Input/output terminals for master/slave operation

Voltage signal input terminals for remote control of constant current mode

Resistance signal input terminals for remote control of constant current mode or constant resistance mode (Switch setting change within the case needed.)

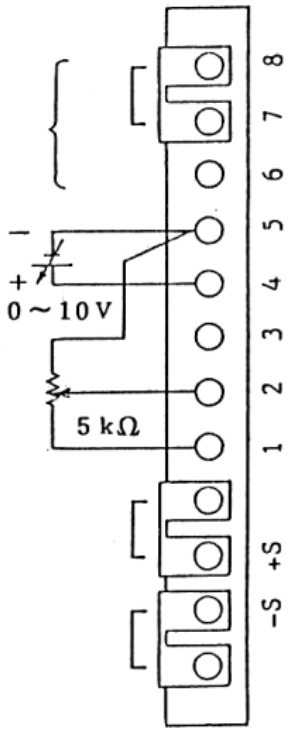


Figure 2.8.1 Remote Voltage Control of Constant Current Mode

2.8.2 Remote Resistance Control of Constant Current Mode

Remote Resistance control is available only for LOAD B channel; because of this restriction it is also referred to as EXT LOAD B mode.

2.8.2.1 To control the PLZ 152W with a variable resistance, proceed as follows:

1. Set the INT/EXT B slide switch to EXT.

   a. Unplug the Load from its AC source and remove any external DC power that may be applied to the Load.

   b. Remove the seven case binding screws shown in Figure 2.8.2 and remove the case.

   c. Locate the INT/EXT B slide switch shown in Figure 2.8.3 and set it in the EXT B (rearward) position.

d. Replace the case and reconnect the Load to the AC and DC power sources.

2. Fashion a three lead shielded cable to a variable resistance (5k ohms recommended) and attach it to terminals 1, 2 and 5 of the Rear Panel Strip as shown in Figure 2.8.4.

3. Set the front panel controls as follows:

   a. Set the INT/EXT switch to INT (out).

   b. Set the A/B switch to B (in).

2.9 Remote Control of Constant Resistance Mode

To operate the PLZ 152W remotely in the Constance Resistance Mode proceed as follows:

1. Set the CC/CR Switch to CR (in).

2. Proceed as in section 2.8.

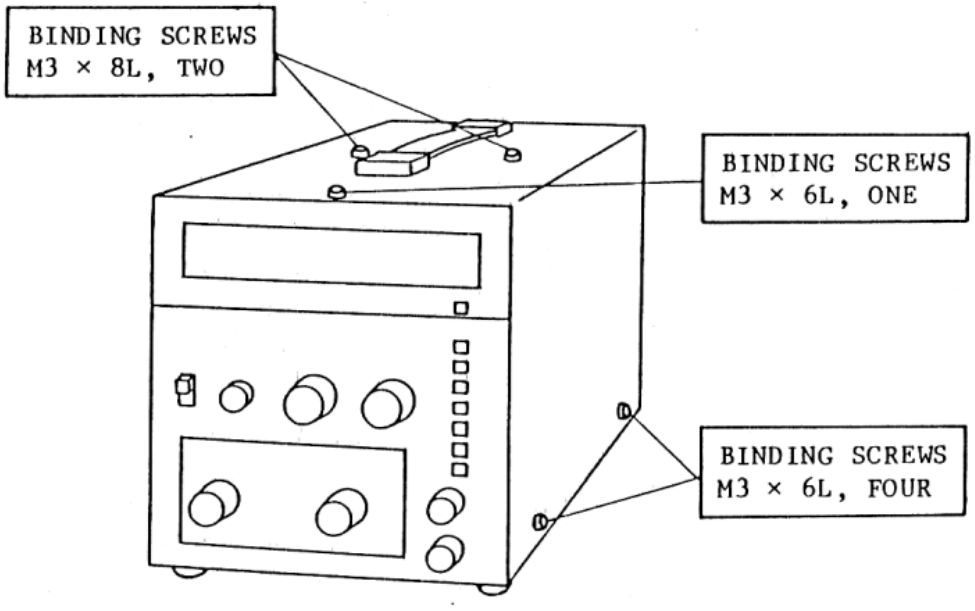


Figure 2.8.2 Case Binding Screws Location

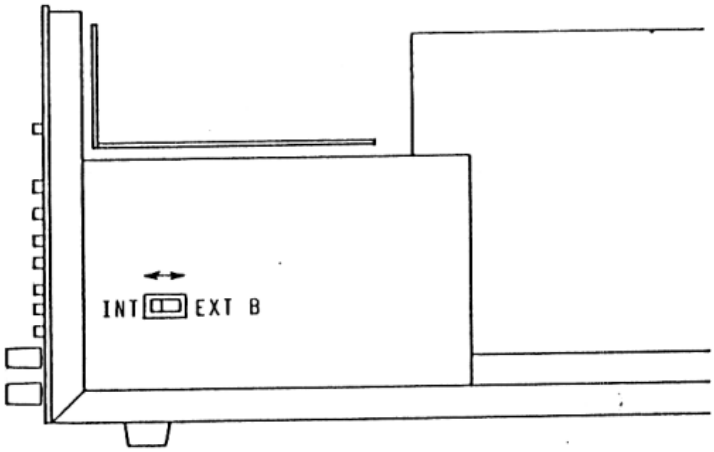


Figure 2.8.3 Location of INT-EXT Switch
(Located inside case)

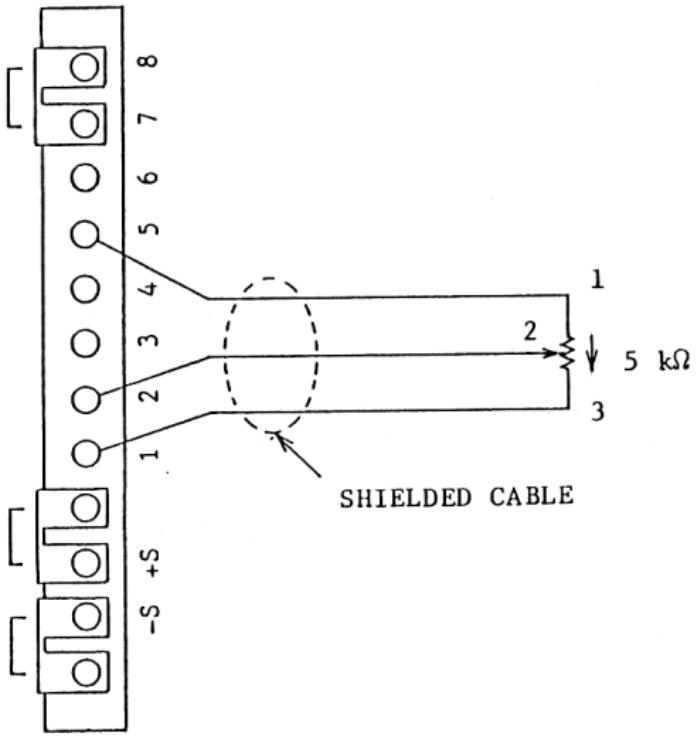


Figure 2.8.4 Rear Panel Terminal Strip Connections
for External Resistance Control

4. MAINTENANCE

Periodic maintenance is recommended for your PLZ 152W. The program should include cleaning, inspection and calibration. For major calibration service contact your Kikusui agent or authorized laboratory.

4.1 Removing the Case of the PLZ 152W

Remove the three screws from the top and four screws from the sides (See Figure 4.1.1). Remove the case and set it aside.

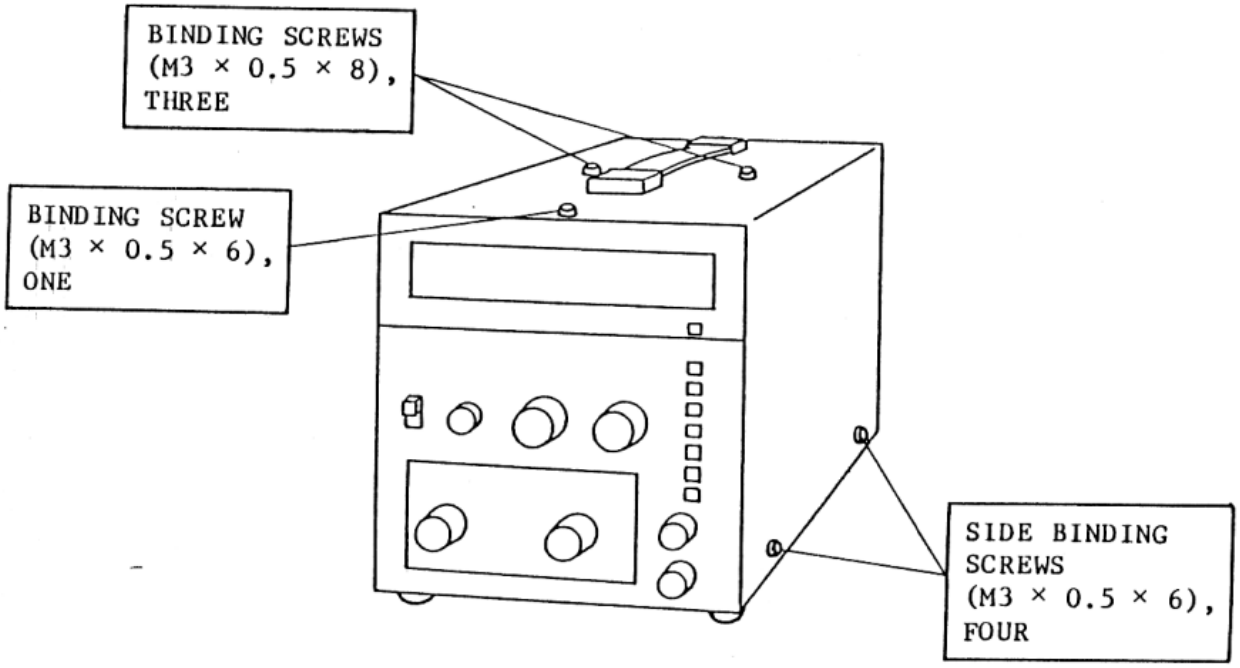


Figure 4.1.1 Case Binding Screws Location

4.2 Inspection and Cleaning

Clean the Front Panel, Rear Panel and Case with a soft cloth and mild detergent. Do not use chemical solvents such as thinners or benzine. Use compressed air to remove dust from the air filter and chassis.

4.2.1 Power Cord

Inspect for any cracks, abrasions or other damage to the cord or plugs. Repair or replace if any damage is discovered.

4.3 Calibration of Digital Voltmeter/Ammeter

Periodically the Digital Meter must be calibrated. Calibrate the ammeter function first. Prepare a test setup as shown in Figure 4.3.1. Turn POWER switch ON (in) and allow the circuits to stablize for 30 minutes before proceeding.

4.3.1 Equipment Required

a. Digital Multimeter, 4 1/2 digits; (Kikusui 1504 or equivalent).

b. Standard shunt resistor (50A, 100mV, accuracy 0.05%).

c. Regulated DC power source (0 - 110VDC, 30A).

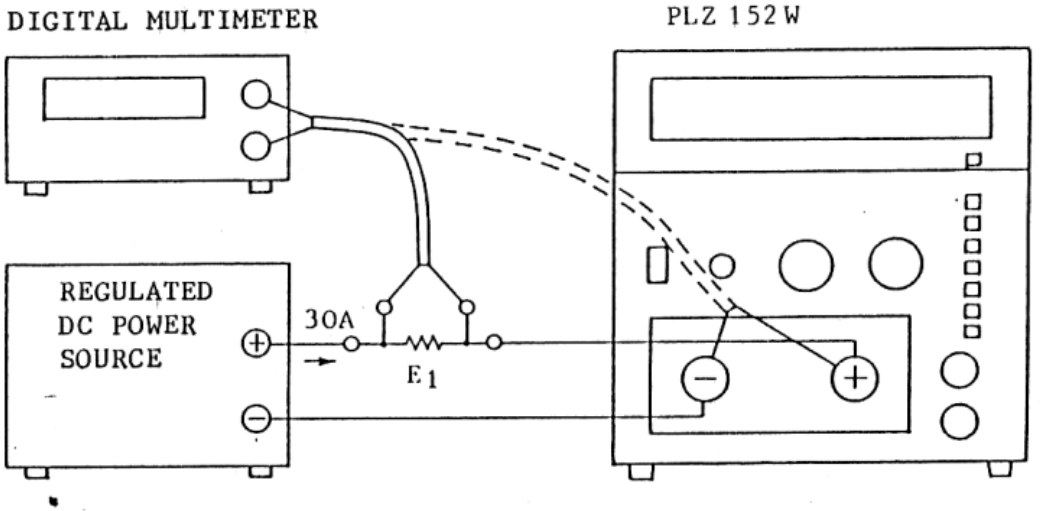


Figure 4.3.1 Calibration Test Setup

4.3.2 Test Setup (See Figure 4.3.1)

a. Adjust the Regulated DC Power Source current to the Load to 30.00 amps.

b. Connect the test leads of the Digital Multimeter across the shunt resistor (Rs), as shown. Allow 30 minutes for circuit stabilization.

c. Set the A/V switch to A (out).
Set the LOAD OFF/ON switch to ON (in).

d. Readjust the Regulated DC Power Source to cause the Multimeter to read 60.00 mV.

4.3.3 Adjustment

For steps (a) through (i), below, refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV603 so that the Digital Panel Meter reads 30.00 A.

b. Set the A/V switch to V (in).

c. Set the LOAD switch to OFF (out).

d. Connect the Digital Multimeter to the DC LOAD terminals.

e. Set the output voltage of the Regulated DC Power Source to 19.000 VDC.

f. Set the LOAD switch to ON (in).

g. Adjust RV602 so that the Digital Panel Meter reads 19.00 VDC.

h. Set the output voltage of the Regulated DC Power Source to 100.00 VDC.

i. Adjust RV604 so that the Digital Panel Meter reads 100.00 VDC.

4.3.4 Setting of the Auto-Ranging Meter Threshold

a. Reduce the output of the Regulated DC Power Source to 19.00 volts.

b. Observe that the Digital Panel Meter is in low range.

c. Increase the output of the Regulated DC Power Source to more than 19.50 volts.

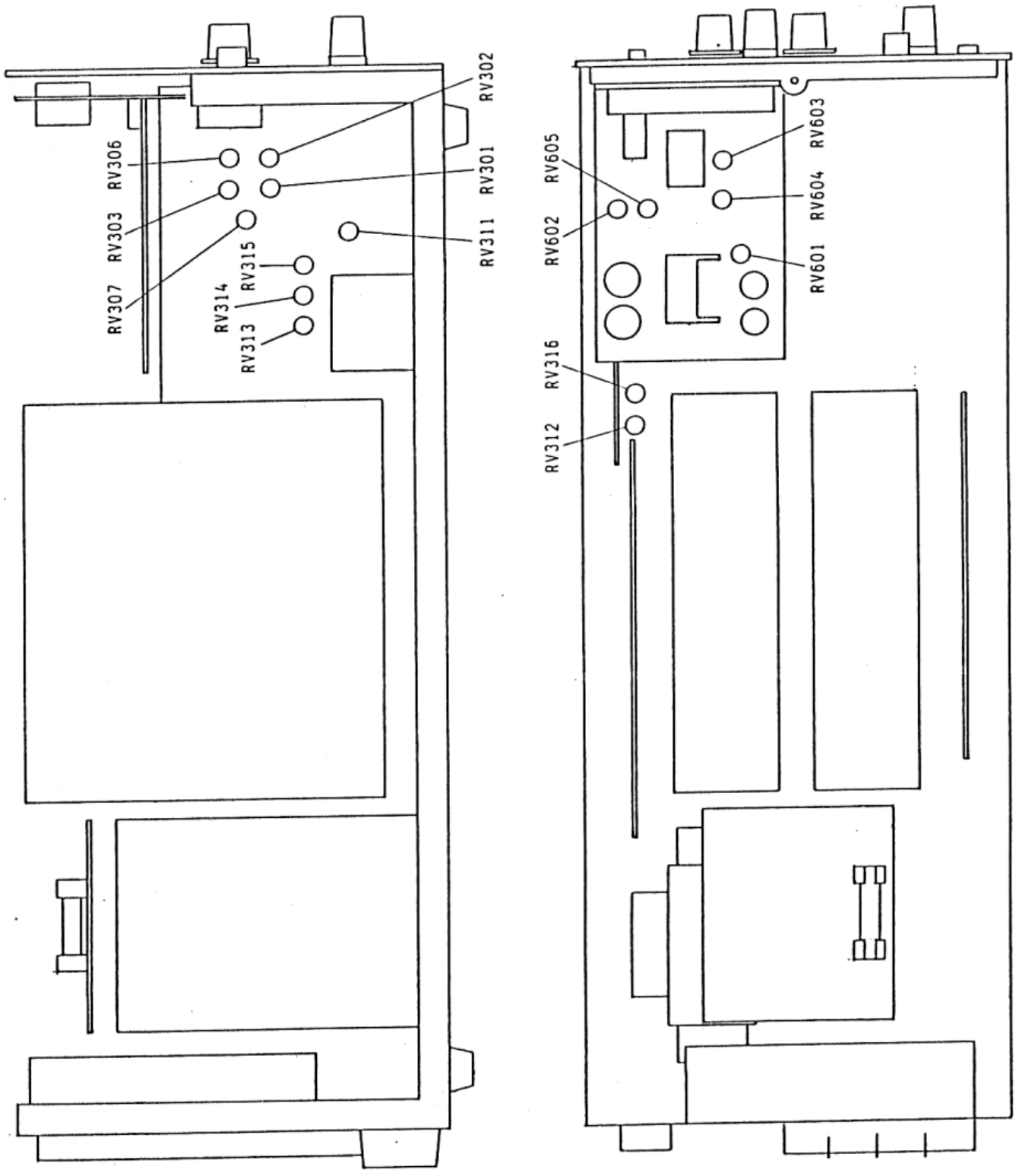


Figure 4.3.2 Calibration Resistors Location

d. Observe that the Digital Panel Meter switches to its high range as the voltage is increased.

e. If the indication did not change as in (d), above, adjust RV601 and repeat steps (a) through (d).

4.4 Calibration of Constant Resistance Range

4.4.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.4.2 Test Setup (See Figure 4.3.1)

a. Connect the Digital Multimeter across the shunt resistor Rs.

b. Set the CC/CR switch to CR (in).

c. Set the 30A / 3A push button switch to 3A (in).
0.1Ω 1Ω 1Ω

d. Set the LOAD A/B switch to A (out).

e. Turn the LOAD A control to the full clockwise position.

f. Set the output of the Regulated DC Power Source so that the Digital Multimeter reads 10.00 VDC.

4.4.3 Adjustment

Refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV301 until the Digital Panel Meter reads 11.0 Amps.

b. Reduce the loading current read on the Digital Panel Meter to 1.10 A with the LOAD A control.

c. Set the 30A / 3A push button switch to 30A (out).
0.1Ω 1Ω 0.1Ω

d. Adjust RV302 until the Digital Panel Meter reads 11.0 A.

NOTE

For Section 4.5 preset all controls as described in Section 4.4.

4.5 Constant Current Range Calibration

4.5.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.5.2 Test Setup (See Figure 4.3.1)

Only the 3.0 A range will be calibrated; the 30 A range is fixed.

a. Set the CC/CR switch to CC (out).

b. Set the 30A / 3A push button switch to 30A (out).
0.1Ω 1Ω 0.1Ω

c. Set the load current to 30 ADC.

d. Set the 30A / 3A push button switch to 3A (in).
0.1Ω 1Ω 1Ω

4.5.3 Adjustment

Refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV306 so that the loading current becomes 3.00A.

b. Set the LOAD A control fully counterclockwise so that the loading current approaches zero.

c. Adjust RV307 until the Digital Panel Meter reads zero.

NOTE

For Section 4.6, preset all controls as described in Section 4.4.

4.6 Calibration of Remote Control Voltage in Constant Current Operation

The objective of this procedure is to assure that a 30.0 A load is applied when +10 VDC is applied to the Remote Control terminals.

4.6.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.6.2 Test Setup (See Figure 4.3.1)

a. Set the LOAD A and LOAD B controls to 30.0 A.

b. Apply a 10.00 VDC signal to the Rear Panel Strip terminals 4 and 5 as shown in Figure 2.8.1.

c. Set the INT/EXT switch to EXT (in).

4.6.3 Adjustment

Refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV303 so that the Digital Panel Meter reads 30.00 A.

NOTE

For Section 4.7, preset all controls as described in Section 4.4.

4.7 Setting the Overcurrent Protection Circuit

The objective of this procedure is to cause the Overvoltage Protector circuit to operate at over 30.0 A to prevent damage to the Load.

4.7.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.7.2 Test Setup (See Figure 4.3.1)

a. Set the Regulated Power Source to 4 VDC.

b. Set the CC/CR switch to CR (in).

c. Set the 30A / 3A push button switch to 30A (out).
0.1Ω 1Ω 0.1Ω

d. Set the LOAD A/B switch to LOAD A (out).

e. Set LOAD A control fully clockwise.

f. Rotate LOAD A control in a clockwise direction. Observe that the loading current is limited to a range of 30.5 to 31.0 Amps.

4.7.3 Adjustment

Refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV312 to accomplish limitations in (f), above.

NOTE

For Section 4.8 preset all controls as described in Section 4.4.

4.8 Setting the Overpower Protection Circuit

The objective of this procedure is to cause the Overpower Protector circuit to operate at over 150 watts to prevent damage to the load.

4.8.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.8.2 Test Setup (See Figure 4.3.1)

a. Set the CC/CR switch to CC (out).

b. Set the 30A/ 3A push button switch to 30A (out).
0.1Ω 1Ω 0.1Ω

c. Apply 5 VDC to the load.

d. Adjust the load for a current reading of 10.0 amps.

e. Increase the source voltage to 16.0 VDC.

4.8.3 Adjustment

a. Adjust RV316 so that the Power Limit lamp starts blinking.

NOTE

For Section 4.9 preset all controls as described in section 4.4.

4.9 Setting the Overvoltage Protection Circuit

The objective of this procedure is to cause the Overvoltage Protection circuit to operate if over 110 VDC is applied.

4.9.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.9.2 Test Setup (See Figure 4.3.1)

a. Set the DC source voltage to under 100 VDC.

b. Set the current load to 0.1 Amp.

c. Increase the DC source voltage input to a maximum of 120 volts.

4.9.3 Adjustment

For step (a) below, refer to Figure 4.3.2 for location of adjustable resistors.

a. Observe that the Overvoltage Protection circuit relay operates between 115 and 120 VDC. If the relay does not operate, adjust RV311 for proper operation.

NOTE

For Section 4.10 preset all controls as described in Section 4.4.

4.10 Calibration of the Current Monitor

The object of this operation is to set the Current Monitor sensitivity to 10 mV/A.

4.10.1 Equipment Required

a. Refer to Section 4.3.1 for needed equipment.

4.10.2 Test Setup (See Figure 4.3.1)

a. Set the current load to 10.00 Amps.

b. Connect the Digital Multimeter to the Current Monitor connector.

4.10.3 Adjustment

For step (a) below, refer to Figure 4.3.2 for location of adjustable resistors.

a. Adjust RV605 until the output voltage reads 100 mV on the Multimeter.

NOTE

For Section 4.11 preset all controls as described in Section 4.4.

4.11 Calibration of Multiplier

4.11.1 Equipment Required

a. Refer to Section 4.3.1 for equipment required.

4.11.2 Test Setup (See Figure 4.3.1)

a. Locate printed circuit board A553 and remove the housings from P5 and P6.

b. Short P5 pin 1 to pin 2.

c. Apply a 10 volt P-P 100Hz sinewave between P6 pins 2 and 3.

d. Monitor U307 pin 3 with an oscilloscope.

e. Adjust RV314 for minimum output as shown on oscilloscope.

f. Adjust RV313 for minimum DC offset as shown on oscilloscope.

NOTE: Output of U307 shall be less than 15mVp-p.

g. Short P6 pin 2 to pin 3.

h. Apply a 10 volt p-p 100Hz sinewave between P5 pin 2 and pin 3.

i. Adjust RV315 for minimum output as shown on oscilloscope.

NOTE

Output of U307 shall be less than 15mVp-p.

j. Remove shorting straps, disconnect oscilloscope and replace housings on P5 and P6.

4.12 Locating System Problems

It may become necessary to occasionally locate problems in PLZ 152W system arrangements.

If the PLZ 152W Load itself is found to have a malfunction, please contact your Kikusui agent for rectification or service.

The following chart is designed as an aid to locating system problems:

SYMPTOM	ITEM	CAUSE (REMEDY)
No loading current flow.	1. Red ALARM LED illuminated.	Loading voltage greater than 110 VDC. Cooling air flow restricted.
	2. Yellow POWER LIMIT LED blinking.	Loading power greater than 150W.
	3. LOAD switch OFF.	Turn LOAD switch ON.
	4. INT/EXT switch not set properly.	Set to proper mode.
	5. Rear Panel Terminal shorting strap between pins 7 and 8 not securly fastened.	Secure shorting strap.
Loading current cannot be varied.	1. Yellow POWER LIMIT LED blinking.	Loading power greater than 150W.
	2. Loading current exceeds 30A.	Reduce input current.
	3. Input Voltage too low.	Increase input voltage to above 4V.
	4. A/B push button not set properly.	Select proper load control.
Switching is inoperative.	1. DC/SW push button switch in DC.	Set to SW (in) position.
	2. LOAD A/B incorrectly set.	Switching will not occur when LOAD A = LOAD B.

5. ACCESSORIES

5.1 Rack Mount and Brackets

The PLZ 152W Loads can be mounted in a standard rack by using brackets, B11, and a frame, RMF-4, (RMF-4M, for metric racks).

a. Attach the brackets to the load(s). Up to 3 Loads can be mounted side by side with the brackets. See Figure 5.1.1.

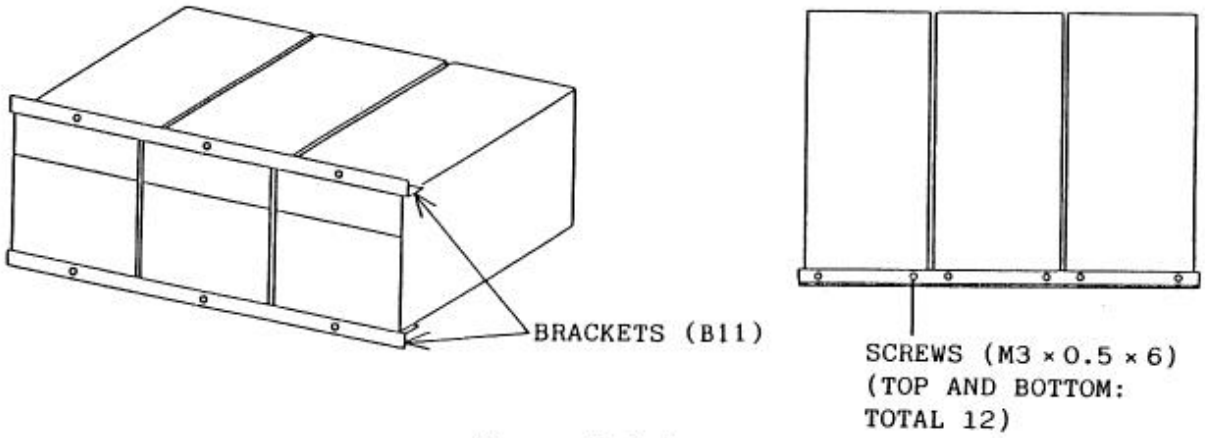


Figure 5.1.1

b. When mounting fewer than 3 Loads, blank panels, BP5, may be fitted to fill any voids. The assembly can then be installed in the rack mount frame. See Figures 5.1.2 and 5.1.3.

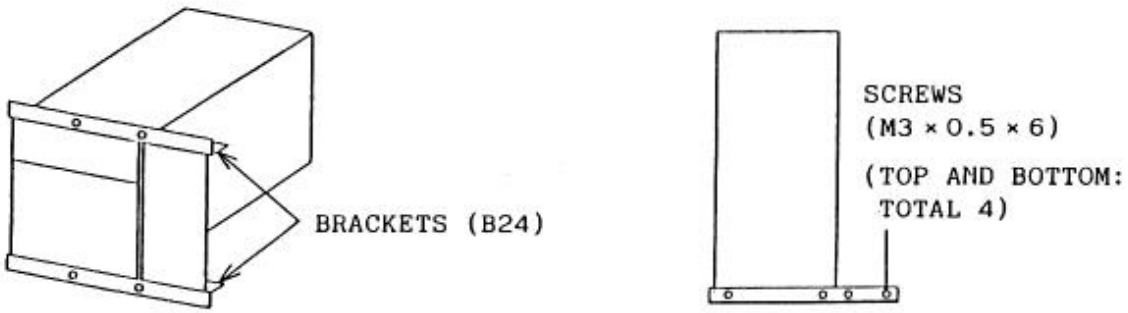


Figure 5.1.2

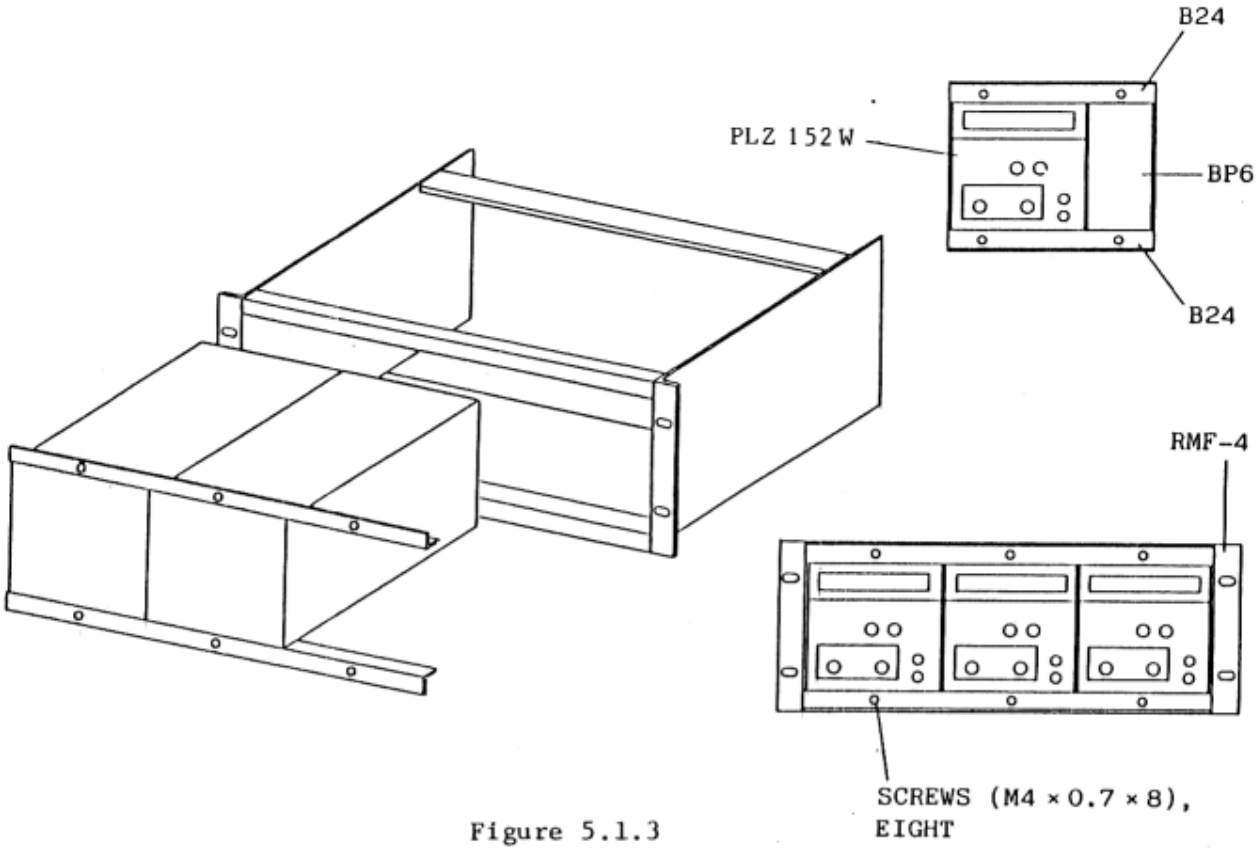


Figure 5.1.3

5.2 Ammeter, Model DOM 152

Model DOM 152, ammeter adds to the versatility of your PLZ 152W Load. When installed, the meter allows both Voltage and Current readings to be taken simultaneously. See Figure 5.2.1.

a. For installation and meter adjustment, refer to the instruction manual accompanying the meter.

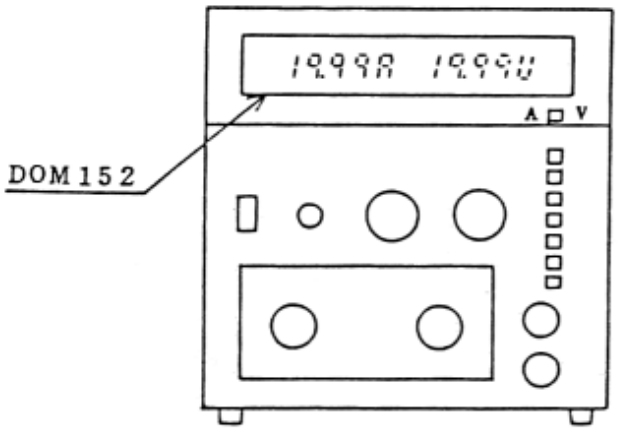
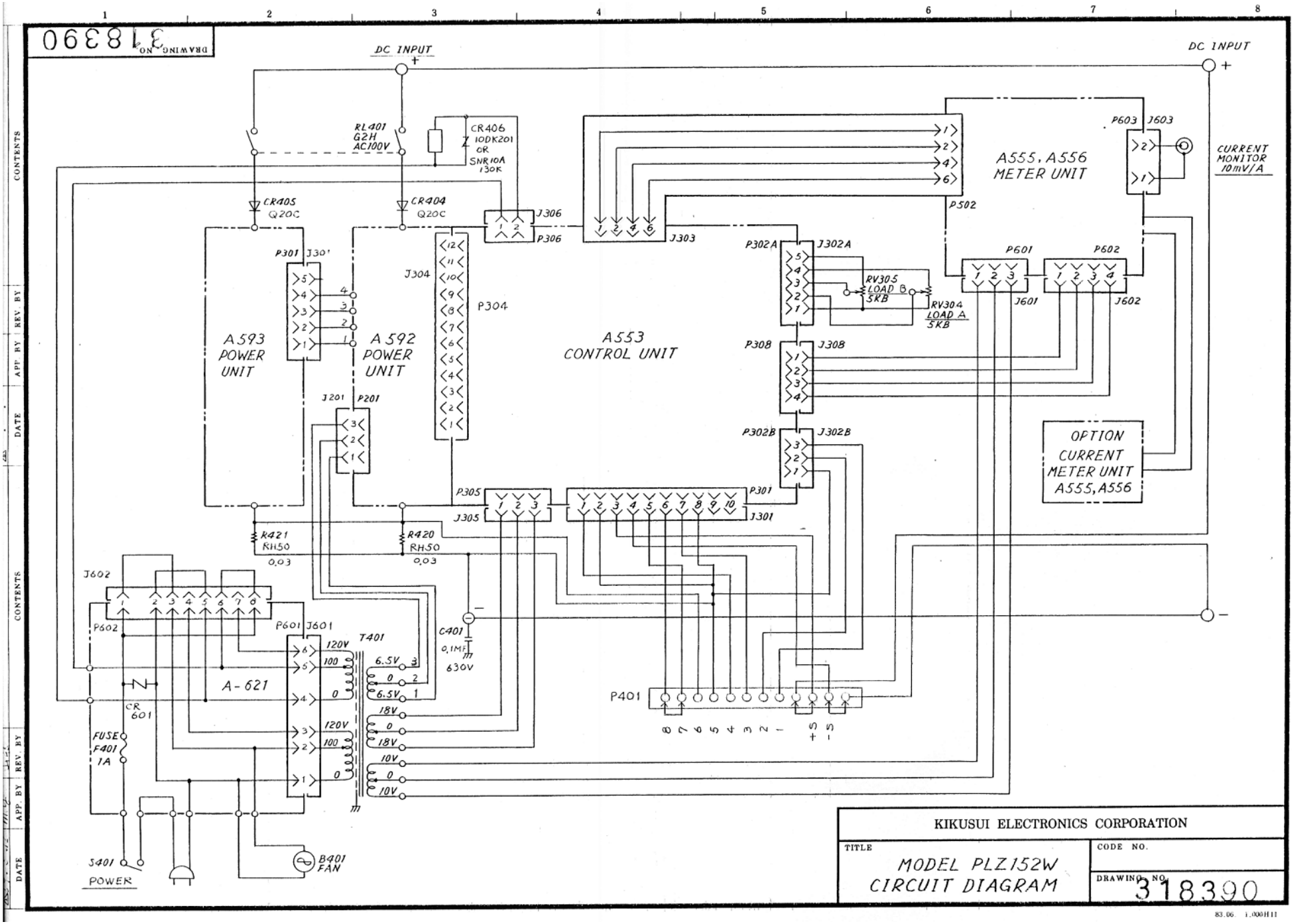


Figure 5.2.1


DRAWING NO 318390
DC INPUT
+
RL401
G2H
AC100V
CR406
10DK201
OR
SNR10A
130K
CR405
Q20C
CR404
Q20C
J306
P306
J303
P502
A555, A556
METER UNIT
P603
J603
CURRENT
MONITOR
10mV/A
P301
J301
J304
P304
A593
POWER
UNIT
A592
POWER
UNIT
A553
CONTROL UNIT
P302A
J302A
RV305
LOAD B
5KB
RV304
LOAD A
5KB
P601
P602
J601
J602
P308
J308
P302B
J302B
OPTION
CURRENT
METER UNIT
A555, A556
J201
P201
P305
J305
P301
J301
R421
RH50
0.03
R420
RH50
0.03
J602
P602
P601
J601
T401
120V
100
0
6.5V
6.5V
18V
18V
10V
10V
C401
0.1MF
630V
A-621
CR
601
FUSE
F401
1A
S401
POWER
B401
FAN
P401
−
DC INPUT
KIKUSUI ELECTRONICS CORPORATION
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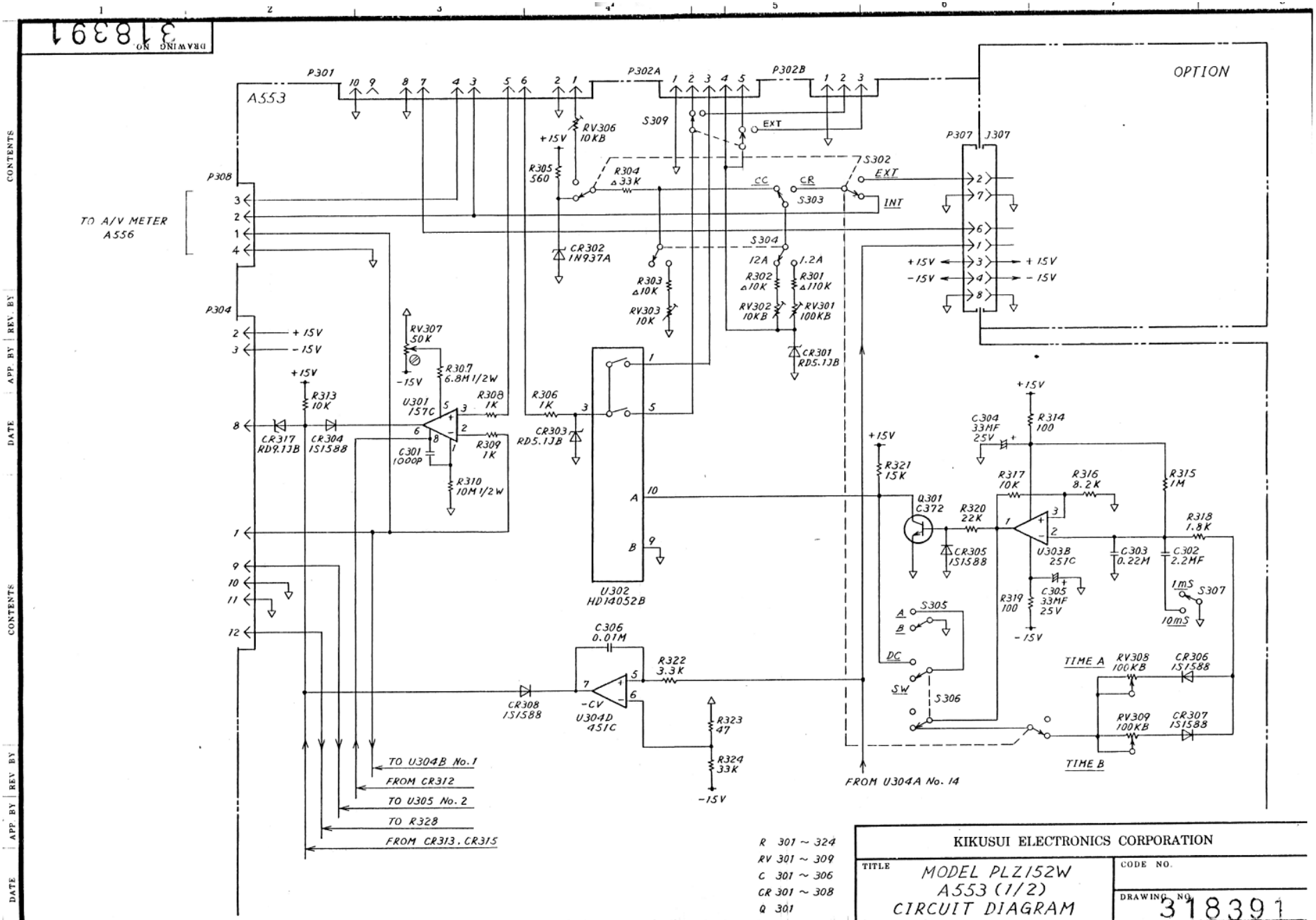
CIRCUIT DIAGRAM
CODE NO.
DRAWING NO.
318390
83.06 1.000H11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A553
P301
P302A
P302B
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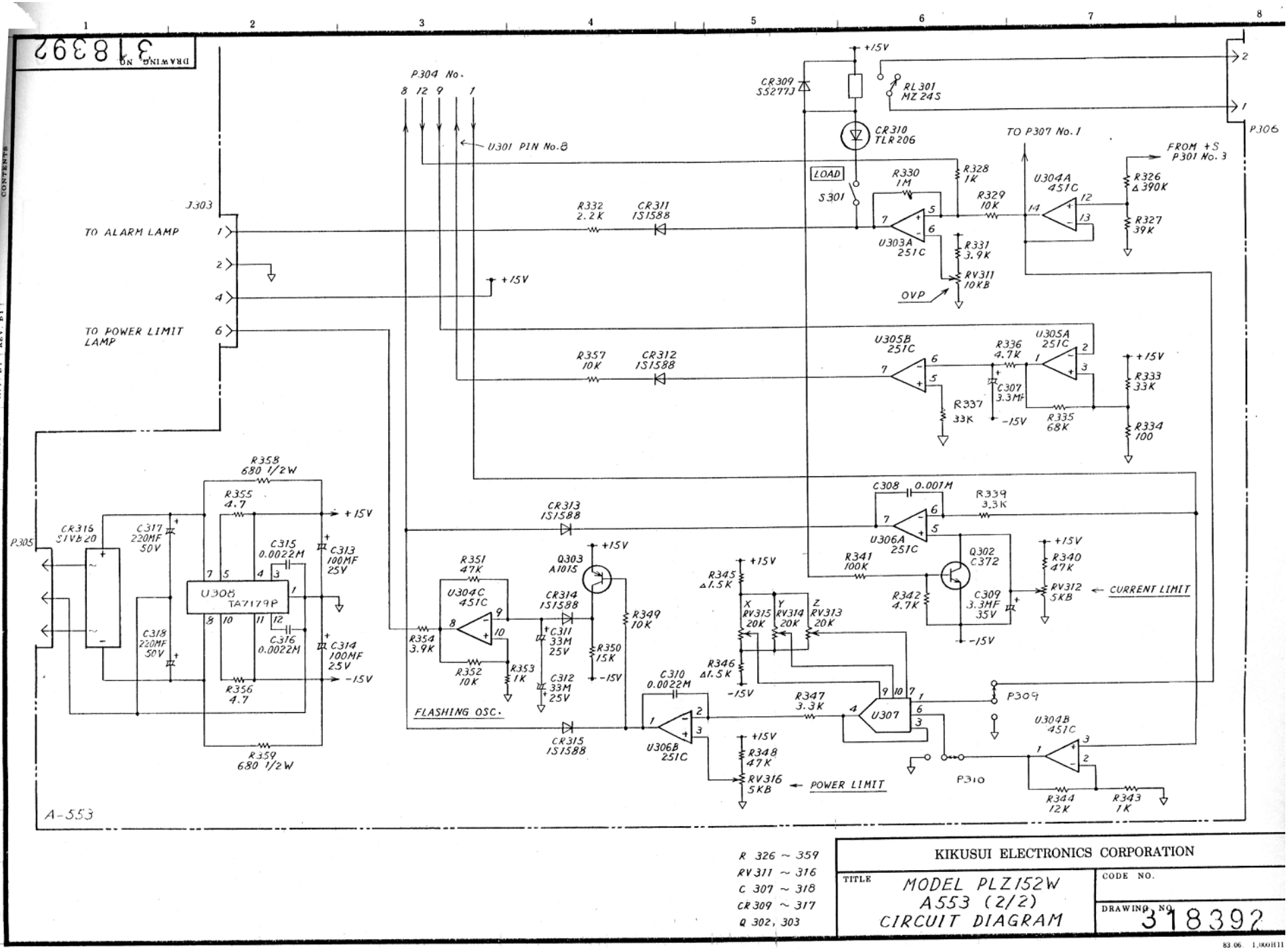
P307 J307
P308
TO A/V METER A556
P304
S309
EXT
S302
S303
S304
CC
CR
INT
RV306 10KB
R305 560
R304 △33K
CR302 1N937A
R303 △10K
RV303 10K
R302 △10K
RV302 10KB
R301 △110K
RV301 100KB
CR301 RD5.1JB
+15V
-15V
RV307 50K
R307 6.8M 1/2W
R308 1K
R313 10K
U301 157C
R309 1K
R310 10M 1/2W
C301 1000P
CR317 RD9.1JB
CR304 1S1588
R306 1K
CR303 RD5.1JB
U302 HD14052B
C306 0.01M
R322 3.3K
CR308 1S1588
-CV
U304D 451C
R323 47
R324 33K
TO U304B No.1
FROM CR312
TO U305 No.2
TO R328
FROM CR313, CR315
R321 15K
Q301 C372
R320 22K
CR305 1S1588
C304 33MF 25V
R314 100
R317 10K
R316 8.2K
R315 1M
R318 1.8K
U303B 251C
C303 0.22M
C302 2.2MF
C305 33MF 25V
R319 100
1mS
10mS
S307
S305
A
B
DC
SW
S306
TIME A
TIME B
RV308 100KB
RV309 100KB
CR306 1S1588
CR307 1S1588
FROM U304A No. 14
R 301 ~ 324
RV 301 ~ 309
C 301 ~ 306
CR 301 ~ 308
Q 301
KIKUSUI ELECTRONICS CORPORATION
TITLE
MODEL PLZ152W
A553 (1/2)
CIRCUIT DIAGRAM
CODE NO.
DRAWING NO.
318391
83.06 1,800HH
CONTENTS
DATE
APP BY
REV BY



R 326 ~ 359
RV 311 ~ 316
C 307 ~ 318
CR 309 ~ 317
Q 302, 303

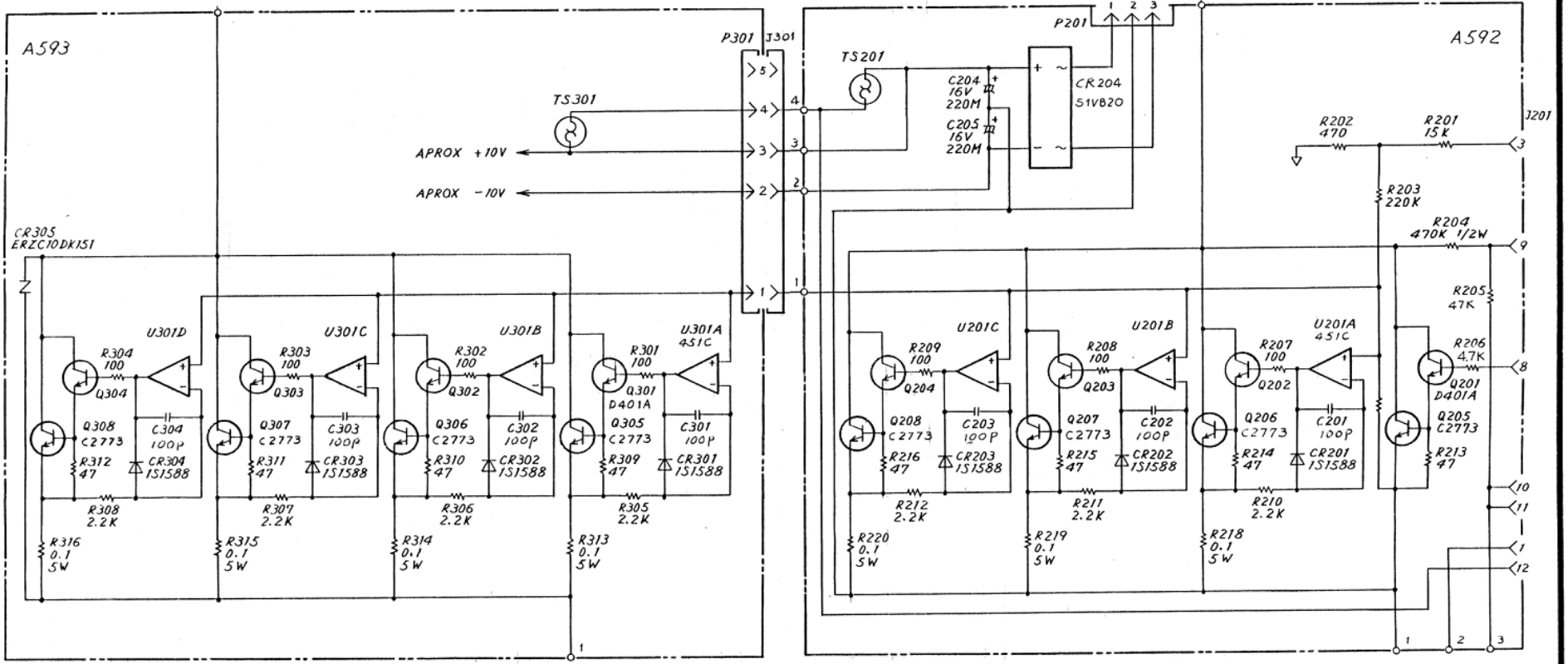
KIKUSUI ELECTRONICS CORPORATION

TITLE: MODEL PLZ152W
A553 (2/2)
CIRCUIT DIAGRAM

CODE NO.

DRAWING NO. 318392

83.06 1,000H11



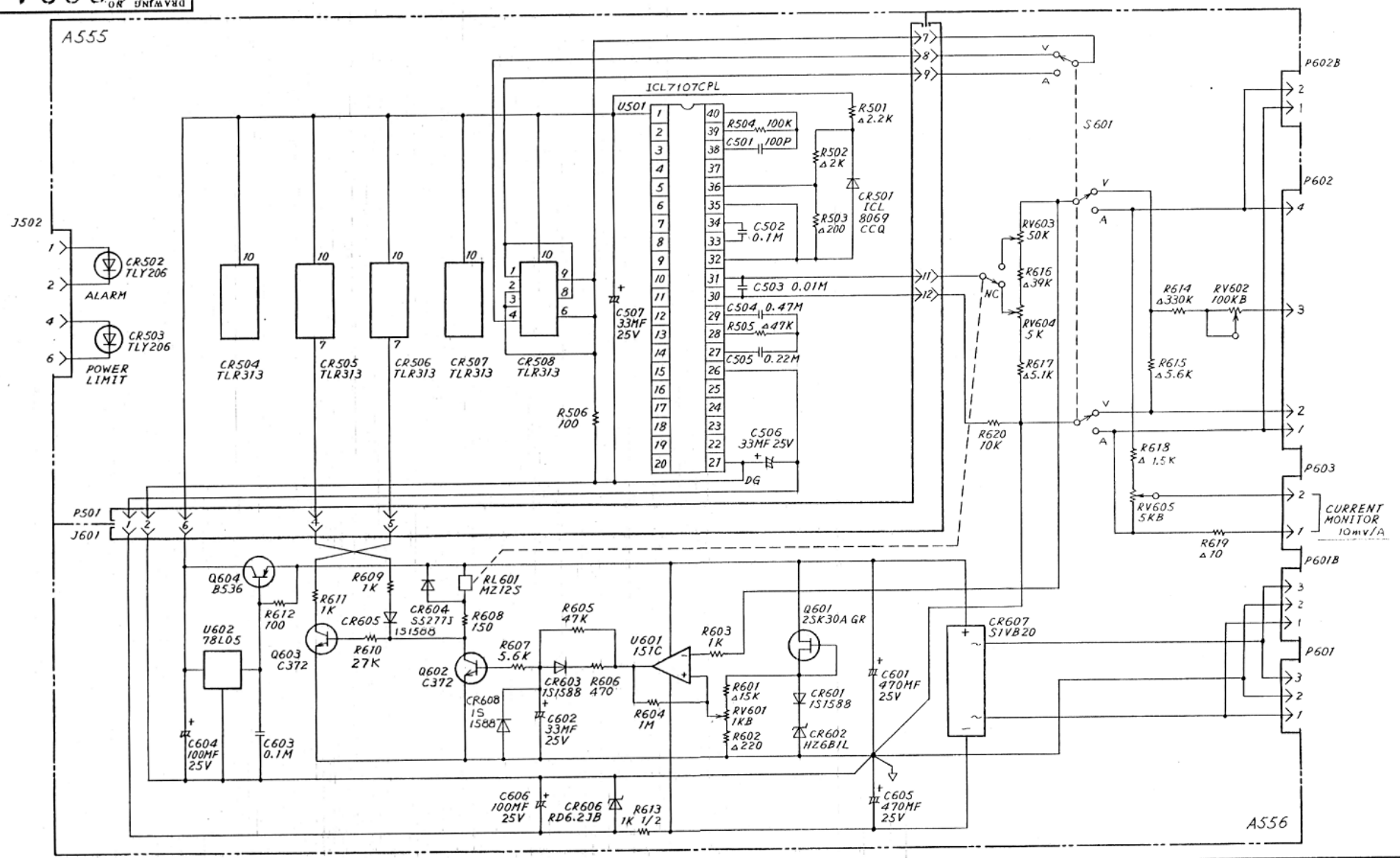
KIKUSUI ELECTRONICS CORPORATION

TITLE: MODEL PLZ152W A592, A593 CIRCUIT DIAGRAM	CODE NO.
	DRAWING NO. 318393

83.06 1,000H11

CONTENTS | DATE | APP. BY | REV. BY

DRAWING NO. 318393



R 501 ~ 506
C 501 ~ 507
CR 501 ~ 508
U 501

R 601 ~ 620
RV 601 ~ 605
C 601 ~ 606
CR 601 ~ 607.608
Q 601 ~ 604
U 601, 602

KIKUSUI ELECTRONICS CORPORATION

TITLE: MODEL PLZ152W A555. A556 CIRCUIT DIAGRAM

CODE NO.

DRAWING NO. 318394