



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/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 adaptor accessories available. Contact TRC Electronics for details and questions.
- 3 years warranty

■ Applications

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

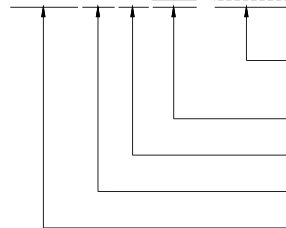
■ Description

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

GSM90 B 12 -P1M



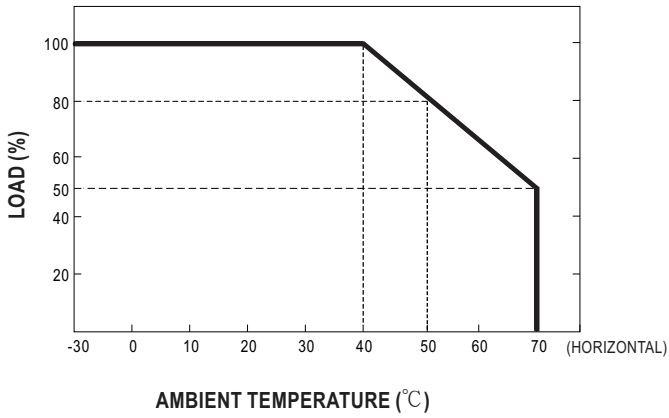
- DC plug type { P1M: Standard model, 2.5φ x 5.5φ x 11mm, C+, tuning fork type
Other options available by customer requested (see Page 4~5)
- Output voltage
- IEC320-C8 AC inlet
- Rated wattage
- Series name

File Name: GSM90B-SPEC 2020-07-15

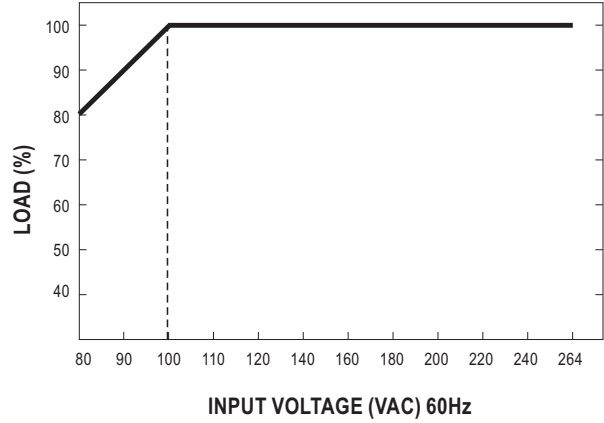
SPECIFICATION

ORDER NO.	GSM90B12-P1M	GSM90B15-P1M	GSM90B19-P1M	GSM90B24-P1M	GSM90B48-P1M		
OUTPUT	SAFETY MODEL NO.	GSM90B12	GSM90B15	GSM90B19	GSM90B24	GSM90B48	
	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 1500ms, 50ms / 115VAC at full load					
HOLD UP TIME (Typ.)	30ms / 230VAC 20ms / 115VAC at full load						
INPUT	VOLTAGE RANGE <small>Note.7</small>	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 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 (Note. 9)	SAFETY STANDARDS	IEC60601-1/IEC60601-1-11, EN60601-1/ 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°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	
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	405.6K 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	<p>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 voltage. Please 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."</p>						

■ Derating Curve

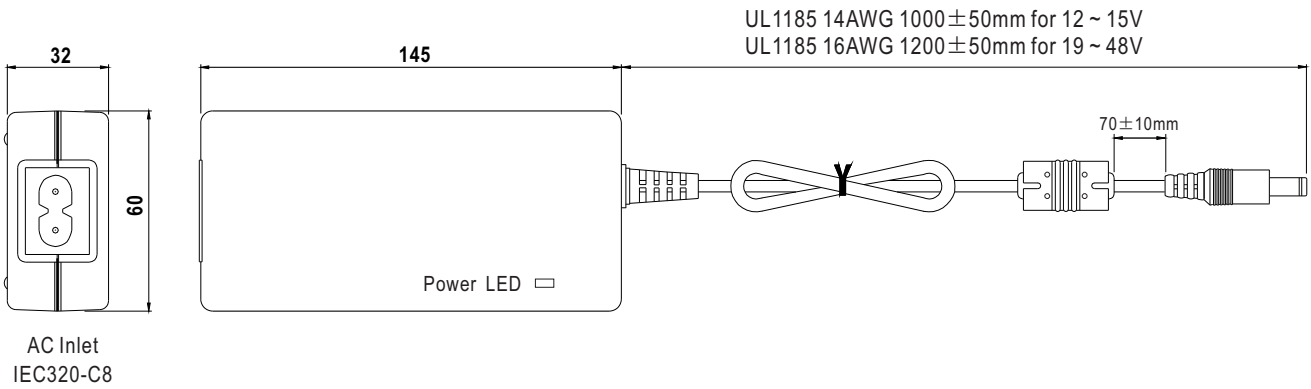


■ Static Characteristics



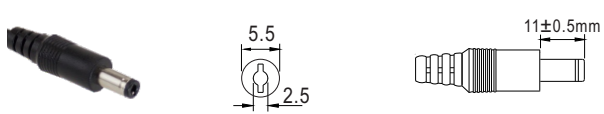
■ Mechanical Specification

Case No. GS90A Unit:mm



■ DC output plug

◎ Standard plug: P1M

P1M	Pin Assignment
	
	Outside ⊖ ⊕ Inside


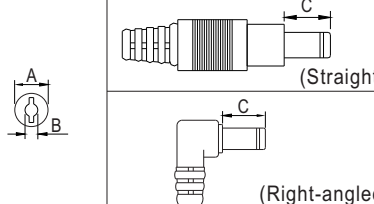

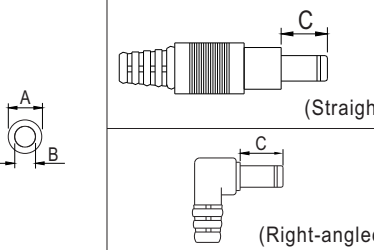



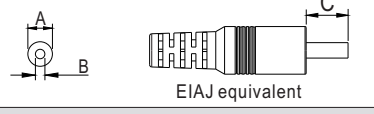

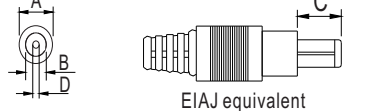
◎ DC plug changeable through:

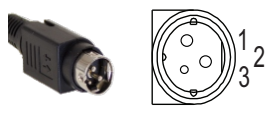
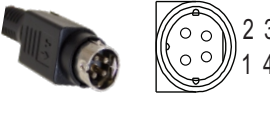



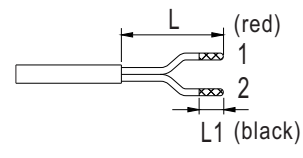
- (1) Customization of the standard part with an optional DC plug according to the table (MOQ applicable)
- (2) Quick adapter accessory (sold separately without MOQ)

Please refer to below table and online selection guide. Example quick adapter accessory:



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

Tuning Fork Style		Type No.	A OD	B ID	C L	Quick Adapter Accessory	
 	(Straight)	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		
	(Right-angled)	P1JR	5.5	2.1	11.0		
		P1IR	5.5	2.1	9.5		
		P1LR	5.5	2.5	9.5		
Barrel Style		Type No.	A OD	B ID	C L	None	
 	(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 OD	B ID	C L	None	
  <p>Floating Locking SWITCHCRAFT original or equivalent</p>	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 OD	B ID	C L	None	
  <p>EIAJ equivalent</p>	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 OD	B ID	C L	D Center Pin	None
  <p>EIAJ equivalent</p>	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	
 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
 KYCON KPPX-4P equivalent	R7B	PIN No.	Output	
		1	+Vo	Available (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
 KYCON KPJX-CM-4S equivalent	R7BF	PIN No.	Output	
		1	+Vo	None
		2	-Vo	
		3	-Vo	
4	+Vo			
DIN 5 Pin (male)	Type No.	Pin Assignment		Quick Adapter Accessory
	R1B	PIN No.	Output	
		1	-Vo	None
		2	-Vo	
		3	+Vo	
		4	-Vo	
5	+Vo			
Stripped and tinned leads	Type No.	Pin Assignment		Quick Adapter Accessory
  Length of Land L1 by request (MW's standard length, L: <u>25</u> mm, L1: <u>5</u> mm)	by customer	PIN No.	Output	
		1	+Vo	None
2	-Vo			