Manual Instruction

1.Usage

474 □ - □feeding power supply is an auto-controlling power source designed specifically for CATV system and can meet various requirements of different CATV users. Of large capacity, low failure rate and multipurpose, it is a highly reliable product.

2. Features

2.1 Wide voltage range.

2.2 Employs magnetic saturation voltage stabilizing transformer or ring efficiency transformer, special circuit design.

2.3 Highly reliable power supply with lightning-proof and over-load protection.

2.4 Weatherproof housing design and flexible installation enables convenient using.

3. Classification.

Function / Item	Controllable		Uncontrollable	
	With power inserter	Without power inserter	With power inserter	Without power inserter
Stable Voltage output	4741EJ	4741E	4741J	4741
Unstable Voltage output	4742EJ	4742E	4742J	4742

4.Operating Instructions

4.1 Cover opening

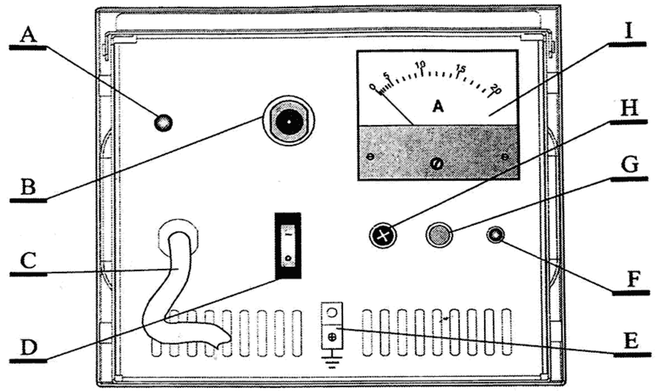
After loosing the locked screws, push the cover toward the top, and pull the cover toward the front panel while lifting, then keep lifting until the cover comes to a stop.

4.2 Cover closing

Turn the cover anticlockwise while lifting, push the cover toward the top to a proper position, and then pull the cover toward the front panel before tightening the screws.

5. Panel function explanation

5.1 Panel function details of 474　E power supply



A. Power indicator: Lights when output is 60V

B. KS/F connector: Power supply~60V/60Hz low voltage AC output port.

C. Power cord: ~220V/50Hz input power feeder.

D. Power switch (with indicator): Connect or cut off the input power to the power supply.

E. Ground terminal: For grounding protection.

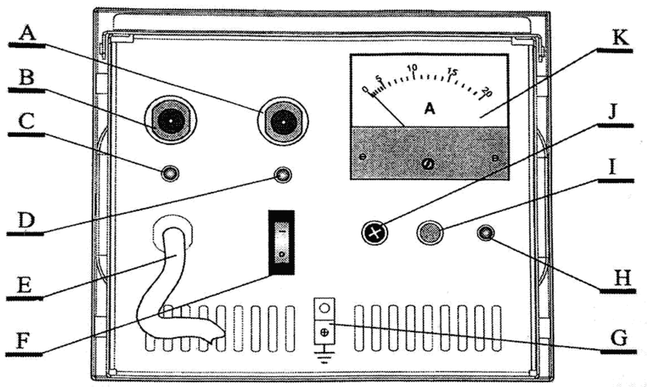
F. Alarming indicator: Lights when overloading power.

G. Reset button: Manually restart the power supply after trouble resolved during overload protection. If trouble in outer circuit remains, it will keep alarming after resetting and cut off the power output automatically in five seconds.

H. Safety tube socket.

I. Ammeter or voltmeter: Indicate loaded AC value or loaded voltage value.

5.2 Panel function detail of 474□EJ Power supply



A.60V output II: AC60V/RF signal output port.

B.60V output I: AC60V/RF signal output port.

C. Power supply indicator I: Lights when output is 60V.

D. Power supply indicator II: Lights when output is 60V.

E. Power cord: ~220V 50Hz input power feeder.

F. Power switch (with indicator): Connect or cut off the input power to the power supply.

G. Ground terminal: For grounding protection.

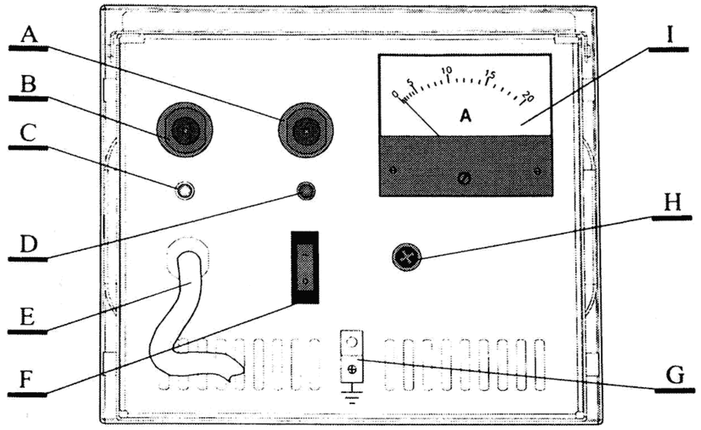
H. Alarming indicator: Lights when overloading power.

I. Reset button: Automatically restart the power supply after trouble resolved during overload protection. If trouble in outer circuit remains, it will keep alarming after resetting and cut off the power output automatically in five seconds.

J. Safety tube socket.

K. Ammeter or voltmeter: Indicate loaded AC value or loaded voltage value.

5.3 Panel function detail of 474 □J Power supply



A.60V output II: AC60V/RF signal output port.

B.60V output I: AC60V/RF signal output port.

C. Power supply indicator I: Lights when output is 60V.

D. Power supply indicator II: Lights when output is 60V.

E. Power cord: ~220V 50Hz input power feeder.

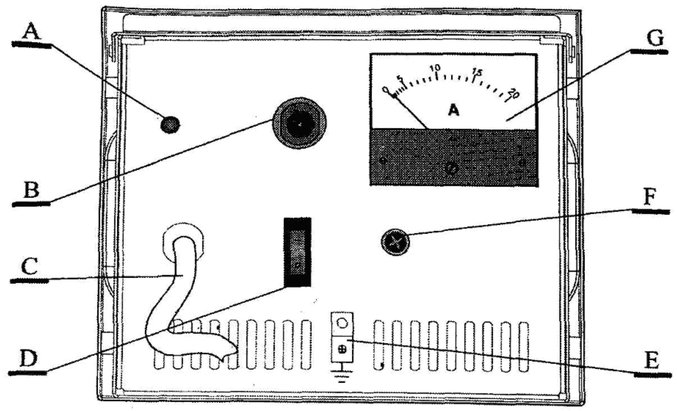
F. Power switch (with indicator): Connect or cut off the input power to the power supply.

G. Ground terminal: For grounding protection.

H. Safety tube socket.

I. Ammeter or voltmeter: Indicate loaded AC value or loaded voltage value.

5.4 Panel function details of 474 power supply.



A. Power supply indicator: Lights when output is 60V.

B.KS/F connector: Power supply~60V/60Hz low voltage AC output port.

C. Power cord: ~220V 50Hz input power feeder.

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E. Ground terminal: For grounding protection.

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G. Ammeter or voltmeter: Indicate loaded AC value or loaded voltage value.

6.Explanation of the Item No.

474 ☒ ☒ - ☒ A

- Current unit: Ampere
- Rated working current
- E: Loading inspection, protection and self-recovery after trouble resolving
- EJ: Has power inserter besides functions in E
- Empty: Has neither overload detection nor power inserter
- 1: Using magnetic saturation voltage stabilizing transformer
- 2: Using toroidal type transformer
- Serial number of power supply

7, Installation and operation

For indoor installation, you should fix the adaptor firmly on a flat top. For outdoor installation, before hanging onto the wall, fasten the board with expansion screw first, then hang the power supply onto the board and fasten the screw to prevent the product from dropping down. When hangs it to steel cable, you should attach the holding block tightly to the cable and fasten the screw to make sure it won't drop from high.

A grounding protection is necessary for safety sake and less possibility of lightning damage. The earthling resistor should not exceed 4Ω.

If possible, you'd better take some weatherproof actions for the well installed power supply, and keep it in drafty place, which can ensure normal working status and prolong its service life.

Do not attempt to open the product and repair by yourself when it doesn't work correctly, please contact the manufacturer or the local dealer for help.

8, Technical data

Model		4741□				4742□			
Nominal Input Voltage AC	(V)	220+10%(-20%)				220±10%			
Nominal Output Voltage AC	(V)	60±3%				60±10%			
Max. Working Current	(A)	3	6	10	15	3	6	10	15
Overload Protecting Current	(A)	4	7.5	13	18	4	7.5	13	18
Time of protecting process	(S)	3--7				3--7			
Delayed restoration time	(S)	40--80				40--80			

Note: *The value of Output Voltage is measured when nominal input voltage is ~220V 50Hz and the power supply output with rated load.

9, Troubleshooting

The Power Supply Unit has been carefully adjusted before leaving factory. If it still functions improperly, please consult the following table.

No.	Problem	Possible Reason		Solution
1	The lamp doesn't light, no voltage output	A	No power	Check whether all cables are well connected
		B	Poor connection of the plug	Re-connect the plug
		C	Blowout	Replace with an identical fuse

2	Alarm	A	Lightning strike and high Voltage interference cause Discharge tube or Capacitor 103/2KV breakdown	Replace with components of the same model
		B	Cable overloaded	Reduce the number of amplifiers or increase power supply units
		C	Output cable is short circuit	Clear short circuit
3	4741 has no regular voltage	A	Damaged resonant capacitor	Change to a new capacitor with the same standard
4	No alarm while overload	A	Transformer EI48N-220 is damaged	Please contact the manufacturer or The local agent
		B	The component in the PCB Is damaged	
		C	Bad current pass mutual inductor	
5	The lamp lights, no voltage output	A	The transformer output has virtual weld	Re-solder
		B	The transformer is damaged	Change transformer
6	Can't re-set automatically.	A	Line overload	Eliminate the overload
7	False alarm	A	The potentiometer on the PCB displaced or parameter of component is changed	Press the Reset button until Electric potential of TP5 is higher than 0.5V of TP4
		B	Evaluated current does not conform to the real consumed one	Test current value with AC Ampere meter

Appendix: Calculation of Concentrated Power Supply

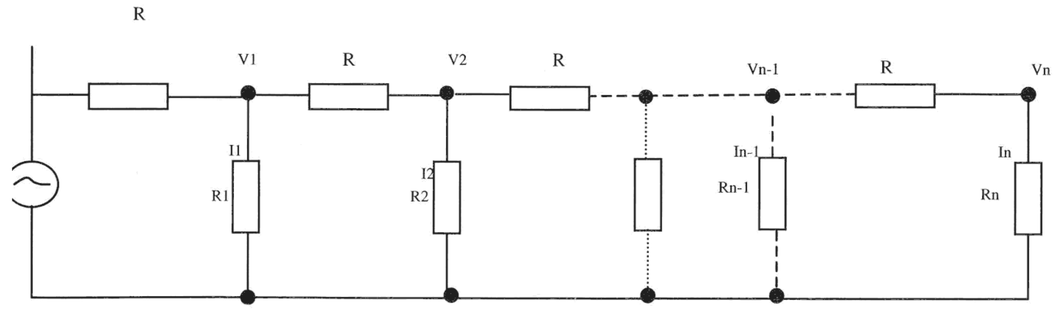
Central power supply means to use central power source at head-end or on some point of the line feed power to amplifiers on the line via cables. This way, power can be managed intensively, thus ensure quality power supply and to avoid broadcasting stops or other problems caused by regional power-cut or decentralized unstable power supply.

The load of central power is central power supply amplifier and the loop resistors of coaxial cables. The number of amplifier it drives is determined by the input characteristics of central power supply amplifier and the loop resistor of the coaxial cable between the amplifiers in the system.

The voltage of the central power supply amplifier usually is 30V—65VAC, 50Hz. The farther the amplifier is from the central power, the lower the voltage is， as the loop resistor of coaxial cable will reduce the voltage. The number of amplifier central power drives is to be calculated according to switch voltage-stabilizing power as follows.

The circuit of an amplifier centralized power supply can be reduced to a figure as below.

This is a complicated circuit and cannot simply apply Ohm's law to calculate. In this



circuit,

R indicates the cable loop resistance between the amplifiers and is 7-8 Ω. (Refer to the cable instruction)

R_1—R_n respectively indicates the equivalent input resistance from the first amplifier to the n one.

V_1---V_n respectively indicates the power input voltage (valid value) from the first amplifier to the n one.

I_1---I_n respectively indicates the power input current (valid value) from the first amplifier to the n one.

$R_1= V_1/I_1$, $R_2=V_2/I_2$, ... , $R_n=V_n/I_n$

It is switching stabilized voltage power supply.

$V_1I_1 =V_2I_2=.....=V_nI_n$

Because the voltage of the cable circuit resistor gradually drops from V_1 to V_n; R_1 to R_n is not a constant, we should not calculate simply by reducing them to serial or parallel resistors, but to calculate from the last level to the first one by one.

Suppose that the Min. normal working voltage of the amplifier is 30V, which is just equal to V_n, the voltage of the last amplifier. Its power consumption is 25W, cable loop resistor R is 7Ω, output voltage of the central power supply is 60VAC, 6A

I_n=24W/30V=0.8A

V_{n-1}=30V+7Ω * 0.8A=35.6V

I_{n-1}=24W/35.6V=0.67A

V_{n-2}=35.6V+7Ω * (0.8A+0.67A)=46VΩ

I_{n-2}=24W/46V=0.52A

V_{n-3}=46V+7Ω * (0.8A+0.67A+0.52A)=60V

Now the voltage is the same as the output voltage of the central power supply, which indicates that this central power supply unit can drive 4 amplifiers in this way. The total output current is:

I = 0.8A+0.67A+0.52A+24W/60V=2.4A

The value is far less than output current value of the central power supply unit, which indicates the power margin of the power supply unit is still wide. In theory it still can connect more amplifier.

Firstly, we will analyze the above result:

n-3 : input voltage V_{n-3}=60V current I_{n-3}=0.4A

n-2 : input voltage V_{n-2} =46V current I_{n-2}=0.52A

n-1 : input voltage V_{n-1}=35.6V current I_{n-1}=0.67A

n : input voltage V_n=30V current I_n=0.8A

The power consumption of the four amplifiers is the same:

$P_{n-3}=P_{n-2}=P_{n-1}=P_n$=24W

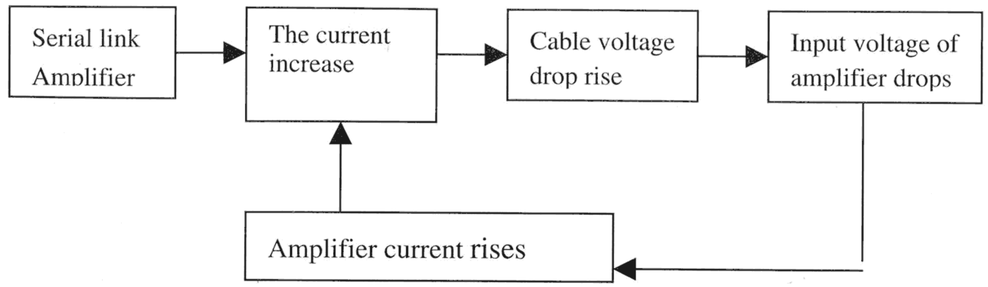
If link another amplifier after the fourth one, by using the same calculating method we will get:

V_{n-4}=60V+7Ω * (0.8A+0.67A+0.52A+0.47A)=76.7V

According to the calculation result, the voltage of the first amplifier should be 76.7V, which is far more than the output voltage (60V) of the central power supply unit. This indicates the system will not work normally if serial link another amplifier.

The actual case is like this:

For easy illustration，we will not take into account the Min. Working voltage of the amplifier power for a while. After serial link another amplifier, the stable working status built by the former 4 amplifiers will be destroyed. The change of the working status is as follows:

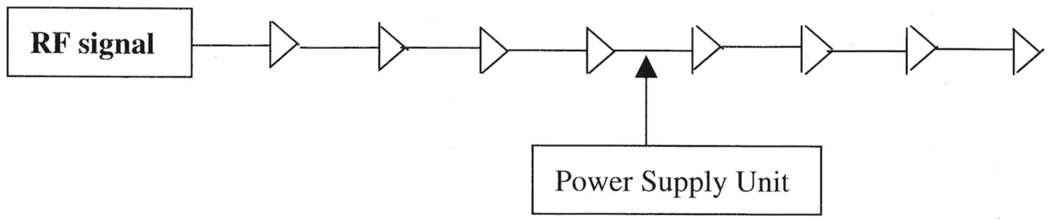


The output voltage of centralized power supply is constant. Firstly the current passing through cables increases, so does the voltage drop between amplifiers, the input voltage of each amplifier falls. The power of the amplifier is fixed, therefore，the current of all amplifiers rises, which results in the current passing through cables going up, voltage drop going up, amplifier voltage going down, and amplifier current going up .....Finally reaches to stable working condition. Then the voltage of the fourth amplifier is less than the corresponding voltage 30V while series link four amplifiers, the current is higher than the corresponding current 0.8A; The fifth amplifier is farthest from the central power supply unit (following the fourth one), its voltage should be far lower than 30V, and the current is much more than 0.8A.

We didn't consider the lowest working voltage of the amplifier (30V) in the above calculation for easy analysis. In fact, when the input voltage of the amplifier (switch stabilizing power) is lower than the lowest working voltage, the power supply unit will not start up at all，not to mention normal work. The above analysis indicates when we link five amplifiers in series; both voltages of the last two amplifiers are under the lowest working voltage. Therefore, the fourth and fifth amplifiers will not be able to work since the power can't start up, which cause none of the amplifiers in the line can work normally. (In actual operation, the power indicator of the amplifier will flash continuously; output current of the

central power supply unit is unstable; and signal can be detected from time to time.)

Can one more amplifier be added on the system? The answer is definite，however，the connecting should be modified slightly.



According to the above calculation, the input voltage of the amplifier is :

Vn=30V　Vn-1= 35.6V　Vn-2=46V　Vn-3=60V

If feed power from the middle to two ends, the number of amplifiers the system drive will be doubled than feed power from one end to the other. Take the above for example, the total output current is 2.4A+2.4A=4.8A, which is smaller than the rated output current. In this way normal working order of amplifier can be guaranteed and overload can be prevented，thus normal working order of the whole circuit can be reached.

From the above analysis, a conclusion can be drawn as follows，

The number of amplifiers driven by the unit is not entirely determined by output competence of the unit. With enough output competence, it is the power of amplifier and the loop resistance between amplifiers that determines the number of amplifiers used. The bigger the amplifier power and cable loop resistance are, the fewer the number of amplifiers that can be used and vice versa. Moreover, if the unit is linked differently，the number of amplifiers driven by the same output power unit is also different.

Tips for the users: Please select an amplifier with low power consumption, coaxial cable with low loop resistance, power supply unit with proper output power and etc. During construction, you'd better use the most appreciated linking way to make full use of the selected equipments.