

# ELECTRIC TUBE EXPANSION SYSTEMS

## “WATTAGE” BASED TORQUE CONTROLLERS

### Why a “Wattage” Based Torque Controller is Right and a “Current” Based Torque Controller is Wrong.

A) Tube expansion can best be done by expanding tubes at a set torque value. Torque is nothing but a rotary force acting on the tubes. For a given drive, the 'RPM' being constant, torque becomes proportional to the drive power.

Hence, if the drive power is controlled for tube expansion, the results will be excellent. All tubes will be expanded equally. Supply voltage fluctuations which are very common, do not affect the performance of a wattage based controller as the controller will trip at a set wattage irrespective of the supply voltage.

B) In case of a current based tube expansion torque controller, the drive current can become proportional to the torque if & only if the supply voltage is absolutely constant. This is never the case. Practically, the supply voltages vary as much as 20% to 25%. This directly affects the expansion results as the drive trips at a set current. That means for a 20% higher supply voltage, the tubes will be effectively expanded by 20% more torque than the required one. Hence tubes will be over-expanded. For supply voltages less than normal, tubes will be under expanded proportionately.

Since, the supply voltages fluctuate quite often, the expansion results of current based controllers will be unpredictable. They will have no consistency.

It is our experience that a seasoned operator will more consistently expand tubes with just a drive than if he is to use a current based Torque Controller. Of course if he were to use a Wattage based torque controller, he would achieve near perfect tube expansions all the time.

**POWERMASTER is the only company in the world to offer you a choice of 2 Wattage based Torque Controllers.**



**PR-2000 - BUILT IN PRINTER**



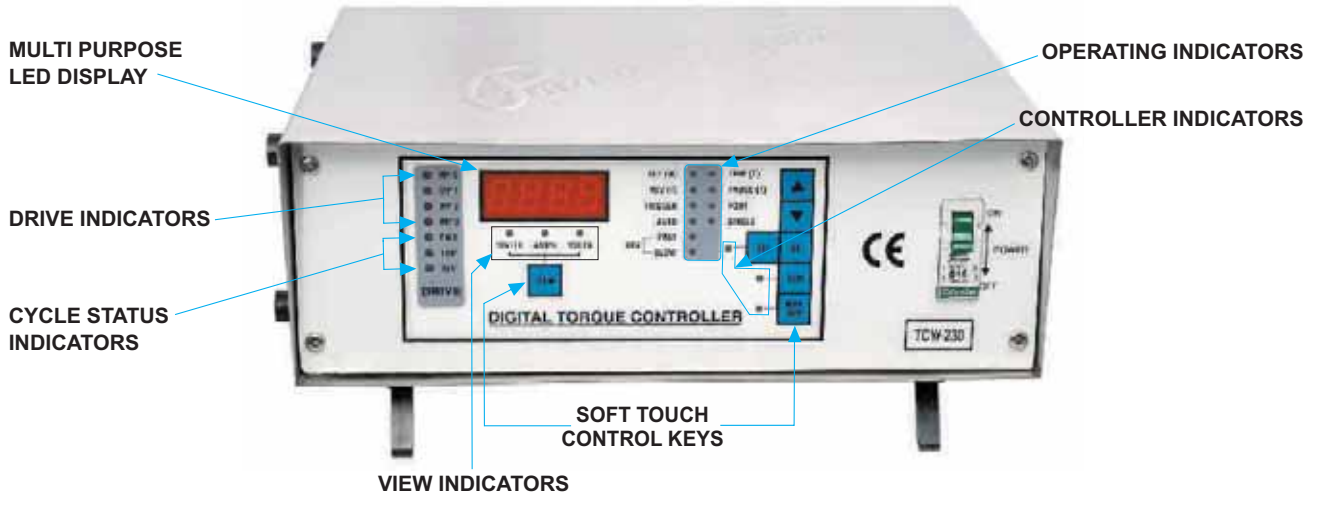
**PR-2000 - EXTERNAL PRINTER**

1. **PR-2000 Series**, with microprocessor control, built in printer and computer connectivity to download and study expansion values. Ability to generate 10 report formats for quality control of expanded joints. Operates with a remote control.



2. **TCW Series**, which is a less expensive alternate to the above but has features like a 'slow start' for the drives, automatic recognition of connected drives and automatic setting of max trip values for each drive.

# TCW TORQUE CONTROLLER



*Features :*

- 1) Fully Solid State Design - no moving parts - no wear and tear of parts - no noise - consequently long life.
- 2) Uses one main circuit board for easy maintenance.
- 3) Uses the latest micro-controller chip for control functions.
- 4) Accurately calibrated digital torque settings with a resolution of 1 watt makes torque settings accurate and can be easily reproduced for identical results.
- 5) Soft start has been provided for all drives. This feature reduces starting currents in the drive. As a result, life of carbon brushes & drive increases.
- 6) Connected drive is automatically recognised & indicated by means of LED on the torque controller.
- 7) Torque setting arranged in four different ranges to suit four different drives. Appropriate wattage range is automatically selected for the connected drive, hence drives can not be abused or overused.
- 8) Actual drive wattage (torque) is displayed. Set wattage (torque), drive current and line voltage can be seen by press of a button.
- 9) Trip time adjustable from ( 0.1 sec to 10 secs. )
- 10) Adjustable reverse time from ( 1 sec to 100 secs.)
- 11) Pause time (time interval between cycles) adjustable from ( 1 sec to 100 secs.)
- 12) Manual reverse by push button, in case of emergency.
- 13) Drive Speed adjustable in reverse rotation.
- 14) Hand (trigger) mode or foot switch mode, both are available.
- 15) Expansions can be carried out either in single cycle mode or auto repeat mode.
- 16) LED indicators provided for forward, reverse & trip conditions of drive.
- 17) MCB has been provided to protect the controller and drives against over current by short circuits.
- 18) Plug in type of PCBs reduce down time to minimum during trouble shooting.
- 19) All the spares inside the panel viz : PCBs, Transformers, CT, Relays DPM etc. can be replaced by use of only a screw driver.
- 20) Superior SCR technology has been incorporated rather than triacs. SCRS have much better voltage, current & dv/dt ratings than triacs. This leads to greater reliability & the power circuit becomes almost failsafe.
- 21) Powermaster has over 1000 TCW Torque Controllers in active use worldwide since its inception in year 2000.

Microprocessor used : 89C55WD (8 bit)  
 Clock Frequency : 12 Mhz  
 Programme Memory : built in  
 Real Power Measurement upto : 2 KW  
 Voltage, Current sampling rate : 50 times/sec.

Model No.	Voltage Single Phase 50/60 Hz	Weight (kg)
TCW-110	110 V	7.5
TCW-230	230 V	7.5

**Note :** Refer to Pg. 23 & 24 for Drive Units, Voltage Stabilizers for use with TCW torque controllers.  
 All TCW torque controllers are supplied with operation manuals.