            | HEP-1000-48 <span>□□</span> |                                                                          | HEP-1000-100 <span>□□</span> |  |
|--------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------|--------------------------------------------------------------------------|------------------------------|--|
| OUTPUT                   | DC VOLTAGE                                            | 24V                                                                                                                                                                     |                            | 48V                         |                                                                          | 100V                         |  |
|                          | RATED CURRENT                                         | 42A                                                                                                                                                                     |                            | 21A                         |                                                                          | 10A                          |  |
|                          | RATED POWER                                           | 1008W                                                                                                                                                                   |                            | 1008W                       |                                                                          | 1000W                        |  |
|                          | RIPPLE & NOISE (max.) <small>Note.2</small>           | 200mVp-p                                                                                                                                                                |                            | 250mVp-p                    |                                                                          | 500mVp-p                     |  |
|                          | VOLTAGE ADJ. RANGE                                    | By built-in potentiometer, SVR                                                                                                                                          |                            |                             |                                                                          |                              |  |
|                          |                                                       | 24 ~ 30V                                                                                                                                                                |                            | 48 ~ 60V                    |                                                                          | 100 ~ 125V                   |  |
|                          | VOLTAGE TOLERANCE <small>Note.3</small>               | ± 1.0%                                                                                                                                                                  |                            | ± 1.0%                      |                                                                          | ± 1.0%                       |  |
|                          | LINE REGULATION                                       | ± 0.5%                                                                                                                                                                  |                            | ± 0.5%                      |                                                                          | ± 0.5%                       |  |
|                          | LOAD REGULATION                                       | ± 0.5%                                                                                                                                                                  |                            | ± 0.5%                      |                                                                          | ± 0.5%                       |  |
|                          | SETUP, RISE TIME                                      | 1800ms, 80ms at full load                                                                                                                                               |                            | 230VAC /115VAC              |                                                                          |                              |  |
| HOLD UP TIME (Typ.)      | 16ms / 230VAC at 75% load                             |                                                                                                                                                                         | 12ms / 230VAC at full load |                             |                                                                          |                              |  |
| INPUT                    | VOLTAGE RANGE <small>Note.4</small>                   | 90 ~ 305VAC      250 ~ 431VDC                                                                                                                                           |                            |                             |                                                                          |                              |  |
|                          | FREQUENCY RANGE                                       | 47 ~ 63Hz                                                                                                                                                               |                            |                             |                                                                          |                              |  |
|                          | POWER FACTOR (Typ.)                                   | PF>0.99/115VAC, PF>0.95/230VAC, PF>0.93/277VAC at full load                                                                                                             |                            |                             |                                                                          |                              |  |
|                          | EFFICIENCY (Typ.)                                     | 95%                                                                                                                                                                     |                            | 96%                         |                                                                          | 96%                          |  |
|                          | AC CURRENT (Typ.)                                     | 10.1A / 115VAC                                                                                                                                                          |                            | 5.3A / 230VAC               |                                                                          | 4.5A / 277VAC                |  |
|                          | INRUSH CURRENT(Typ.)                                  | Cold start 40A at 230VAC                                                                                                                                                |                            |                             |                                                                          |                              |  |
|                          | LEAKAGE CURRENT                                       | <0.75mA / 240VAC                                                                                                                                                        |                            |                             |                                                                          |                              |  |
| PROTECTION               | OVERLOAD                                              | 105~125% rated current<br>Protection type : Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover               |                            |                             |                                                                          |                              |  |
|                          | SHORT CIRCUIT                                         | Constant current limiting, unit will shutdown after 5 sec, re-power on to recover                                                                                       |                            |                             |                                                                          |                              |  |
|                          | OVER VOLTAGE                                          | 30 ~ 35V                                                                                                                                                                |                            | 60 ~ 70V                    |                                                                          | 125 ~ 145V                   |  |
|                          |                                                       | Protection type :Shut down O/P voltage,re-power on to recover                                                                                                           |                            |                             |                                                                          |                              |  |
|                          | OVER TEMPERATURE                                      | Protection type :Shut down O/P voltage, recovers automatically after temperature goes down                                                                              |                            |                             |                                                                          |                              |  |
| FUNCTION                 | OUTPUT VOLTAGE PROGRAMMABLE(PV) <small>Note 5</small> | Adjustment of output voltage is allowable to 50 ~ 125% of nominal output voltage<br>Please refer to the Function Manual.                                                |                            |                             |                                                                          |                              |  |
|                          | OUTPUT CURRENT PROGRAMMABLE(PC) <small>Note 5</small> | Adjustment of constant current level is allowable to 20 ~ 100% of rated current.<br>Please refer to the Function Manual.                                                |                            |                             |                                                                          |                              |  |
|                          | REMOTE ON/OFF CONTROL                                 | Power ON : Short circuit      Power OFF : Open circuit                                                                                                                  |                            |                             |                                                                          |                              |  |
|                          | AUXILIARY POWER                                       | 12V @ 0.5A tolerance ±10%, ripple=150mVp-p                                                                                                                              |                            |                             |                                                                          |                              |  |
|                          | DC-OK SIGNAL                                          | The TTL signal out, PSU turn on = 4.4 ~ 5.5V ; PSU turn off = -0.5 ~ 0.5V. Please refer to the Function Manual.                                                         |                            |                             |                                                                          |                              |  |
| ENVIRONMENT              | WORKING TEMP.                                         | -40 ~ +70℃ (Refer to "Derating Curve")                                                                                                                                  |                            |                             |                                                                          |                              |  |
|                          | WORKING HUMIDITY                                      | 20 ~ 95% RH non-condensing                                                                                                                                              |                            |                             |                                                                          |                              |  |
|                          | STORAGE TEMP., HUMIDITY                               | -40 ~ +80℃, 10 ~ 95% RH non-condensing                                                                                                                                  |                            |                             |                                                                          |                              |  |
|                          | TEMP. COEFFICIENT                                     | ± 0.03%/℃ (0 ~ 50℃)                                                                                                                                                     |                            |                             |                                                                          |                              |  |
|                          | VIBRATION                                             | 20 ~ 500Hz, 10G 12min./1cycle, period for 72min. each along X, Y, Z axes                                                                                                |                            |                             |                                                                          |                              |  |
| SAFETY & EMC<br>(Note.7) | SAFETY STANDARDS                                      | UL62368-1, TUV BS EN/EN62368-1, BIS IS13252(Part1): 2010/IEC 60950-1:2005(NOTE 9), EAC TP TC 004 approved; design refer to BS EN/EN61558-1, BS EN/EN60335-1(by request) |                            |                             |                                                                          |                              |  |
|                          | WITHSTAND VOLTAGE                                     | I/P-O/P:3KVAC    I/P-FG:2KVAC    O/P-FG:1.25KVAC                                                                                                                        |                            |                             |                                                                          |                              |  |
|                          | ISOLATION RESISTANCE                                  | I/P-O/P, I/P-FG,O/P-FG:100M Ohms/500VDC/25℃ / 70%RH                                                                                                                     |                            |                             |                                                                          |                              |  |
|                          | EMC EMISSION                                          | Parameter                                                                                                                                                               | Standard                   |                             | Test Level / Note                                                        |                              |  |
|                          |                                                       | Conducted                                                                                                                                                               | BS EN/EN55032 (CISPR32)    |                             | Class B                                                                  |                              |  |
|                          |                                                       | Radiated                                                                                                                                                                | BS EN/EN55032 (CISPR32)    |                             | Class B                                                                  |                              |  |
|                          |                                                       | Harmonic Current                                                                                                                                                        | BS EN/EN61000-3-2          |                             | Class A                                                                  |                              |  |
|                          |                                                       | Voltage Flicker                                                                                                                                                         | BS EN/EN61000-3-3          |                             | -----                                                                    |                              |  |
|                          | EMC IMMUNITY                                          | BS EN/EN55024 , BS EN/EN61000-6-2                                                                                                                                       |                            |                             |                                                                          |                              |  |
|                          |                                                       | Parameter                                                                                                                                                               | Standard                   |                             | Test Level / Note                                                        |                              |  |
|                          |                                                       | ESD                                                                                                                                                                     | BS EN/EN61000-4-2          |                             | Level 3, 8KV air ; Level 2, 4KV contact                                  |                              |  |
|                          |                                                       | Radiated                                                                                                                                                                | BS EN/EN61000-4-3          |                             | Level 3                                                                  |                              |  |
|                          |                                                       | EFT / Burst                                                                                                                                                             | BS EN/EN61000-4-4          |                             | Level 3                                                                  |                              |  |
|                          |                                                       | Surge                                                                                                                                                                   | BS EN/EN61000-6-2          |                             | 2KV/Line-Line 4KV/Line-Earth                                             |                              |  |
|                          |                                                       | Conducted                                                                                                                                                               | BS EN/EN61000-4-6          |                             | Level 3                                                                  |                              |  |
|                          |                                                       | Magnetic Field                                                                                                                                                          | BS EN/EN61000-4-8          |                             | Level 4                                                                  |                              |  |
|                          |                                                       | Voltage Dips and Interruptions                                                                                                                                          | BS EN/EN61000-4-11         |                             | >95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods |                              |  |
| OTHERS                   | MTBF                                                  | 583.7K hrs min.    Telcordia SR-332 (Bellcore) ; 52.3K hrs min.    MIL-HDBK-217F (25℃)                                                                                  |                            |                             |                                                                          |                              |  |
|                          | DIMENSION                                             | 310*144*48.5mm (L*W*H)                                                                                                                                                  |                            |                             |                                                                          |                              |  |
|                          | PACKING                                               | 4Kg;4pcs/18.25Kg/1.04CUFT                                                                                                                                               |                            |                             |                                                                          |                              |  |

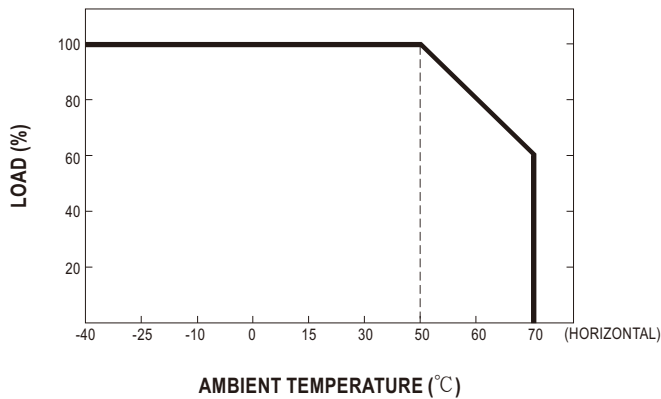
**SPECIFICATION FOR CHARGER (Option function)**

| MODEL                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HEP-1000-24 □□                                                                                                                                                          | HEP-1000-48 □□                                                           | HEP-1000-100 □□                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------|
| OUTPUT                         | BOOST CHARGE VOLTAGE Vboost                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 28.8V                                                                                                                                                                   | 57.6V                                                                    | 115.2V                                  |
|                                | FLOAT CHARGE VOLTAGE Vfloat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 27.6V                                                                                                                                                                   | 55.2V                                                                    | 110.4V                                  |
|                                | RECOMMENDED BATTERY CAPACITY(AMP HOURS)(Note 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 120 ~ 350AH                                                                                                                                                             | 60 ~ 175AH                                                               | 30 ~ 85AH                               |
|                                | BATTERY TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Open & Sealed Lead Acid                                                                                                                                                 |                                                                          |                                         |
|                                | OUTPUT CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 35A                                                                                                                                                                     | 17.5A                                                                    | 8.7A                                    |
| INPUT                          | VOLTAGE RANGE      Note 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 90 ~ 305VAC      250 ~ 431VDC                                                                                                                                           |                                                                          |                                         |
|                                | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 47 ~ 63Hz                                                                                                                                                               |                                                                          |                                         |
|                                | POWER FACTOR (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PF>0.99/115VAC, PF>0.95/230VAC, PF>0.93/277VAC at full load                                                                                                             |                                                                          |                                         |
|                                | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 95%                                                                                                                                                                     | 96%                                                                      | 96%                                     |
|                                | AC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10.1A / 115VAC      5.3A / 230VAC      4.5A / 277VAC                                                                                                                    |                                                                          |                                         |
|                                | INRUSH CURRENT(Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Cold start 40A at 230VAC                                                                                                                                                |                                                                          |                                         |
|                                | LEAKAGE CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <0.75mA / 240VAC                                                                                                                                                        |                                                                          |                                         |
| PROTECTION                     | SHORT CIRCUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Constant current limiting, unit will shutdown after 5 sec, re-power on to recover.                                                                                      |                                                                          |                                         |
|                                | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 30 ~ 35V                                                                                                                                                                | 60 ~ 70V                                                                 | 125 ~ 145V                              |
|                                | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Protection type :Shut down O/P voltage,re-power on to recover                                                                                                           |                                                                          |                                         |
| FUNCTION                       | REMOTE ON/OFF CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Power ON : Short circuit      Power OFF : Open circuit                                                                                                                  |                                                                          |                                         |
|                                | AUXILIARY POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12V @ 0.5A tolerance ±10%, ripple=150mVp-p                                                                                                                              |                                                                          |                                         |
|                                | DC-OK SIGNAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The TTL signal out, PSU turn on = 4.4 ~ 5.5V ; PSU turn off = -0.5 ~ 0.5V. Please refer to the Function Manual.                                                         |                                                                          |                                         |
| ENVIRONMENT                    | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -40 ~ +70℃ (Refer to "Derating Curve")                                                                                                                                  |                                                                          |                                         |
|                                | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 20 ~ 95% RH non-condensing                                                                                                                                              |                                                                          |                                         |
|                                | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -40 ~ +80℃, 10 ~ 95% RH non-condensing                                                                                                                                  |                                                                          |                                         |
|                                | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ±0.03%/℃ (0 ~ 50℃)                                                                                                                                                      |                                                                          |                                         |
|                                | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20 ~ 500Hz, 10G 12min./1cycle, period for 72min. each along X, Y, Z axes                                                                                                |                                                                          |                                         |
| SAFETY & EMC<br>(Note.5)       | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | UL62368-1, TUV BS EN/EN62368-1, BIS IS13252(Part1): 2010/IEC 60950-1:2005(NOTE 7), EAC TP TC 004 approved; design refer to BS EN/EN61558-1, BS EN/EN60335-1(by request) |                                                                          |                                         |
|                                | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | I/P-O/P:3KVAC    I/P-FG:2KVAC    O/P-FG:1.25KVAC                                                                                                                        |                                                                          |                                         |
|                                | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | I/P-O/P, I/P-FG,O/P-FG:100M Ohms/500VDC/25℃ / 70%RH                                                                                                                     |                                                                          |                                         |
|                                | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Parameter                                                                                                                                                               | Standard                                                                 | Test Level / Note                       |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Conducted                                                                                                                                                               | BS EN/EN55032 (CISPR32)                                                  | Class B                                 |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated                                                                                                                                                                | BS EN/EN55032 (CISPR32)                                                  | Class A                                 |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Harmonic Current                                                                                                                                                        | BS EN/EN61000-3-2                                                        | Class A                                 |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Voltage Flicker                                                                                                                                                         | BS EN/EN61000-3-3                                                        | -----                                   |
|                                | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | BS EN/EN55024 , BS EN/EN61000-6-2                                                                                                                                       |                                                                          |                                         |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Parameter                                                                                                                                                               | Standard                                                                 | Test Level / Note                       |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ESD                                                                                                                                                                     | BS EN/EN61000-4-2                                                        | Level 3, 8KV air ; Level 2, 4KV contact |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated                                                                                                                                                                | BS EN/EN61000-4-3                                                        | Level 3                                 |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EFT / Burst                                                                                                                                                             | BS EN/EN61000-4-4                                                        | Level 3                                 |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Surge                                                                                                                                                                   | BS EN/EN61000-6-2                                                        | 2KV/Line-Line 4KV/Line-Earth            |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Conducted                                                                                                                                                               | BS EN/EN61000-4-6                                                        | Level 3                                 |
| Magnetic Field                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | BS EN/EN61000-4-8                                                                                                                                                       | Level 4                                                                  |                                         |
| Voltage Dips and Interruptions |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | BS EN/EN61000-4-11                                                                                                                                                      | >95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods |                                         |
| OTHERS                         | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 583.7K hrs min.    Telcordia SR-332 (Bellcore) ; 52.3K hrs min.    MIL-HDBK-217F (25℃)                                                                                  |                                                                          |                                         |
|                                | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 310*144*48.5mm (L*W*H)                                                                                                                                                  |                                                                          |                                         |
|                                | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4Kg;4pcs/18.25Kg/1.04CUFT                                                                                                                                               |                                                                          |                                         |
| NOTE                           | 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.<br>2. This is Mean Well's suggested range. Please consult your battery manufacturer for their suggestions about maximum charging current limitation.<br>3. Derating may be needed under low input voltages. Please check the derating curve for more details.<br>4. In charge mode: When O/P voltage < 67% of Vset for 5 sec. the unit will shut down afterwards.<br>5. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 720mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies."<br>(as available on <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> )<br>6. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).<br>7. Some model may not have the BIS logo, please contact your MEAN WELL sales for more information.<br>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a> |                                                                                                                                                                         |                                                                          |                                         |

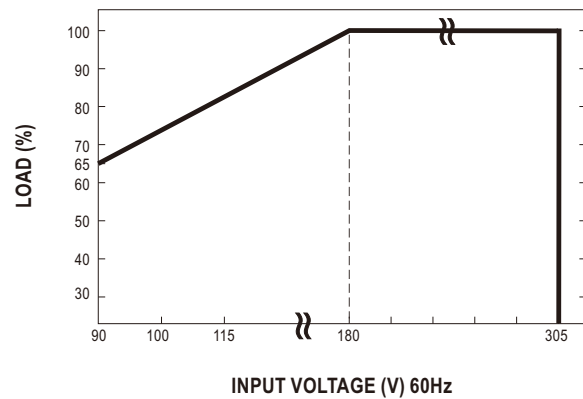
## BLOCK DIAGRAM



## DERATING CURVE



## STATIC CHARACTERISTICS



※ For 100V model charging mode, output current is 20% rated min. when operating temperature at -40°C, and can reach 100% above -30°C.

## TABLE OF FUNCTION

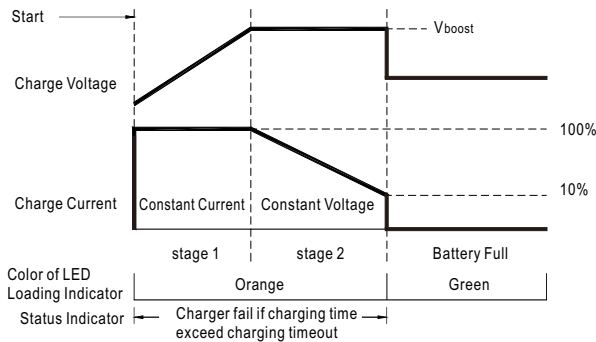
| I/O TYPE      | Function type | Power Supply Function | Charging Function | PV/PC Programmable | PMBus Protocol | CANBus Protocol | LED Indicator | Remote On/Off | DC-OK Signal | Temperature Compensation | 12V/0.5A Aux. output |
|---------------|---------------|-----------------------|-------------------|--------------------|----------------|-----------------|---------------|---------------|--------------|--------------------------|----------------------|
| Terminal type | Blank         | V(default)            | V                 | V                  | V              |                 | V             | V             | V            | V                        | V                    |
|               | CAN           | V(default)            | V                 | V                  |                | V               | V             | V             | V            | V                        | V                    |
| Wiring type   | Blank         | V                     |                   | V                  |                |                 |               |               | V            |                          | V                    |
|               | PM            | V                     |                   |                    | V              |                 |               |               | V            |                          | V                    |
|               | CAN           | V                     | V                 |                    |                | V               |               |               | V            |                          | V                    |
|               | CPM           |                       | V                 |                    | V              |                 |               |               |              | V                        | V                    |
|               | CCAN          |                       | V                 |                    |                | V               |               |               |              | V                        | V                    |

## FUNCTION MANUAL

### 1. Charging Curve (For charger type or setting HEP-1000 to charger mode)

- ※ By default, the HEP-1000 operates in power supply mode, and it can be configured to charger mode by PMBus, CANBus, or SBP-001.
- ※ By factory default, this charger performs the default curve which can be programmed via PMBus and CANBus.
- ※ To accommodate the parameters of the charging curve, SBP-001, the smart battery charging programmer designed by MEAN WELL, and a personal computer are needed. Please contact MEAN WELL for details.

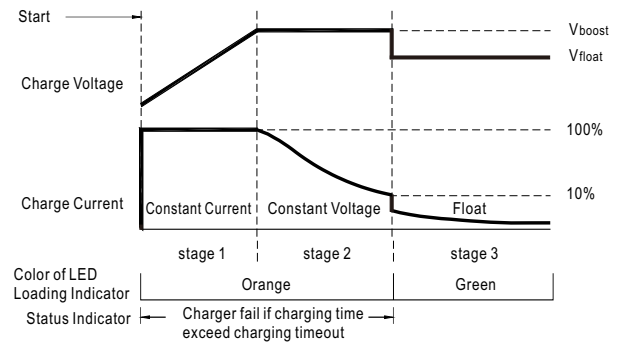
#### ※ 2 stage charging curve



| State            | 24    | 48    | 100    |
|------------------|-------|-------|--------|
| Constant Current | 35A   | 17.5A | 8.7A   |
| Vboost           | 28.8V | 57.6V | 115.2V |

◎ Suitable for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese).

#### ※ 3 stage charging curve (default)



| State            | 24    | 48    | 100    |
|------------------|-------|-------|--------|
| Constant Current | 35A   | 17.5A | 8.7A   |
| Vboost           | 28.8V | 57.6V | 115.2V |
| Vfloat           | 27.6V | 55.2V | 110.4V |

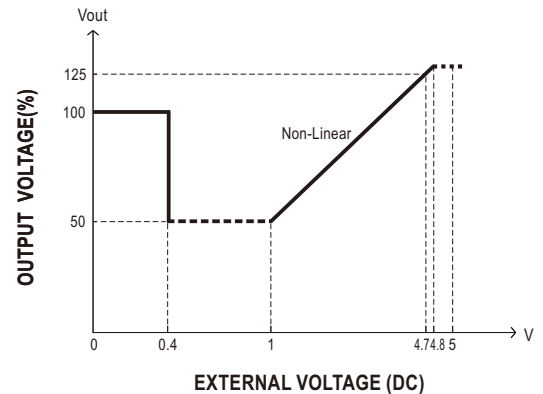
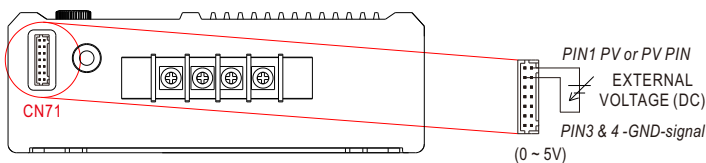
◎ Suitable for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese).

### 2. Front Panel LED Indicators & Corresponding Signal at Function Pins (Terminal type)

| LED            | Description                                                                                                                                                                                                                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green          | Float (stage 3)                                                                                                                                                                                                                                 |
| Orange         | Charging (stage 1 or stage 2)                                                                                                                                                                                                                   |
| Red            | Abnormal status (OTP, OLP, Charging timeout.)                                                                                                                                                                                                   |
| Red (Flashing) | The LED will flash with the red light when the internal temperature reaches 95°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus interface.) |

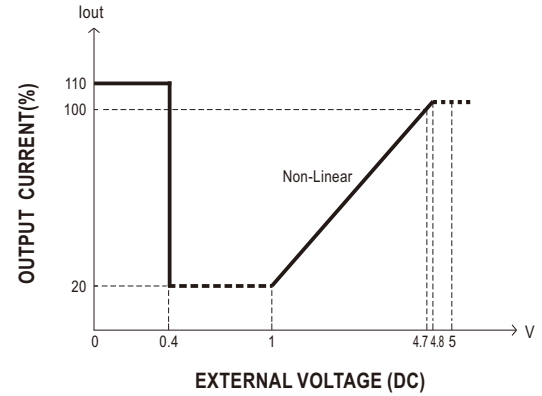
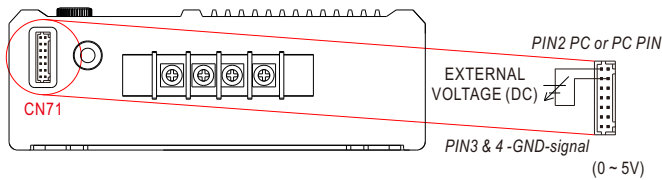
### 3. Output Voltage Programming (or, PV / remote voltage programming / remote adjust / margin programming / dynamic voltage trim)

- ※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.
- (For Blank type of Terminal and wiring)



## 4. Output Current Programming (or, PC / remote current programming / dynamic current trim)

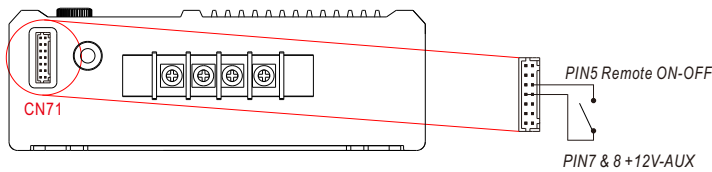
※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.  
(For Blank type of Terminal and wiring)



⦿ When O/P voltage is below 80% of Vset for 5 sec, the unit will shut down afterwards, re-power on to recover.

## 5. Remote ON-OFF Control (Terminal type)

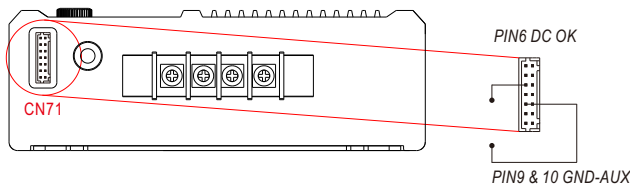
The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.



| Remote ON-OFF | Power Supply Status |
|---------------|---------------------|
| Short circuit | ON                  |
| Open circuit  | OFF                 |

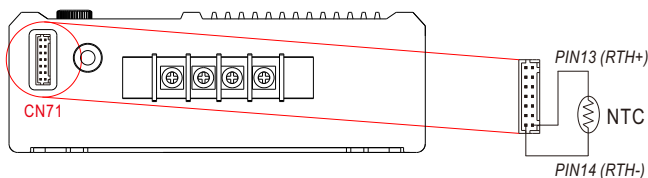
## 6. DC-OK Signal

DC-OK signal is a TTL level signal. The maximum source current is 10mA and the maximum external voltage is 5.5V.



| DC-OK signal     | Power Supply Status |
|------------------|---------------------|
| "High" >4.4~5.5V | ON                  |
| "Low" <-0.5~0.5V | OFF                 |

## 7. Temperature Compensation



- ⦿ To exploit the temperature compensation function, please attach the temperature sensor, NTC, which is enclosed with the charger, to the battery or the battery's vicinity.
- ⦿ The charger is able to work normally without the NTC.

## 8. PMBus Communication Interface

HEP-1000 supports PMBus Rev. 1.1 with maximum 100KHz bus speed, allowing information reading, status monitoring, output trimming, etc. For details, please refer to the User's Manual.



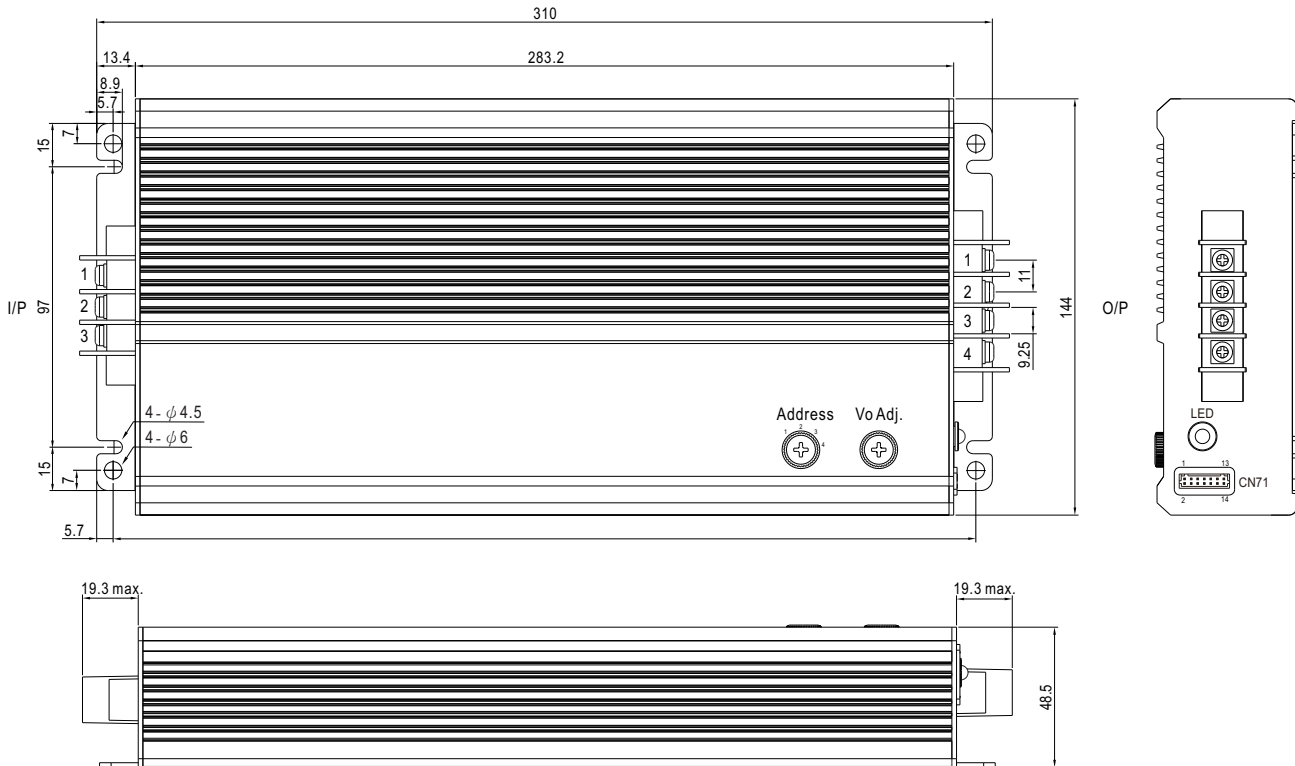
## MECHANICAL SPECIFICATION

Case No.228F

Unit:mm

Tolerance:±1

※Blank-Type (Terminal type)



※ Output voltage current level can be adjusted through internal potentiometer.(Vo Adj.)

(Can access by removing the rubber stopper on the case.)

※ PMBus interface address selection.(Address)

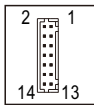
AC Input Terminal Pin No. Assignment

| Pin No. | Assignment |
|---------|------------|
| 1       | FG (⊖)     |
| 2       | AC/L       |
| 3       | AC/N       |

DC Output Terminal Pin No. Assignment

| Pin No. | Assignment |
|---------|------------|
| 1,2     | -V         |
| 3,4     | +V         |

※Control Pin No. Assignment(CN71) : JST S14B-PHDKS-B or equivalent



|                |                                  |
|----------------|----------------------------------|
| Mating Housing | JST PHDR-14VS or equivalent      |
| Terminal       | JST SPHD-001T-P0.5 or equivalent |

| Pin No. | Function      | Description                                                                                                                                                                                                                                                                                                |
|---------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | PV            | Connection for output voltage programming.(Note1)                                                                                                                                                                                                                                                          |
| 2       | PC            | Connection for constant current level programming.(Note.1)                                                                                                                                                                                                                                                 |
| 3,4     | GND (Signal)  | Negative output voltage signal.                                                                                                                                                                                                                                                                            |
| 5       | Remote ON-OFF | The unit can turn the output ON/OFF by dry contact between Remote ON/OFF and +12-AUX.(Note.2)<br>Short (10.8 ~ 13.2V) : Power ON ; Open(0 ~ 0.5V) : Power OFF ; The maximum input voltage is 13.2V                                                                                                         |
| 6       | DC-OK         | Low (-0.5 ~ 0.5V) : When $V_{out} \leq 77\% \pm 6\%$ at power mode. $V_{out} \leq 66\% \pm 6\%$ at charger mode.<br>High (4.4 ~ 5.5V) : When $V_{out} \geq 80\% \pm 6\%$ at power mode. $V_{out} \geq 67\% \pm 6\%$ at charger mode.<br>The maximum sourcing current is 10mA and only for output. (Note.2) |
| 7,8     | +12V-AUX      | Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX (pin9 & 10).<br>The maximum load current is 0.5A. This output is not controlled by "Remote ON-OFF".                                                                                                                                            |
| 9,10    | GND-AUX       | Auxiliary voltage output GND.<br>The signal return is isolated from the output terminals (+V & -V).                                                                                                                                                                                                        |
| 11      | SDA           | For PMBus model: Serial Data used in the PMBus interface. (Note.2)                                                                                                                                                                                                                                         |
|         | CANH          | For CANBus model: Data line used in CANBus interface. (Note.2)                                                                                                                                                                                                                                             |
| 12      | SCL           | For PMBus model: Serial Clock used in the PMBus interface. (Note.2)                                                                                                                                                                                                                                        |
|         | CANL          | For CANBus model: Data line used in CANBus interface. (Note.2)                                                                                                                                                                                                                                             |
| 13      | RTH+          | Temperature sensor(NTC, 5KOhm) comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage.                                                                                                                                                        |
| 14      | RTH-          |                                                                                                                                                                                                                                                                                                            |

Note1: Non-isolated signal, referenced to [GND(signal)].

Note2: Isolated signal, referenced to GND-AUX.

※W-Type (Wiring type)



※ Output voltage current level can be adjusted through internal potentiometer.  
(Can access by removing the rubber stopper on the case.)

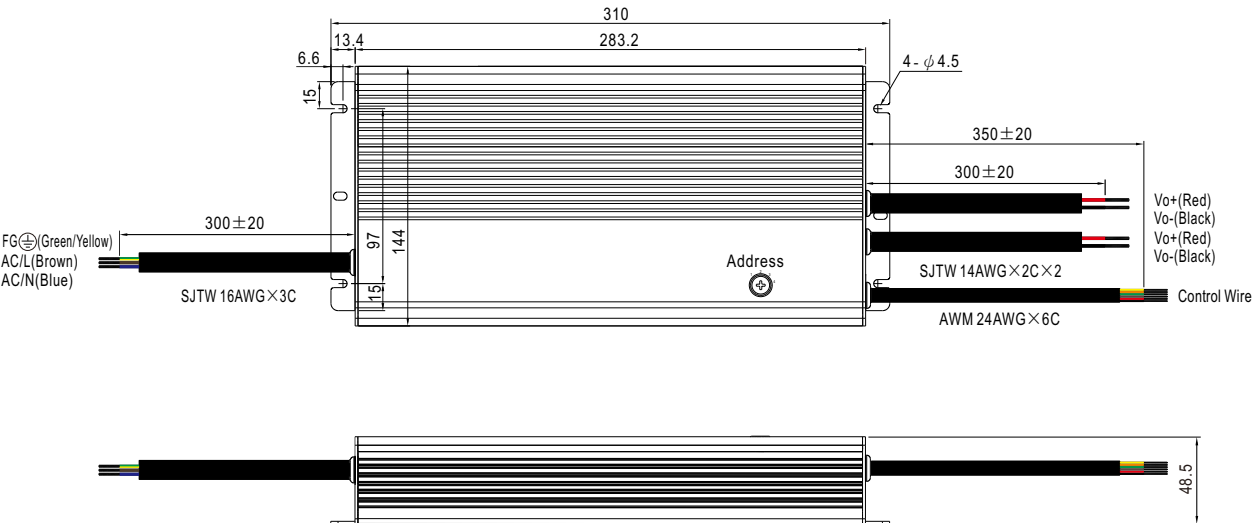
※ Control Wire Assigment : (AWM 24AWG×6C)

| Color  | Function     | Description                                                                                                                                                                                                                                                                                            |
|--------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yellow | PV           | Connection for output voltage programming.(Note1)                                                                                                                                                                                                                                                      |
| Orange | PC           | Connection for constant current level programming.(Note.1)                                                                                                                                                                                                                                             |
| Green  | GND (Signal) | Negative output voltage signal.(PV/PC GND)                                                                                                                                                                                                                                                             |
| Brown  | DC-OK        | Low (0 ~ 0.5V) : When $V_{out} \leq 77\% \pm 6\%$ at power mode. $V_{out} \leq 66\% \pm 6\%$ at charger mode.<br>High (4.4 ~ 5.5V) : When $V_{out} \geq 80\% \pm 6\%$ at power mode. $V_{out} \geq 67\% \pm 6\%$ at charger mode.<br>The maximum sourcing current is 10mA and only for output.(Note.2) |
| Red    | +12V-AUX     | Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX.<br>The maximum load current is 0.5A.                                                                                                                                                                                                      |
| Black  | GND-AUX      | Auxiliary voltage output GND.<br>The signal return is isolated from the output terminals (+V & -V).                                                                                                                                                                                                    |

Note1: Non-isolated signal, referenced to [GND(signal)].

Note2: Isolated signal, referenced to GND-AUX (GND for CANBus and PMBus protocol).

※W-Type (Wiring type with charger)



※ Output voltage current level can be adjusted through internal potentiometer.  
(Can access by removing the rubber stopper on the case.)

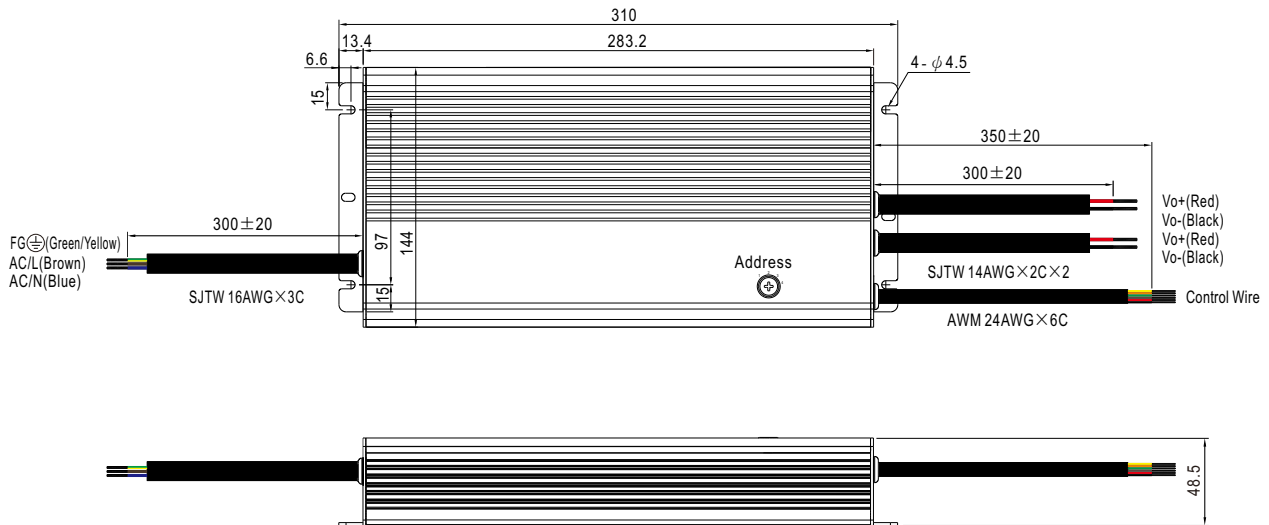
※ Control Wire Assigment : (AWM 24AWG×6C)

| Color  | Function | Description                                                                                                                                         |
|--------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Yellow | SDA      | For PMBus model: Serial Data used in the PMBus interface. (Note.1)                                                                                  |
|        | CANH     | For CANBus model: Data line used in CANBus interface. (Note.1)                                                                                      |
| Orange | SCL      | For PMBus model: Serial Clock used in the PMBus interface. (Note.1)                                                                                 |
|        | CANL     | For CANBus model: Data line used in CANBus interface. (Note.1)                                                                                      |
| Green  | RTH-     | Temperature sensor(NTC, 5KOhm) comes along with the charger can be connected to the unit to allow temperature compensation of the charging voltage. |
| Brown  | RTH+     |                                                                                                                                                     |
| Red    | +12V-AUX | Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX.<br>The maximum load current is 0.5A.                                                   |
| Black  | GND-AUX  | Auxiliary voltage output GND.<br>The signal return is isolated from the output terminals (+V & -V).                                                 |

Note1: Isolated signal, referenced to GND-AUX.



### ※W-Type (Wiring of WPM/WCAN)



※ Output voltage current level can be adjusted through internal potentiometer.  
(Can access by removing the rubber stopper on the case.)

※ Control Wire Assigment : (AWM 24AWG×6C)

| Color  | Function     | Description                                                                                                                                                                                                                                                                                            |
|--------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yellow | SDA          | For PMBus model: Serial Data used in the PMBus interface. (Note.1)                                                                                                                                                                                                                                     |
|        | CANH         | For CANBus model: Data line used in CANBus interface. (Note.1)                                                                                                                                                                                                                                         |
| Orange | SCL          | For PMBus model: Serial Clock used in the PMBus interface. (Note.1)                                                                                                                                                                                                                                    |
|        | CANL         | For CANBus model: Data line used in CANBus interface. (Note.1)                                                                                                                                                                                                                                         |
| Green  | GND (Signal) | Negative output voltage signal.(PV/PC GND)                                                                                                                                                                                                                                                             |
| Brown  | DC-OK        | Low (0 ~ 0.5V) : When $V_{out} \leq 77\% \pm 6\%$ at power mode. $V_{out} \leq 66\% \pm 6\%$ at charger mode.<br>High (4.4 ~ 5.5V) : When $V_{out} \geq 80\% \pm 6\%$ at power mode. $V_{out} \geq 67\% \pm 6\%$ at charger mode.<br>The maximum sourcing current is 10mA and only for output.(Note.1) |
| Red    | +12V-AUX     | Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX.<br>The maximum load current is 0.5A.                                                                                                                                                                                                      |
| Black  | GND-AUX      | Auxiliary voltage output GND.<br>The signal return is isolated from the output terminals (+V & -V).                                                                                                                                                                                                    |

Note1: Isolated signal, referenced to GND-AUX.