



User's Manual



Video



BS EN/EN60601-1/-1-11 ANSI/AAMI ES60601-1/-1-11 IEC60601-1/-1-11



TPTC004



## Features

- 2 pole AC inlet IEC320-C8, Class II power unit
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1/-1-11 and IEC/BS EN/EN60601-1/-1-11
- Extremely low leakage current
- No load power consumption<0.15W
- Energy efficiency level VI and meet CoC Version 5
- -30~+70°C wide range working temperature
- Protections: Short circuit / Overload / Over voltage / Over temperature
- LED indicator for power on
- Lifetime > 90 K hours
- Various DC plug quick adapter accessory available (Plug kit sold sperately, please refer to : [https://www.meanwell.com/upload/pdf/DC\\_plug.pdf](https://www.meanwell.com/upload/pdf/DC_plug.pdf) )
- 3 years warranty

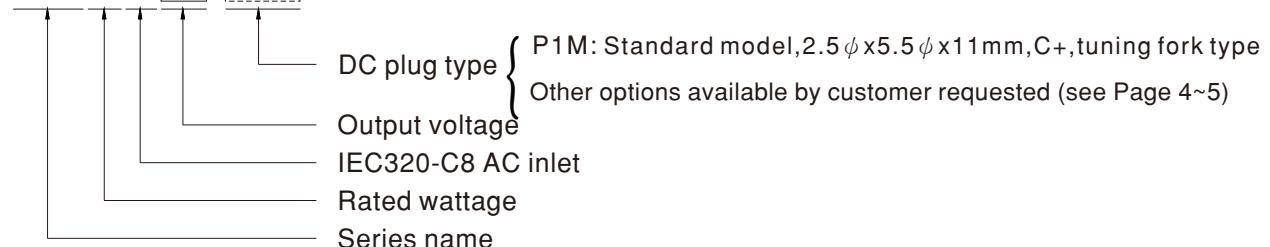
## Description

GSM90B is a highly reliable, 90W desktop style single-output green medical adaptor series. This product is equipped with a 2-pin (no FG) standard IEC320-C8 power plug, adopting the input range from 80VAC to 264VAC. The entire series supplies different output voltages between 12VDC and 48VDC that can satisfy the demands for various kinds of medical electrical devices. The circuitry design meets the international medical standards (2\*MOPP), having an ultra low leakage current (<100μA), fitting the medical devices in direct electrical contact with the patients.

With the efficiency up to 91% and the extremely low no-load power consumption below 0.15W, GSM90B is compliant with USA EISA 2007/DoE, Canada NRCAN, Australia and New Zealand MEPS, EU ErP, and meet Code of Conduct (CoC) Version 5. The supreme feature allows the adaptor to save the energy when it is either under the operating mode or the standby mode. The entire series utilizes the 94V-0 flame retardant plastic case, providing the double insulation that effectively prevents electrical shock. GSM90B is approved with the international medical safety certificates.

## Model Encoding

**GSM90B 12 -P1M**



## Applications

- Mobile clinical workstation
- Oral irrigator
- Portable hemodialysis machine
- Breath Machine
- Medical computer monitor

## GTIN CODE

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

**SPECIFICATION**

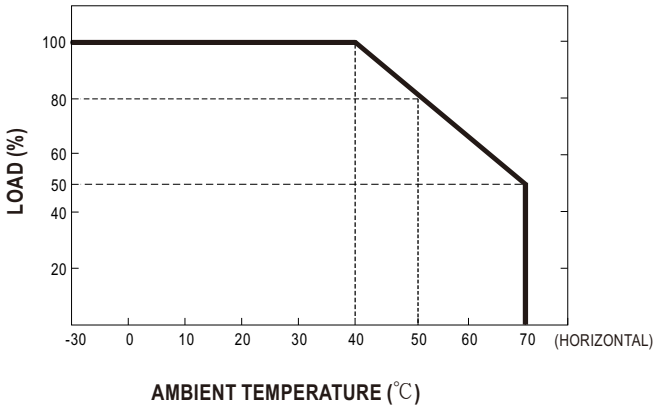
| ORDER NO.                 |                                                               | GSM90B12-P1M                                                                                                                                                                     | GSM90B15-P1M                                                                                                                 | GSM90B19-P1M | GSM90B24-P1M                                                              | GSM90B48-P1M                                                         |  |
|---------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------|----------------------------------------------------------------------|--|
| OUTPUT                    | SAFETY MODEL NO.                                              | GSM90B12                                                                                                                                                                         | GSM90B15                                                                                                                     | GSM90B19     | GSM90B24                                                                  | GSM90B48                                                             |  |
|                           | DC VOLTAGE                      Note.2                        | 12V                                                                                                                                                                              | 15V                                                                                                                          | 19V          | 24V                                                                       | 48V                                                                  |  |
|                           | RATED CURRENT                                                 | 6.67A                                                                                                                                                                            | 6A                                                                                                                           | 4.74A        | 3.75A                                                                     | 1.87A                                                                |  |
|                           | CURRENT RANGE                                                 | 0 ~ 6.67A                                                                                                                                                                        | 0 ~ 6A                                                                                                                       | 0 ~ 4.74A    | 0 ~ 3.75A                                                                 | 0 ~ 1.87A                                                            |  |
|                           | RATED POWER (max.)                                            | 80W                                                                                                                                                                              | 90W                                                                                                                          | 90W          | 90W                                                                       | 90W                                                                  |  |
|                           | RIPPLE & NOISE (max.) Note.3                                  | 120mVp-p                                                                                                                                                                         | 120mVp-p                                                                                                                     | 120mVp-p     | 180mVp-p                                                                  | 200mVp-p                                                             |  |
|                           | VOLTAGE TOLERANCE Note.4                                      | ± 5.0%                                                                                                                                                                           | ± 5.0%                                                                                                                       | ± 4.0%       | ± 3.0%                                                                    | ± 2.5%                                                               |  |
|                           | LINE REGULATION                      Note.5                   | ± 1.0%                                                                                                                                                                           | ± 1.0%                                                                                                                       | ± 1.0%       | ± 1.0%                                                                    | ± 1.0%                                                               |  |
|                           | LOAD REGULATION                                               | ± 5.0%                                                                                                                                                                           | ± 5.0%                                                                                                                       | ± 4.0%       | ± 3.0%                                                                    | ± 2.5%                                                               |  |
|                           | SETUP, RISE TIME                      Note.6                  | 1000ms, 50ms / 230VAC                      1500ms, 50ms / 115VAC at full load                                                                                                    |                                                                                                                              |              |                                                                           |                                                                      |  |
| HOLD UP TIME (Typ.)       | 30ms / 230VAC                      20ms / 115VAC at full load |                                                                                                                                                                                  |                                                                                                                              |              |                                                                           |                                                                      |  |
| INPUT                     | VOLTAGE RANGE                      Note.7                     | 80 ~ 264VAC                      113 ~ 370VDC                                                                                                                                    |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | FREQUENCY RANGE                                               | 47 ~ 63Hz                                                                                                                                                                        |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | POWER FACTOR (Typ.)                                           | PF>0.91 / 230VAC                      PF>0.95 / 115VAC at full load                                                                                                              |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | EFFICIENCY (Typ.)                                             | 88%                                                                                                                                                                              | 89%                                                                                                                          | 89%          | 90%                                                                       | 91%                                                                  |  |
|                           | AC CURRENT (Typ.)                                             | 1.3A / 115VAC                      0.6A / 230VAC                                                                                                                                 |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | INRUSH CURRENT (Typ.)                                         | Cold start    30A / 115VAC                      60A / 230VAC                                                                                                                     |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | LEAKAGE CURRENT(max.)                                         | Touch current < 100µA/264VAC                                                                                                                                                     |                                                                                                                              |              |                                                                           |                                                                      |  |
| PROTECTION                | OVERLOAD                                                      | 110 ~ 150% rated output power<br>Protection type : Hiccup mode, recovers automatically after fault condition is removed                                                          |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | OVER VOLTAGE                                                  | 105 ~ 135% rated output voltage<br>Protection type : Shut down o/p voltage, re-power on to recover                                                                               |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | OVER TEMPERATURE                                              | Shut down o/p voltage, re-power on to recover                                                                                                                                    |                                                                                                                              |              |                                                                           |                                                                      |  |
| ENVIRONMENT               | WORKING TEMP.                                                 | -30 ~ +70℃ (Refer to "Derating Curve")                                                                                                                                           |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | WORKING HUMIDITY                                              | 20% ~ 90% RH non-condensing                                                                                                                                                      |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | STORAGE TEMP., HUMIDITY                                       | -40 ~ +85℃, 10 ~ 95% RH non-condensing                                                                                                                                           |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | TEMP. COEFFICIENT                                             | ± 0.03% / °C (0 ~ 40℃)                                                                                                                                                           |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | VIBRATION                                                     | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes                                                                                                          |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | OPERATING ALTITUDE                      Note.8                | 3000 meters                                                                                                                                                                      |                                                                                                                              |              |                                                                           |                                                                      |  |
| SAFETY & EMC<br>(Note. 9) | SAFETY STANDARDS                                              | IEC60601-1/IEC60601-1-11, BS EN/EN60601-1/ BS EN/EN60601-1-11, ANSI/AAMI ES60601-1 / ES60601-1-11(3.1 version), CAN/CSA-C22.2 No. 60601-1:14 - Edition 3, EAC TP TC 004 approved |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | ISOLATION LEVEL                                               | Primary-Secondary: 2xMOPP                                                                                                                                                        |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | WITHSTAND VOLTAGE                                             | I/P-O/P: 4KVAC                                                                                                                                                                   |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | ISOLATION RESISTANCE                                          | I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH                                                                                                                                        |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | EMC EMISSION                                                  | Parameter                                                                                                                                                                        | Standard                                                                                                                     |              |                                                                           | Test Level / Note                                                    |  |
|                           |                                                               | Conducted emission                                                                                                                                                               | BS EN/EN55011 (CISPR11), FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B)                                                       |              |                                                                           | Class B                                                              |  |
|                           |                                                               | Radiated emission                                                                                                                                                                | BS EN/EN55011 (CISPR11), FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B)                                                       |              |                                                                           | Class B                                                              |  |
|                           |                                                               | Harmonic current                                                                                                                                                                 | BS EN/EN61000-3-2                                                                                                            |              |                                                                           | Class A                                                              |  |
|                           |                                                               | Voltage flicker                                                                                                                                                                  | BS EN/EN61000-3-3                                                                                                            |              |                                                                           | -----                                                                |  |
|                           | EMC IMMUNITY                                                  | BS EN/EN60601-1-2, BS EN/EN61204-3                                                                                                                                               |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           |                                                               | Parameter                                                                                                                                                                        | Standard                                                                                                                     |              |                                                                           | Test Level / Note                                                    |  |
|                           |                                                               | ESD                                                                                                                                                                              | BS EN/EN61000-4-2                                                                                                            |              |                                                                           | Level 4, 15KV air ; Level 4, 8KV contact                             |  |
|                           |                                                               | RF field susceptibility                                                                                                                                                          | BS EN/EN61000-4-3                                                                                                            |              |                                                                           | Level 3, 10V/m( 80MHz~2.7GHz )<br>Table 9, 9~28V/m( 385MHz~5.78GHz ) |  |
|                           |                                                               | EFT bursts                                                                                                                                                                       | BS EN/EN61000-4-4                                                                                                            |              |                                                                           | Level 3, 2KV                                                         |  |
|                           |                                                               | Surge susceptibility                                                                                                                                                             | BS EN/EN61000-4-5                                                                                                            |              |                                                                           | Level 3, 1KV/Line-Line                                               |  |
|                           |                                                               | Conducted susceptibility                                                                                                                                                         | BS EN/EN61000-4-6                                                                                                            |              |                                                                           | Level 3, 10V                                                         |  |
|                           |                                                               | Magnetic field immunity                                                                                                                                                          | BS EN/EN61000-4-8                                                                                                            |              |                                                                           | Level 4, 30A/m                                                       |  |
| Voltage dip, interruption |                                                               | BS EN/EN61000-4-11                                                                                                                                                               |                                                                                                                              |              | 100% dip 1 periods, 30% dip 25 periods,<br>100% interruptions 250 periods |                                                                      |  |
| OTHERS                    |                                                               | MTBF                                                                                                                                                                             | 2743.3K hrs min.                      Telcordia SR-332 (Bellcore) ; 353.3K hrs min.                      MIL-HDBK-217F (25℃) |              |                                                                           |                                                                      |  |
|                           | DIMENSION                                                     | 145*60*32mm (L*W*H)                                                                                                                                                              |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | PACKING                                                       | 0.45Kg; 30pcs/14.5Kg/0.9CUFT                                                                                                                                                     |                                                                                                                              |              |                                                                           |                                                                      |  |
| CONNECTOR                 | PLUG                                                          | See page 4~5    ; Other type available by customer requested                                                                                                                     |                                                                                                                              |              |                                                                           |                                                                      |  |
|                           | CABLE                                                         | See page 4~5    ; Other type available by customer requested                                                                                                                     |                                                                                                                              |              |                                                                           |                                                                      |  |

**NOTE**

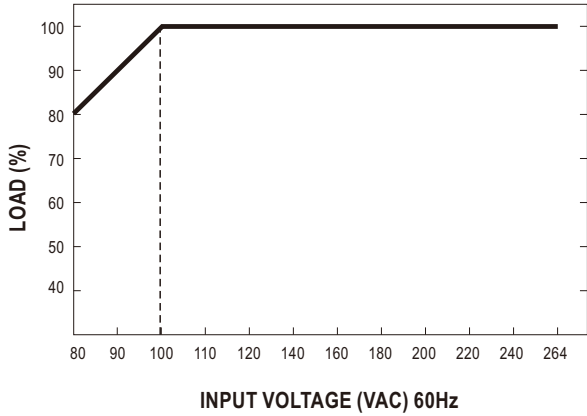
- All parameters are specified at 230VAC input, rated load, 25°C 70% RH ambient.
- DC voltage: The output voltage set at point measure by plug terminal & 50% load.
- Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1 $\mu$ f & 47 $\mu$ f capacitor.
- Tolerance: includes set up tolerance, line regulation, load regulation.
- Line regulation is measured from low line to high line at rated load.
- Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.
- Derating may be needed under low input voltage. Please check the derating curve for more details.
- The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).
- The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies."  
(as available on <http://www.meanwell.com>)

※ Product Liability Disclaimer : For detailed information, please refer to <https://www.meanwell.com/serviceDisclaimer.aspx>

### Derating Curve

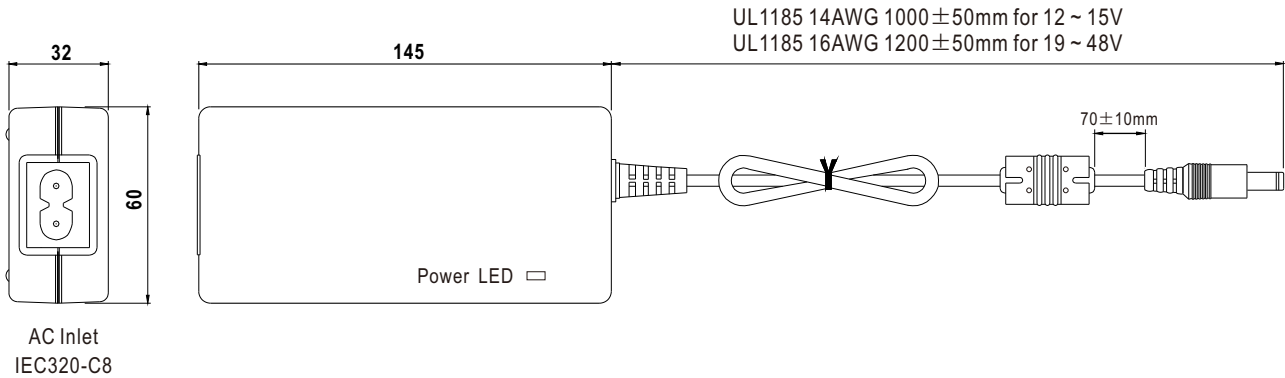


### Static Characteristics



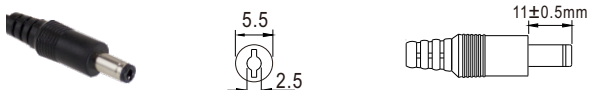
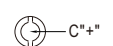
### Mechanical Specification

Case No. GS90A Unit:mm



### DC output plug

☉ Standard plug: P1M

| P1M                                                                                 | Pin Assignment                                                                        |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |
|                                                                                     | Outside ⊖ ⊕ Inside                                                                    |

☉ DC plug changeable through:

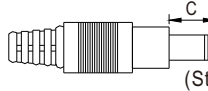
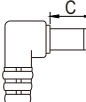
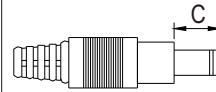
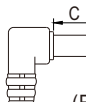
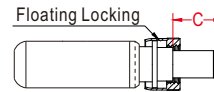
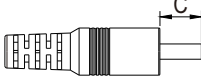
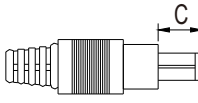
- (1) Customization of the standard part with an optional DC plug according to the table (MOQ applicable)
- (2) Quick adapter accessory (sold separately without MOQ)

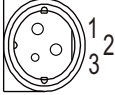
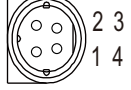
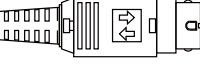
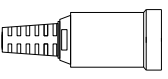
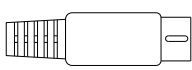
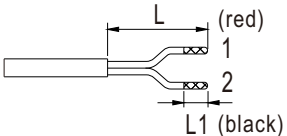
Please refer to below table and online selection guide : [https://www.meanwell.com/upload/pdf/DC\\_plug.pdf](https://www.meanwell.com/upload/pdf/DC_plug.pdf)

Example quick adapter accessory:



☉ Optional DC plug: (Available in customized cable or quick adapter)

| Tuning Fork Style                                                                                                                                                                                                                                                                                                           |                                                                                                       | Type No. | A<br>OD | B<br>ID | C<br>L | Quick Adapter<br>Accessory               |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------|---------|---------|--------|------------------------------------------|------|
| <br>                                                                                                                                                      | <br>(Straight)       | P1I      | 5.5     | 2.1     | 9.5    | Available<br>(Current rating: 7.5A max.) |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P1L      | 5.5     | 2.5     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P1J      | 5.5     | 2.1     | 11.0   |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | <br>(Right-angled)  | P1JR     | 5.5     | 2.1     | 11.0   |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P1IR     | 5.5     | 2.1     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P1LR     | 5.5     | 2.5     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P1MR     | 5.5     | 2.5     | 11.0   |                                          |      |
| Barrel Style                                                                                                                                                                                                                                                                                                                |                                                                                                       | Type No. | A<br>OD | B<br>ID | C<br>L | None                                     |      |
| <br>                                                                                                                                                  | <br>(Straight)     | P2I      | 5.5     | 2.1     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2J      | 5.5     | 2.1     | 11.0   |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2L      | 5.5     | 2.5     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | <br>(Right-angled) | P2M      | 5.5     | 2.5     | 11.0   |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2IR     | 5.5     | 2.1     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2JR     | 5.5     | 2.1     | 11.0   |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2LR     | 5.5     | 2.5     | 9.5    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             |                                                                                                       | P2MR     | 5.5     | 2.5     | 11.0   |                                          |      |
| Lock Style                                                                                                                                                                                                                                                                                                                  |                                                                                                       | Type No. | A<br>OD | B<br>ID | C<br>L | None                                     |      |
| <br><br><br>Floating Locking<br>SWITCHCRAFT original or equivalent | P2S(S761K)                                                                                            | 5.53     | 2.03    | 12.06   |        |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P2K(761K)                                                                                             | 5.53     | 2.54    | 12.06   |        |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P2C(S760K)                                                                                            | 5.53     | 2.03    | 9.52    |        |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P2D(760K)                                                                                             | 5.53     | 2.54    | 9.52    |        |                                          |      |
| Min. Pin Style                                                                                                                                                                                                                                                                                                              |                                                                                                       | Type No. | A<br>OD | B<br>ID | C<br>L | None                                     |      |
| <br><br><br>EIAJ equivalent                                        | P3A                                                                                                   | 2.35     | 0.7     | 11.0    |        |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P3B                                                                                                   | 4.0      | 1.7     | 11.0    |        |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P3C                                                                                                   | 4.75     | 1.7     | 11.0    |        |                                          |      |
| Center Pin Style                                                                                                                                                                                                                                                                                                            |                                                                                                       | Type No. | A<br>OD | B<br>ID | C<br>L | D<br>Center Pin                          | None |
| <br><br><br>EIAJ equivalent                                        | P4A                                                                                                   | 5.5      | 3.4     | 11.0    | 1.0    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P4B                                                                                                   | 6.5      | 4.4     | 11.0    | 1.4    |                                          |      |
|                                                                                                                                                                                                                                                                                                                             | P4C                                                                                                   | 7.4      | 5.1     | 11.0    | 0.6    |                                          |      |

| Min. DIN 3 Pin with Lock (male)                                                                                                                                                                                                                                                      | Type No.    | Pin Assignment |        | Quick Adapter Accessory                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|--------|------------------------------------------|
|                                                                                                                                                                                                                                                                                      |             | PIN No.        | Output |                                          |
|   <br>KYCON KPPX-3P equivalent    | R6B         | 1              | +Vo    | None                                     |
|                                                                                                                                                                                                                                                                                      |             | 2              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 3              | +Vo    |                                          |
| Min. DIN 4 Pin with Lock (male)                                                                                                                                                                                                                                                      | Type No.    | Pin Assignment |        | Quick Adapter Accessory                  |
|                                                                                                                                                                                                                                                                                      |             | PIN No.        | Output |                                          |
|   <br>KYCON KPPX-4P equivalent    | R7B         | 1              | +Vo    | Available<br>(Current rating: 7.5A max.) |
|                                                                                                                                                                                                                                                                                      |             | 2              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 3              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 4              | +Vo    |                                          |
| Min. DIN 4 Pin with Lock (female)                                                                                                                                                                                                                                                    | Type No.    | Pin Assignment |        | Quick Adapter Accessory                  |
|                                                                                                                                                                                                                                                                                      |             | PIN No.        | Output |                                          |
|   <br>KYCON KPJX-CM-4S equivalent | R7BF        | 1              | +Vo    | None                                     |
|                                                                                                                                                                                                                                                                                      |             | 2              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 3              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 4              | +Vo    |                                          |
| DIN 5 Pin (male)                                                                                                                                                                                                                                                                     | Type No.    | Pin Assignment |        | Quick Adapter Accessory                  |
|                                                                                                                                                                                                                                                                                      |             | PIN No.        | Output |                                          |
|                             | R1B         | 1              | -Vo    | None                                     |
|                                                                                                                                                                                                                                                                                      |             | 2              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 3              | +Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 4              | -Vo    |                                          |
|                                                                                                                                                                                                                                                                                      |             | 5              | +Vo    |                                          |
| Stripped and tinned leads                                                                                                                                                                                                                                                            | Type No.    | Pin Assignment |        | Quick Adapter Accessory                  |
|                                                                                                                                                                                                                                                                                      |             | PIN No.        | Output |                                          |
|  <br>Length of Land L and L1 by request<br>(MW's standard length, L: <u>25</u> mm, L1: <u>5</u> mm)            | by customer | 1              | +Vo    | None                                     |
|                                                                                                                                                                                                                                                                                      |             | 2              | -Vo    |                                          |

## Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>