This is how I believe the speed controller works.

IC 2 pins 1,2,3 and transistor Q1 control the trigger angle of the SCR's as follows.
Q 1 is normally held off by the raw 22 volt supply. At every zero crossing of the AC input this 22 volt rail drops to near zero volts for a very short time. At this point Q 1 conducts discharging C7. C7 then starts to charge again trough R 24 so producing a saw tooth waveform synchronised with the AC supply. When the level of this waveform becomes less than the voltage on pin 3 of IC 2 pin 1 of IC2 goes high. This low to high transition is differentiated by C 9 causing Q 2 to generate a pulse to turn on the SCR. The higher the voltage on pin 3 of IC 2 the earlier in the cycle the SCR is turned on increasing the conduction angle.
IC2B is just a summing amplifier. It compares the voltage on pin 6 which is roughly proportional with the actual motor speed with the desired speed reference on pin 5
IC2C generates a voltage proportional to the motor current by amplifying the voltage across the current sense resistor R21. A proportion of this voltage is summed with the desired speed signal to compensate for the resistance of the motor windings.
The circuitry around IC1 controls the rate at which the motor speed is ramped up at startup or if the speed pot was turned up rapidly.
IC2D compares the voltage across the current sense resistor with a preset reference voltage and if the current exceeds a certain value IC2D via Q3 causes the small SCR Q4 to latch on shutting down the speed controller and lighting the fault LED.
The circuitry around Q4 also prevents the motor from starting when power is applied and the forward / reverse switch is not in the stop position.

Les.