

Customer:			
Model:	MR30101	MR3010E12B1-RSR	
Customer Part Numbe	r:		
Revision:	V1.1	V1.1 Brushless DC Fan	
Description:	Brushless		
Issue Date:			
Revision Date:			
Drawn By:	Checked By:	Annuavad Dva	
SPECI	FICATIONS FOR AP		
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BRUSHLESS DC FAN SPECIFICATIONS

1. SCOPE

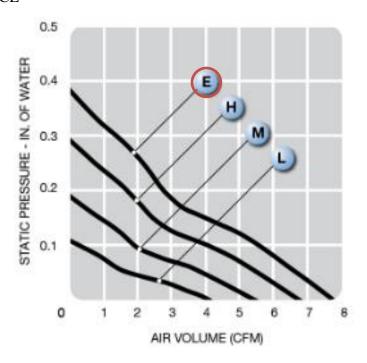
This specification applies to axial fan model: MR3010E12B1-RSR

2. SPECIFICATIONS

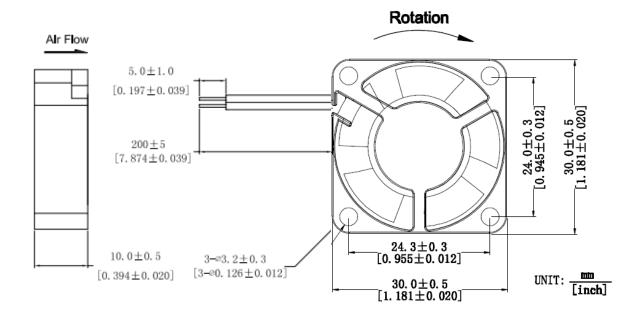
Brushless DC motor	2. SI ECHTCATIONS		
Impeller MaterialUL94V-0 PBTMass8gBearingsBall BearingMotor InsulationClass AMaximum Free-Air Flow7.7 CFMMaximum Back Pressure0.38 In H2ORated Voltage12.0 VDCOperating Voltage8.0 ~ 14.0 VDCRated Current0.13 APower1.56 WRated Speed11,500 RPMOperating Temperature-10°C to +70°CStorage Temperature-40°C to +70°CSound Pressure Level34 dB(A). As measured in a sound isolated room; background noise 20 dB or less; microphone distance 1m from intake side of fanInsulation ResistanceMin 10M ohm between frame and (+) lead at 500 VDCDielectric StrengthMax 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1secShock Resistance3.2G, 11 millisecond (1/2 sine), twice to all three axesL10 Life Expectancy50,000 Hours at 40CLead Wires 3XUL1571#28AWG200+/-5mm(+) RED (-) BLACK (FG-Tach) YELLOWRoHS ComplianceRoHS & Reach CompliantMotor ProtectionLocked Rotor Protection and Auto-RestartOptional FeaturesTachometer Output	Motor Design	Brushless DC motor	
Mass8gBearingsBall BearingMotor InsulationClass AMaximum Free-Air Flow7.7 CFMMaximum Back Pressure0.38 In H2ORated Voltage12.0 VDCOperating Voltage8.0 ~ 14.0 VDCRated Current0.13 APower1.56 WRated Speed11,500 RPMOperating Temperature-10°C to +70°CStorage Temperature-40°C to +70°CSound Pressure Level34 dB(A). As measured in a sound isolated room; background noise 20 dB or less; microphone distance 1m from intake side of fanInsulation ResistanceMin 10M ohm between frame and (+) lead at 500 VDCDielectric StrengthMax 5 mA between frame and (+) lead at 500 VDCDielectric Expectancy3.2G, 11 millisecond (1/2 sine), twice to all three axesL10 Life Expectancy50,000 Hours at 40CLead Wires 3XUL1571#28AWG(+) RED (-) BLACK (FG-Tach) YELLOW(-) BLACK (FG-Tach) YELLOWRoHS ComplianceRoHS & Reach CompliantMotor ProtectionLocked Rotor Protection and Auto-RestartOptional FeaturesTachometer Output			
Bearings Ball Bearing Motor Insulation Class A Maximum Free-Air Flow Maximum Back Pressure Rated Voltage 12.0 VDC Operating Voltage Rated Current O.13 A Power Rated Speed 11,500 RPM Operating Temperature Storage Temperature Sound Pressure Level Insulation Resistance Min 10M ohm between frame and (+) lead at 500 VDC Dielectric Strength Max 5 mA between frame and (+) lead at 500 VDC Dielectric Strength Shock Resistance L10 Life Expectancy Lead Wires 3X UL1571#28AWG (+) RED (-) BLACK (FG-Tach) YELLOW ROHS Compliance RoHS Compliance RoHS & Reach Compliant Max 5 mAbetween Output RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output	Impeller Material	UL94V-0 PBT	
Motor InsulationClass AMaximum Free-Air Flow7.7 CFMMaximum Back Pressure0.38 In H2ORated Voltage12.0 VDCOperating Voltage8.0 ~ 14.0 VDCRated Current0.13 APower1.56 WRated Speed11,500 RPMOperating Temperature-10°C to +70°CStorage Temperature-40°C to +70°CSound Pressure Level34 dB(A). As measured in a sound isolated room; background noise 20 dB or less; microphone distance 1m from intake side of fanInsulation ResistanceMin 10M ohm between frame and (+) lead at 500 VDCDielectric StrengthMax 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1secShock Resistance3.2G, 11 millisecond (1/2 sine), twice to all three axesL10 Life Expectancy50,000 Hours at 40CLead Wires 3XUL1571#28AWG200+/-5mm(+) RED (-) BLACK (FG-Tach) YELLOWRoHS ComplianceRoHS & Reach CompliantMotor ProtectionLocked Rotor Protection and Auto-RestartOptional FeaturesTachometer Output	Mass	8g	
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Rated Voltage Operating Voltage Rated Current O.13 A Power I.56 W Rated Speed Operating Temperature Storage Temperature Sound Pressure Level Insulation Resistance Min 10M ohm between frame and (+) lead at 500 VDC Dielectric Strength Max 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1sec Shock Resistance Lead Wires 3X UL1571#28AWG (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance Mon 10 VDC Rated VDC No. 24.0 VDC No. 34.0 VDC A. 34.0	Maximum Free-Air Flow	7.7 CFM	
Operating Voltage8.0 ~ 14.0 VDCRated Current0.13 APower1.56 WRated Speed11,500 RPMOperating Temperature-10°C to +70°CStorage Temperature-40°C to +70°CSound Pressure Level34 dB(A). As measured in a sound isolated room; background noise 20 dB or less; microphone distance 1m from intake side of fanInsulation ResistanceMin 10M ohm between frame and (+) lead at 500 VDCDielectric StrengthMax 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1secShock Resistance3.2G, 11 millisecond (1/2 sine), twice to all three axesL10 Life Expectancy50,000 Hours at 40CLead Wires 3XUL1571#28AWG200+/-5mm(+) RED(-) BLACK (FG-Tach) YELLOWRoHS ComplianceRoHS & Reach CompliantMotor ProtectionLocked Rotor Protection and Auto-RestartOptional FeaturesTachometer Output	Maximum Back Pressure	$0.38 \text{ In H}_2\text{O}$	
Rated Current Power Rated Speed Operating Temperature Storage Temperature Sound Pressure Level Insulation Resistance Dielectric Strength Shock Resistance L10 Life Expectancy Lead Wires 3X 200+/-5mm RoHS Compliance More Tonor C 11,500 RPM 12,500 RPM 13,500 RPM 14,000 Lead or on; 14,000 background noise 20 dB or less; microphone distance 1m from intake side of fan 15,000 Hours 20 dB or less; microphone distance 1m from intake side of fan 16,000 Max 5 mA between frame and (+) lead at 500 VDC 16,000 Max 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1sec 16,000 Hours at 40C 17,000 Hours at 40C 18,000 Hours at 40C 19,000 Hours at 40C 10,000 H	Rated Voltage	12.0 VDC	
Power 1.56 W Rated Speed 11,500 RPM Operating Temperature -10°C to +70°C Storage Temperature -40°C to +70°C Sound Pressure Level 34 dB(A). As measured in a sound isolated room; background noise 20 dB or less; microphone distance 1m from intake side of fan Insulation Resistance Min 10M ohm between frame and (+) lead at 500 VDC Dielectric Strength Max 5 mA between frame and (+) lead at 500 VAC for 60sec, or 600 VAC for 1sec Shock Resistance 3.2G, 11 millisecond (1/2 sine), twice to all three axes L10 Life Expectancy 50,000 Hours at 40C Lead Wires 3X UL1571#28AWG (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features	Operating Voltage	8.0 ~ 14.0 VDC	
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Shock Resistance 3.2G, 11 millisecond (1/2 sine), twice to all three axes L10 Life Expectancy 50,000 Hours at 40C Lead Wires 3X UL1571#28AWG (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output	Insulation Resistance	Min 10M ohm between frame and (+) lead at 500 VDC	
Shock Resistance L10 Life Expectancy Lead Wires 3X 200+/-5mm (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance Motor Protection Optional Features 3.2G, 11 millisecond (1/2 sine), twice to all three axes 50,000 Hours at 40C (+) RED (-) BLACK (FG-Tach) YELLOW RoHS & Reach Compliant Locked Rotor Protection and Auto-Restart Tachometer Output	Dielectric Strength	` '	
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Lead Wires 3X 200+/-5mm (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant Locked Rotor Protection and Auto-Restart Optional Features UL1571#28AWG (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant	Shock Resistance	3.2G, 11 millisecond (1/2 sine), twice to all three axes	
200+/-5mm (+) RED (-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output	L10 Life Expectancy	,	
(-) BLACK (FG-Tach) YELLOW RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output	Lead Wires 3X	UL1571#28AWG	
RoHS Compliance RoHS & Reach Compliant Motor Protection Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output	200+/-5mm		
RoHS Compliance RoHS & Reach Compliant Locked Rotor Protection and Auto-Restart Optional Features Tachometer Output		(-) BLACK	
Motor ProtectionLocked Rotor Protection and Auto-RestartOptional FeaturesTachometer Output			
Optional Features Tachometer Output	-	<u>.</u>	
	Motor Protection	Locked Rotor Protection and Auto-Restart	
Lot marking Date code stamped on label or frame	Optional Features	Tachometer Output	
	Lot marking	Date code stamped on label or frame	



3. PERFORMANCE



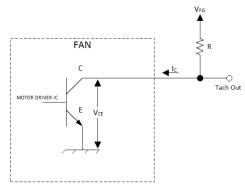
4. MECHANICAL Dimensional Drawing – Unit: mm





5. SENSOR SPECIFICATION: Frequency Generator (Tachometer) Output

a. OUTPUT CIRCUIT

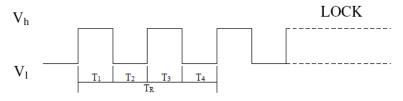


b. ELECTRICAL SPECIFICATIONS

$$\begin{split} V_{CE}\left(sat\right) &= 0.5 \text{ V MAX} \\ I_{C} &= 5 \text{ mA MAX} \end{split} \qquad \begin{aligned} V_{FG} &= 12 \text{ V MAX} \\ R &= V_{FG} / I_{C} \end{aligned}$$

c. WAVEFORM OUTPUT

When the rotor is turned the output will take the form of a square wave When the rotor is locked the output will be either HI or LO



$$\begin{split} T_1 = T_2 = T_3 = T_4 = 1/4T_R \\ N = RPM \\ T_R = 60/N \end{split}$$