

Distributed by:

**JAMECO**<sup>®</sup>  
ELECTRONICS

**www.Jameco.com ♦ 1-800-831-4242**

The content and copyrights of the attached  
material are the property of its owner.

Jameco Part Number 212266



# 120W Single Output Industrial DIN RAIL Power Supply

# DR-120 series



### ■ Features :

- AC input range selectable by switch
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- UL 508(industrial control equipment)approved
- LED indicator for power on
- 100% full load burn-in test
- Fixed switching frequency at 55KHz
- 3 years warranty

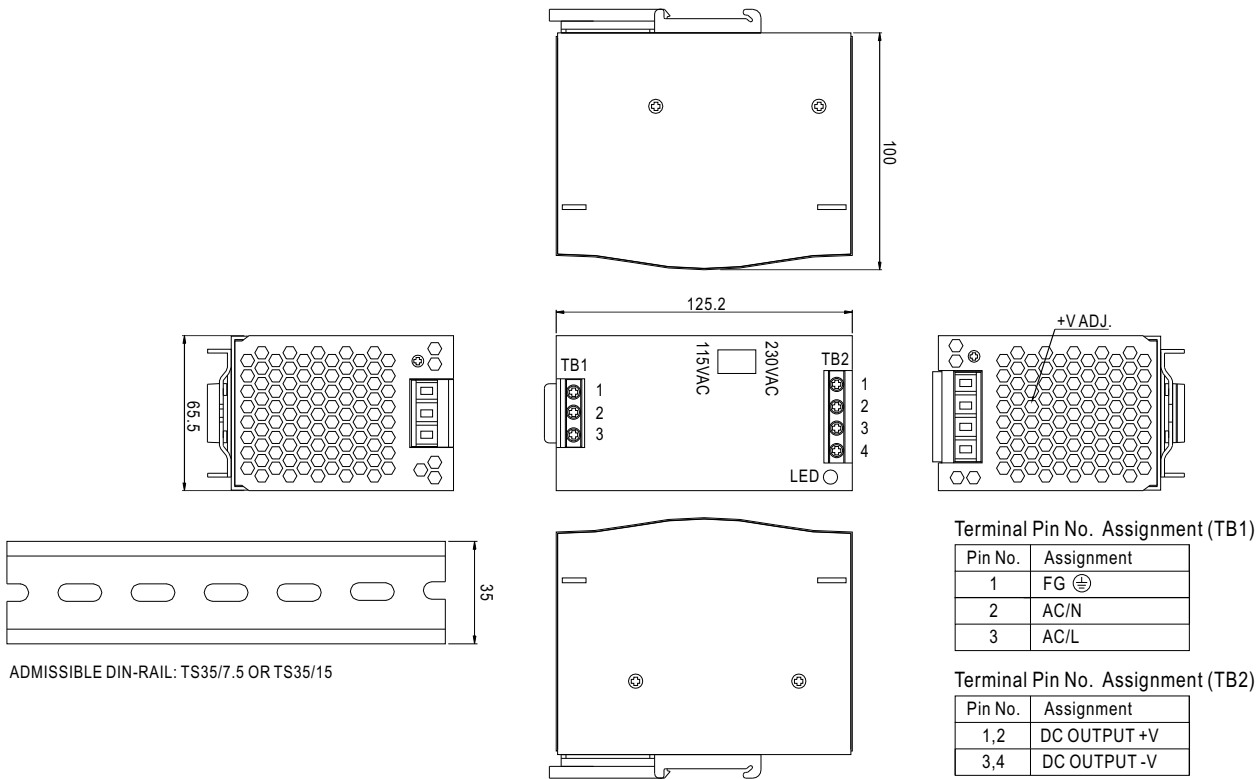


### SPECIFICATION

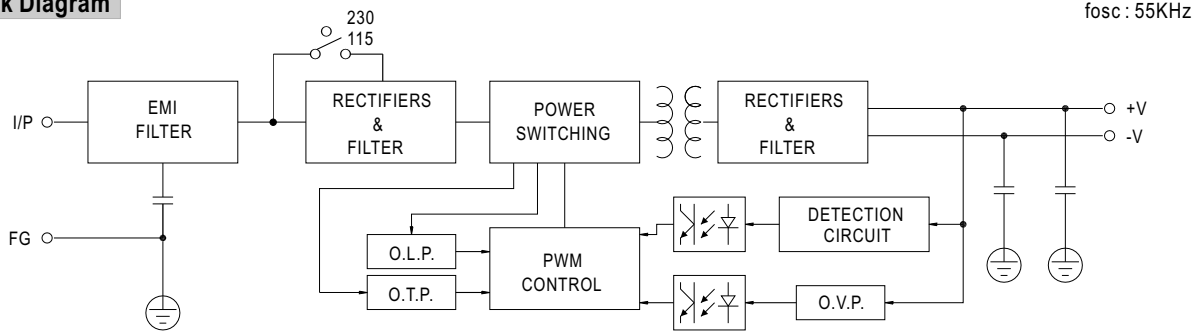
MODEL	DR-120-12	DR-120-24	DR-120-48	
OUTPUT	DC VOLTAGE	12V	24V	48V
	RATED CURRENT	10A	5A	2.5A
	CURRENT RANGE	0 ~ 10A	0 ~ 5A	0 ~ 2.5A
	RATED POWER	120W	120W	120W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	100mVp-p
	VOLTAGE ADJ. RANGE	12 ~ 14V	24 ~ 28V	48 ~ 53V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME	500ms, 70ms/230VAC    500ms, 70ms/115VAC at full load		
HOLD UP TIME (Typ.)	36ms/230VAC    32ms/115VAC at full load			
INPUT	VOLTAGE RANGE	88 ~ 132VAC/176 ~ 264VAC by switch		248 ~ 370VDC
	FREQUENCY RANGE	47 ~ 63Hz		
	EFFICIENCY (Typ.)	80%	84%	85%
	AC CURRENT (Typ.)	2.6A/115VAC    1.6A/230VAC		
	INRUSH CURRENT (Typ.)	COLD START 20A/115VAC    40A/230VAC		
LEAKAGE CURRENT	<3.5mA / 240VAC			
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed		
	OVER VOLTAGE	15 ~ 16.5V	29 ~ 33V	58 ~ 65V
	OVER TEMPERATURE	85°C ±5°C (TSW1) Protection type : Shut down o/p voltage, recovers automatically after temperature goes down	90°C ±5°C (TSW1)	90°C ±5°C (TSW1)
ENVIRONMENT	WORKING TEMP.	-10 ~ +60°C (Refer to output load derating curve)		
	WORKING HUMIDITY	20 ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH		
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6		
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC    I/P-FG:1.5KVAC    O/P-FG:0.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC		
	EMI CONDUCTION & RADIATION	Compliance to EN55011, EN55022 (CISPR22) Class B		
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3		
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, ENV50204, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A		
OTHERS	MTBF	136.8Khrs min.    MIL-HDBK-217F (25°C)		
	DIMENSION	65.5*125.2*100mm (W*H*D)		
	PACKING	0.79Kg; 20pcs/16.5Kg/1.29CUFT		
NOTE	<ol style="list-style-type: none"> <li>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</li> <li>2. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf &amp; 47uf parallel capacitor.</li> <li>3. Tolerance : includes set up tolerance, line regulation and load regulation.</li> <li>4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.</li> </ol>			

Case No. 921A Unit:mm

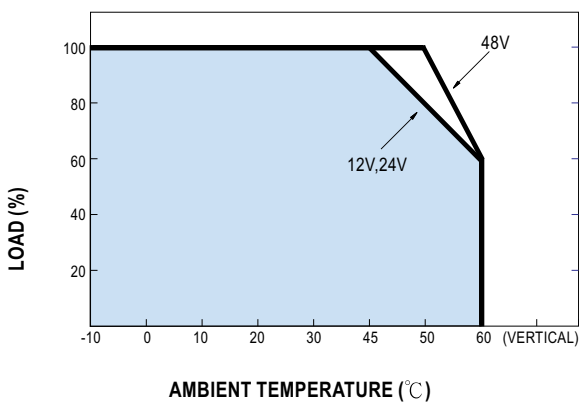
**Mechanical Specification**



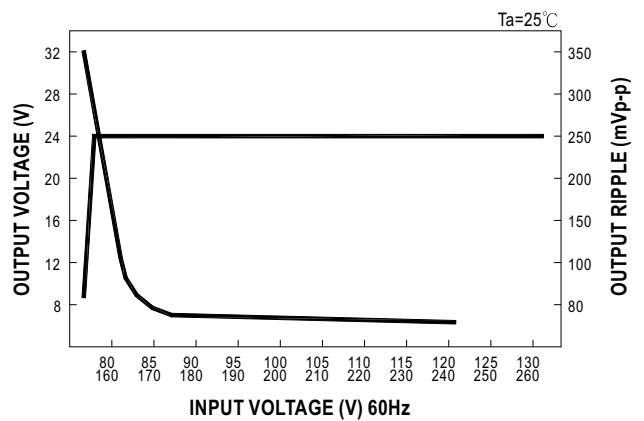
**Block Diagram**



**Derating Curve**



**Static Characteristics (24V)**



# Quality Engineering Test Report

**SERIES: DR-120     120W AC-DC SINGLE OUTPUT SWITCHING POWER SUPPLY**

**SAMPLE: A. DR-120-12     12V/10A     B. DR-120-24     24V/5A     C. DR-120-48     48V/2.5A**

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT						
1	MAX. INRUSH CURREN	I/P:230VAC     SPEC:60A O/P: FULL LOAD	A: 30.617A B: 37.656A C: 27.812A	P						
2	SET UP TIME	I/P:230VAC     SPEC:500mS O/P:FULL LOAD	A: 268.86mS B: 309.21mS C: 301.30mS	P						
3	RISE TIME	I/P:230VAC     SPEC:70mS O/P:FULL LOAD	A: 18.82 mS B: 45.88 mS C: 32.29 mS	P						
4	HOLD UP TIME	I/P:230VAC     SPEC:30mS O/P:FULL LOAD	A: 39.19mS B: 43.18mS C: 44.21mS	P						
5	LINE REGULATION	I/P:176-264VAC     SPEC: A: ± 0.5 % O/P:FULL LOAD     B: ± 0.5 % C: ± 0.5 %	A. +0.00 % ~ +0.05 % B. -0.00 % ~ +0.024 % C. -0.012 % ~ +0.037 %	P						
6	LOAD REGULATION	I/P:230VAC     SPEC: A: ± 1 % O/P:MIN. TO FULL     B: ± 1 % LOAD     C: ± 1 %	A. -0.35 % ~ +0.35 % B. -0.024 % ~ +0.024 % C. -0.04 % ~ +0.08 %	P						
7	OUTPUT VOLTAGE TOLERANCE	I/P:176-264VAC     SPEC: A: ± 2 % O/P:0% TO FULL LOAD     B: ± 1 % C: ± 1 %	A. -0.73 % ~ +0.049 % B. -0.078 % ~ +0.000 % C. -0.077 % ~ +0.039 %	P						
8	OVER LOAD PROTECTION	I/P:230VAC     SPEC: A: 105 % ~ 150 % O/P:TESTING     B: 105 % ~ 150 % C: 105 % ~ 150 %	A: 129% B: 120% C: 135%	P						
9	AC INPUT VOLTAGE RANGE	I/P:TESTING     SPEC:176-264VAC O/P:FULL LOAD	A. 125.0V ~ 264 VAC B. 129.087V ~ 264 VAC C. 125.062V ~ 264 VAC	P						
10	RIPPLE&NOISE	I/P:230VAC     SPEC: A: 80 mVp-p O/P:FULL     B: 80 mVp-p LOAD     C: 100 mVp-p	A: 24 mVp-p B: 16 mVp-p C: 37 mVp-p	P						
11	AC INPUT CURRENT	I/P:230VAC     SPEC:1.7A O/P:FULL LOAD	A: 1.229 A B: 1.208 A C: 1.149 A	P						
12	EFFICIENCY	I/P:230VAC     SPEC: A: 80 % O/P:FULL LOAD     B: 84 % C: 85 %	A: 81.938% B: 85.422% C: 85.977%	P						
13	OVER VOLTAGE PROTECTION	I/P:230VAC     SPEC: A: 15~16.5V O/P:MIN LOAD     B: 29~33V C: 58~65V	A: 16.2V B: 31.2V C: 59.9V	P						
14	O/P VOLTAGE ADJ.RANGE	I/P:230VAC     SPEC: A: 12 V ~ 14 V O/P:MIN. LOAD     B: 24 V ~ 28 V C: 48 V ~ 53 V	A. 10.65 V ~ 15.084 V B. 21.339 V ~ 29.781 V C. 39.76 V ~ 55.88 V	P						
15	GROUND LEAKAGE CURRENT	I/P:240VAC     SPEC: L-FG--<3.5mA N-FG--<3.5mA	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">A:</td> <td>L-FG: 1.74mA N-FG: 1.75mA</td> </tr> <tr> <td>B:</td> <td>L-FG: 1.74mA N-FG: 1.75mA</td> </tr> <tr> <td>C:</td> <td>L-FG: 1.74mA N-FG: 1.75mA</td> </tr> </table>	A:	L-FG: 1.74mA N-FG: 1.75mA	B:	L-FG: 1.74mA N-FG: 1.75mA	C:	L-FG: 1.74mA N-FG: 1.75mA	P
A:	L-FG: 1.74mA N-FG: 1.75mA									
B:	L-FG: 1.74mA N-FG: 1.75mA									
C:	L-FG: 1.74mA N-FG: 1.75mA									

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT																																							
16	DIELECTRIC / WITHSTAND VOLTAGE	SPEC: I/P- O/P: 3KVAC/ 1 min. I/P - FG: 1.5KVAC/ 1 min. O/P -FG: 0.5KVAC/ 1 min.	<table border="1"> <tr> <td>A:</td> <td>I/P-O/P: 8mA I/P-FG: 5.9mA O/P-FG: 14.8mA</td> </tr> <tr> <td>B:</td> <td>I/P-O/P: 6.2mA I/P-FG: 4.8mA O/P-FG: 7.2mA</td> </tr> <tr> <td>C:</td> <td>I/P-O/P: 9.45mA I/P-FG: 7.79mA O/P-FG: 15.5mA</td> </tr> </table>	A:	I/P-O/P: 8mA I/P-FG: 5.9mA O/P-FG: 14.8mA	B:	I/P-O/P: 6.2mA I/P-FG: 4.8mA O/P-FG: 7.2mA	C:	I/P-O/P: 9.45mA I/P-FG: 7.79mA O/P-FG: 15.5mA	P																																	
A:	I/P-O/P: 8mA I/P-FG: 5.9mA O/P-FG: 14.8mA																																										
B:	I/P-O/P: 6.2mA I/P-FG: 4.8mA O/P-FG: 7.2mA																																										
C:	I/P-O/P: 9.45mA I/P-FG: 7.79mA O/P-FG: 15.5mA																																										
17	INSULATION RESISTANCE	SPEC: I/P-O/P: 500VDC/100M $\Omega$ ms MIN. I/P-FG: 500VDC/100M $\Omega$ ms MIN. O/P-FG: 500VDC/100M $\Omega$ ms MIN.	<table border="1"> <tr> <td>A:</td> <td>TEST OK</td> </tr> <tr> <td>B:</td> <td>TEST OK</td> </tr> <tr> <td>C:</td> <td>TEST OK</td> </tr> </table>	A:	TEST OK	B:	TEST OK	C:	TEST OK	P																																	
A:	TEST OK																																										
B:	TEST OK																																										
C:	TEST OK																																										
18	BURN-IN TEST	I/P: 230VAC O/P: FULL LOAD TA:25.7°C BURN-IN DURATION : 2.5 hrs	B:NON BREAK	P																																							
19	ENVIRONMENT TEST	<p>1.LOW TEMPERATURE TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:-13.8°C</p> <p>2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:52.2C</p> <p>3.High Humidity High Voltage On/Off Test I/P:267VAC O/P:FULL LOAD AMBIENT TEMPERATURE:26.7°C AMBIENT HUMIDITY:95%</p>	<p>AFTER 14.5 hrs POWER ON <u>OK</u></p> <p>AFTER 6.5 hrs NON BREAK</p> <p>AFTER 14 hrs POWER ON NON BREAK</p>	P																																							
20	TEMPERATURE RISE TEST Trise OF PARTS	<p>B: I/P :230VAC AFTER1.5 hr BURN-IN O/P :FULL LOAD TA:26.1°C</p> <table border="1"> <thead> <tr> <th></th> <th>POSITION</th> <th>P/N</th> <th>TEMP</th> <th>Trise</th> </tr> </thead> <tbody> <tr> <td></td> <td>BD1</td> <td>BRIDGE DIODE</td> <td>66.8°C</td> <td>40.7°C</td> </tr> <tr> <td></td> <td>Q1</td> <td>MAIN TRANSISTOR</td> <td>76.6°C</td> <td>50.5°C</td> </tr> <tr> <td></td> <td>T1</td> <td>MAIN TRANSFORMER WIRE</td> <td>80.7°C</td> <td>54.6°C</td> </tr> <tr> <td></td> <td>D51</td> <td>O/P DIODE</td> <td>74.1°C</td> <td>48.0°C</td> </tr> <tr> <td></td> <td>C52</td> <td>O/P FILTER CAPACITOR</td> <td>67.8°C</td> <td>41.7°C</td> </tr> <tr> <td></td> <td>C5</td> <td>I/P FILTER CAPACITOR</td> <td>51.2°C</td> <td>25.1°C</td> </tr> <tr> <td></td> <td>LF2</td> <td>I/P FILTER TRANSFORMER</td> <td>63.4°C</td> <td>37.3°C</td> </tr> </tbody> </table>		POSITION	P/N	TEMP	Trise		BD1	BRIDGE DIODE	66.8°C	40.7°C		Q1	MAIN TRANSISTOR	76.6°C	50.5°C		T1	MAIN TRANSFORMER WIRE	80.7°C	54.6°C		D51	O/P DIODE	74.1°C	48.0°C		C52	O/P FILTER CAPACITOR	67.8°C	41.7°C		C5	I/P FILTER CAPACITOR	51.2°C	25.1°C		LF2	I/P FILTER TRANSFORMER	63.4°C	37.3°C	P
	POSITION	P/N	TEMP	Trise																																							
	BD1	BRIDGE DIODE	66.8°C	40.7°C																																							
	Q1	MAIN TRANSISTOR	76.6°C	50.5°C																																							
	T1	MAIN TRANSFORMER WIRE	80.7°C	54.6°C																																							
	D51	O/P DIODE	74.1°C	48.0°C																																							
	C52	O/P FILTER CAPACITOR	67.8°C	41.7°C																																							
	C5	I/P FILTER CAPACITOR	51.2°C	25.1°C																																							
	LF2	I/P FILTER TRANSFORMER	63.4°C	37.3°C																																							
21	CRITICAL COMPONENT RECORD ( FOR QC INSPECTION REFERENCE ONLY )	<p>B: FUSE :4A/250V BRIDGE DIODE :D3SB60 LINE FILTER :TF-411 TRANSFOMER TF-798 POWER SWITCHER :2SK2850 OUTPUT DIODE :ESAD92-02 20A/200V OUTPUT CAPACITOR : N.C.C KY1500uF/35V 105°C INPUT CAPACITOR :RUBYCON 330uF/200V 85°C P.C.B :DR-120A-R1 FR-4 20Z DS</p>																																									
22	LIFE CYCLE	<p>B: SUPPOSE C52 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta:25°C Tc52:66.7°C Life: 97264.8hrs I/P:230VAC O/P:FULL LOAD Ta:45°C Tc52:89.8°C Life: 19630.8hrs</p>		P																																							
DATE	SAMPLE	TEST RESULT	TEST	APPROVAL																																							
20011012	RD SAMPLE 12V,24V,48V	PASS	VINCENT	MAX LIN																																							
20020423	A111B01 12V,24V,48V	PASS	VINCENT	MAX LIN																																							
20020605	A205B02 12V,24V	PASS	VINCENT	MAX LIN																																							
20021206	A2011b01 24V	PASS	VINCENT	MAX LIN																																							