



E-Star Power Development Co., Ltd. (E-STAR)

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90W Desktop type Medical power supply > GSM90A



Features

- 3 pole AC inlet IEC320-C14, Class I power unit
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/EN60601-1
- 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 > 130 K hours
- Various DC plug quick adapter accessory available
- 3 years warranty

Applications

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

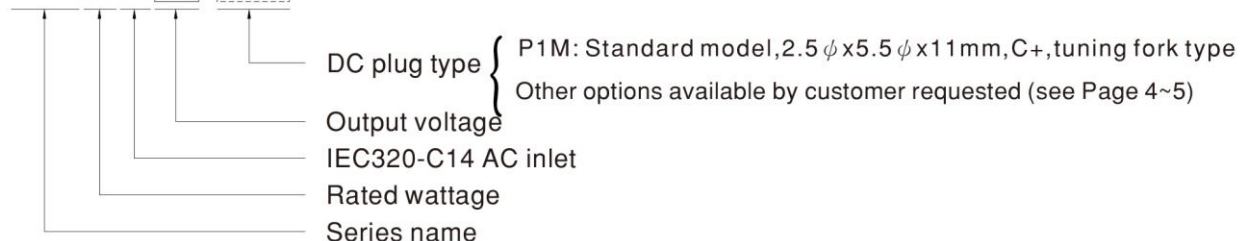
Description

GSM90A is a highly reliable, 90W desktop style single-output green medical adaptor series. This product is equipped with a 3-pin (with FG) standard IEC320-C14 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, GSM90A 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. GSM90A is approved with the international medical safety certificates.

Model Encoding

GSM90A 12-P1M





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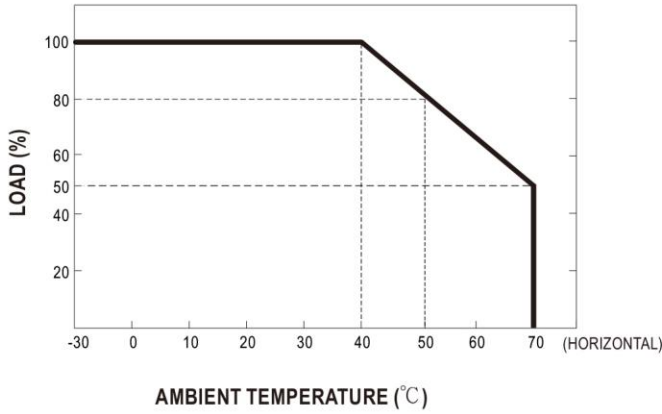
SPECIFICATION

| ORDER NO. | GSM90A12-P1M | GSM90A15-P1M | GSM90A19-P1M | GSM90A24-P1M | GSM90A48-P1M | |
|--------------------------------------|---|--|--|--------------|---|--|
| OUTPUT | SAFETY MODEL NO. | GSM90A12 | GSM90A15 | GSM90A19 | GSM90A48 | |
| | DC VOLTAGE <small>Note.2</small> | 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.) <small>Note.3</small> | 120mVp-p | 120mVp-p | 120mVp-p | 180mVp-p | 200mVp-p |
| | VOLTAGE TOLERANCE <small>Note.4</small> | ±5.0% | ±5.0% | ±4.0% | ±3.0% | ±2.5% |
| | LINE REGULATION <small>Note.5</small> | ±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 <small>Note.6</small> | 1000ms, 50ms / 230VAC 1000ms, 50ms / 115VAC at full load | | | | |
| HOLD UP TIME (Typ.) | 40ms / 230VAC 25ms / 115VAC at full load | | | | | |
| INPUT | VOLTAGE RANGE <small>Note.7</small> | 80 ~ 264VAC | | | | |
| | 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.) | Earth leakage current < 115 μA/264VAC , Touch current < 100 μA/264VAC | | | | |
| PROTECTION | OVERLOAD | 110 ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed | | | | |
| | OVER VOLTAGE | 105 ~ 135% rated output voltage 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°C (Refer to "Derating Curve") | | | | |
| | WORKING HUMIDITY | 20% ~ 90% RH non-condensing | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH non-condensing | | | | |
| | TEMP. COEFFICIENT | ±0.03% / °C (0~40°C) | | | | |
| | VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes | | | | |
| | OPERATING ALTITUDE <small>Note.8</small> | 3000 meters | | | | |
| SAFETY & EMC <small>(Note 9)</small> | SAFETY STANDARDS | IEC60601-1, TUV EN60601-1, ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22.2 No. 60601-1:14 - Edition 3, EAC TPTC 004 approved | | | | |
| | ISOLATION LEVEL | Primary-Secondary: 2xMOPP, Primary-Earth: 1xMOPP | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:SHORT | | | | |
| | ISOLATION RESISTANCE | I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH | | | | |
| | EMC EMISSION | Parameter | Standard | | | Test Level / Note |
| | | Conducted emission | EN55011 (CISPR11), FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B) | | | Class B |
| | | Radiated emission | EN55011 (CISPR11), FCC PART 15 / CISPR22, CAN ICES-3(B)/NMB-3(B) | | | Class B |
| | | Harmonic current | EN61000-3-2 | | | Class A |
| | | Voltage flicker | EN61000-3-3 | | | ----- |
| | EMC IMMUNITY | EN60601-1-2, EN61204-3 | | | | |
| | | Parameter | Standard | | | Test Level / Note |
| | | ESD | EN61000-4-2 | | | Level 4, 15KV air ; Level 4, 8KV contact |
| | | RF field susceptibility | EN61000-4-3 | | | Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz) |
| | | EFT bursts | EN61000-4-4 | | | Level 3, 2KV |
| | | Surge susceptibility | EN61000-4-5 | | | Level 3, 1KV/Line-Line , 2KV/Line-FG |
| Conducted susceptibility | | EN61000-4-6 | | | Level 3, 10V | |
| Magnetic field immunity | | EN61000-4-8 | | | Level 4, 30A/m | |
| Voltage dip, interruption | | EN61000-4-11 | | | 100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods | |
| OTHERS | MTBF | 387.5K hrs min. MIL-HDBK-217F(25°C) | | | | |
| | 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 | 1. All parameters are specified at 230VAC input, rated load, 25°C 70% RH ambient. 2. DC voltage: The output voltage set at point measure by plug terminal & 50% load. 3. Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1μF & 47μF capacitor. 4. Tolerance: includes set up tolerance, line regulation, load regulation. 5. Line regulation is measured from low line to high line at rated load. 6. 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. 7. Derating may be needed under low input voltages. Pleas check the derating curve for more details. 8. 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). 9. 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." | | | | | |

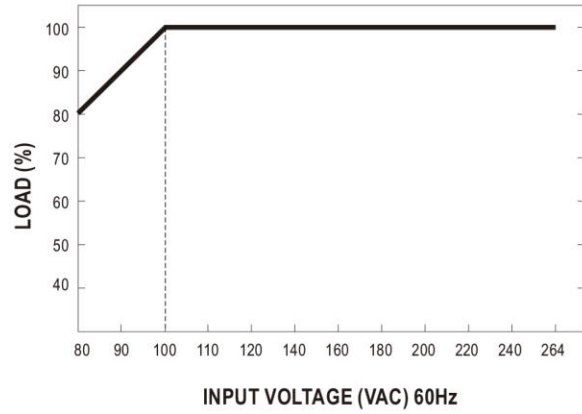


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Derating Curve

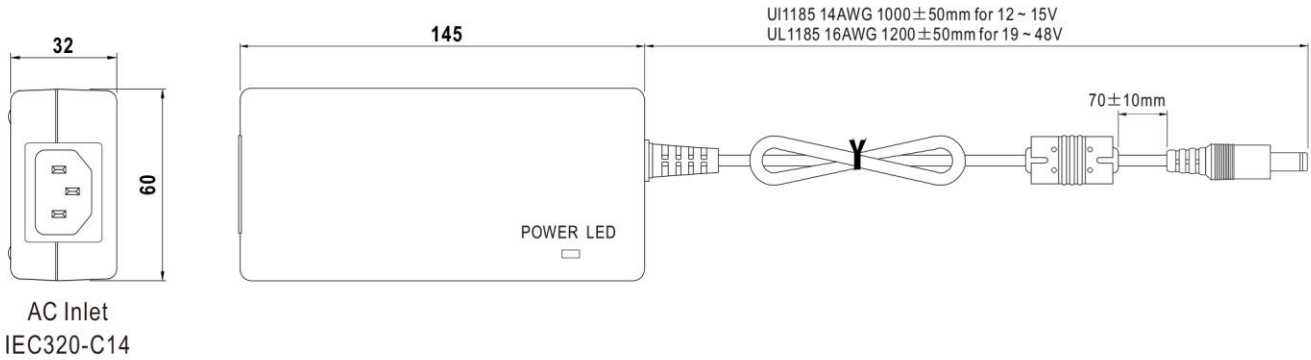


Static Characteristics



Mechanical Specification

Case No. GS90A Unit:mm



DC output plug

© Standard plug: P1M

| P1M | Pin Assignment |
|-----|--|
| | |
| | Outside ⊖ ⊕ Inside -V connected to AC FG(standard) -V not connected to AC FG(optional) |



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
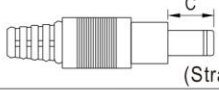
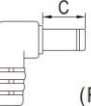


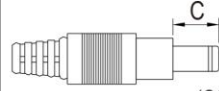
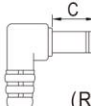


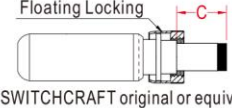




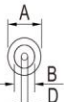
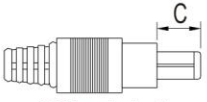
◎ DC plug changeable through:

- (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)

Example quick adapter accessory:


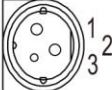


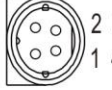



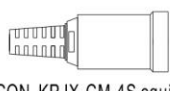




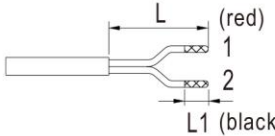


◎ Optional DC plug: (Available in customized cable or quick adapter)

| Tuning Fork Style | | Type No. | A | B | C | Quick Adapter Accessory | |
|--|------------|----------|------|-------|--|-------------------------|-------------------------|
| | | | OD | ID | L | | |
|  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>(Straight)</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>(Right-angled)</p> </div> </div> | P1I | 5.5 | 2.1 | 9.5 | Available (Current rating: 7.5A max.) | | |
| | P1L | 5.5 | 2.5 | 9.5 | | | |
| | P1J | 5.5 | 2.1 | 11.0 | | | |
| | 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 | B | C | Quick Adapter Accessory | |
| | | | OD | ID | L | | |
|  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>(Straight)</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>(Right-angled)</p> </div> </div> | P2I | 5.5 | 2.1 | 9.5 | None | | |
| | P2J | 5.5 | 2.1 | 11.0 | | | |
| | P2L | 5.5 | 2.5 | 9.5 | | | |
| | 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 | B | C | Quick Adapter Accessory | |
| | | | OD | ID | L | | |
|  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>Floating Locking SWITCHCRAFT original or equivalent</p> </div> </div> | P2S(S761K) | 5.53 | 2.03 | 12.06 | None | | |
| | 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 | B | C | Quick Adapter Accessory | |
| | | | OD | ID | L | | |
|  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>EIAJ equivalent</p> </div> </div> | P3A | 2.35 | 0.7 | 11.0 | None | | |
| | P3B | 4.0 | 1.7 | 11.0 | | | |
| | P3C | 4.75 | 1.7 | 11.0 | | | |
| Center Pin Style | | Type No. | A | B | C | D | Quick Adapter Accessory |
| | | | OD | ID | L | Center Pin | |
|  <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>EIAJ equivalent</p> </div> </div> | P4A | 5.5 | 3.4 | 11.0 | 1.0 | None | |
| | P4B | 6.5 | 4.4 | 11.0 | 1.4 | | |
| | P4C | 7.4 | 5.1 | 11.0 | 0.6 | | |



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