



## 220 Watt MEDICAL Series DVTR220M Desk Top Adapter



### Features

- Universal Input Range 80 – 264Vac
- High Efficiency up to 94%
- No Load Power Consumption <150mW
- Approval EN55011 and CISPR/FCC Class B
- Approval IEC/EN/UL 60601-1 2 MOPP
- Approval IEC/EN 60601-1-11 (TR220MB) (Home Health Care)
- Over Voltage Protection
- Continuous Short Circuit Protection
- Operating Altitude 5000m
- Approval IP22
- Meets CoC Tier 2 and DOE Level VI

MODEL NUMBER	OUTPUT VOLTAGE [ VDC ]	OUTPUT CURRENT MAX. [ A ]	RIPPLE & NOISE Note 1	VOLTAGE ACCURACY [ % ] Note 2	LOAD CAPACITANCE [ $\mu$ F ] Note 3	LOAD REGULATION [ % ] Note 4	EFF. TYP. [ % ] Note 5
TR220MA120	12	16,67	120	$\pm$ 2	16500	$\pm$ 4	91
TR220MA240	24	9,17	200	$\pm$ 2	9270	$\pm$ 3	93
TR220MA360	36	6,11	200	$\pm$ 2	6160	$\pm$ 2	93
TR220MA480	48	4,58	200	$\pm$ 2	4540	$\pm$ 2	94
TR220MA560	56	3,93	200	$\pm$ 2	4070	$\pm$ 2	94
TR220MB120	12	16,67	120	$\pm$ 2	16500	$\pm$ 4	91
TR220MB240	24	9,17	200	$\pm$ 2	9270	$\pm$ 3	93
TR220MB360	36	6,11	200	$\pm$ 2	6160	$\pm$ 2	93
TR220MB480	48	4,58	200	$\pm$ 2	4540	$\pm$ 2	94
TR220MB560	56	3,93	200	$\pm$ 2	4070	$\pm$ 2	94

Note:

1. Add a 0.1 $\mu$ F ceramic capacitor and a 10 $\mu$ F E.L. capacitor to output for ripple & noise measuring @20MHz BW.
  2. Vin=115Vac and 230Vac, Io=60% Full load Tc=25°C
  3. Vin=115Vac and 230Vac, Output is max. load
  4. Load regulation measured from 60% to 100% full load and from 60% to 20% full load (60% $\pm$ 40% full load).
  5. Typical efficiency at 230Vac and 75% full load at 25°C.
- Typical at 25°C, nominal line and 75% load, unless otherwise specified.

### Ordering Information

Model	Class I or II	Output	DC Plug Type	Cable	DC Cable Length
TR220M	X	XXX	-XX	E	XX
	A: Class I B: Class II	120 : 12V	STANDARD OUTPUT DC PLUG	UL2464 with OVP	471 : 950mm with Ferrite Core 12 : 1220mm with Ferrite Core 13 : 1800mm with DC Plug
		240 : 24V			
		360 : 36V			
		480 : 48V			
	560 : 56V				

### Example:

TR220MA240-1538E12, Class I, 24Vdc Output, Din Power Plug Molded Type 1538, Cable Length 1220mm  
TR220MB360-11E13, Class II, 36Vdc Output, DC Plug Type 11, Cable Length 1800mm

Technische Änderungen vorbehalten / Specifications are subject to change without notice

### INPUT SPECIFICATIONS:

Input Voltage Range.....		80-264Vac
Input Frequency Range.....		47 to 63Hz
Input Current.....	100% Load, Vin=100Vac	2,5A max.
Leakage Current.....	Earth	300µA max.
	Touch	100µA max.
Under Voltage Protection .....		50V min. – 65V max.
Power Factor .....	230Vac/50Hz @ Full load	0,92 min.

### OUTPUT SPECIFICATIONS:

Hold-up Time .....	Vin 115Vac	22ms typ.
Line Regulation.....	Vin=High line to low line, full load	±1.0% max.
Over Voltage Protection .....		Latch Off
Short Circuit Protection .....	Auto recovery	Continuous

### GENERAL SPECIFICATIONS:

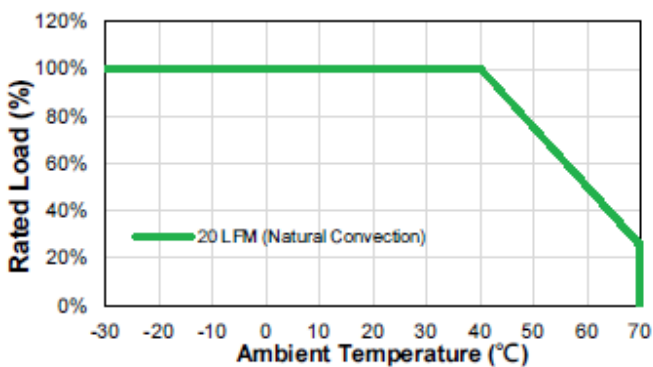
Isolation.....	Input to Output , 1 minute (without dielectric breakdown)	4400VAC max.
	Input to Earth (Ground) , 1 minute (without dielectric breakdown)	1800VAC max.
	Output to Earth (Ground) , 1 minute (without dielectric breakdown)	1800VAC max.
Isolation Resistance .....	Input to output	100 MΩ min.
Switching Frequency .....		100KHz typ.
Operating Temperature Range .....	see derating curve	-30°C to +70°C
Storage Temperature Range .....		-40°C to +85°C
Humidity .....	Non condensing	93% RH max.
Cooling .....		Natural Convection
MTBF .....	Io=100%; Ta=25°C per MIL-HDBK-217F	585Khrs min.
Altitude .....		5000m max.
Shock .....	MIL-STD-810F Table 516.5	75g typ.
Vibration .....	MIL-STD-810F Table 514.5C-VIII	4g typ
Dimensions .....		180 x 75 x 44,5 mm
Weight.....		950g typ.

### SAFETY & EMC:

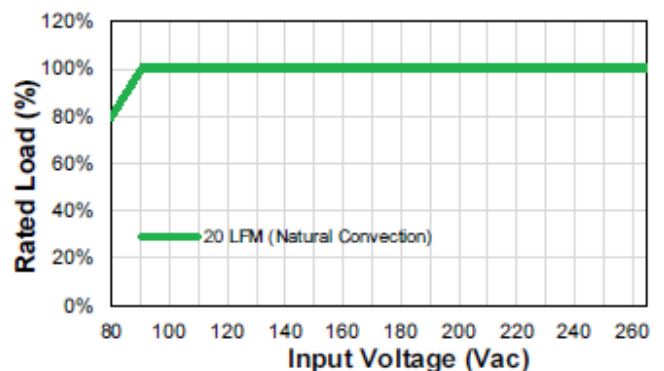
Safety.....	Class I, Class II, IEC60601-1, EN60601-1, ANSI/AAMI ES60601-1, Ed 3.1 IEC/EN 60601-1-11 for TR220MB (Home Health Care)
EMC Emission .....	EN55011, EN61000-3-2, EN6100-3-3, FCC CFR47 Part 15
Conducted Disturbance.....	EN55011 Class B, FCC CFR47 Part 15
Radiated Disturbance.....	EN55011 Class B, FCC CFR47 Part 15
Harmonic Current Emissions .....	EN 61000-3-2
Voltage Fluctuations & Flicker .....	EN 61000-3-3
EMC Immunity .....	EN60601-1-2 Ed4.0, IEC61000-4-2, 3, 4, 5, 6, 8, 11
Electrostatic Discharge (ESD) .....	IEC 61000-4-2 Air Discharge: ±15kV Contact Discharge: ±8kV
Radio-Frequency, Continuous, Radiated Disturbance .....	IEC 61000-4-3
Electrical Fast Transient (EFT) .....	IEC 61000-4-4, ±1kV, ±2kV
Surge .....	IEC61000-4-5, L-N: ±0.5kV, ±1kV L-E (Ground): ±0.5kV, ±1kV, ±2kV
Conducted Disturbances, Induced by RF Fields.....	IEC 61000-4-6 +COR1
Power Frequency Magnetic Field .....	IEC 61000-4-8
Voltage Dips .....	IEC 61000-4-11, Dips:30% reduction, Dips: >95% Reduction, Criteria A
Voltage Interruptions .....	IEC 61000-4-11, >95% Reduction

## Derating Curve

### DVTRM220M Derating Curve



### DVTRM220M Input Voltage Derating Curve



# Mechanical Specification

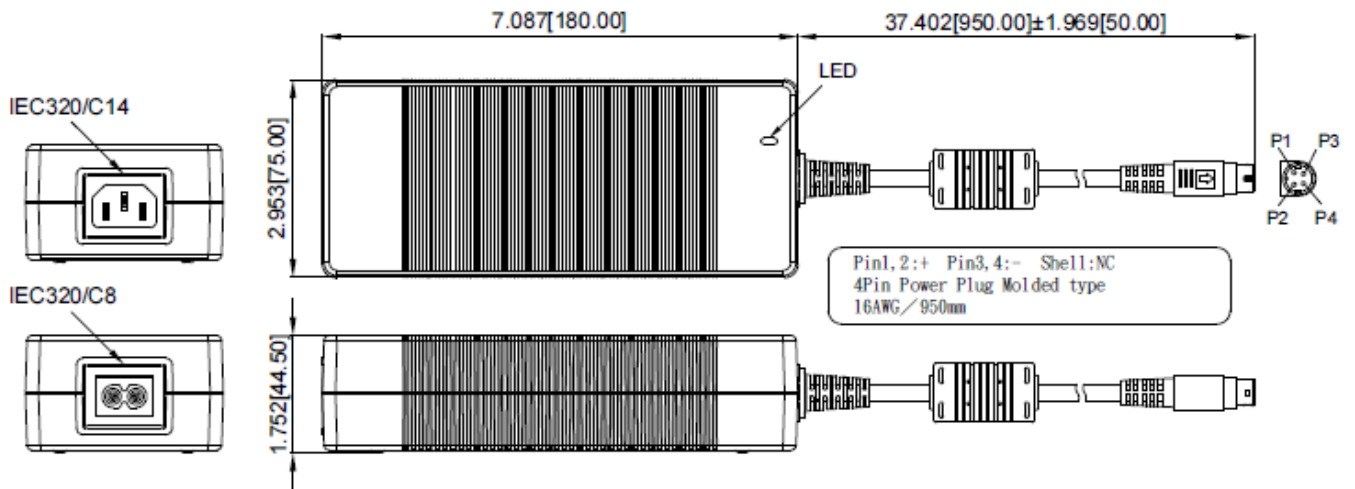
# Series DVTR220M

All Dimensions in Inches (mm); Tolerance: Inches: x.xxx=±0.02, mm: x.xx=±0.5

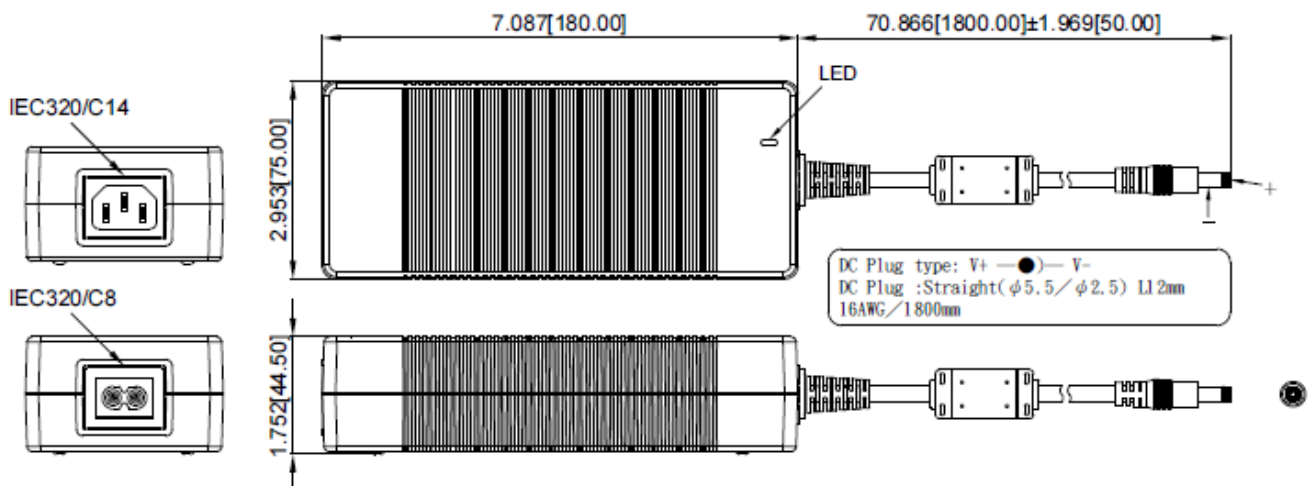
\*For Output Voltage 12Vdc and 24V model, it must select Din Power Plug Molded Type or equivalent

\* For Output Voltage 36Vdc to 56Vdc models, it's able to select Din Power Plug Molded Type, DC Jack or equivalent.

## Din Power Plug

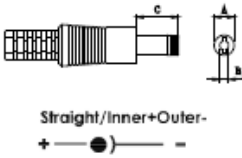
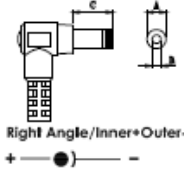
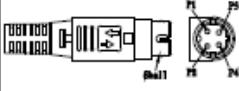
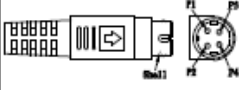


## DC Jack



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## STANDARD OUTPUT DC PLUG

DC Plug Type	DC Plug E Cable Length Number	A	B	C	Cable Type	Cable Length	Cable AWG
		OD (mm)	ID (mm)	L (mm)			
 <p>Straight/Inner+Outer- + — ● — -</p>	11E13	Φ5.5	Φ2.1	12	UL2464	1800mm with Ferrite Core	16AWG for 36V,48V,56V
	12E13	Φ5.5	Φ2.5	12			
	23E13	Φ5.5	Φ2.1	9.5			
	26E13	Φ5.5	Φ2.5	9.5			
 <p>Right Angle/Inner+Outer- + — ● — -</p>	01E13	Φ5.5	Φ2.1	12			
	02E13	Φ5.5	Φ2.5	12			
	21E13	Φ5.5	Φ2.5	9.5			
	24E13	Φ5.5	Φ2.1	9.5			
Din Plug Type	Cable Number - XXXXX	Pin Assignment		Cable Type	Cable Length	Cable AWG	
		PIN No.	Polarity				
KYCON KPPX-4P equivalent with Lock (Din Power Plug Assembly Type) 	1446E12	P1	-	UL2464	1200mm with Ferrite Core	16AWG for 24V	
		P2	+				
		P3	-				
	1446E471	P4	+		950mm with Ferrite Core	16AWG for 12V	
		Shell	No Connection				
KYCON KPPX-4P equivalent without Lock (Din Power Plug Molded Type) 	1538E12	P1	+	UL2464	1200mm with Ferrite Core	16AWG for 24V	
		P2	+				
		P3	-				
	1538E471	P4	-		950mm with Ferrite Core	16AWG for 12V	
		Shell	No Connection				

Other DC Plug Type on request