

INITIAL SET UP INSTRUCTIONS

TCW-09 TORQUE CONTROLLER



1. Before connecting to a power source. Always connect the drive unit to the back of the TCW by the 14-pin plug and make sure it is twisted into the lock position. This is crucial to the wellbeing of the unit. Connect the main lead.
2. Plug into a either a 220v or 110v supply depending on the unit supplied.
3. The unit will go through its internal checks and will illuminate the correct drive unit lamp indicator.

SETTING TORQUE, DRIVE AND DWELL TIMES

4. **PRESS SET** on the controller indicators.
5. By using the Soft Touch Control Keys go up and down as desired to set the Torque Wattage. This can be determined by doing dummy rolls on test pieces or measuring the tube for the finished value to achieve a gas tight seal. Once at a value, **PRESS OK**. This will be the torque value when the unit will stop rolling.
6. The next value to set is the trip time in seconds before the unit goes into reverse. Again, **PRESS OK**.
7. The reverse time is for the unit to "Back Out" the expander from the rolled tube. **PRESS OK**
8. The final value is the Pause Time. This is to allow the operator to move the rolling unit and expander to the next tube before the auto cycle starts again, Once set, **PRESS OK**.

The next option is for either AUTO or SINGLE. We suggest **SINGLE** especially at first as the machine will go into continuous cycles on Auto. Then **PRESS OK**.

The final option is for fast or slow reverse. Once selected **PRESS OK**.
Then **PRESS RUN**.

On the soft touch control keys, you also have a manual reverse button if required and a View button to allow you to see all values set.

DETERMINING THE TORQUE VALUE BY FINISHED ID.

- Known Tube Material.
- Tube OD.
- Tube Sheet Hole Size.

KNOWN TUBE MATERIAL

These materials and percentages can be guideline values to rolling tubes of like materials.

| | |
|----------------------------|-------|
| Copper & Cupro Nickel | 8-10% |
| Steel & Carbon Steel | 7-8% |
| Stainless Steel & Titanium | 4-5% |
| Admiralty Brass | 7-8% |

TEST CHART FOR DETERMINING PROPER AMOUNT OF TUBE EXPANSION

| | Tube Test Values | Test 1 | Test 2 | Test 3 | Test 4 |
|----------|---|--------|--------|--------|--------|
| A | Tube Sheet Hole Size | .757 | | | |
| B | Tube Outside Diameter (OD). | .750 | | | |
| C | Clearance (A Minus B) | .007 | | | |
| D | Tube Inside Diameter (ID). | .620 | | | |
| E | Tube ID when Metal to Metal Contact is reached. (D Plus C). | .627 | | | |
| F | Tube Inside Diameter after rolling. | .636 | | | |
| G | Actual amount of roll on diameter (F Minus E). | .009 | | | |

You can use this chart to your advantage by predetermining both the % of wall reduction required and the actual inside diameter which should be rolled. After the completion of **"E"** you realize any additional increase of the inside diameter of the tube will result in actual wall reduction. Since the amount of wall reduction greatly determines the quality of the tube joint, you should arrive at the % required for your application prior to tube rolling.

By subtracting the tube inside diameter **"D"** from **"B"** you determine the actual wall thickness. This example would therefore be .130". If you then take the 7% wall reduction times the wall thickness you arrive at .0091". Adding .0091" (**"G"**) to .627" (**"E"**) we get **"F"** the inside diameter of the tube after rolling (**.636"**).