



Features

- Universal AC input / Full range
- 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
- EN61000-6-2(EN50082-2) industrial immunity level
- 100% full load burn-in test
- 3 years warranty

Description

NDR-120 is one economical slim 120W DIN rail power supply series, adapt to be installed on TS-35/7.5 or TS-35/15 mounting rails. The body is designed 40mm in width, which allows space saving inside the cabinets. The entire series adopts the full range AC input from 90VAC to 264VAC and conforms to EN61000-3-2, the norm the European Union regulates for harmonic current.

NDR-120 is designed with metal housing that enhances the unit's power dissipation. With working efficiency up to 89%, the entire series can operate at the ambient temperature between -20°C and 70°C under air convection. It is equipped with constant current mode for over-load protection, fitting various inductive or capacitive applications. The complete protection functions and relevant certificates for industrial control apparatus (UL508, TUV EN60950-1, and etc.) make NDR-120 a very competitive power supply solution for industrial applications.

Model Encoding

NDR - 120 - 12

Output voltage

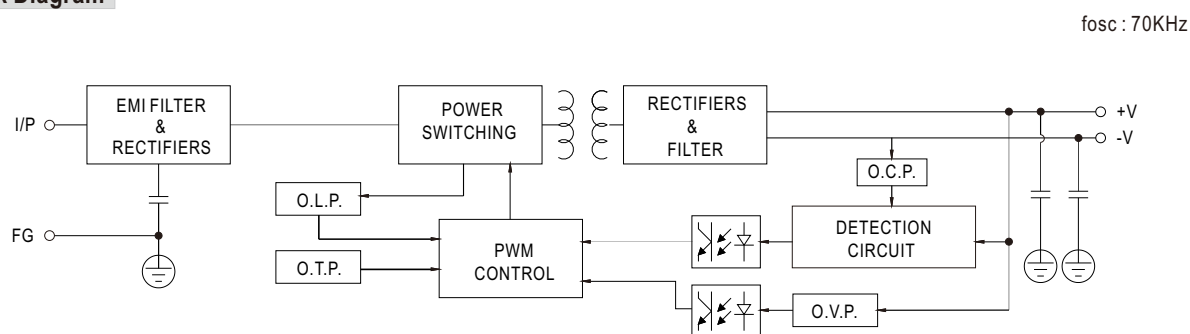
Output wattage

Series name

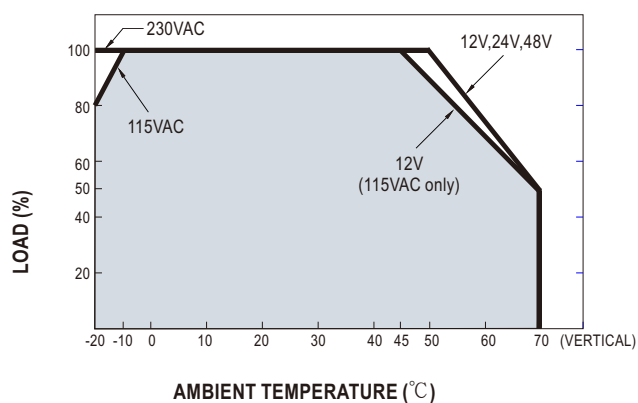
SPECIFICATION

MODEL		NDR-120-12		NDR-120-24		NDR-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	100mVp-p		120mVp-p		150mVp-p	
	VOLTAGE ADJ. RANGE	12 ~ 14V		24 ~ 28V		48 ~ 55V	
	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	1200ms, 60ms/230VAC 2500ms, 60ms/115VAC at full load					
	HOLD UP TIME (Typ.)	16ms/230VAC 10ms/115VAC at full load					
INPUT	VOLTAGE RANGE Note.6	90 ~ 264VAC 127 ~ 370VDC [DC input operation possible by connecting AC/L(+), AC/N(-)]					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	85.5%		88%		89%	
	AC CURRENT (Typ.)	2.25A/115VAC 1.3A/230VAC					
	INRUSH CURRENT (Typ.)	20A/115VAC 35A/230VAC					
	LEAKAGE CURRENT	<1mA / 240VAC					
PROTECTION	OVERLOAD	105 ~ 130% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed					
	OVER VOLTAGE	14 ~ 17V		29 ~ 33V		56 ~ 65V	
		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.	-20 ~ +70°C (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 95% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)					
	VIBRATION	Component:10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6					
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UI508, TUV EN60950-1 approved;(meet EN60204-1)					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC / 25°C / 70% RH					
	EMC EMISSION	Compliance to EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61000-6-2 (EN50082-2), EN61204-3, heavy industry level, criteria A					
OTHERS	MTBF	456.3K hrs min. MIL-HDBK-217F (25°C)					
	DIMENSION	40*125.2*113.5mm (W*H*D)					
	PACKING	0.6Kg; 20pcs/13Kg/1.16CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 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. 5. Installation clearances : 40mm on top, 20mm on the bottom, 5mm on the left and right side are recommended when loaded permanently with full power. In case the adjacent device is a heat source, 15mm clearance is recommended. 6. Derating may be needed under low input voltage. Please check the derating curve for more details.						

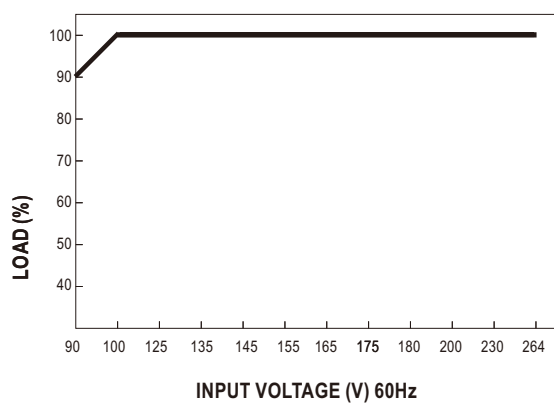
Block Diagram



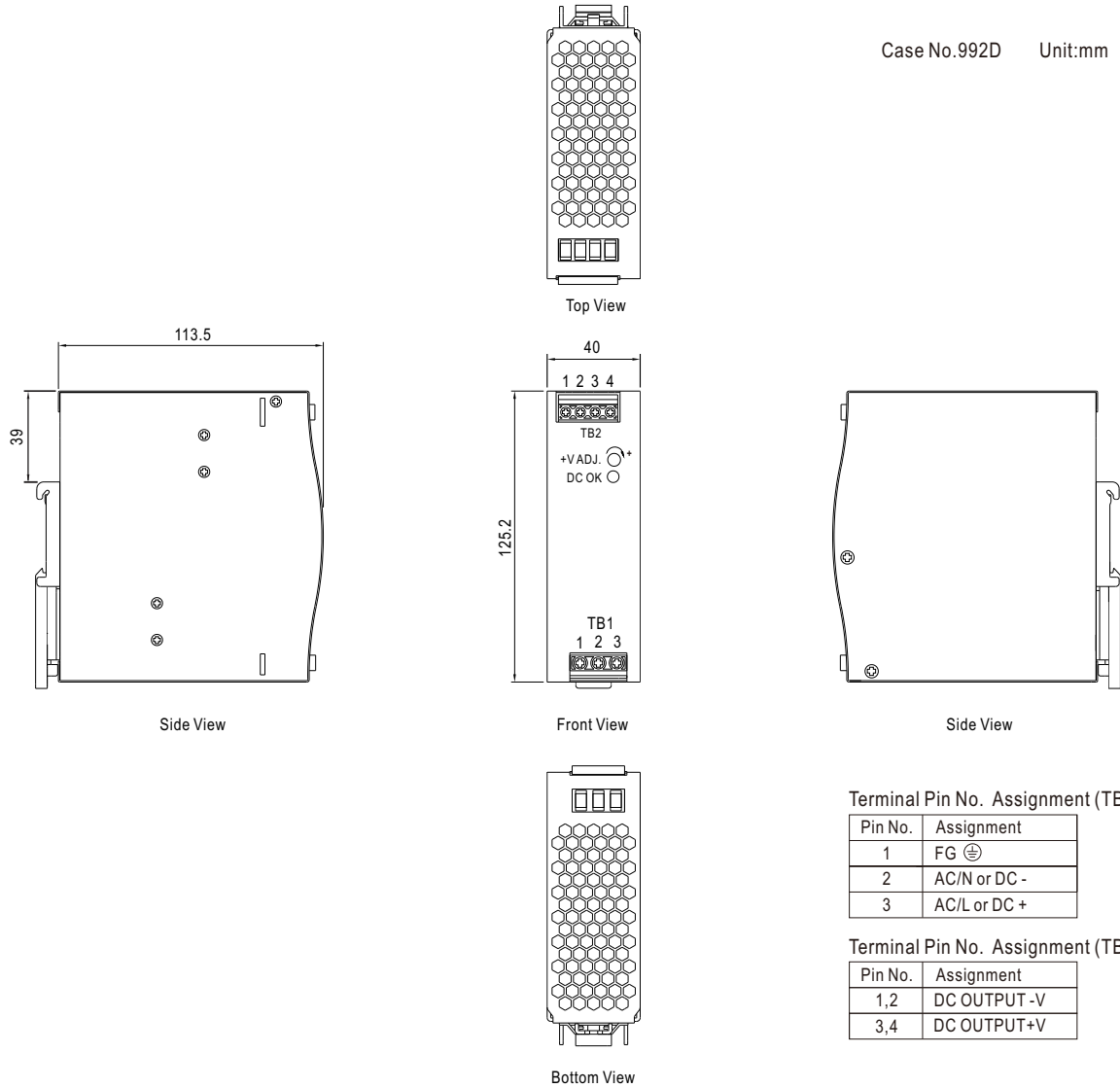
Derating Curve



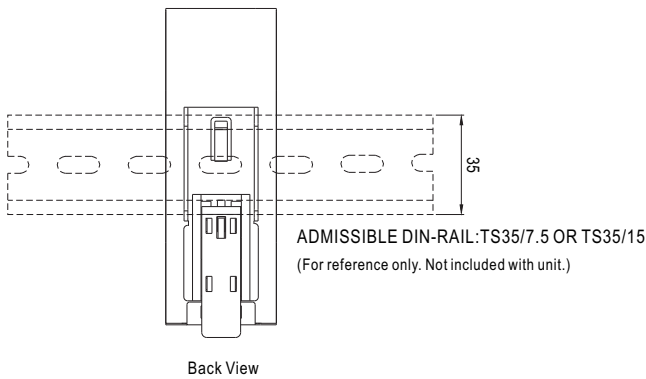
Static Characteristics



Mechanical Specification



Installation Instruction



This series fits DIN-RAIL TS35/7.5 or TS35/15.
For installation details, please refer to the USER MANUAL on
http://www.meanwell.com/search/NDR-120/NDR_manual.pdf



Test Report: NDR-120-48

120W Single Output Industrial DIN RAIL

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

MODEL : NDR-120-48

DVT TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 46.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 48V~55 V	I/P: 230VAC/115VAC O/P: MIN LOAD Ta: 25°C	46.89V~57.71V/230VAC 46.89V~57.71V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1 %~ -1 % (Max)	I/P: 100VAC /264VAC O/P: FULL/ MIN. LOAD Ta: 25°C	V1: 0.012%~0.037%	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 100VAC~ 264VAC O/P: FULL LOAD Ta: 25°C	V1: 0%~ 0.012%	P
5	LOAD REGULATION	V1: 1 %~ -1 % (Max)	I/P: 230VAC O/P: FULL ~MIN LOAD Ta: 25°C	V1: 0.012%~0.037%	P
6	SET UP TIME	230VAC/1200ms (Max) 115VAC/2500ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/721.035ms 115VAC/1577.984ms	P
7	RISE TIME	230VAC/60ms (Max) 115VAC/60ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/39.107ms 115VAC/39.458ms	P
8	HOLD UP TIME	230VAC/16ms (TYP.) 115VAC/10ms (TYP.)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/62.265ms 115VAC/13.687ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5%	P
10	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230VAC O/P(1) FULL /Min LOAD 90%DUTY/1KHZ (2) (1) FULL /Min LOAD 90%DUTY/3KHZ (3) FULL /Min LOAD 90%DUTY/5KHZ (4) FULL /Min LOAD 50%DUTY/120HZ Ta: 25°C	219mVp-p 195mVp-p 182mVp-p 368mVp-p	P

120W Single Output Industrial DIN RAIL **NDR-120** series

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	66.043V~264V	P
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON:3Sec OFF:3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST:OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
4	EFFICIENCY	89% (TYP)	I/P:230 VAC O/P:FULL LOAD Ta:25°C	90.31%	P
5	INPUT CURRENT	230V/ 1.3A (Typ) 115V/ 2.25 A (Typ)	I/P: 230 VAC/115VAC O/P:FULL LOAD Ta:25°C	I =0.97A/ 230VAC I =1.91A/ 115VAC	P
6	INRUSH CURRENT	230V/35A (Typ) 115V/20A (Typ) COLD START	I/P:230VAC/115VAC O/P:FULL LOAD Ta:25°C	I =33.554A/ 230VAC I =17.573A/ 115VAC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~130% RATED OUTPUT POWER	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta:25°C	116.0%/ 264VAC 115.6%/ 230VAC 116.8%/100VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH:56V~65V(Typ)	I I/P:264VAC I/P: 230VAC I/P: 90VAC O/P:MIN LOAD Ta:25°C	62.16V/ 264VAC 62.35V/ 230VAC 62.37V/90VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: NO DAMAGE	I/P: 230 VAC O/P:FULL LOAD	O.T.P. Active Shunt down Re-power ON	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Constant Current Limiting	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 11 A/600 V	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off (2)Output Short (3)FULL LOAD CONTINUE Ta:25°C	(1)510V (2)390V (3)502V	P
2	Diode Peak Voltage	D100 Rated 20A/300V	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2)Output Short (3)FULL LOAD CONTINUE Ta:25°C	(1) 274V (2)– 251V (3) 249V	P
3	Input Capacitor Voltage	C5 Rated: 180U/400V	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Burn-IN 1Hour Ta:25°C	(1)366V (2)366V (3)362V	P
4	Control IC Voltage Test	PWM IC U1 1380 Rated 28 V(MAX) 9 V(MIN.)	I/P:High-Line +3V =267 V O/P:(1)FULL LOAD (2) Output Short (3)NO LOAD VR 下限.LOW LINE Ta:25°C	(2) 17.2V (3) 17.0V (4) 17.4V	P

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	EN 60950 I/P-O/P: 3KVAC/min I/P-FG: 2 KVAC/min O/P-FG:0.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:0.6 KVAC/min Ta:25°C	I/P-O/P:3.188mA I/P-FG:3.69mA O/P-FG:3.93mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG: 9999MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	EN 60950 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	15mΩ BY CASE	P
4	LEAKAGE CURRENT	EN 60950 1mA< 240VAC	I/P:264 VAC O/P:Min LOAD Ta:25°C	L-FG:0.295mA N-FG:0.295Ma	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100%,LOAD Ta:25°C	PASS	P
2	E.S.D	EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P
4	SURGE	IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV	I/P: 230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	P

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																								
1	TEMPERATURE RISE TEST	MODEL : NDR-120-12 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=31.0℃ 2. HIGH AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=48.8℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=32.0℃</th><th>HIGH AMBIENT Ta=48.8℃</th></tr></thead><tbody><tr><td>1</td><td>U1</td><td>63.6℃</td><td>80.2℃</td></tr><tr><td>2</td><td>U107</td><td>63.0℃</td><td>79.4℃</td></tr><tr><td>3</td><td>C5</td><td>61.0℃</td><td>77.7℃</td></tr><tr><td>4</td><td>Q1</td><td>71.2℃</td><td>88.9℃</td></tr><tr><td>5</td><td>T1</td><td>87.7℃</td><td>104.4℃</td></tr><tr><td>6</td><td>C105</td><td>77.7℃</td><td>94.5℃</td></tr><tr><td>7</td><td>D5</td><td>105.3℃</td><td>107.9℃</td></tr><tr><td>8</td><td>C36</td><td>82.3℃</td><td>98.4℃</td></tr><tr><td>9</td><td>BD1</td><td>62.7℃</td><td>78.8℃</td></tr><tr><td>10</td><td>D100</td><td>76.3℃</td><td>93.1℃</td></tr><tr><td>11</td><td>D101</td><td>82.3℃</td><td>98.9℃</td></tr><tr><td>12</td><td>RTH2</td><td>82.3℃</td><td>98.9℃</td></tr><tr><td>13</td><td>LF2</td><td>87.5℃</td><td>103.4℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta=32.0℃	HIGH AMBIENT Ta=48.8℃	1	U1	63.6℃	80.2℃	2	U107	63.0℃	79.4℃	3	C5	61.0℃	77.7℃	4	Q1	71.2℃	88.9℃	5	T1	87.7℃	104.4℃	6	C105	77.7℃	94.5℃	7	D5	105.3℃	107.9℃	8	C36	82.3℃	98.4℃	9	BD1	62.7℃	78.8℃	10	D100	76.3℃	93.1℃	11	D101	82.3℃	98.9℃	12	RTH2	82.3℃	98.9℃	13	LF2	87.5℃	103.4℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 108% LOAD Ta : 25℃	TEST : OK	P																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -20℃	TEST : OK	P																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																								
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	0%/℃ (0~50℃)	P																																																								
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40℃~ +85℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																								

120W Single Output Industrial DIN RAIL **NDR-120** series

7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20°C ~ +70°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec	OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=50°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=50°C LIFE TIME	(1) 98990HRS (2) 18794HRS (3) 39950HRS (4) 72914HRS	P
10	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 456.3KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C		P

SAMPLE	TESTER	APPROVAL
PRODUCT SAMPLE	FRANK	WANGDEZHAO

2007/3/20 A50-S014