



**Features**

- . Input 90V to 264VAC, 50~60Hz suitable for worldwide use
- . Output voltage optional from 12V to 54Vdc constant voltage
- . Protections: Short Circuit / Overload / Over Voltage Protection
- . 100% full load burn-in test for 2Hrs to make every unit reliable
- . Suitable for BF application with appropriate system consideration
- . Cooling by free air convection, operating temperature -20~50°C
- . Long life and high reliability design with 2 years warranty
- . Low standby consumption power <0.5W
- . No minimum load required and extremely low leakage current

**Safety Standards**

- . IEC60601-1 CB report for worldwide use
- . UL ANSI/AAMI ES60601-1/CAN/CSA-C22.2 for USA
- . TUV BS EN/EN 60601-1 for European Union



**Product Description:**

This is a highly reliable AC/DC open framed type 110W medical grade oral irrigator switching power supply solution with wide range 90-264Vac input and designed strictly according to the international medical safety standards. The design is with a very low no load power consumption less than 0.5W and ultra-low leakage current. The entire series supplies different models with output voltages ranging between 12Vdc and 54Vdc that can satisfy the demands for various types of medical equipment such as oral irrigator, hemodialysis machine, medical computer monitors, sleep apnea machine and so on. The 110W open frame type medical switching power supply is built-in full protections of over load / short circuit and over voltage with small and compact size of 130 x 86.5 x 42.8mm.

**Technical Specification**

Typ. Model	KNW-110-12	KNW-110-24	KNW-110-36	KNW-110-48	KNW-110-54
<b>Output</b>					
Output Voltage	12VDC	24VDC	36VDC	48VDC	54VDC
Rated Current	8.3A	4.58A	3.05A	2.3A	2.04A
Current Range	0 ~ 8.3A	0 ~ 4.58A	0 ~ 3.05A	0 ~ 2.3A	0 ~ 2.04A
Output Power	100W Max.	110W Max.	110W Max.	110W Max.	110W Max.
Voltage Tolerance	±5%	±5%	±5%	±3%	±3%
Ripple & Noise	200mVp-p	200mVp-p	200mVp-p	250mVp-p	300mVp-p
<b>Input</b>					
Input voltage	90 - 264Vac or 120- 370Vdc				
Input Frequency	50-60Hz (When the input is AC)				
Power Factory (Typ.)	PF>0.93 / 230VAC PF>0.98 / 115VAC at full load				
Input Current	2A Max. @ 100 ~240Vac 50/60Hz input				
Inrush Current	80A Max. @ 100 ~240Vac 50/60Hz input				
Efficiency (Typ.)	88%	88%	89%	89%	90%
Leakage Current	≤0.15mA @ full input range				
<b>Protections</b>					
Over current	115~150% rated output power. Auto-Recovery when the fault is removed				
Short Circuit	No damage. Auto-Recovery when the fault is removed				
Over temperature	Shut down o/p voltage, re-power on to recover				
<b>Environmental</b>					
Operation Temperature	-20°C to +50°C, 20%RH to 90%RH				
Storage Temp, Humidity	-45~ +85°C, 10%RH to 95%RH				
Operation Altitude	≤2000m @ full load and rated operating temperatures				
MTBF	≥50000Hrs @ full load and rated operating temperatures				
<b>Mechanical</b>					
Dimensions (L x W x H)	127.0 x 91.0 x 33.0mm (5.00 x 3.58 x 1.30 inch)				
Unit Weight	240g±20 grams				
Packing Information	50pcs/ Carton, carton dimensions:47*37*20cm, 13.2kgs/ Carton				

## TEST REPORT

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDIDTION	RESULT	VERDICT
1	RIPPLE & NOISE	200mVp-p (Max)	I/P:230VAC / O/P:FULL LOAD / Ta:25°C	135mVp-p	P
2	VOLTAGE TOLERANCE	-3% ~ +3% (Max)	I/P:90VAC~264VAC O/P:FULL~MIN. LOAD / Ta:25°C	-0.98% ~ +1.36% of output voltage	P
3	LINE REGULATION	-0.5% ~ +0.5% (Max)	I/P:90VAC ~264VAC O/P:FULL LOAD / Ta:25°C	-0.16% ~ +0.158% of output voltage	P
4	LOAD REGULATION	-1% ~ +1% (Max)	I/P:230VAC O/P:FULL ~MIN LOAD / Ta:25°C	-0.62% ~ +0.68% of output voltage	P
5	OVER/UNDERSHOOT	<±5%	I/P: 230VAC O/P:FULL LOAD / Ta:25°C	0.7%	P
6	SET UP TIME	3000 mS (Max)	I/P:230VAC O/P:FULL LOAD / Ta:25°C	2230 mS	P
7	RISE TIME	30 mS (Max)	I/P: 230VAC O/P:FULL LOAD / Ta:25°C	26 mS	P
8	HOLD UP TIME	10 mS (Min)	I/P: 115VAC O/P:FULL LOAD / Ta:25°C	14 mS	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDIDTION	RESULT	VERDICT
1	VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD / Ta:25°C	78V~264V	P
2	FREQUENCY RANGE	50HZ - 60HZ (Typ) NO DAMAGE OSC	I/P: 100VAC ~ 240VAC O/P:FULL~MIN LOAD / Ta:25°C	TEST: OK	P
3	EFFICIENCY	90% (Typ)	I/P:230VAC O/P:FULL LOAD / Ta:25°C	90.56%	P
4	AVERAGE EFFICIENCY	88%	I/P:115/230VAC & O/P:25%、50%、75%、100% LOAD & Ta:25°C	88.83% (115VAC) 89.28% (230VAC)	P
5	AC CURRENT	2A (Max)	I/P:100VAC & O/P:FULL LOAD Ta:25°C	1.78A	P
6	INRUSH CURRENT	<80A COLD START	I/P: 230VAC / O/P:FULL LOAD Ta:25°C	44.9A	P
7	LEAKAGE CURRENT	<0.15mA	I/P:240VAC & O/P:Min LOAD Ta:25°C	L-FG:0.138mA N-FG:0.129mA	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDIDTION	RESULT	VERDICT
1	OVER LOAD PROTECTION	115 ~ 150% (Typ)	I/P:230VAC & O/P:TESTING Ta:25°C	139.4% HICCUP MODE	P
2	OVER VOLTAGE PROTECTION	115 ~ 135% (Typ)	I/P:230VAC O/P:MIN LOAD & Ta:25°C	Hiccup mode ,recovers automatically after fault condition is removed	P
3	SHORT PROTECTION	SHORT OUTPUT 1 HOUR NO DAMAGE	I/P:264VAC O/P:FULL LOAD & Ta:25°C	NO DAMAGE HICCUP MODE	P

### SAFETY TEST & E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDIDTION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 4KVAC/min I/P- FG: 2KVAC/min O/P-FG: 1.5KVAC/min	I/P-O/P: 4 KVAC/min I/P-FG: 2.4KVAC/min O/P-FG: 1.8KVAC/min Ta:25°C	I/P-O/P: 3.25mA I/P-FG: NA O/P-FG: NA 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: NA O/P-FG: NA NO DAMAGE	P
3	CONDUCTION	BS EN/EN55032(CISPR32), FCC PART 15 / CISPR22 CAN	I/P: 230 VAC (50HZ) O/P: FULL/50% LOAD Ta: 25°C	PASS Test by certified Lab	P
4	RADIATION	BS EN/EN55032(CISPR32), FCC PART 15 / CISPR22 CAN	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab	P
5	SURGE	BS EN/EN61000-4-5 LIGHT INDUSTRY L-N: 1KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA B	P
6	E.S.D	BS EN/EN61000-4-2 LIGHT INDUSTRY AIR: 8KV / Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA B	P

TEST RESULT	TESTER	REVIEW	APPROVAL
<b>PASS</b>	<b>ZHU LI</b>	<b>WANG LW</b>	<b>ZHANG DL</b>