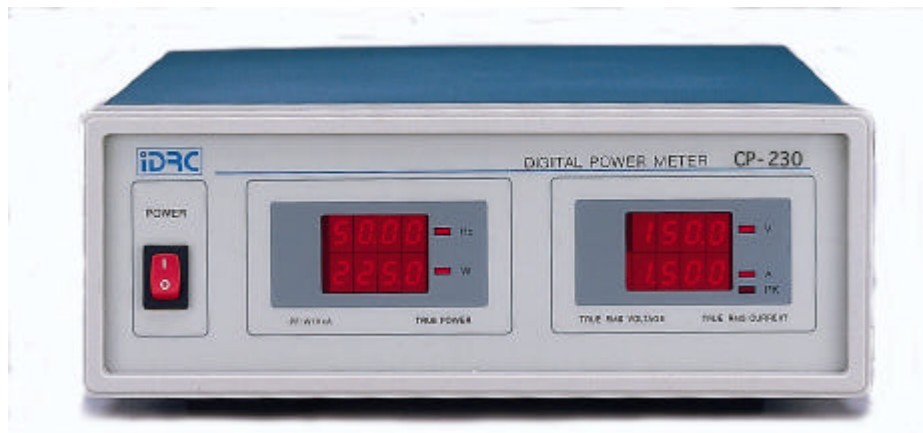


# CP-200 SERIES

## DIGITAL POWER METER

# OPERATION MANUAL



## **CERTIFICATION**

IDRC certifies that this product was thoroughly tested and inspected and found to meet Published specifications when shipped from the factory. IDRC further certifies that its calibration measurements are traceable to the ITRI (Industrial Technology Research Institute/Center for Measurement Standards), to the extent allowed by ITRI's calibration facility.

## **WARRANTY PERIOD - ONE YEAR FREE CHARGE**

This product is warranted against defects in materials and workmanship for a period of ONE YEAR from date of shipment. During warranty period, IDRC will at its option, either repair or replace products which prove to be defective. IDRC are not liable errors contained herein or for incidental or consequential damages.

## **WARRANTY SERVICE**

We will repair or replace the instrument during the warranty period provided it is returned to your nearest IDRC authorized service center. Buyer shall pre-pay shipment charges to service center and service center will pay shipment charges to return product to buyer. The freight prepaid by Buyer if the product return to IDRC International Sale Dept. the RMA (Return Material Authorization Number) must be obtained directly from the IDRC for warranty repairs. No liability will be accepted if returned without such permission.

## **LIMITATION OF WARRANTY**

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the buyer, Buyer-supplied products interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance. No other warranty is expressed or implied. IDRC specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

## **ALL RIGHTS RESERVED**

No part of this publication may be produced, stored in a retrieval system, or transmitted in any form, or by means, electronic, mechanical photocopying, recording or otherwise without prior permission of IDRC.

# CONTENTS :

## 1.GENERAL DISCRPTION

1.1 Equipment Check List.....	1-1
1.2 Accessories(optional).....	1-1

## 2.SPECIFICATIONS..... 2-1

## 3.PANEL DESCRIPTIONS

3.1 FRONT PANEL DESCRIPTIONS.....	3-1
3.2 REAR PANEL DESCRIPTIONS.....	3-2

## 4.OPERATION 4-1

## 5.APPLICATION

5.1 Using PT to extend the voltage rate.....	5-1
5.2 Using CT to extend the current rate.....	5-2

# APPENDIX:

CABLE CONNECTIONS FOR CALIBRATOR.....	A1-1
---------------------------------------	------

# 1. GENERAL DISCRPTION

## 1.1 Equipment Check List

The following items comprise a complete instrument :

- \* User Manuel
- \* AC Line Power Cord
- \* AC Male Plug with Power Cord for connect to Source terminal
- \* AC Female Socket with power cord for connect to LOAD terminal
- \* Hook Terminal x 4
- \* Spare fuse: 250mA (500mA(FAST))
- \* Traceable Calibration Certificate

## 1.2 Accessories (Optional)

- \* CPA-100: Universal Test Adapter
- \* CPR-200: Rack Mount Kit for 19 inch Cabinet

## 2.Specification

### TRMS Voltage

MAX. Voltage	300V / 600VRMS Manual selectable
Resolution	0.1V
Accuracy	$\pm 0.5\%$ reading $\pm 0.2\%$ range $\pm 2C$
Frequency Range	30Hz 5KHz
Input Impedance	1M
Crest Factor	3:1

### TRMS Current

MAX. Current	30ARMS
Auto Ranging	0.3A / 3A / 30A
Resolution	0.1mA / 1mA / 10mA
Accuracy	$\pm 0.5\%$ reading $\pm 0.2\%$ range $\pm 2C$
Frequency Range	30Hz 5KHz
Input Impedance	Approx 10m or 5m
Crest Factor	3:1
Peak Over Indicator	2.5 times of range

### True Watt

Auto Ranging	90W / 900W / 9000W(300V)180W / 1800W / 18000W(600V)
Resolution	0.01W / 0.1W / 1W
Accuracy	$\pm 0.3\%$ reading $\pm 0.2\%$ range $\pm 2C$
Frequency Range	30Hz 5KHz
Crest Factor	Same as V/A

### Frequency

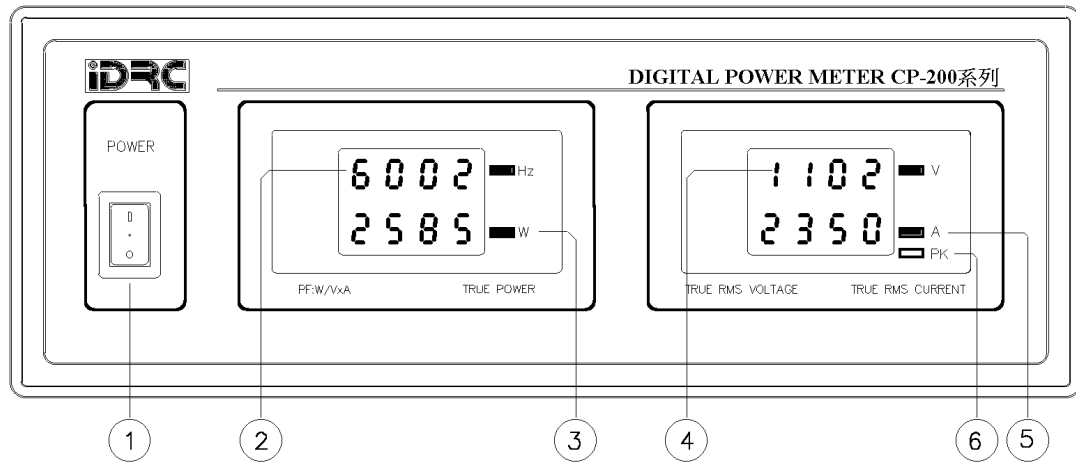
Measurement Range	10Hz 5KHz
Resolution	0.01Hz(<100Hz) 0.1Hz(>100Hz) 1Hz(>1KHz)
Accuracy	$\pm 0.01\%$ reading $\pm 1C$
Input Voltage	10V-600VRMS

### General

Data Update Rate	2.5 times/sec
Environment	0~50 ; 20% 80% RELATIVE HUMIDITY
Power Supply	110V/220V $\pm 10\%$ ; 50Hz/60Hz 10W
Dimension	260x110x350mm (W.H.D)
Weight	Approx 4.2Kgs

# 3.PANEL DESCRIPTIONS

## 3.1 FRONT PANEL DESCRIPTIONS :



D:\PWSWU\CP-210B\STR\FPLFIG01.PCB

(1) POWER : Power Control On/Off Switch

\* When POWER turn on, all the 7-segment displays with dot LED and LED annunciators will light about 1 second, after above step then functions going to working.

CAUTION: Check right AC line voltage applied before POWER ON

(2) FREQUENCY DATA DISPLAY : Display of Frequency Data

\* Stand alone working with another three displays to make sure sampling rate is fast.

(3) WATT DATA DISPLAY : Display Unit of Watt Data

\*All data is true RMS(Root Mean Square)

(4) VOLTAGE DATA DISPLAY : Display Unit of Voltage Data

\*All data is true RMS(Root Mean Square)

(5) CURRENT DATA DISPLAY : Display of Current Data

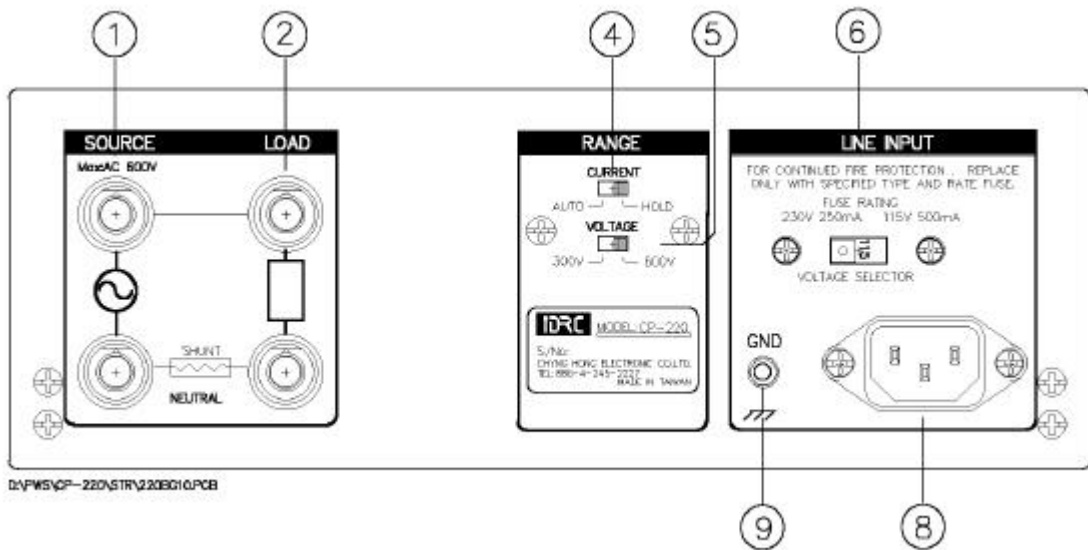
\* All data is True RMS(Root Mean Square).

(6) PEAK CURRENT LED ANNUNCIATORS : Peak current indicator

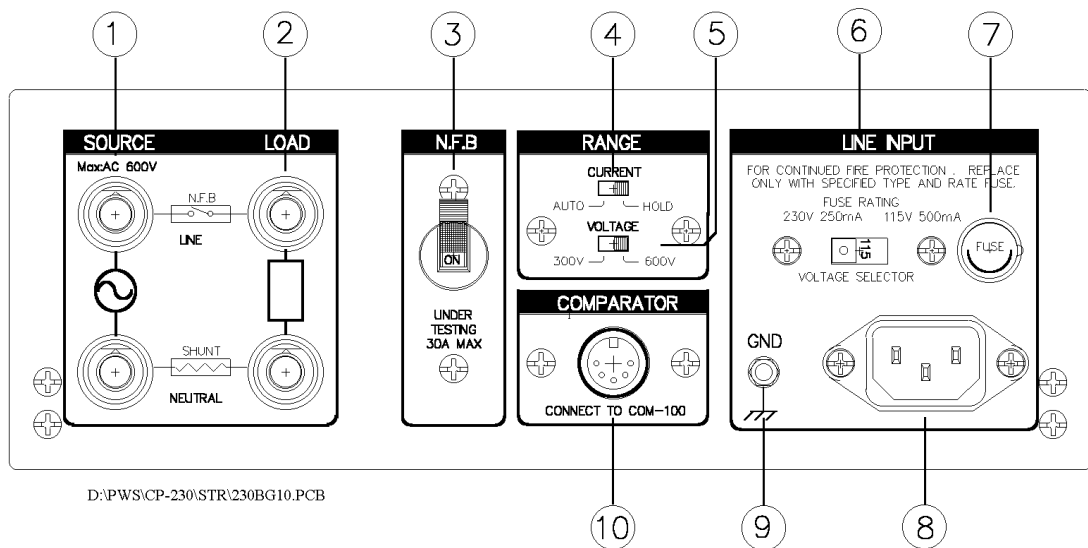
\* 'PeaK' LED annunciators will light When the peak of current waveform is great than 2.5 times of each current range, But that can not change current range.

### 3.2 REAR PANEL DESCRIPTIONS :

【 FIG 3-1 】 CP-220 REAR PANEL



【 FIG 3-2 】 CP-230 REAR PANEL



(1) SOURCE : Source terminals Binding Post Connectors

\* Source terminals Connection to AC Source for variable AC voltage input of the LOAD terminals.

\* Red binding post connect to AC cable 'Line' side(white wire).

\* Black binding post connect to AC cable 'Neutral' side(Black wire).

CAUTION : 600V AC MAX

(2) LOAD : Load terminals Binding Post Connectors

\* LOAD terminals connect to the AC input of UUT (Unit Under TEST).

\* Red binding post connect to AC cable 'Line' side(white wire).

\* Black binding post connect to AC cable 'Neutral' side(Black wire).

CAUTION : 30A MAX

(3) N.F.B. : No Fuse Breaker switch

\* Power Breaker switch will turn off when LOAD terminals current exceed the maximum of rated Load current.

\* Power Breaker switch control the LOAD terminals AC power on/off

CAUTION : 30A MAX

(4) Range Hold: Current range hold switch.

(5) Voltage range selector: source voltage range select switch.

\* Source Voltage is under 300V THEN set 600V location. Else SET 300V location.

(6) LINE VOLTAGE SELECTOR : Line voltage select switch

\* AC line is 100V to 130V, set 115V location

\* AC line is 200V to 260V, set 230V location

(7) FUSE : Fuse holder

\* Fuse is FAST Blow type

\* Fuse rate is 500mA when line voltage is 115V range Fuse rate is 250mA when line voltage is 230V range

CAUTION: FOR CONTINUED FIRE PROTECTION REPLACE ONLY WITH SPECIFIED TYPE AND RATE FUSE. DISCONNECT INPUT POWER BEFORE REPLACING FUSE.

(8) AC LINE SOCKET : AC line input socket

\* Connect to a three wire power cord.

CAUTION: TO AVOID SHOCK HAZARD FOR INTERNATIONAL SALE, LINE VOLTAGE SELECTOR CONSULT SET TO 230V. PLEASE SET YOUR AREA LINE VOLTAGE IN ADVANCE.

(9) REAR PANEL GROUND TERMINAL:

WARNING:

To avoid shock hazard, connect the factory supplied three-conductor line power cord to a properly grounded power outlet. Do not use a two-conductor adapter or extension cord; this will break the protective ground connection. Use the rear-panel ground terminal for a protective grounding wire if there is any question as to instrument earth grounding.

(10) DIN terminal: Comparator output terminal



## 4.OPERATION

General Procedures :

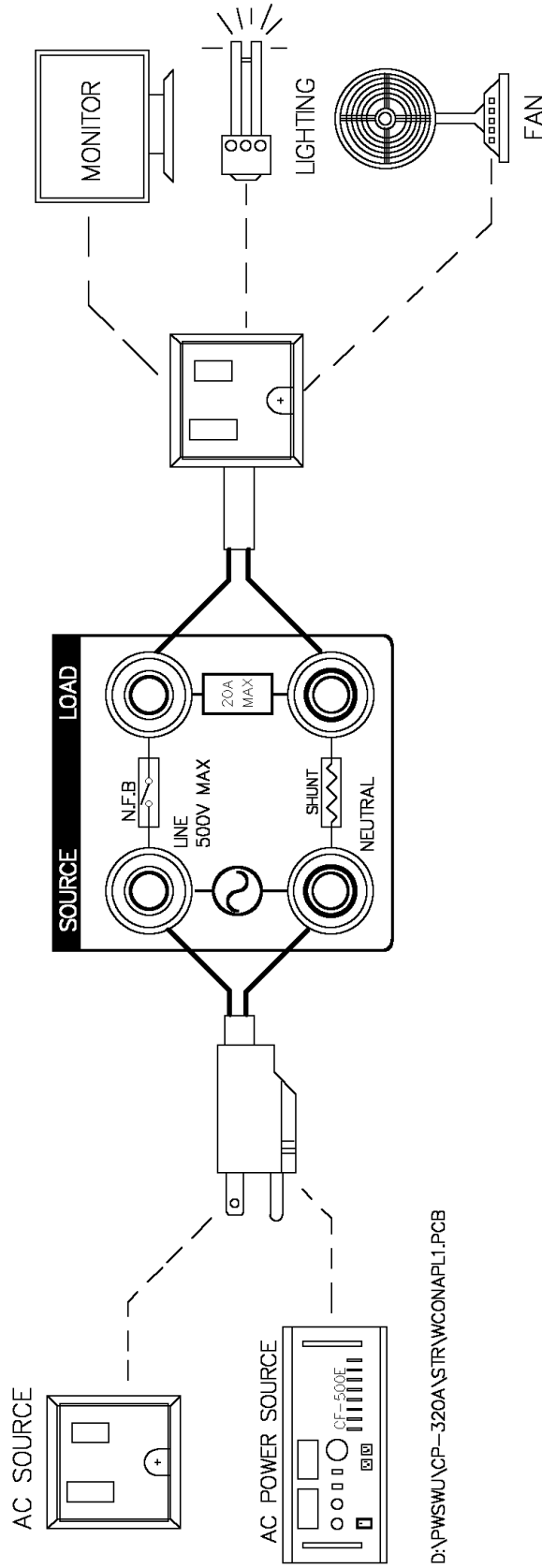
- (1) Turn off all the switches before enabling the power. Then turn on the main power.
- (2) Make sure that SOURCE terminal is connected to the required power.
- (3) Connect the LOAD to the measurement unit.
- (4) Be sure that the terminals of SOURCE & LOAD connected to LINE/NEUTRAL are different.
- (5) Select the required Voltage range on the Rear panel.
- (6) Applications for measuring (as the diagram 4-1)
- (7) NOTE: Parameters of Vrms, Arms, W and Hz can be calculated as the below:

$$P F = \frac{( \text{ T r u e } \quad W )}{( \text{ A r m s } \times V \text{ r m s } )} \quad (\text{Power Factor})$$

$$V A R = \frac{\quad}{(VA)^2 - W^2} \quad (\text{Reactive Power})$$

$$V A = V \text{ r m s } \times \text{ A r m s} \quad (\text{Apparent Power})$$

【Diagram 4-1】



D:\PWSWU\CP-320A\STR\WCNAPL1.PCB

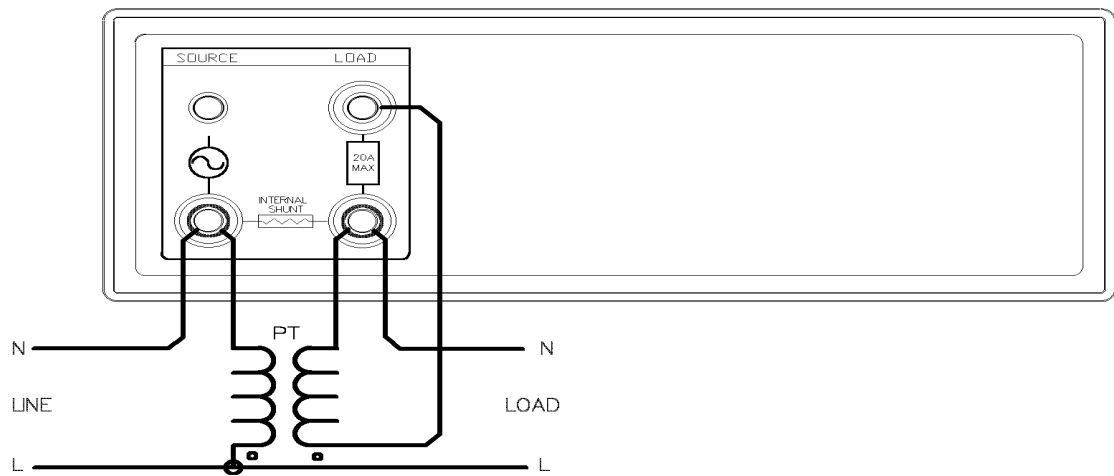
Examples of productions:  
Power supply, monitor, Television,  
Fan, Motor, Consumer products...

# 5 . APPLICATION

## 5.1 Using PT to extend the voltage rate:

Potential Transformer (PT's) are used to extend the voltage range of the CP-200 series. PT's are available in many division ratios, e.g., 10:1, 100:1, 1000:1. When using a PT's with the CP-210A series, the operator must multiply the voltage and power reading by the ratio of the PT used. The PT connections are shown as following figure.

NOTE: The bandwidth and ratio accuracy of the PT will affect the overall voltage and power measurement accuracy.

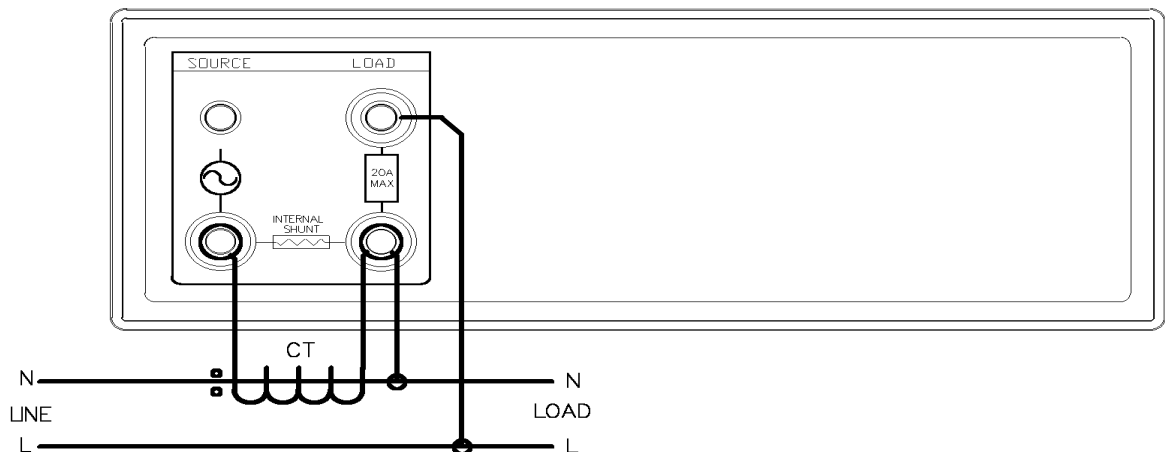


upplfg05

## 5.2 Using CT to extend the current rate:

Current Transformer (CT's) are used to extend the current range of the CP-210A series. CT's are available in many division ratios, e.g., 10:1, 100:1, 1000:1. When using a CT's with the CP-210A series, the operator must multiply the current and power reading by the ratio of the CT used. The CT connections are shown as following figure.

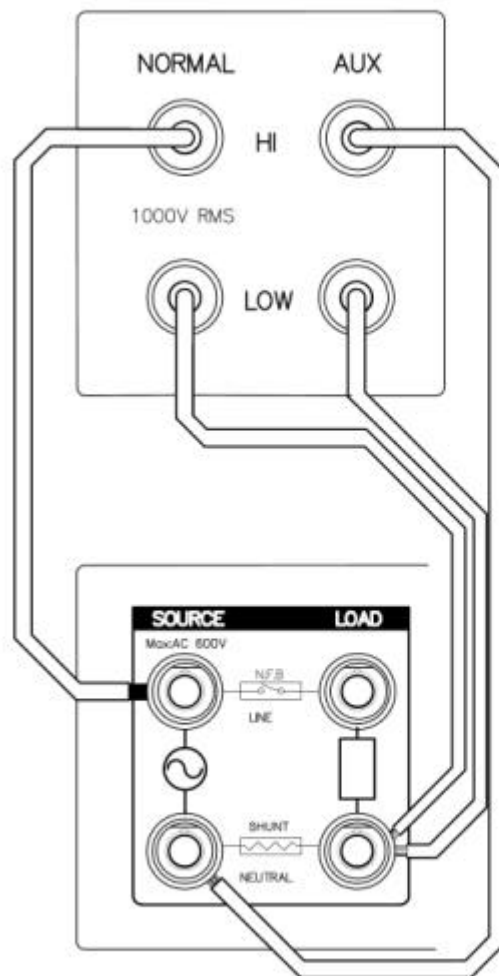
NOTE: The bandwidth and ratio accuracy of the CT will affect the overall current and power measurement accuracy.



upplfg04

# Appendix : Cable Connections for Calibrator

## FLUKE 5500A CALIBRATOR



1. "LO"s :tied
2. PHASE:180.00
3. PF:Lead
4. WIRE :  
 VOLTAGE  
 12AWG(Min)  
 20CM(Max)  
 CURRENT  
 12AWG(Min)  
 20CM(Max)

CP-200 SERIES  
 CP-300 SERIES

210BCN01.PCB