



PHASECON

FOR THYRISTOR CONTROLLERS

R12500 REGENERATIVE CONTROL CARD

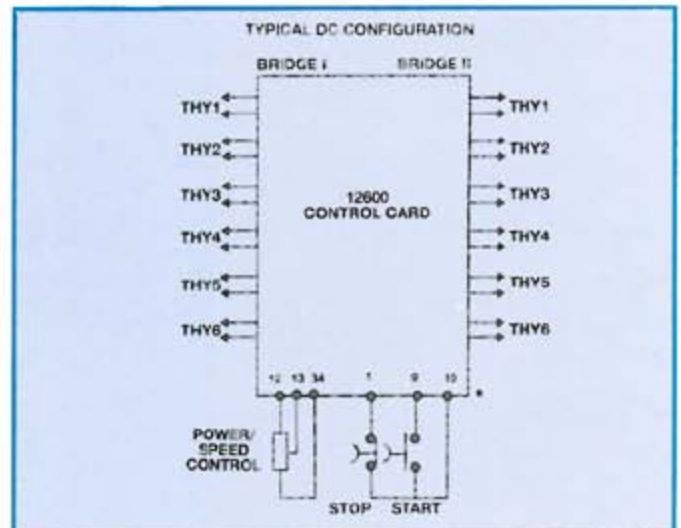
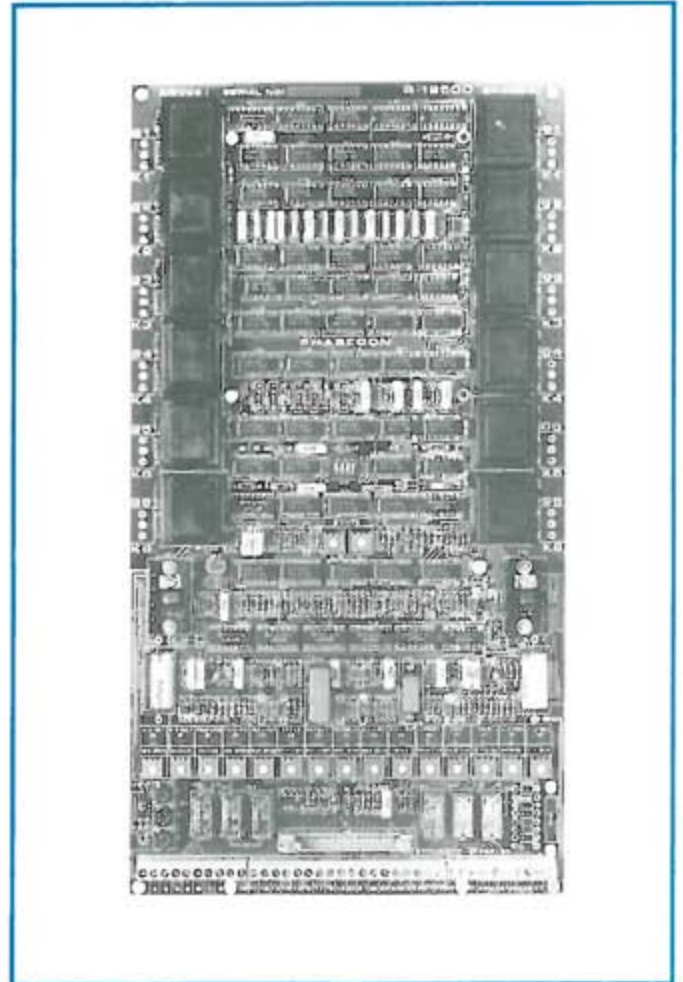
The R12500 is used in all PHASECON 3 phase regenerative DC Controllers
Ideal for replacement of all magnetic amplifier and MG sets

APPLICATIONS

- DC – regenerative variable speed control
- Plating rectifier control – anodic or cathodic
- 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 – feedback
- Forward and reverse bridge lock-out switches
- High quality plated through-hole PCB with solder mask and component layout silkscreen





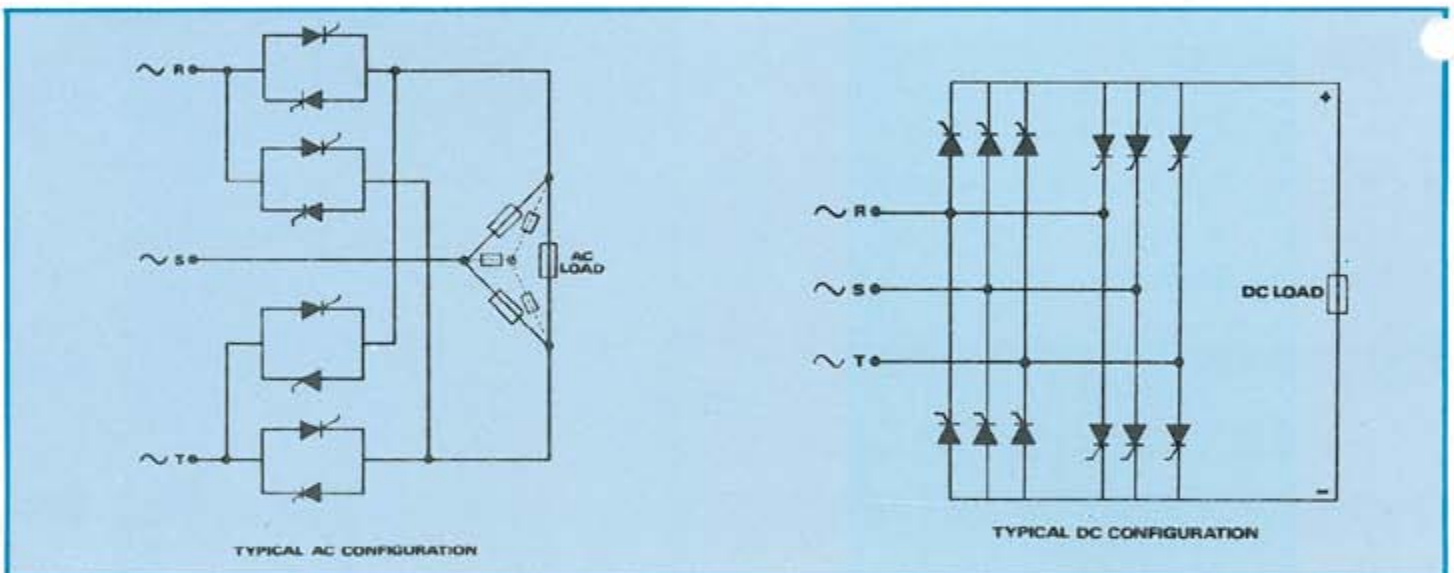
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FOR THYRISTOR CONTROLLERS

SPECIFICATIONS

- Supply 18 V, 4 wire supply from PHASECON synchronisation/supply transformer
- Thyristor pulses 500 mA repetitive pulses generated over 1 ms, the first pulse being 200 μ s and the following pulses 100 μ s
- Speed/voltage reference 0 to ± 5 V typical
- Voltage feedback 0 to 100 V range selectable
- Current feedback From 3 CTs star connected or DC shunt 60 mV or 50 mV

APPLICATION DETAILS



OUR MANUFACTURING PROGRAMME INCLUDES

- Single phase DC variable speed drives up to 7,5 kW
- Three phase DC variable speed drive up to 250 kW
- Regenerative drive systems single and 3 phase
- AC motor soft starters (variable starting torque)
- Slipping motor speed controllers
- Furnace control panels (phase control or burst firing)
- Transformer primary controller
- DC injection braking of AC motors
- Phase control systems to customers' requirements



PHASECON

FOR THYRISTOR CONTROLLERS

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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
- Slipping 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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THREE PHASE REGENERATIVE DC DRIVE K12500 / K12600

1. CONNECT SUPPLY:

- The P12500 control card will be used with either P1250MB0 or P12600MB
- To the fuses marked R, S, T if fuses ever blow, replace with either the same or a equivalent. It should be noted the control card is phase rotation sensitive.

2. CONNECT CONTROLS:

- Fan voltage is 220V AC
- Connect the lines to the terminals on the mother board (PCB closest to the heatsink) as per drawing P12500MB or P12600MB

3. CONNECT LOAD

- To the connections marked A1 and A2

4. SWITCH SETTING

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

- SW1-1 AC control 180 degrees firing angle
- SW1-2 DC control 120 degrees firing angle
- SW1-3 bridge 1 (forward) selected
- SW1-4 bridge 2 (reverse) selected

5. POTENTIO-METER DESCRIPTIONS

• 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
• IMAX	Limit of maximum current
• PRESET-H	Factory set (do not adjust)
• PRESET-L	Factory set (do not adjust)

6. LAMPS OR LED INDICATORS:

• +12 VOLTS	Supply voltage (healthy state on)
• +5 VOLTS	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 tacho point
• 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 on)
• RUN	Indication that drive is in the run state
• -5 VOLTS	Supply voltage (healthy state on)
• -12 VOLTS	Supply voltage (healthy state on)

7. DESCRIPTION OF RELAY:

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



8. SETTING OF POTENTIO-METERS:

The controller has been set for 400 volts DC and fitted with a burden resistor for the required current when leaving the factory. The following procedure should be used to setup 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 on; if not, you must swap incoming supply between the R-phase and T-phase
- Check that the TRIP lamp is on
- Check that +12, -12, +5 and -5 Volts lamps are on
- Motor must be in unloaded condition
- Switch on (start) run
- Turn reference pot up slowly
- Adjust MAX VOLTS for maximum output voltage (motor revolution)
- Adjust SPD-STAB for smooth control if stability is not attained then increase burden resistor
- Turn reference back to zero
- Turn off (stop)
- Connect TACHO
- Turn on (start)
- Turn reference pot up slightly; if motor runs away switch off swap TACHO input around and try again (its 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
- 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 or BII-LIMIT respectively
- If you cannot 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 shut down without causing damage
- You are ready to run



9. CURRENT CALCULATIONS

When using CT as form of feedback instead of a 50 milli-volt shunt, the following must be taken into consideration for the value of the resistor for the maximum current demand. The resistor 184 (name BURDEN RESISTOR which is the 5WATT 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:

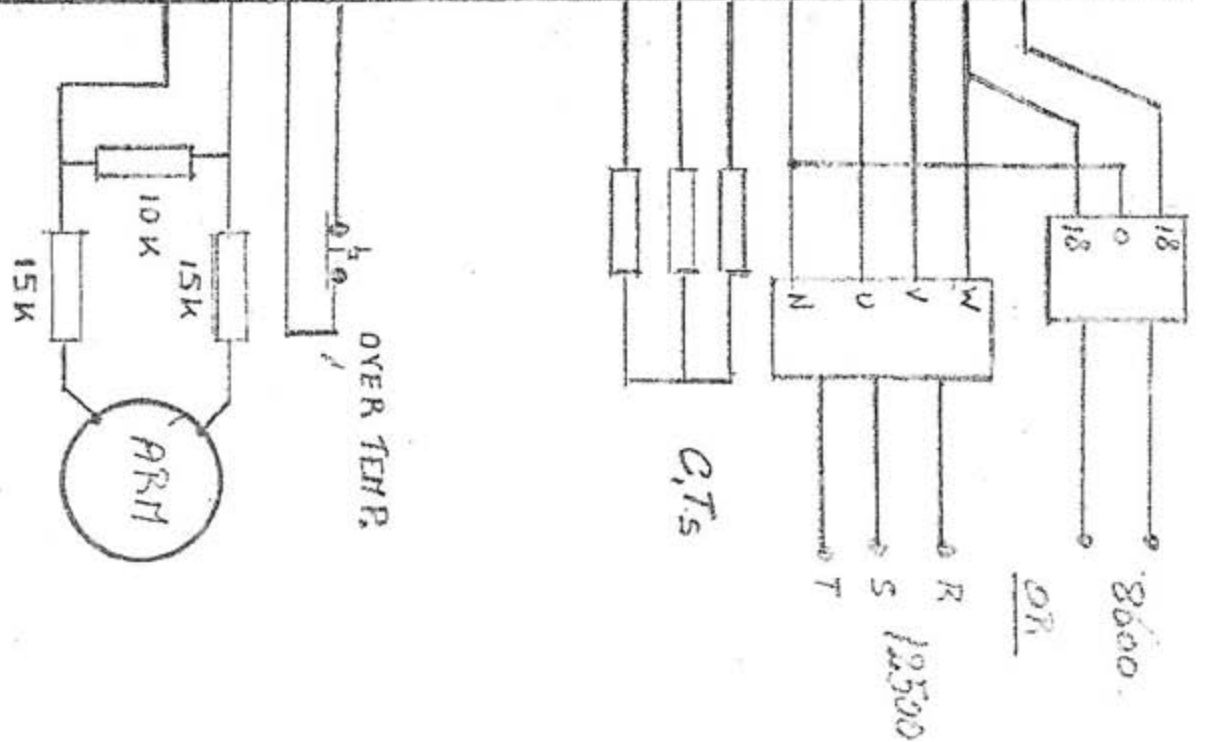
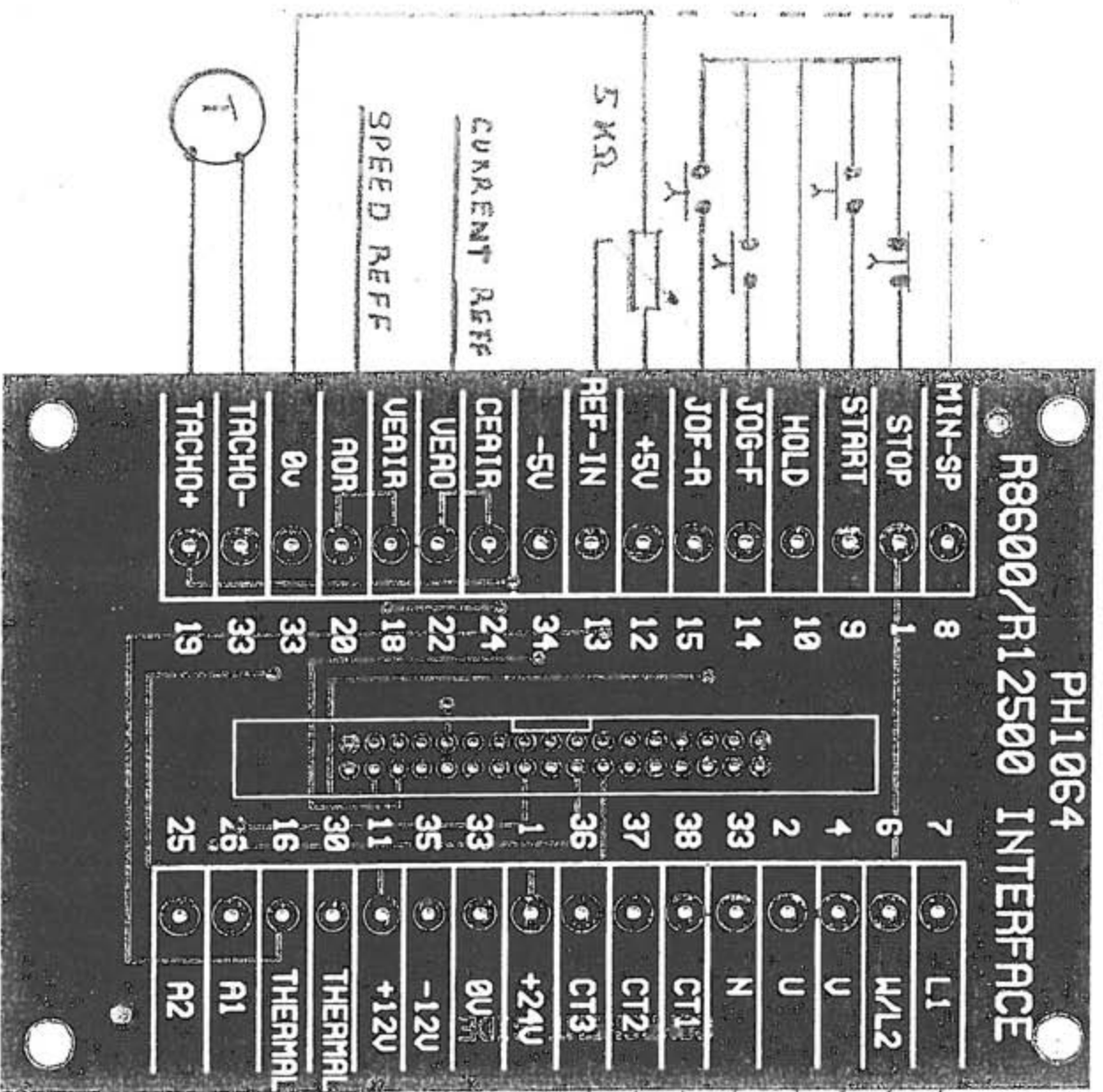
$$\begin{aligned} \text{CURRDEM} &= \frac{\text{CURRENT REQUIRED}}{\text{CT RATIO}} \\ \text{i.e. CURRDEM} &= \frac{45 \text{ amps}}{200/1} \\ &= 0,225 \\ \text{BURDEN RESISTOR} &= \frac{2,5 \text{ volts}}{\text{CURRDEM}} \\ &= \frac{2,5}{0,225} \\ &= 11\text{ohms} \end{aligned}$$

The BURDEN RESISTOR need to run is 11ohms or a resistor as close as possible. If the voltage of the BURDEN is higher than 4,95 VOLTS the electronic TRIP will TRIP the card off.

ANY QUERIES OR PROBLEMS DO NOT HESITATE TO CALL PHASECON



PH1064 R8600/R12500 INTERFACE

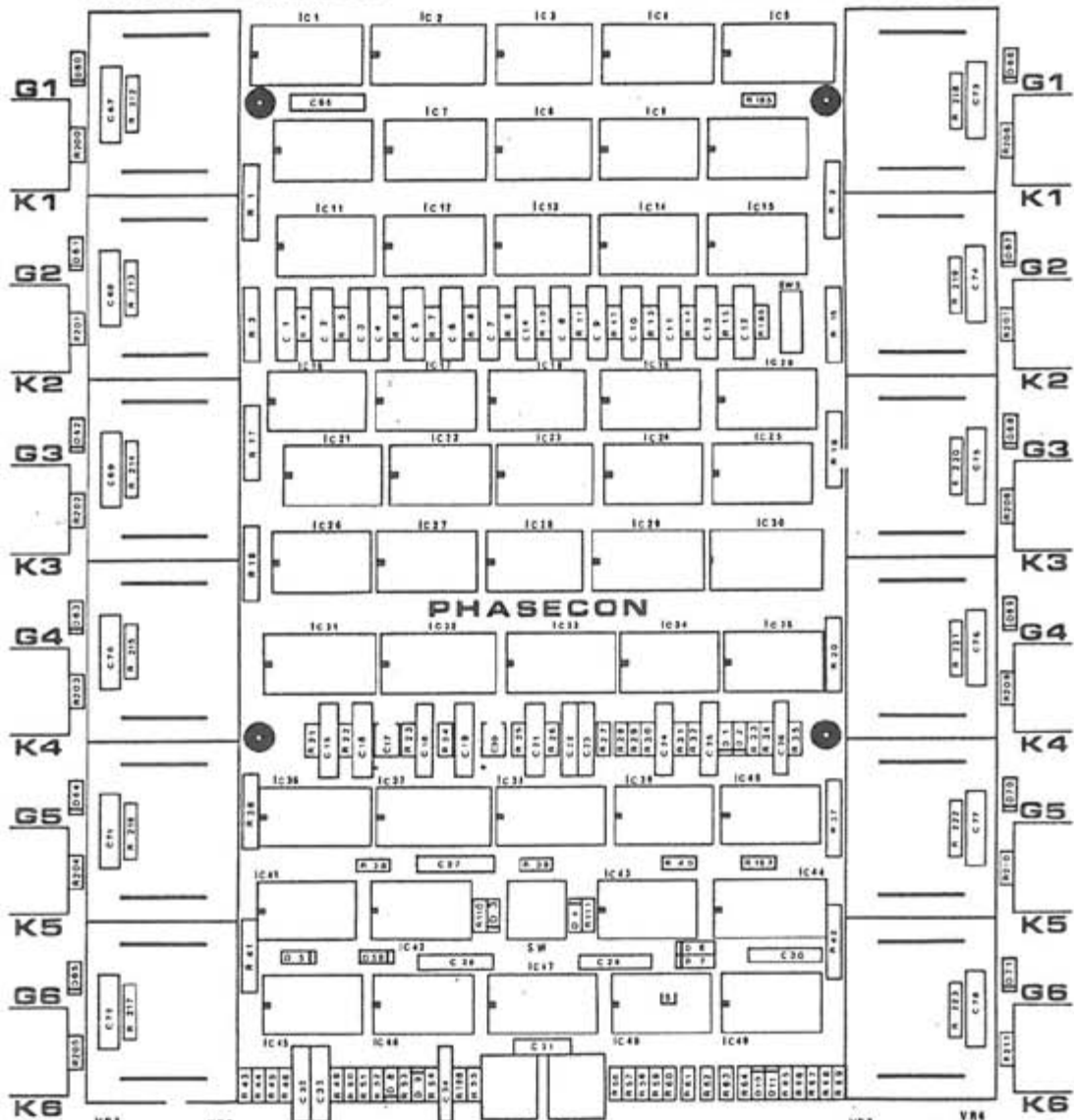




BRIDGE I SERIAL NO:

R-12500

BRIDGE II



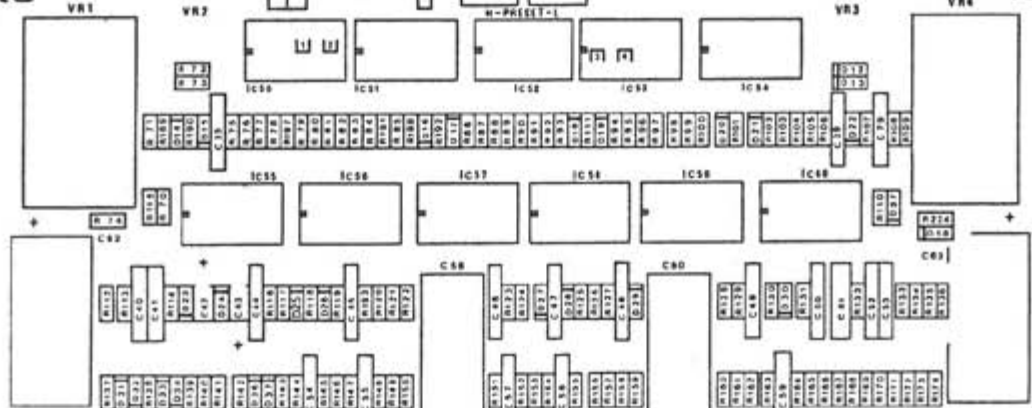
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R-12500

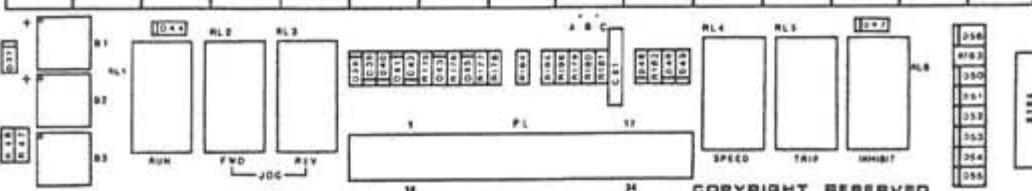
BRIDGE

WHEEL

LEGEND 30-11-85

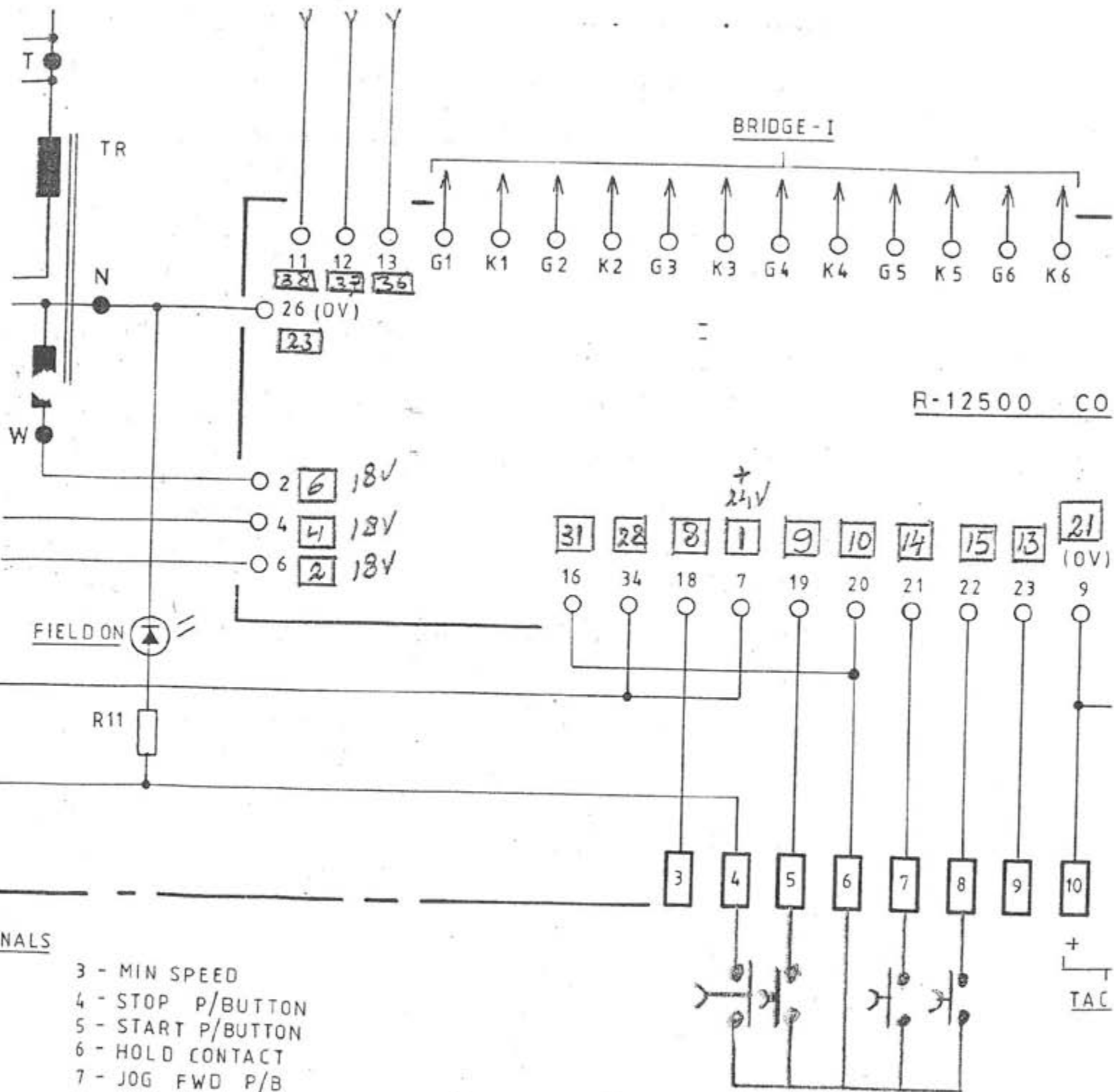


+ 12 VOLT	+ 5 VOLT	PHASE LOCK	FWD - REF	REV - REF	SPEED	BRIDGE - I	BRIDGE - II	B I - REF	B II - REF	CURRENT	TRIP	RUN	- 5 VOLT	- 12 VOLT
WIN SPEED	ACCELER	DECELER	JOG SPEED	MAX SPEED	B I - LIMIT	B II - LIMIT	SPD STAR	MAX VOLTS	NULL	PRESET - R	PRESET - A	IA - STAR	OVERVOLT	I - MAX



AF1435 PHASECON

FROM
C.T.



R-12500 CO

BRIDGE-I

FIELD ON

R11

+
TACH

TERMINALS

- 3 - MIN SPEED
- 4 - STOP P/BUTTON
- 5 - START P/BUTTON
- 6 - HOLD CONTACT
- 7 - JOG FWD P/B
- 8 - JOG REV P/B
- 9 - SPEED REF INPUT
- 10 -] TACHO INPUT
- 11 -] TACHO INPUT
- 12 - AUX VOLTAGE ERROR AMP INPUT
- 13 - +12 VOLT REF SUPPLY
- 14 - -12 VOLT REF SUPPLY
- 15 - CURRENT ERROR AMP INPUT REFERENCE
- 16 - VOLTAGE ERROR AMP OUTPUT
- 17 - " " " INPUT REFERENCE
- 18 - ACCELERATION OUTPUT REFERENCE

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