ENS LYON

P53.2

INSTRUCTION MANUAL

The AFX9660SB DC regulated power supply has three-way high accuracy output, of which two ways are adjustable and one way is fixed.

The two adjustable outputs can also be selected for constant voltage or constant current, designed in high stability and performence circuit. In constant voltage state, the output voltage can be arbitrarily adjusted from 0V on in the nominal range; and in the state of constant current, the output current can be adjustable from 0A on in the nominal range. The two outputs can also be connected in parallel or in series, while the master in output used for voltage or current (in parallel connection) adjustment. The maximum output voltage in series is 60V, and the maximum output current in parallel is 6A.

There're two 3-digit-LCD meters for indicating each of the two outputs with high accuracy.

The one fixed way outputs 5V voltage. Due to the single chip integrated regulator, this output has good stability and ripple factor, and has reliable overload protection to protect the unit against being damaged whenever overload or short circuit.

The unit features in small size, good performence, novel appearence and etc, it is the ideal power supply unit for science investigation, college, factory, electronic appliance maintenance and etc.

1. Technical specification

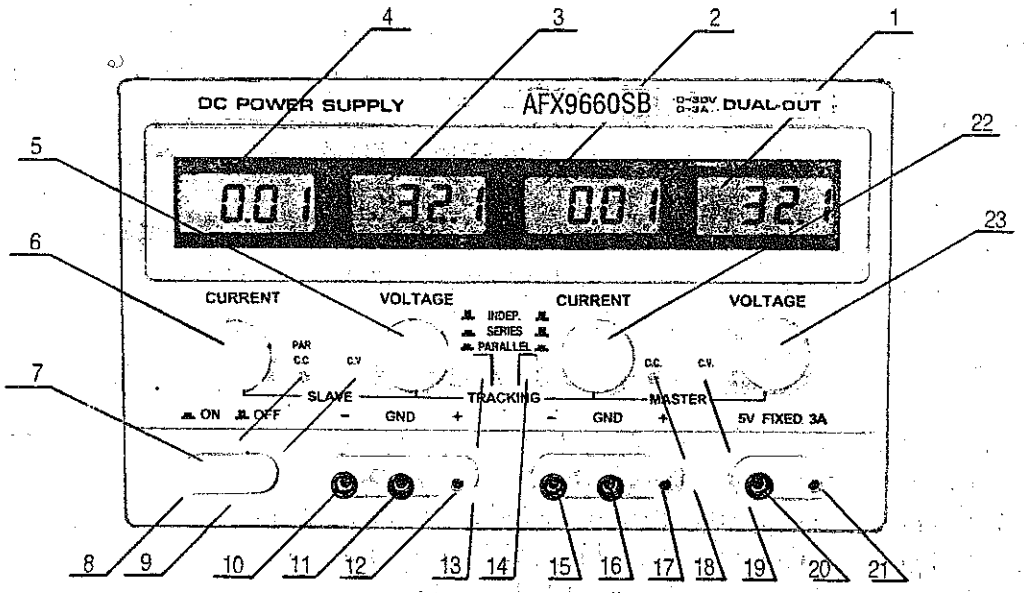
1.1 Input voltage: AC 220V ± 10% 50Hz ± 2Hz
1.2 Two adjustable outputs
1.2.1 Output voltage: 0 ~ 30V (adjustable continously)
1.2.2 Output current: 0 ~ 3A (adjustable continously)
1.2.3 Source effect: CV ≤ 1×10^{-4} + 0.5mV
CC ≤ 2×10^{-3} + 1mA
1.2.4 Load effect: CV ≤ 1×10^{-4} + 2mV
CC ≤ 2×10^{-3} + 3mA
1.2.5 Ripple & noise: CV ≤ 0.5mVr.m.s.
CC ≤ 3mAr.m.s.
1.2.6 Protection: current-limiting protection
1.2.7 Meter indication: 3- digit volt LCD & amp LCD each for two
(accuracy: voltmeter ±1% + 2 digit
ammeter ±2% + 2 digit)

1.3 Fixed output

1.3.1 Output voltage:	5V ± 3%
1.3.2 Output current:	3A
1.3.4 Source effect:	$\leqslant 1 \times 10^{-4} + 1mV$
1.3.4 Load effect:	$\leqslant 1 \times 10^{-3}$
1.3.5 Ripple & noise:	⩽0.5mVr.m.s.
1.3.6 Protection:	current-limiting & short-circuit protection
1.4 Operating ambient:	0 ~ +40℃
	RH 〈 90%
1.5 Size:	360mm × 265mm × 165mm
1.6 Operating time:	operating continously for 8 hours

2 .Operation

2.1 Function of pannel controls



(1) Volt-LCD: indicates master output voltage value
(2) Amp-LCD: indicates master output current value
(3) Volt-LCD: indicates slave output voltage value
(4) Amp-LCD: indicates slave output current value

(5) Slave constant voltage adjustment: adjust slave output voltage value
(6) Slave constant current adjustment: adjust slave output current value (adjust the curent-limiting protection point)

(7) Power switch: it is set to "ON" state (the switch is pressed in), the unit is switched on , at this time , the constant voltage (C. V.) or constant current (C. C.) indicator is on , otherwise , the unit is in "OFF" state (the switch is sprung out)

(8) Slave constant current state or two-ways parallel state indicator: when slave output is in constant current state or the two adjustable is in parallel, this indicator is on.

(9) Slave constant voltage indicator: when slave output is in constant voltage state , this indicator is on.

(10) Slave output negative binding post: negative polarity of output voltage is connected to negative terminal of load.

(11) Case grounded terminal: the case is connected to the earth.

(12) Slave output positive binding post: positive polarity of output voltage is connected to positive terminal load.

(13/14) The control switch for selecting the two adjustable outputs independent、 series or parallel .
(15) Master output negative binding post: negative polarity of output voltage is connected to negative terminal of load.

(16) Case grounded terminal: the case is connected to the earth.
(17) Master output positive binding post: positive polarity of output voltage is connected to positive terminal of load.

(18) Master output C. C. state indicator: when master output is in C. C. state, this indicator is on.
(19) Master output C. V. state indicator: when master output power is in C. V. state, this indicator is on.

(20) Fixed 5V DC output negative binding post: negative polarity of output voltage is connected to negative terminal of load.

(21) Fixed 5V DC output positive binding post: positive polarity of output voltage is connected to positive terminal of load.

(22) Master output C. C. adjustment: adjust master output current value (adjust current-limiting protection point)

(23) Master output C. V. adjustment: adjust master output voltage value.

2. 2 Operating method

2. 2. 1 Independence use of two adjustable outputs

2. 2. 1. 1 Set (13) and (14) switch to spring out position (■ position)

2. 2. 1. 2 When the adjustable output is used as C. V. output, first should rotate clockwise the C. C. adjustment to Max, then turn on power switch (7), adjust C. V adjustment (5) and (23) till slave & master DC output voltage reach required voltage value, at this time, the C. C. indicator (9) and (19) light on.

2. 2. 1. 3 Used as C. C. output, after turning on power switch (7), first rotate clockwise the C. V. adjustment (5) and (23) to Max, while rotate counterclockwise the C. C. adjustment (6) and (22) to Min., then connect the required load, again rotate clockwise adjustment (6) and (22) till output current reach the required current value. At this time, the C. V. state indicator (9) and (19) go out and the C. C. state indicator (8) and (18) light on.

2. 2. 1. 4 Used as the C. V. output , in general the C. C. adjustment (6) and (22) should be set to Max, but for this unit, the current-limiting protection point can also be set arbitrarily.
Setting procedure is: turn on power , rotate counterclockwise the C. C. adjustment (6) and (22) to Min, then make the positive and negative output terminal in short connection and rotate clockwise the C. C. adjustment (6) and (22) till output current equal to the required current- limiting protection point, so the current -limiting protection point is well set

2. 2. 2 Series using of the two adjustable outputs

2. 2. 2. 1 Press in switch (13) (▬ position), switch (14) is set to "out" (■position). At this time, turn the master voltage adjustment (23) and the slave output voltage tracks strictly the master output voltage, and the output voltage can be up to 60V (voltage between terminal of (10) and (17)).

2. 2. 2. 2 Before the series connecting, it must be examined if the negative terminals of both master and slave output are connected to GND terminal, if they are, must be disconnected, otherwise, short-circuit will be caused in the slave output when the two outputs are connected in series.

2. 2. 2. 3 When the two outputs are in series , the output voltage is controlled by master output , but current adjustment of two outputs is still independent. Therefore , attention should be paid to the position of the C. C. adjustment (6). For example, knob (6) is at the position of counterclockwise to end or current of slave output excesses current- limiting protection point, at this time, the voltage of slave output will not track the voltage of master. So knob (6) should be rotated clockwise to Max when the two output are in series.

2. 2. 2. 4 By series connection, if there is power output, proper leads corresponding to output power should be used to short connect the negative terminal of master output with positive terminal of slave output reliably. Since it is shorted by a switch inside the unit, current will pass on the shorted switch when there is power output . This will affect the reliability of the unit.

2. 2. 3 Parallel using of the two adjustable outputs

2. 2. 3. 1 Press in switch (13) (■position) as well as switch (14) (▬ position), at this time, the two outputs are in parallel, adjust voltage adjustment (23) of master output, the voltage of two ways keep same, and slave output C. C. indicator (8) lights on .

2. 2. 3. 2 When the two outputs are in parallel, the C. C. adjustment (6) of slave output does not work. When used as C. C. supply, simply adjust the C. C. adjustment (22) of master output, at this time, output current of both master and slave output are controlled by it and are same, output current is up to 6A.

2.2.3.3 While the two outputs in parallel, proper leads corresponding to output power be used to short reliably the two positive terminals and the two negative terminal of master、slave output separately, so as to make load connected reliabily with the two parallel outputs. If the load is only connected to one of the output terminal, unbalance may be caused to current of the two outputs, this may also damage the series/parallel switch.

2.3 The digital display is in 3-digit. If you need more accurate indication, please use more precise measuring instrument to calibrate it in outer circuit.

2.4 Cautions

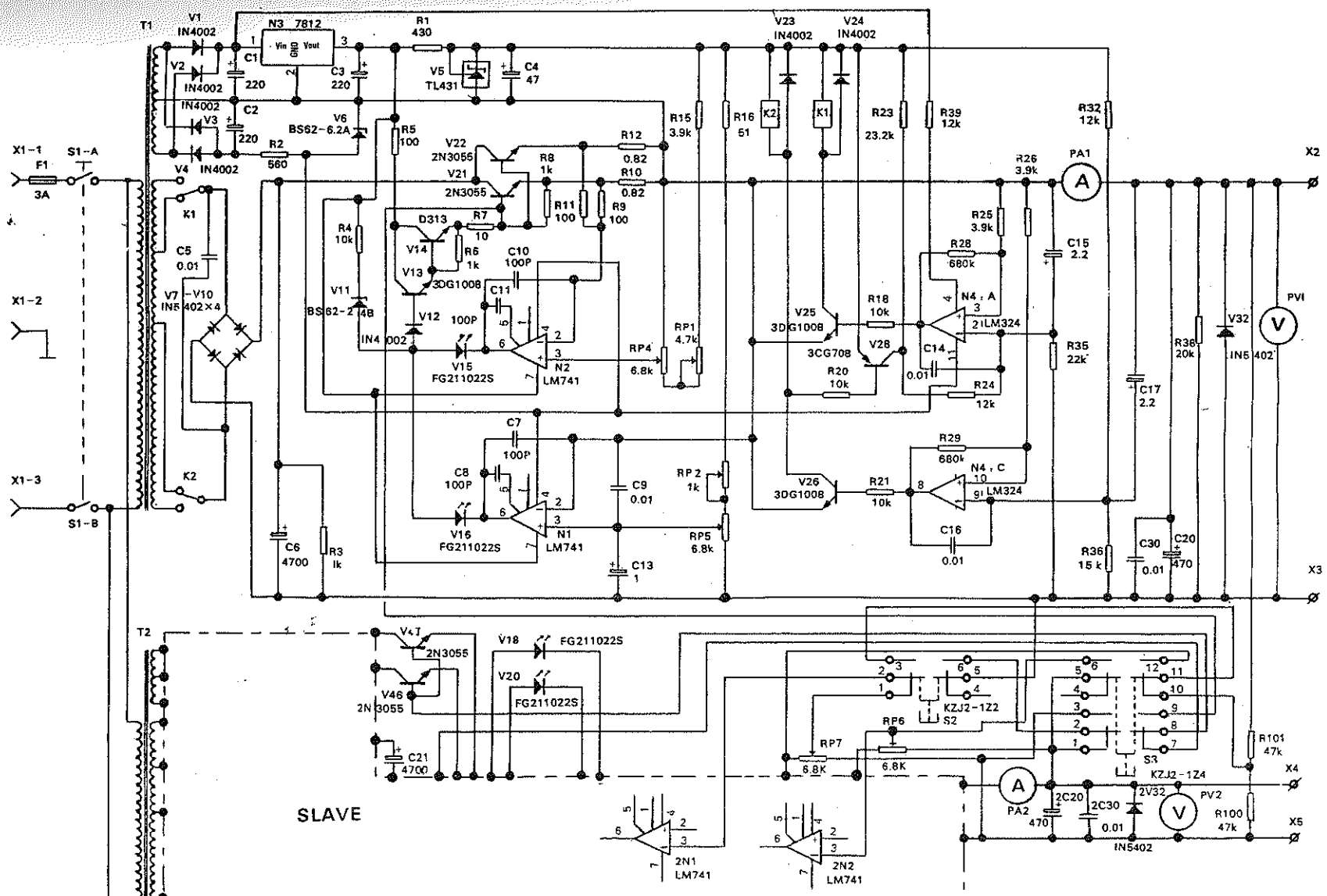
2.4.1 This unit has perfect protection function, 5V output has reliable protection for current-limiting and short circuit. The two adjustable outputs have current-limiting protection, As there is controlling circuit for regulating transistor's power loss in the circuit, when short circuit accurs , power loss on large power transistor is not very high , it can't cause any damage to the unit . But there is still power loss when short circuit , in order to reduce aging and energy consumption, so this situation should be find as soon as possible and turn off power, then exclude the faults.

2.4.2 After operating , please place the unit in dry 、 ventilating and clean place . Pull out plug for storage if there is no using for long time .

2.4.3 To maintain the unit , you should cut off input power

3 .Accessories

3.1 Instrution manual 1 copy


T1
V1 IN4002
V2 IN4002
V3 IN4002
V4 IN4002
N3 7812
C1 220
C2 220
C3 220
R1 430
V5 TL431
C4 47
V6 BS62-6.2A
R2 560
R5 100
V22 2N3055
V21 2N3055
R8 1k
R12 0.82
R10 0.82
R11 100
R9 100
R15 3.9k
R16 51
V23 IN4002
V24 IN4002
K2
K1
R23 23.2k
R39 12k
R32 12k
R26 3.9k
PA1
X2
X1-1
S1-A
F1 3A
X1-2
X1-3
S1-B
K1
K2
C5 0.01
V7 -V10 IN5402×4
R4 10k
D313
R7 10
V14
R6 1k
V13 3DG1008
C10 100P
V11 BS62-2.4B
V12 IN4002
C11 100P
V15 FG211022S
N2 LM741
RP4 6.8k
RP1 4.7k
R25 3.9k
R28 680k
C15 2.2
V25 3DG1008
V28 3CG708
R18 10k
R20 10k
N4:A LM324
C14 0.01
R24 12k
R35 22k
C17 2.2
PV1
V32 IN5402
R36 20k
C7 100P
C8 100P
V16 FG211022S
N1 LM741
C9 0.01
RP2 1k
RP5 6.8k
C13 1
C6 4700
R3 1k
V26 3DG1008
R21 10k
R29 680k
N4:C LM324
C16 0.01
R36 15k
C30 0.01
C20 470
X3
T2
V47 2N3055
V46 2N3055
V18 FG211022S
V20 FG211022S
C21 4700
SLAVE
2N1 LM741
2N2 LM741
KZJ2-1Z2
S2
RP6
RP7
6.8K
6.8K
S3
KZJ2-1Z4
R101 47k
X4
PA2
2C20 470
2C30 0.01
2V32 IN5402
PV2
R100 47k
X5