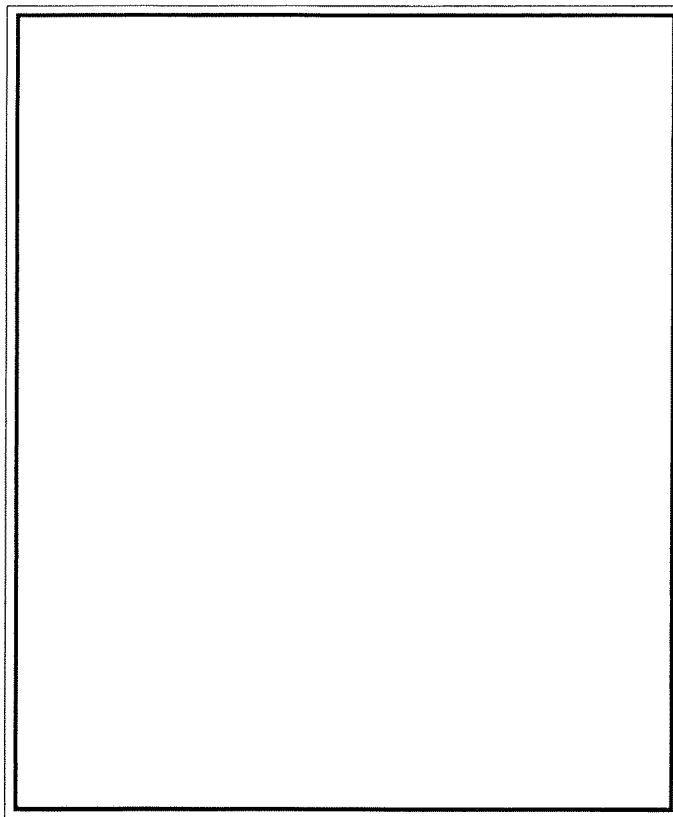


WARNER

Installation & Operation Manual

SECO® DC Drive
PCM SCR Series Models 610, 620
1/20 - 1/4 H.P.



LINEAR AND ELECTRONICS DIVISION
BRISTOL PLANT

383 MIDDLE STREET

BRISTOL, CT 06010

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WARRANTY

Warner Electric/Dana warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

This warranty extends only to the original purchaser and is not transferable or assignable without Warner Electric/Dana's prior consent. Warranty service can be obtained in the following manner: by returning any defective product, transportation charges prepaid, to the appropriate Warner Electric/Dana factory. Additional warranty information may be obtained by writing the Customer Service Department, Warner Electric, 449 Gardner Street, South Beloit, Illinois 61080, or by calling 815-389-3771.

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Warner Electric/Dana's obligation under this warranty is limited to the repair or replacement of the defective product and in no event shall Warner Electric/Dana be liable for consequential, indirect, or incidental damages of any kind incurred by reason of the manufacture, sale or use of any defective product. Warner Electric/Dana neither assumes nor authorizes any other person to give any other warranty or to assume any other obligation or liability on its behalf.

WITH RESPECT TO CONSUMER USE OF THE PRODUCT, ANY IMPLIED WARRANTIES WHICH THE CONSUMER MAY HAVE ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL CONSUMER PURCHASE. WITH RESPECT TO COMMERCIAL AND INDUSTRIAL USES OF THE PRODUCT, THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Receipt of Shipment

All equipment is tested before shipment, and is shipped in good condition. Any damages or shortages evident when the equipment is received must be immediately reported to the commercial carrier who transported the equipment. If required, assistance is available from the nearest Warner Electric Representative. Always refer to the Warner Electric order number, model number, and serial number when contacting Warner Electric.

NOTE: The information contained here is accurate at the time of publication.
Warner Electric reserves the right to make design changes to motor controls described in this manual at anytime and without notice.

For your safety and for proper operation, please take time to carefully read all instructions before installing and operating this unit.

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SECTION I

SPECIFICATIONS AND TECHNICAL DATA

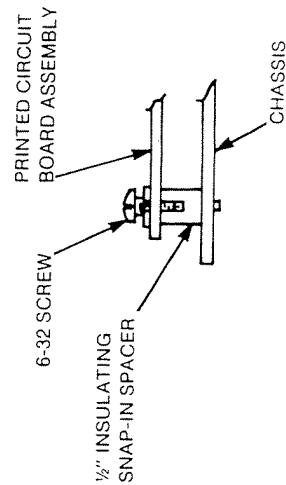
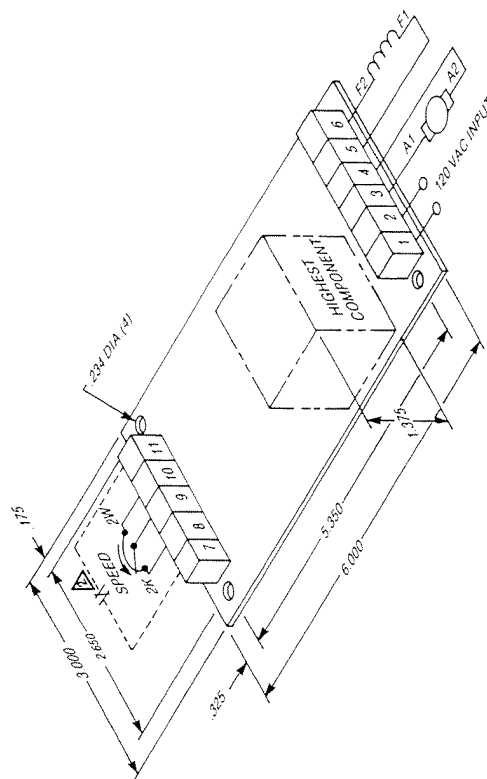
	Model 610	Model 620
Input Voltage	120 VAC, 50/60 Hz	120 VAC, 50/60 Hz
Horsepower	1/20 thru 1/4	1/12 thru 1/4 (two ranges)
Operating Temp.	0°C to 40°C	0° to 55°C
Speed Range	20:1	50:1
Load Regulation (% of base speed)	± 8	± 2
Full Wave Rectification:		
Armature Voltage	0-90 VDC	0-90 VDC
Field Voltage	100 VDC	50 VDC and 100 VDC
Line Voltage Compensation	+10% -5%	+10% -5%
Preset Speed Control	Standard	Standard
Adjustable Control		
Minimum Speed	0-20% Base Speed	0-20% Base Speed
Maximum Speed	+10 to -30% Base Speed	+10 to -30% Base Speed
I.R. Drop	N.A.	Standard
Compensation		
Torque Control	N.A.	30 to 150% Rated Current

Wire size should be based upon local electrical codes. The following current rating table may help in selecting proper wire and fuse sizes

Horsepower	Input Voltage	AC Input Full Load Current	Recommended Fuse
1/20	120	.8	1A FNM
1/12	120	1.3	2A FNM
1/8	120	2.1	3.5A FNM
1/6	120	3.2	4A FNM
1/4	120	4.3	5A FNM

SECTION II

MOUNTING AND CONNECTION INSTRUCTIONS

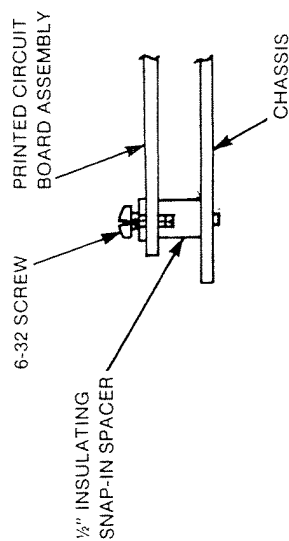
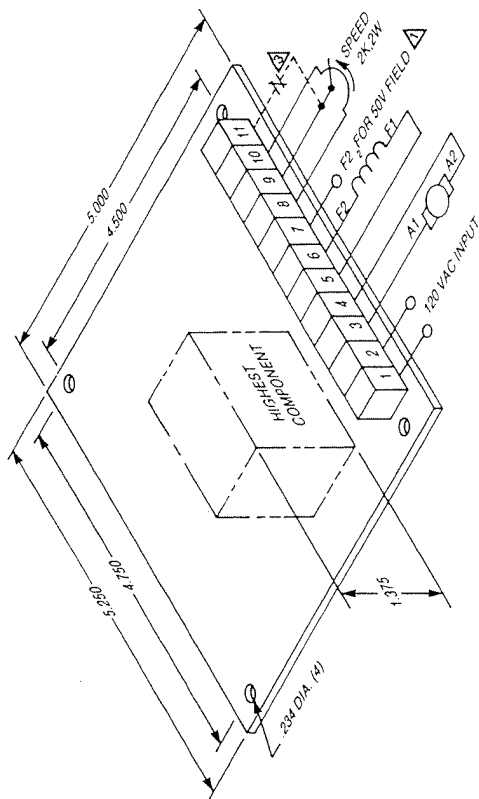


SUGGESTED MOUNTING

MODEL 610

B29911

4



SUGGESTED MOUNTING

MODEL 620

B29912

- 1 Ignore F1 and F2 if permanent magnet motor is used. F₂ is 50 VDC terminal to match half wave field motors.
- 2 Customer supplied contact for stopping drive.
- 3 Customer supplied reference shorting contact. Can be defeated by excessive IR Comp signal (adjusting stopping requires removal of AC power or disconnection of armature contactor).

5

Before applying AC voltage, the following checks should be made:

1. Check all connections that have been made. Be certain that they agree with the connection diagram. Be certain that all connections are properly secured and tightened.
2. Check motor for proper alignment and for secure mounting. Also check for proper and tight connections at the motor terminal.
3. Measure resistance from all motor terminals to ground. Resistance should be greater than .5 megohms. DO NOT use a megger or devices that use a generator when the motor is connected to the motor control.

PRECAUTIONS:

1. Do not attempt to operate the motor with the field disconnected (except PM motors).
2. Do not connect to DC power line.
3. The direction of motor rotation may be reversed by reversing the motor armature leads.
4. Any external switching is the user's responsibility. It is absolutely necessary to provide a normally closed contact when stopped or in neutral when reversing.
Model 610 N.C. Contact between terminals 7 & 11.
Model 620 N.C. Contact between terminals 9 & 11.
5. Circuit common is **not** earth ground. Any connection between the two will cause severe damage to the control.

SECTION III ADJUSTMENT PROCEDURE

TORQUE ADJUST (Model 620 Only): This adjustment sets the Maximum Torque (armature current) supplied to the motor. Setting this control to "MIN" will limit the armature current to approximately 30% of its rated value. A setting of "MAX" limits armature current at approximately 150% of rated value. Normal position for Torque Adjustment is at "MAX."

MINIMUM SPEED ADJUST: With no load on motor, turn power switch "On." Set speed pot at "0" adjust "MIN" speed pot until armature voltage reads zero, or adjust until motor just stops.

MAXIMUM SPEED ADJUST: Turn the speed pot to 100 and adjust "MAX" speed pot to the base speed of the motor — usually 1750 RPM.

I.R. DROP COMPENSATION (Model 620 Only): This adjustment provides a means to adjust armature feedback. This feedback is used to compensate for motor losses, and to obtain a flat load regulation over the specified speed range.

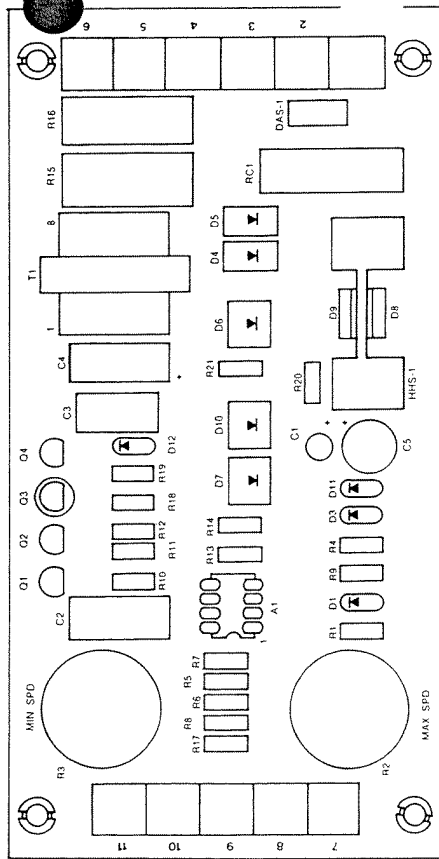
Clockwise rotation of this adjustment increases the amount of feedback. If the feedback is too low, the motor speed will fall off as the motor load is increased. If the feedback is too high, the motor speed will increase as the motor load increases. If the feedback is extremely high, the system becomes unstable and pulsations result.

THE ACTUAL IR COMPENSATION ADJUSTMENT IS MADE AS FOLLOWS:

With no load on the motor, apply power to the control and slowly increase the speed adjust potentiometer. The motor speed will increase as the potentiometer is turned. Set the speed control to approximately 200 RPM (about 15 on the dial). The motor will now be running smoothly. Measure the no load speed. Apply full load to the motor (retaining speed adjust setting — turn off power if necessary). If the motor speed drops, increase the IR Compensation feedback until the unloaded speed is obtained.

HI-LO JUMPER (Model 620 Only): This provides an adjustment for the motor HP range. For HP rating through 1/8 HP, Jumper should be in "LOW" position. For HP rating of 1/4 HP, Jumper should be "HIGH" position.

SECTION IV SCHEMATIC AND REPLACEMENT PARTS LIST



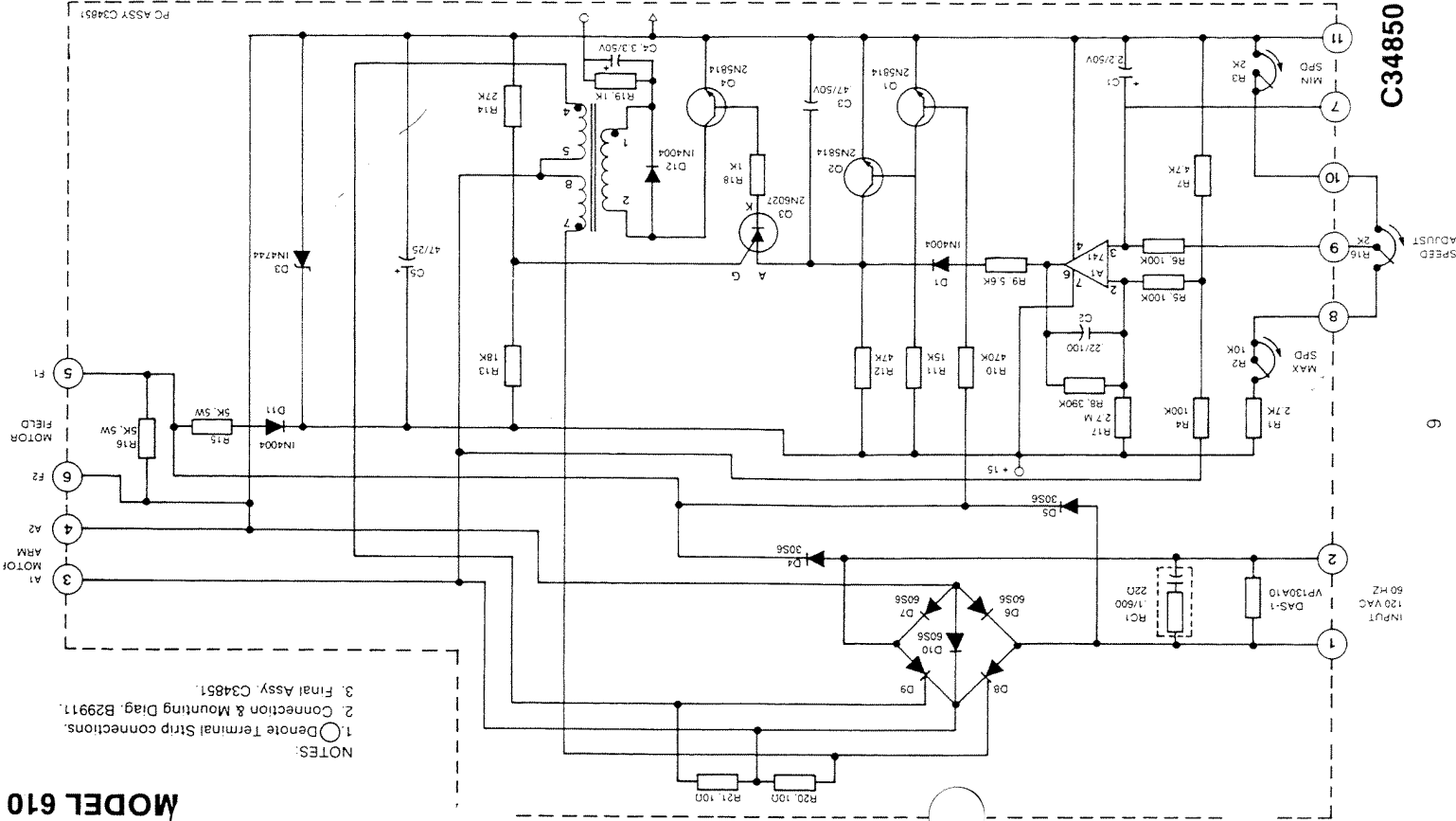
C34851

REPLACEMENT PARTS LIST MODEL 610

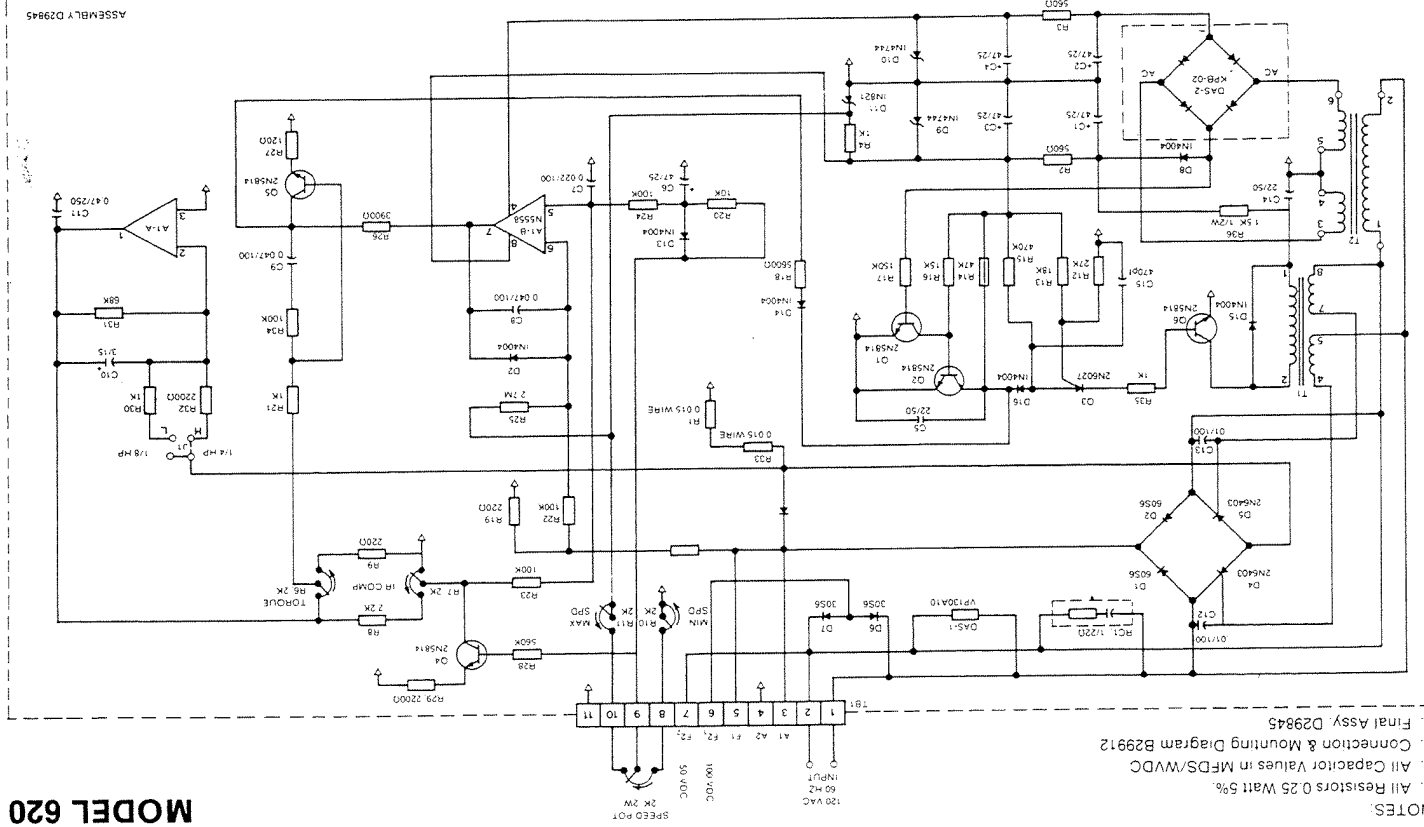
Item	Qty	Part Number	Description
R17	1	PRE1034-46	Resistor, 2.7M, 1/4W
F15,16	2	PRE1005-12	Resistor, 5K, 5W
R14	1	PRE1031-97	Resistor, 27K, 1/4W
R13	1	PRE1031-93	Resistor, 27K, 1/4W
R12	1	PRE1034-04	Resistor, 18K, 1/4W
R11	1	PRE1031-91	Resistor, 47K, 1/4W
R10	1	PRE1031-91	Resistor, 15K, 1/4W
R9	1	PRE1034-28	Resistor, 470K, 1/4W
R8	1	PRE1031-81	Resistor, 5.6K, 1/4W
R7	1	PRE1034-26	Resistor, 390K, 1/4W
R4,5,6	1	PRE1031-79	Resistor, 4.7K, 1/4W
R3	3	PRE1034-12	Resistor, 100K, 1/4W
R2	1	APT1007-02	Pot, 2K, 2W
R1	1	PRE1031-73	Resistor, 2.7K, 1/4W
C5	1	PCA2032-01	Capacitor, 47/25V
C3	1	PCA1010-02	Capacitor, 47/50V
C2	1	PCA1033-00	Capacitor, 22/100V
C1	1	PCA2031-01	Capacitor, 2.2/50V
RC1	1	PCA1028-00	Snubber, 1/600V, 22
HHS1	1	HHS1003-00	Heatsink
D8,9	2	ATY1034-00	SCR, 10 AMP
D3	1	PD13001-00	Diode, 1N4744
D4,5	2	PD11004-00	Diode, MR506, 3 AMP
D6,7,10	3	PD12020-00	Diode, 6 AMP
D11,12	3	PD11006-00	Diode, 1N4004
DAS1	1	PSU2003-00	MOV, 130 RMS-VP130A10
A1	1	ATQ1006-00	OP-AMP-741-8 Pin
Q3	1	ATR4001-00	Transistor, 2N6027
Q1,2,4	3	ATR1009-00	Transistor, 2N5814
T1	1	PTR2008-00	Transformer
(For A1)	1	HWA1116-00	Socket, IC 8 Pin
	4	HFA4023-00	Standoff, 1/2" Snap-in
	1	HWA2011-02	Terminal strip, 5 pos.
	1	HWA2011-01	Terminal strip, 6 pos.
	1	PCBC34852D	P.C. Board
R19,R18	2	PRE1031-63	Resistor, 1K, 1/4W
R20,21	2	PRE1031-15	Resistor, 10 ohm, 1/4W
C4	1	PCA2015-02	Capacitor, 3.3/50V

MODEL 610

NOTES:
1. Denote Terminal Strip connections.
2. Connection & Mounting Diag. B29911.
3. Final Assy. C34851.



C34850



NOTES:

1. All Resistors 0.25 Watt 5%.
2. All Capacitor Values in MFDS/WDC.
3. Connection & Mounting Diagram B29912
4. Final Assy. D29845

Notes:

1. Ref. Schem D29846
2. Ref. Connection and Dim.

D29845

REPLACEMENT PARTS LIST
MODEL 620

Item	Qty	Part	Description	Item	Qty	Part	Description
For A1	1	HWAL116-00	Socket IC, 8 Pin	R25	1	PRE1034-46	Resistor, 2.7 Meg
C15	4	HFA4023-00	Standoff, 1/2" Snap-in	C11	1	PCA1003-01	Capacitor, 0.47/250
J1	1	PCA1030-00	Capacitor, 470 PF/200	C7	1	PCA1005-01	Capacitor, 0.022/100
HHS1	1	HPA1028-02	Jumper, 4 Pin	C8,9	2	PCA1005-04	Capacitor, 0.047/100
R36	1	HHS1003-00	Heat Sink, SCR	C12,13	2	PCA1005-05	Capacitor, 0.01/100
R27	1	PRE1001-67	Resistor, 1500 ohm, 1/2W	C10	1	PCA2015-02	Capacitor, 3/15
R3,2	1	PRE1001-41	Resistor, 120 ohm, 1/2W	RC1	1	PCA1028-00	Snubber, .1/25 ohm
R5	2	PRE1001-57	Resistor, 560 ohm, 1/2W	C6,4,3,	5	PCA2032-01	Capacitor, 47/25
R1,33	1	PRE1002-43	Resistor, 8.2K, 2W	C5,14	2	PCA1033-00	Capacitor, 22/50
R19,9	2	PRE1009-05	Resistor, 0.015, Wire	TBI	1	HWZ4007-11	Terminal Strip, 11 Pos.
R35,4	2	PRE1031-47	Resistor, 220 ohm	T2	1	PTR4027-00	Power Transformer
30,21	4	PRE1031-63	Resistor, 1 K	T1	1	PTR2008-00	Pulse Transformer
R17	1	PRE1034-16	Resistor, 150K	R11,10,	4	APT1007-02	Pot, 2K, 2W
R29,8,32	3	PRE1031-71	Resistor, 2.2K	R28	1	PRE1034-30	Resistor, 560K
R26	1	PRE1031-77	Resistor, 3.9K	DAS-1	1	PSU2003-00	MOV, VP130A10
R18	1	PRE1031-81	Resistor, 5.6K	D5,4	2	ATY1033-00	SCR, 2N6403
R20	1	PRE1031-87	Resistor, 10K	Q6,5,4,	5	ATR1009-00	Transistor, 2N5814
R16	1	PRE1031-91	Resistor, 15K	Q3	1	ADR4001-00	PUT, 2N6027
R13	1	PRE1031-93	Resistor, 18K	D7,6	2	PD11004-00	Diode, MR506
R12	1	PRE1031-97	Resistor, 27K	D16,15,14	13,12,8	PDI1006-00	Diode, IN4004
R14	1	PRE1034-04	Resistor, 47K	D3,2,1	3	PD12020-00	Diode, IN4744, 15V Zene
R31	1	PRE1034-08	Resistor, 68K	D11	2	PD13001-00	Diode, IN821, 6.2V
R34,24	4	PRE1034-12	Resistor, 100K	DAS-2	1	PD13002-00	Diode Bridge, KBP-02
23,22	1	PJU1002-00	Mini Jumper, Berg.	A1	1	AIC1003-00	AMP, Dual, N5558
For J1	1	PRE1034-28	Resistor, 470K		1	PCBD29865	P.C. Board
R15	1						