PHASECON
FOR THYRISTOR CONTROLLERS

R8600 REGENERATIVE CONTROL CARD

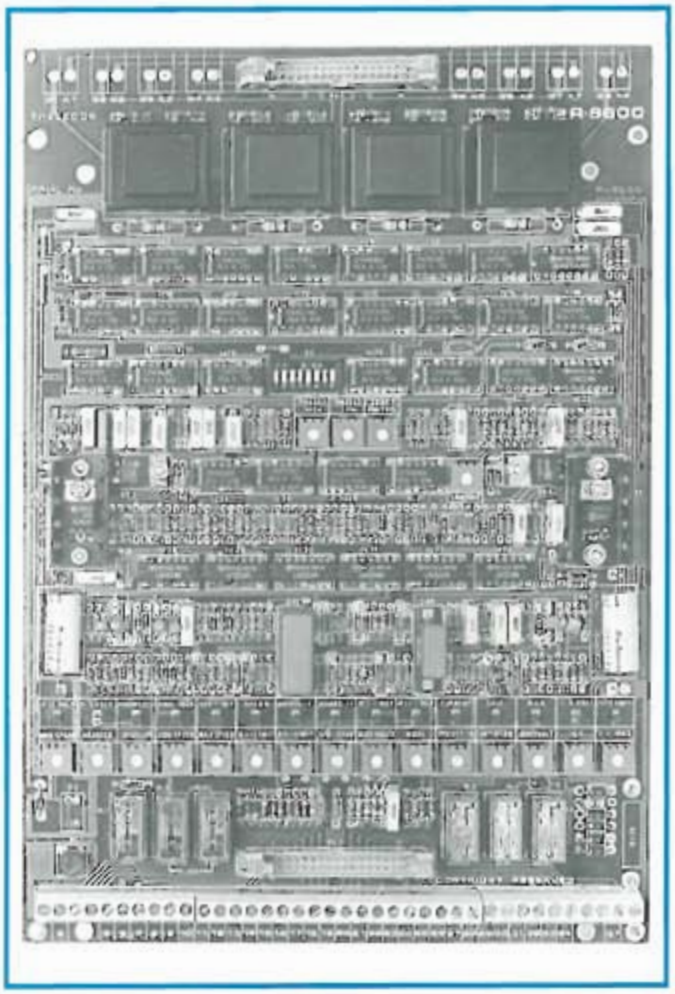
The R8600 Control card is used in all PHASECON single phase regenerative controllers
Ideal for replacement of existing or obsolete control electronics
Ideal for magnetic amplifier replacement and MG sets

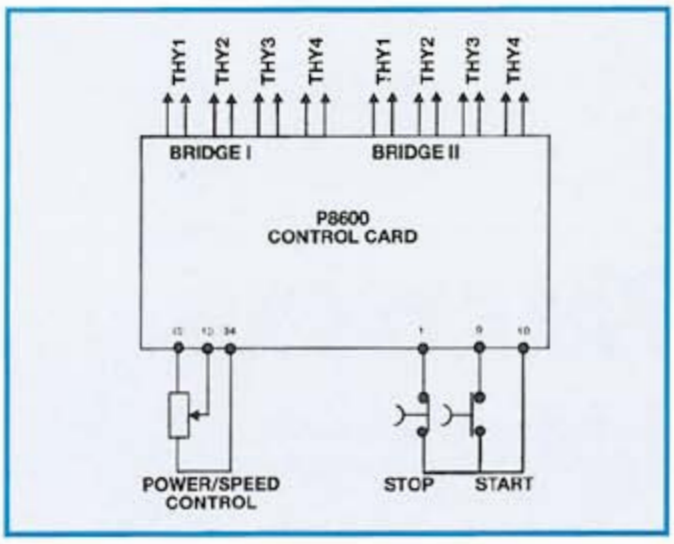
APPLICATIONS

- DC – regenerative speed control
- Plating rectifier control
- Crane control
- DC motor field control

UNIQUE FEATURES

- Digital CMOS counter for accurate balanced phase shift control
- High frequency pulse trains to thyristors
  Minimum and maximum clamp of phase shift
- Digital bridge selection logic
- Only one set of CTs for both bridges
- Automatic tacho-loss circuit – reverts to isolated armature feedback on loss of tacho
- Forward and reverse bridge lock-out switches
- High quality plated through-hole PCB with solder mask and component layout silkscreen





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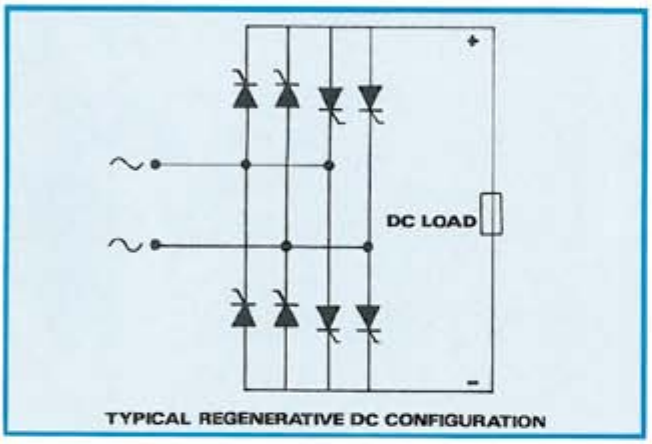
SPECIFICATIONS

- Supply : 18 V – 0 V – 18 V from PHASECON supply transformer
- Thyristor gate pulses : 500 mA repetitive pulses generated over 1 ms. The first pulse being 200 μs followed by 100 μs pulses
- Speed/voltage reference : 0 to ±5 V DC typical
- Voltage/speed feedback : 0 to 100 V DC or selectable
- Current feedback : From ACCT or DC shunt 50 mV or 60 mV

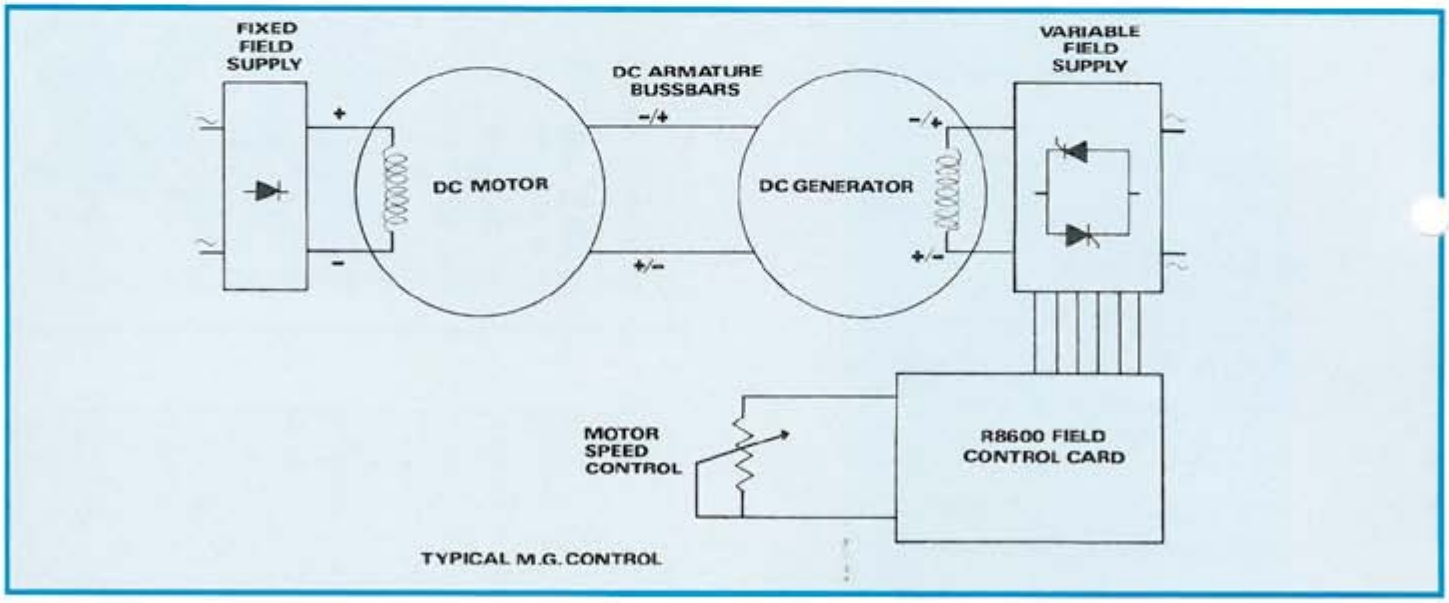
APPLICATION DETAILS



TYPICAL REGENERATIVE DC CONFIGURATION

OUR MANUFACTURING PROGRAMME INCLUDES

- 1 phase and 3 phase variable speed drives
- 1 phase and 3 phase regenerative drives
- AC motor soft starters
- Furnace control panels
- Transformer primary power controllers
- DC injection braking of AC motors
- Welding equipment current ramp up and down controllers



TYPICAL M.G. CONTROL

PHASECON
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PO Box 28, Kya Sand 2163

We would like to introduce ourselves to your company with our manufacturing program. We manufacture single phase and three phase controllers for all kinds of applications. Listed below are a few applications that are the most common. We can supply these items in a chassis mount format or in boxes/panels; or with switch gear per your requirement.

- Primary / Secondary control of transformers
- Controlling of DC motors in single and bi-directional control
- Field controllers
- Controlled high voltage DC supplies
- Controlled low voltage supplies (with low ripple)
- Induction heaters (high frequency) i.e. hardening / melting
- Soft starters
- Slipring motor starters
- Furnaces controllers
- Battery charges
- Flying saw / shear croppers
- Controlling of tube mills
- Rectifiers
- Traction rectifiers
- Anodizing plants
- Vibrators
- Magnetizers

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K8600
SINGLE PHASE REGENERATIVE DC DRIVE

The P8600 control card will be used the mother board P8600 MOTHER BOARD.

1. CONNECT SUPPLY:

- To the fuses marked R, S, T if fuse ever blow replace with either the same or an equivalent
- It should be noted the control card is phase rotation sensitive

2. CONNECT CONTROLS:

- Fan voltage is 220V AC
- Connect the control lines to the terminals on the mother board (PCB closest to the heat sink) as per drawing P8600MB

3. CONNECT LOAD:

- To the connections marked A1 and A2

4. SWITCH SETTINGS:

If the switch is **up** this equals **ON**

- SW-1 bridge 1 (forward) selected
- SW-2 bridge 2 (reverse) selected
- SW-3 current stability enable
- SW-4 120 degrees firing
- SW-5 120 degrees firing
- SW-6 not used
- SW-7 180 degrees firing
- SW-8 180 degrees firing

5. POTENTIO-METER DESCRIPTION:

• N-MIN	Reference adjustment away from zero
• ACCELER	Rate of acceleration
• DECELER	Rate of deceleration
• JOG SPEED	Maximum rate of jogging
• MAX SPEED	Maximum speed allowed by tacho feedback
• BI-LIMIT	Maximum allowed current of bridge
• BII-LIMIT	Maximum allowed current of bridge
• SPD-STAB	Stability of output voltage
• MAX VOLTS	Maximum speed allowed by armature feedback
• NULL	Adjustment of zero position
• PRESET-R	
• PRESET-A	
• I-STAB	Stability of output current
• OVER VOLT	Limit of maximum voltage
• I-MAX	Limit of maximum current
• PRESET H	Factory set (do not adjust)
• PRESET L	Factory set (do not adjust)

6. LAMPS OR LED INDICATORS:

• +12V	Supply voltage (healthy state on)
• +5V	Supply voltage (healthy state on)
• PHASELOCK	Phase rotation (healthy state on)
• FWD-REF	Status of reference input direction
• REV-REF	Status of reference input direction
• SPEED	Status of input of tacho on equals input
• BRIDGE-1	Status of bridge selection
• BRIDGE-11	Status of bridge selection
• BI-REF	Status of bridge reference demand
• BII-REF	Status of bridge reference demand
• CURRENT	Status of current input
• TRIP	Trip indication (healthy state indictation)
• RUN	Indication that drive is in run state
• -5V	Supply voltage (healthy state on)
• -12V	Supply voltage (healthy state on)

7. DESCRITIPTION OF RELAY:

• Relay 1	Run relay
• Relay 2	Jog forward
• Relay 3	Jog reverse
• Relay 4	Zero speed
• Relay 5	Trip delay
• Relay 6	Inhibit relay

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8. SETTING OF POTENTIO-METER:

The controller has been set for 340 or 180 Volts DC and fitted with a burden resistor of the required current, when leaving the factory. The following procedure should be used to set up the controller on site, to ensure the correct control of the drive.

- I-MAX set anti-clockwise
- Check that the field is connected and correct voltage
- Switch bridge II off at switches
- Turn acceleration ½ way
- Power up
- Phaselock lamp must come off, if not, then swap incoming supply between the R-phase and the T-phase
- Check that the TRIP lamp is on
- Check that +12V, -12V, +5V and -5V lamps are on
- Switch on (run). START motor must be in unloaded condition
- Turn reference pot up slowly
- Adjust MAX VOLTS for maximum output voltage (motor reveloution)
- Adjust SPD-STAB for smooth control; if stability is not assattained then increase burden resistor
- Turn reference back to zero
- Turn off
- Connect tacho feedback
- Turn on
- Turn reference pot up slightly, if motor runs away switch off swap TACHO input aeound and try again (is polarity sensitive)
- Adjust max speed equal to max volts otherwise if the two are different and you lose TACHO input problems will occur
- Stop
- Enable bridge II
- Start
- Stop (must regen down to zero)
- Press jog forward if connected
- Adjust jog speed
- Stop
- Load motor
- Start
- Turn reference pot up slowly
- Adjust maximum allowed current with I-MAX
- To limit current in either the forward or reverse direction
- Adjust BI-LIMIT and BII-LIMIT respectively to limit current in fall direction
- If you can reach maximum speed check the voltage across the burden resistor as you are running in current limit. If it is greater than 4,0 Volts then you must fit a lower value
- Adjust over volts so if the control card loses voltage feedback the card will shutdown without causing damage
- You are ready to run!!

9. CURRENT CALCULATION:

When using CT as a form of feedback, instead of 50 milli-volt shunt the following must be taken into consideration for the value of the resistor for the maximum current demand. The resistor R175 (name BURDEN resistor, which is a 5 WATT resistor on the bottom left hand side of the control card) is fitted by the factory for current that, has been requested if you wish to change the burden resistor you must follow the following procedure:

$$\text{CURRDEM} = \frac{\text{CURRENT REQUIRED}}{\text{CT RATIO}}$$

Example:

$$\text{CURRDEM} = \frac{45\text{amps}}{200/1}$$
$$= 0.225\ \text{VOLTS}$$

$$\text{BURDEN RESISTOR} = \frac{2.5\ \text{VOLTS}}{0.225}$$
$$= 11\text{ohms}$$

The BURDEN resistor needs to run at 11ohms or a resistor as close as possible. If the voltage of the BURDEN is higher than 4.95 VOLTS, the electron trip will trip the card off.

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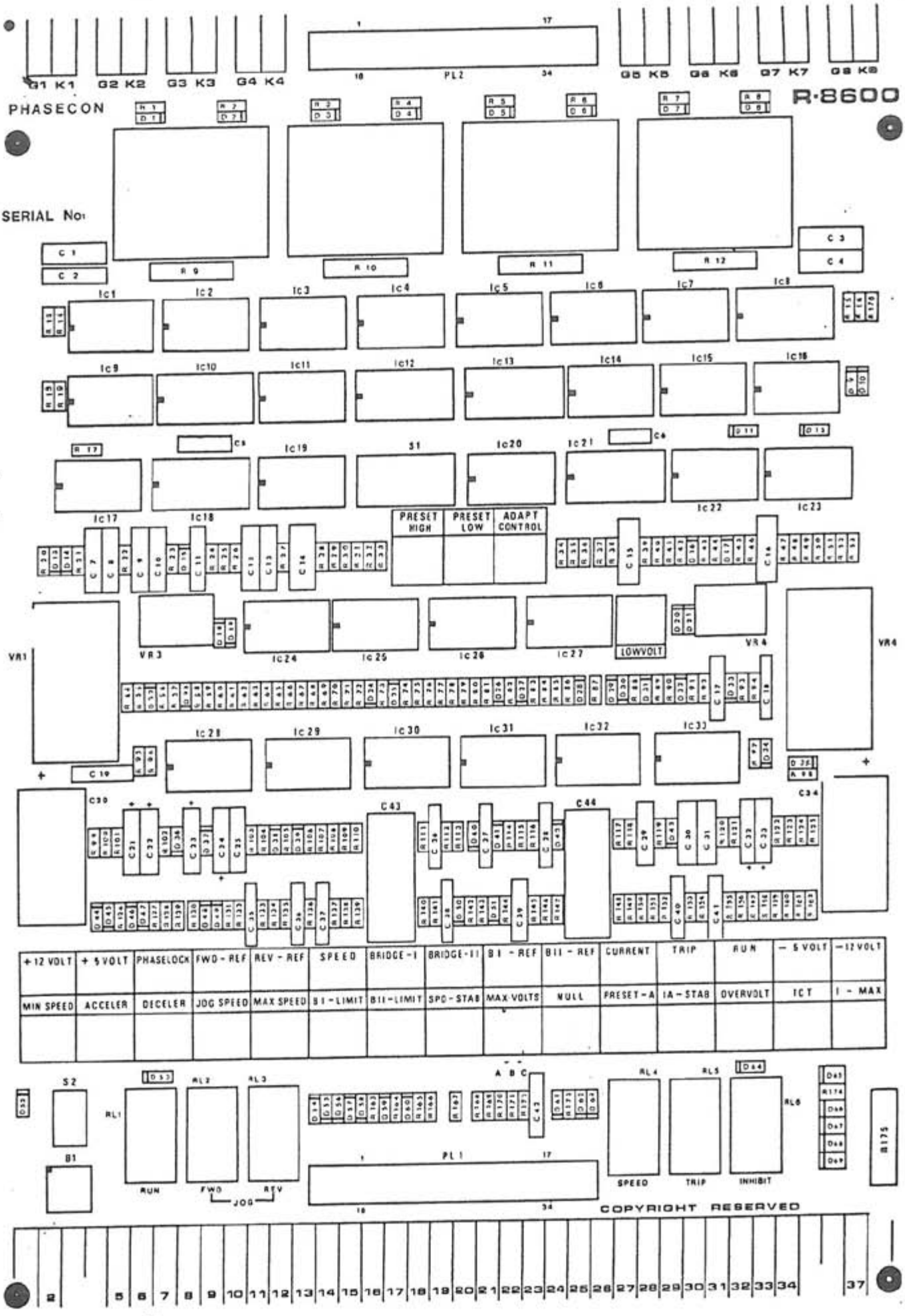
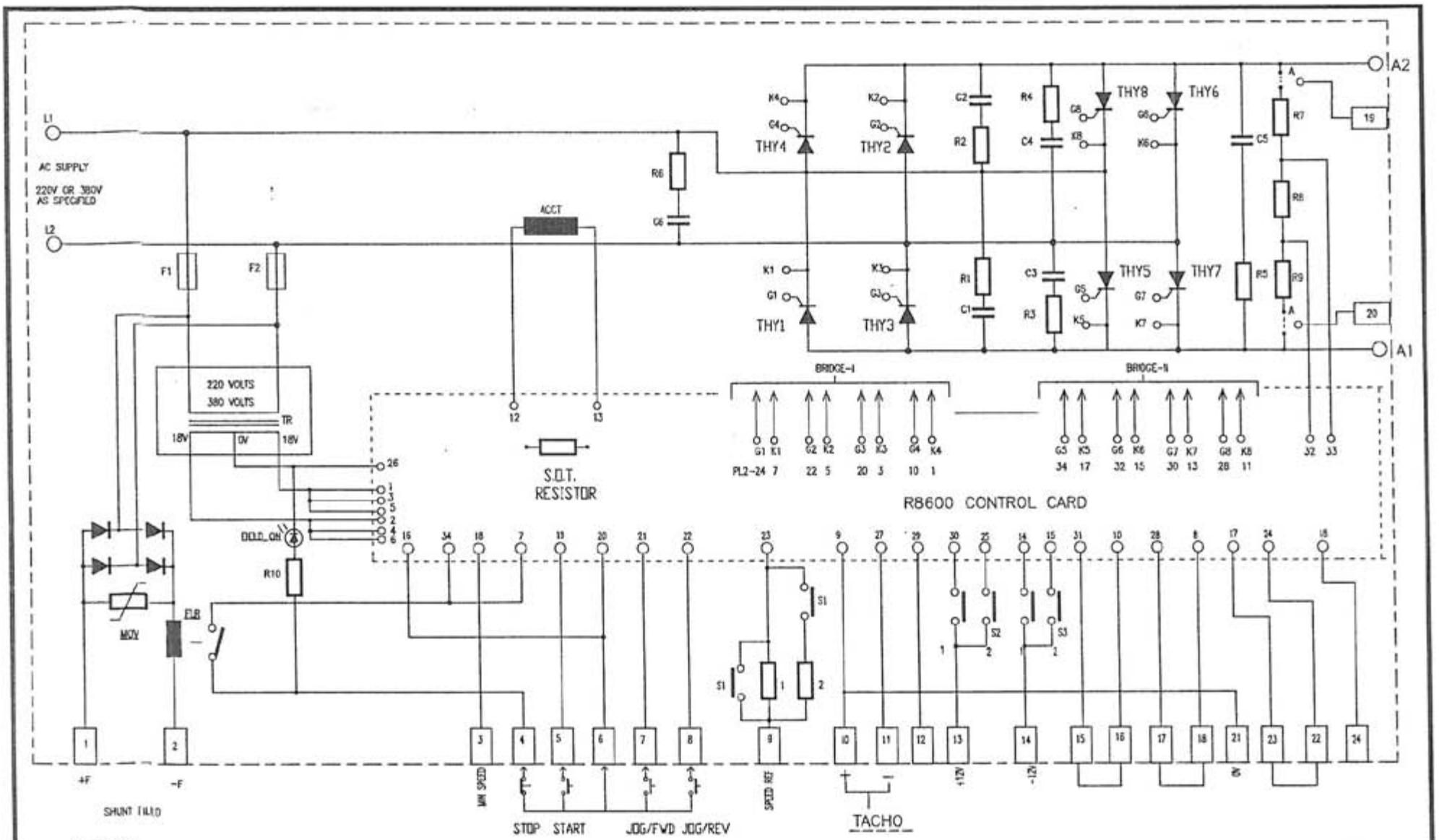


PHASECON PTY (LTD)

FOR THYRISTOR CONTROLLERS

28 STAAL STR KYASAND

TEL : 011-4622100



3 = MIN SPEED

12 = AUX VIA 5K

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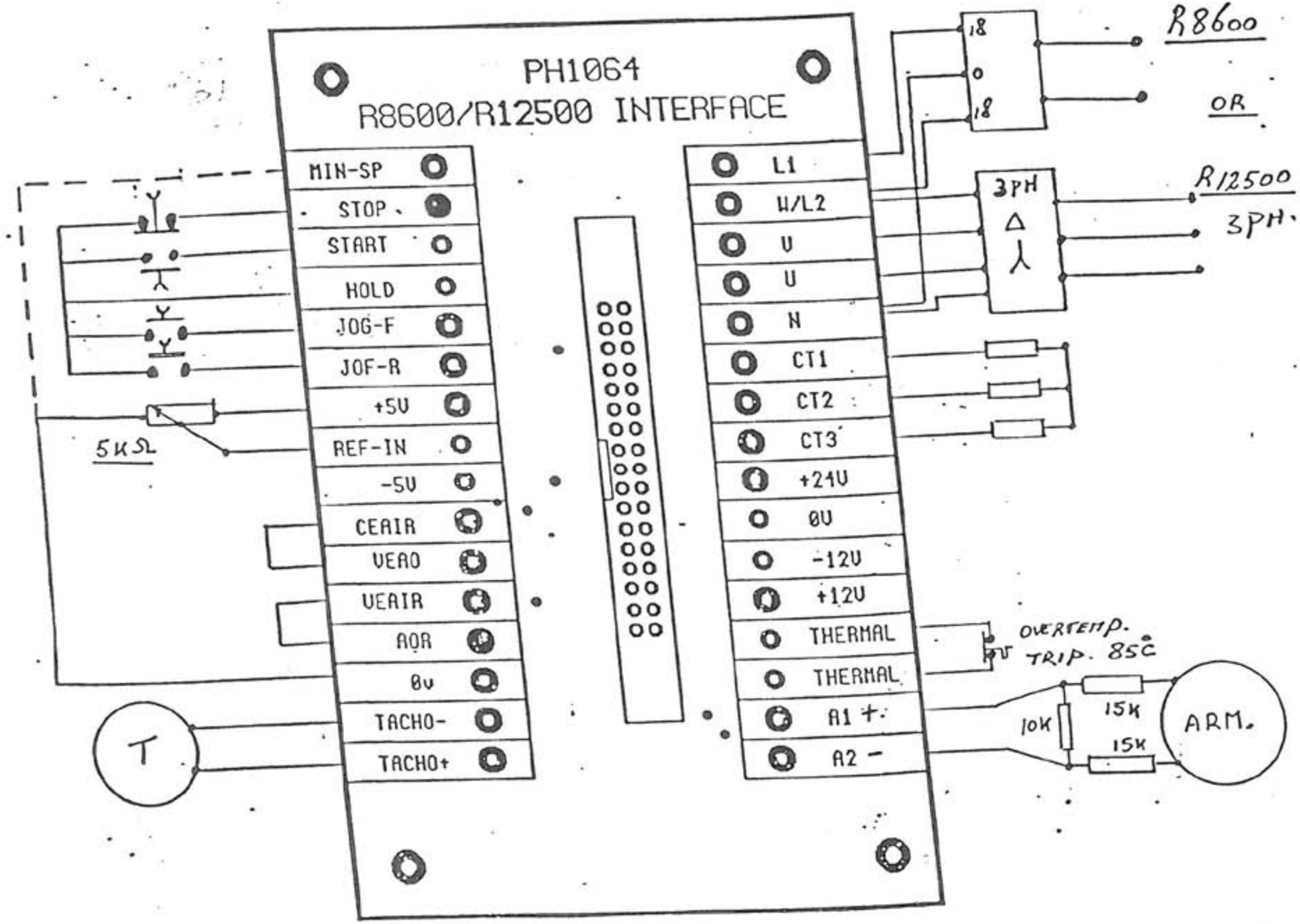
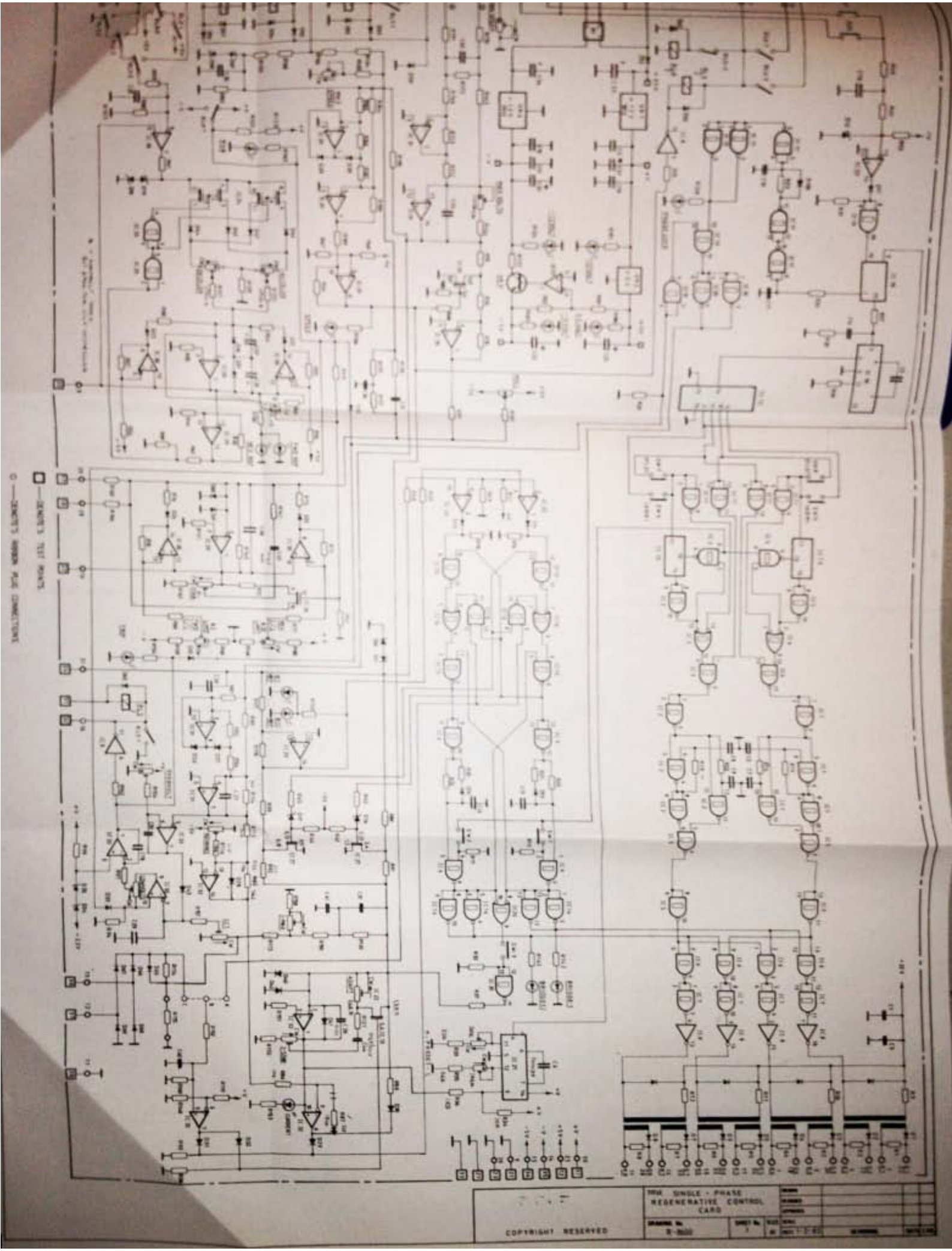
Phasecon (PTY) LTD PO Box 35591, Northcliff,2115. Tel.:462-2100	TITLE R8600-MB		DRAWN: C.R.		
			DESIGNED: P.R.R.	REVISIONS	DATE CKD.
			APPROVED		
CUSTOMER STANDARD	DRAWING No. PCN0099	SHEET No. 1 OF 1	SIZE A3	SCALE	
				DATE 10/10/92	


PH1064
R8600/R12500 INTERFACE
MIN-SP
STOP
START
HOLD
JOG-F
JOF-R
+5V
REF-IN
-5V
CEAIR
VERO
VEAIR
AOR
0v
TACHO-
TACHO+
L1
U/L2
V
U
N
CT1
CT2
CT3
+24V
0V
-12V
+12V
THERMAL
THERMAL
A1 +
A2 -
5KΩ
T
18
0
18
R8600
OR
3PH
R12500
3PH.
OVERTEMP.
TRIP. 85C
10K
15K
15K
ARM.


SINGLE - PHASE
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CARD
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