



## ■ 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
- 3 years warranty

## ■ Applications

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

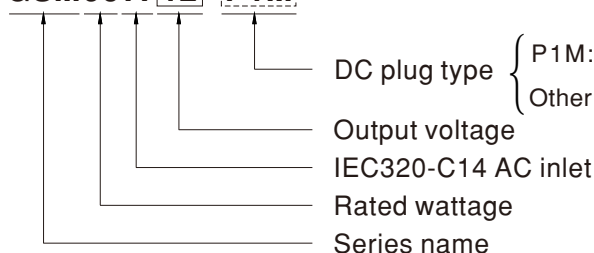
## ■ Description

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**



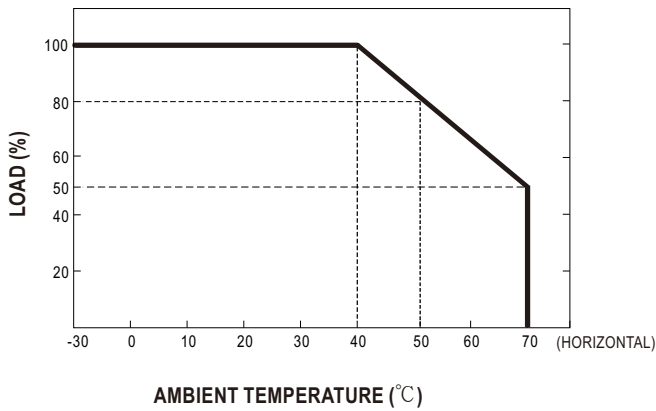
DC plug type { P1M: Standard model, 2.5φ x 5.5φ x 11mm, C+, tuning fork type  
Other options available by customer requested (see Page 4~5)

Output voltage  
IEC320-C14 AC inlet  
Rated wattage  
Series name

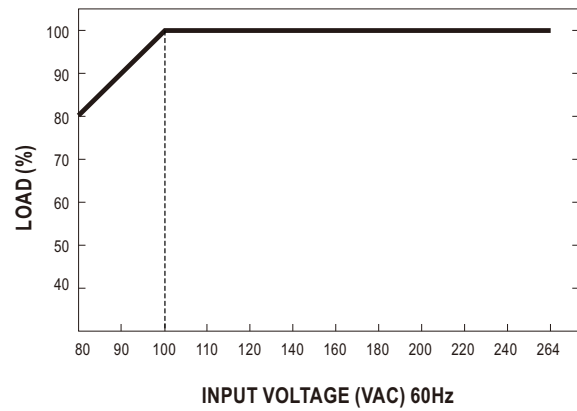
**SPECIFICATION**

ORDER NO.	GSM90A12-P1M	GSM90A15-P1M	GSM90A19-P1M	GSM90A24-P1M	GSM90A48-P1M		
<b>OUTPUT</b>	<b>SAFETY MODEL NO.</b>	GSM90A12	GSM90A15	GSM90A19	GSM90A24	GSM90A48	
	<b>DC VOLTAGE</b> Note.2	12V	15V	19V	24V	48V	
	<b>RATED CURRENT</b>	6.67A	6A	4.74A	3.75A	1.87A	
	<b>CURRENT RANGE</b>	0 ~ 6.67A	0 ~ 6A	0 ~ 4.74A	0 ~ 3.75A	0 ~ 1.87A	
	<b>RATED POWER (max.)</b>	80W	90W	90W	90W	90W	
	<b>RIPPLE &amp; NOISE (max.)</b> Note.3	120mVp-p	120mVp-p	120mVp-p	180mVp-p	200mVp-p	
	<b>VOLTAGE TOLERANCE</b> Note.4	±5.0%	±5.0%	±4.0%	±3.0%	±2.5%	
	<b>LINE REGULATION</b> Note.5	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	
	<b>LOAD REGULATION</b>	±5.0%	±5.0%	±4.0%	±3.0%	±2.5%	
	<b>SETUP, RISE TIME</b> Note.6	1000ms, 50ms / 230VAC      1000ms, 50ms / 115VAC at full load					
<b>HOLD UP TIME (Typ.)</b>	40ms / 230VAC      25ms / 115VAC at full load						
<b>INPUT</b>	<b>VOLTAGE RANGE</b> Note.7	80 ~ 264VAC					
	<b>FREQUENCY RANGE</b>	47 ~ 63Hz					
	<b>POWER FACTOR (Typ.)</b>	PF>0.91 / 230VAC      PF>0.95 / 115VAC at full load					
	<b>EFFICIENCY (Typ.)</b>	88%	89%	89%	90%	91%	
	<b>AC CURRENT (Typ.)</b>	1.3A / 115VAC      0.6A / 230VAC					
	<b>INRUSH CURRENT (Typ.)</b>	Cold start 30A/115VAC      60A / 230VAC					
	<b>LEAKAGE CURRENT(max.)</b>	Earth leakage current < 100µA/264VAC , Touch current < 100µA/264VAC					
<b>PROTECTION</b>	<b>OVERLOAD</b>	110 ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	<b>OVER VOLTAGE</b>	105 ~ 135% rated output voltage Protection type : Shut down o/p voltage, re-power on to recover					
	<b>OVER TEMPERATURE</b>	Shut down o/p voltage, re-power on to recover					
<b>ENVIRONMENT</b>	<b>WORKING TEMP.</b>	-30 ~ +70°C (Refer to "Derating Curve")					
	<b>WORKING HUMIDITY</b>	20% ~ 90% RH non-condensing					
	<b>STORAGE TEMP., HUMIDITY</b>	-40 ~ +85°C , 10 ~ 95% RH non-condensing					
	<b>TEMP. COEFFICIENT</b>	±0.03% / °C (0~40°C)					
	<b>VIBRATION</b>	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes					
	<b>OPERATING ALTITUDE</b> Note.8	3000 meters					
<b>SAFETY &amp; EMC (Note 9)</b>	<b>SAFETY STANDARDS</b>	IEC60601-1, TUV EN60601-1, ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22.2 No. 60601-1:14 - Edition 3 approved					
	<b>ISOLATION LEVEL</b>	Primary-Secondary: 2xMOPP, Primary-Earth: 1xMOPP					
	<b>WITHSTAND VOLTAGE</b>	I/P-O/P:4KVAC    I/P-FG:2KVAC    O/P-FG:SHORT					
	<b>ISOLATION RESISTANCE</b>	I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH					
	<b>EMC EMISSION</b>	<b>Parameter</b>	<b>Standard</b>			<b>Test Level / Note</b>	
		Conducted emission	EN55011 (CISPR11)			Class B	
		Radiated emission	EN55011 (CISPR11)			Class B	
		Harmonic current	EN61000-3-2			Class A	
		Voltage flicker	EN61000-3-3			-----	
	<b>EMC IMMUNITY</b>	EN55024 , EN60601-1-2, EN61204-3					
		<b>Parameter</b>	<b>Standard</b>			<b>Test Level / Note</b>	
		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		
<b>OTHERS</b>	<b>MTBF</b>	387.5K hrs min. MIL-HDBK-217F(25°C)					
	<b>DIMENSION</b>	145*60*32mm (L*W*H)					
	<b>PACKING</b>	0.45Kg; 30pcs/14.5Kg/1CUFT					
<b>CONNECTOR</b>	<b>PLUG</b>	See page 4~5 ; Other type available by customer requested					
	<b>CABLE</b>	See page 4~5 ; Other type available by customer requested					
<b>NOTE</b>	<ol style="list-style-type: none"> <li>All parameters are specified at 230VAC input, rated load, 25°C 70% RH ambient.</li> <li>DC voltage: The output voltage set at point measure by plug terminal &amp; 50% load.</li> <li>Ripple &amp; noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1µf &amp; 47µf capacitor.</li> <li>Tolerance: includes set up tolerance, line regulation, load regulation.</li> <li>Line regulation is measured from low line to high line at rated load.</li> <li>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.</li> <li>Derating may be needed under low input voltages. Please check the derating curve for more details.</li> <li>The ambient temperature derating of 3.5°C / 1000m is needed for operating altitude greater than 2000m(6500ft).</li> <li>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 <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</li> </ol>						

■ Derating Curve

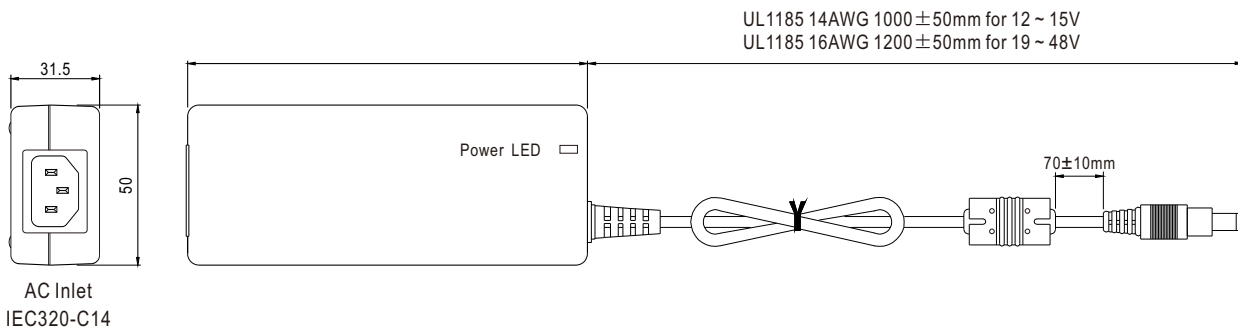


■ Static Characteristics



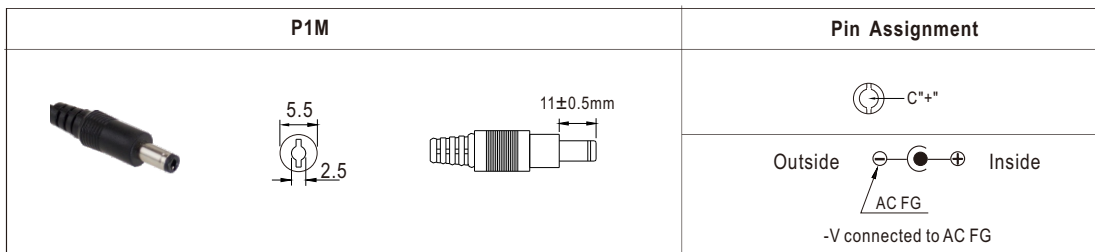
■ Mechanical Specification

Case No. GS90A Unit:mm



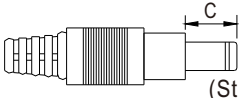
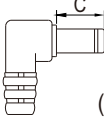


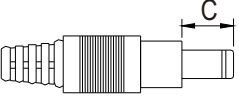
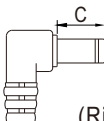

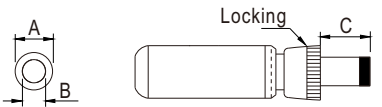

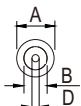
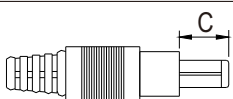

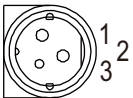
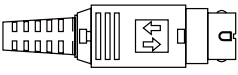




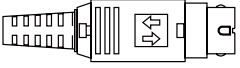


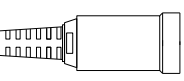




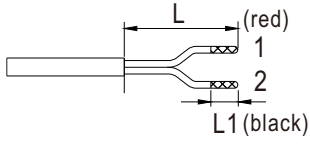
■ DC output plug

◎ Standard plug: P1M



© Optional DC plug:

Tuning Fork Style		Type No.	A	B	C	
			OD	ID	L	
 	 (Straight)	P1I	5.5	2.1	9.5	
		P1J	5.5	2.1	11.0	
		P1L	5.5	2.5	9.5	
	 (Right-angled)	P1IR	5.5	2.1	9.5	
		P1JR	5.5	2.1	11.0	
		P1LR	5.5	2.5	9.5	
		P1MR	5.5	2.5	11.0	
Barrel Style		Type No.	A	B	C	
			OD	ID	L	
 	 (Straight)	P2I	5.5	2.1	9.5	
		P2J	5.5	2.1	11.0	
		P2L	5.5	2.5	9.5	
		P2M	5.5	2.5	11.0	
	 (Right-angled)	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	
			OD	ID	L	
  Locking 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	
Center Pin Style		Type No.	A	B	C	D
			OD	ID	L	Center Pin
   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			
			PIN No.	Output		
   KYCON KPPX-3P equivalent	R6B	1	+Vo			
			2	-Vo		
			3	+Vo		

Min. DIN 4 Pin with Lock (male)	Type No.	Pin Assignment	
		PIN No.	Output
   <p>KYCON KPPX-4P equivalent</p>	R7B	1	+Vo
		2	-Vo
		3	-Vo
		4	+Vo
Min. DIN 4 Pin with Lock (female)	Type No.	Pin Assignment	
   <p>KYCON KPJX-CM-4S equivalent</p>	R7BF	1	+Vo
		2	-Vo
		3	-Vo
		4	+Vo
DIN 5 Pin (male)	Type No.	Pin Assignment	
  	R1B	1	-Vo
		2	-Vo
		3	+Vo
		4	-Vo
		5	+Vo
Stripped and tinned leads	Type No.	Pin Assignment	
  <p>Length of Land L1 by request (MW's standard length, L: <u>25</u> mm, L1: <u>5</u> mm)</p>	by customer	1	+Vo
		2	-Vo

**Installation Manual**

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