110V / 220V DC MOTOR CONTROL PCB MODULE

USER INFORMATION SHEET

A. CONNECTION DETAILS

Connections are made using the 8 pin terminal block on the PCB. The pinout of terminals on the PCB is as follows (Refer to diagram for pin numbering) :

PIN 1 :   110V / 220V AC POWER INPUT
PIN 2 :   110V / 220V AC POWER INPUT
PIN 3 :   ARM +
PIN 4:   ARM- / FIELD -
PIN 5 :   FIELD +
PIN 6:   SPEED POT HIGH
PIN 7:   SPEED POT WIPER
PIN 8:   SPEED POT LOW

The speed pot is already wired to pins 6, 7, and 8 on the PCB. If desired, the pot may be removed and mounted at any other convenient location. In such a case, keep the wire lengths to a minimum and avoid running the wires alongside any power cables. The use of a shielded cable is reccommended, especially in electrically noisy environments. Connect the cable shield to the system earth.

Pins 1 and 2 are used to connect the input power. Use 110V or 220V as per the model ordered by you. Connect a fuse of 2 times the motor rating in series for protection of the circuit.

Pins 3 and 4 are used to connect PMDC motors , or armature of shunt wound motors. Keep connecting wires as short as possible to minimise voltage drop on the conductors. Keep connecting wires away from any sensitive circuits, as they carry switching currents. Twisitng the wires together will minimise pickup problems. Connect an external slow blow fuse of 1.3 times the motor rating in series for protection of the motor. Pins 4 and 5 are used to connect the field of shunt wound motors. The field vlotage is 90V DC for 110V models and 180V DC for 220V models.

A switch or relay contact may be connected between the INHIBIT lug and pin 6 on the terminal block (SPEED POT HIGH) to control the motor operation. The motor will run when the contact is open, and stop when the contact is closed.

B. MAKING ADJUSTMENTS

Adjustments for optimum operation can be made by setting the four presets mounted on the PCB. Refer to the diagram for preset locations.

MIN : This is for setting the minimum speed. Set the speed control pot to minimum speed, and then adjust the MIN preset till the desired minimum speed is obtained. In case a minimum speed or zero is

desired, adjust the preset till the motor just starts moving, and the reduce the setting till the motor just stops.

MAX : This is for setting the maximum speed. Set the speed control pot to maximum speed, and then adjust the MAX preset till the desired maximum speed is obtained.

CL : This is for setting the current limit. Connect an ammeter in series with the motor, and set the speed control pot midway. Apply friction braking till the motor stalls, and adjust the CL preset till the ammeter reads the motor's rated current.

IR : This is for setting IR compensation for optimum speed regulation. Remove all load from the motor and set the speed control midway. Measure the motor speed with a tacho. Now connect the load to the motor, and adjust the IR preset till the tacho indicates the original no-load speed.

C. APPLICATION NOTES

VOLTAGE FOLLOWER / SPEED CONTROL THROUGH PLC : Disconnect the speed control pot from the PCB. The voltage to be tracked can be fed between SPEED POT LOW (Pin 8 on the terminal block), and WIPER (Pin 7 on the terminal block). The voltage can be derived from a tacho, D/A converter, etc. and a level of 10V corresponds to full speed. Set the MIN SPEED preset to zero in this case. Note that the input is **not isolated** from the AC supply.

BRAKING : Disconnect the motor positive lead from the PCB. Connect an SPDT relay and brake resistor as follows . The relay must be a break-before-make type.
> POLE : To motor positive lead.
> NO : To drive ARM+ terminal.
> NC : To one end of brake resistor.

Connect the other end of the brake resistor to the ARM- terminal. The motor will run when the relay is energised. This configuration has the advantage that the motor will brake if power fails.
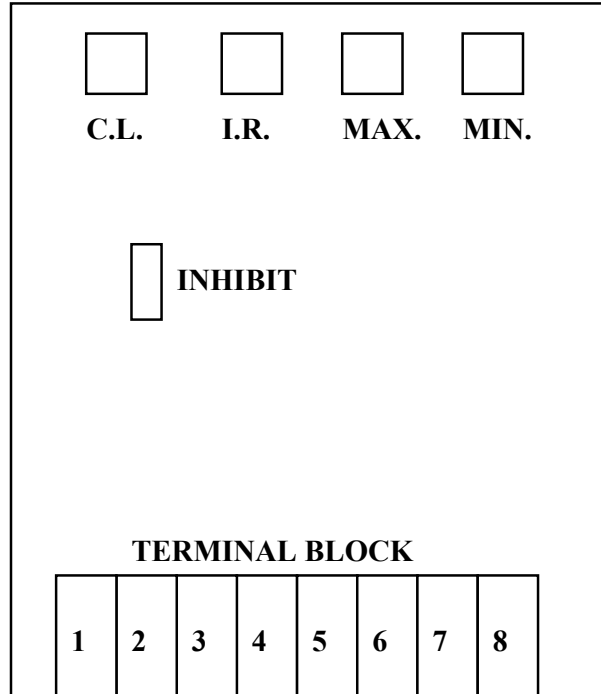
REVERSING : Disconnect the motor from the drive. Connect a DPDT relay as follows :
> POLE1 and POLE2 : To motor wires.
> NO1 and NC2 : To drive ARM+ terminal.
> NO2 and NC1 : To drive ARM- terminal.

Ensure that the motor is fully stopped , by using INHIBIT signal, before the motor is reversed, or else damage to both drive and motor can result.

```
┌─────────────────────────────────────┐
│   ▢        ▢        ▢        ▢       │
│  C.L.     I.R.     MAX.     MIN.     │
│                                      │
│   ▯ INHIBIT                          │
│                                      │
│                                      │
│         TERMINAL BLOCK               │
│  ┌──┬──┬──┬──┬──┬──┬──┬──┐           │
│  │ 1│ 2│ 3│ 4│ 5│ 6│ 7│ 8│          │
│  └──┴──┴──┴──┴──┴──┴──┴──┘           │
└─────────────────────────────────────┘
```

DIAGRAM OF PCB MODULE

PIN 1   **: 110 / 220V AC POWER INPUT**

PIN 2   **: 110 / 220V AC POWER INPUT**

PIN 3   **: ARM +**

PIN 4   **: ARM - / FIELD -**

PIN 5   **: FIELD +**

PIN 6   **: SPEED POT HIGH**

PIN 7   **: SPEED POT WIPER**

PIN 8   **: SPEED POT LOW**