

# Thermocouple Welder

## Model 300 Tig Welder

**THERM-X**  
THE TEMPERATURE SPECIALISTS

- **Easy to use**
- **Reliable**
- **Portable**
- **Repeatable**
- **Economical**
- **WideRange**

The Model 300 is a TIG (tungsten-inert gas) welder that operates in conjunction with a bottle of argon gas and a pressure reducing valve. The energy from an electrical arc, flowing through two thermocouple wires, raises the temperature of the two wires to their melting point. At the arc's termination, the molten wires cool to form a perfectly welded thermocouple. Since this is not a gas welder, there is no contamination from a third metal used in making the junction, nor do air-borne particles or gasses contaminate the weld. The two different wire compositions are completely alloyed in the junction and exhibit less than 0.01°C Variation from one thermocouple to the next at the same temperature.

The welding of the thermocouple is done by placing the two wires into the wire holder, inserting the holder into the weld cavity, and pressing the WELD push button which starts a sequence of events as follows:

**Argon purges the weld cavity and continues to flow. The Argon flows into the chamber automatically or can be admitted into the weld chamber by pushing the PURGE push button**

**A high-frequency field is generated inside the weld cavity which ionizes the argon.**

**A heavy current (about 12 amps) flows from the tungsten tip to the thermocouple wires, starting the weld process. The start of current flow terminates the high-frequency field. The argon remains ionized because of the current flow.**

**The 12-amp welding current continues for about 0.1 second and is terminated by a timing circuit initiated at the start of current flow.**



The Model 300 operates equally well with wire from 20 to 40 gauge with the time adjustment on front panel. In all cases, a firm, shiny weld is made. In the case of lighter wire (i.e. 40 gauge) the excess energy contained in the arc is dissipated as heat in the wire holder. The holder acts as a heat sink and as an electrical conduit for the arc. The jaws are made of copper for high thermal conductivity. The holder must be held against the copper weld cavity during the welding period to ensure a return path to ground for the arc.

### Dimension:

**Width 8 3/4"; height 6 1/4", depth 6 3/4", weight 10 lbs, power 115VAC, 60 Hz.**

### Pricing:

#300	Welder with holder	\$1325.00
#300-E	Replacement Electrode	\$3.00
#258-H	Replacement Holder	\$125.00
#258-H6	Six Foot Hose Assembly	\$15.50
#258-R	Regulator	\$160.00

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## MODEL 300 THERMOCOUPLE WELDER

### ELECTRODE ADJUSTMENT

The rear of the instrument has a knob used to tighten the grip on the tungsten electrode. Rotating the knob counter-clockwise loosens the grip on the tungsten rod so that it can be removed from the front of the instrument using a pair of needle-nose pliers. The tip of the electrode should be clean and shaped into a sharp cone. When re-installing the tungsten electrode, use the depth gage provided to place the tip about .020 inch from the end of a typical pair of thermocouple wires inserted in the wire holder.

### PRECAUTIONS

The instrument is safe as long as a finger is not inserted into the weld cavity. The welding current initiates at the welding electrode and travels through the wires to the copper jaws to the welding cavity brass ring. Do not put a finger in this cavity. Insert only the holder that is provided as part of this equipment.

The model 300 thermocouple welder is used in conjunction with bottled argon gas which acts as the purging agent. Argon flows into the weld cavity and drives out oxygen so the welding of the thermocouple can take place in an inert environment.

Argon, inert gas, is not a dangerous substance. Bottled gas, however, is potentially hazardous since it is held in very high pressure. In addition, if large amounts of argon are released in a closed space, the normal atmosphere of 20% oxygen and 80% nitrogen can be driven out. Any personnel in a space where argon is leaking must leave immediately.

A Required safety precaution is to chain the argon bottle to the wall or to a work station so that it cannot fall over. If there are any questions regarding operation or maintenance of the model 300 welder please contact our office.

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# Thermocouple Welder

- EASY-TO-USE**    **Single push button operation for a wide range of wire sizes**
- RELIABILITY**    **Produces high integrity TIG welds**
- PORTABILITY**    **Light-weight welder weighs just 10 pounds**
- ECONOMY**        **Special preparation of wire not required prior to welding**
- WIDE RANGE**     **Welds wire sizes from 44 to 20 AWG**

## INSTALLATION

Connect a pressure regulator to the bottle of argon and use an argon hose of the appropriate length to connect the valve to the welder.

Pressure at the welder should be set at 2 to 3 psi. The line cord simply connects to 115v, 60hz power . The instrument is equipped with a 20a-250v fuse.

## OPERATION

the wires to be welded are stripped and placed in the holder so that the bare wires are in contact with each other and the copper jaws of the holder. allow the bare wires to protrude about two diameters (for 20 gauge about .064 to .090). the amount of wire protruding will determine the final size of the welded junction.

for 20 gauge wire the welding electrode should be set so that it is .050" away from the end of the wires. this can be reduced slightly for smaller wire. this adjustment is not critical. the depth gage is provided to set this dimension.

place the holder in the weld cavity making certain that the copper jaws are in contact with the ridge inside the cavity. push the "purge" button for about one second to clear the oxygen before each welding session. pushing the "weld" button starts the welding cycle which the timers will automatically terminate.

the timing should be set to the minimum weld time which produces a satisfactory weld. this is not critical as the holder acts as a heat sink to limit the weld.

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