Arc Melt Furnace- Single Arc

MODEL SA-200

Arc melt furnaces provide a cost saving alternative to resistance or inductance heating furnaces for many applications. Rather than heaters or induction coils, an electric arc is used to heat up and/or melt parts. Our smallest Arc Melt Furnace can instantly reach temperatures over 3000C, and will cool down to room temperature in minutes. The SA-200 Arc Melt Furnace is simple to operate, extremely reliable and has a low acquisition and operation cost. The available options such as load locks, rotating hearth, and more, make this furnace versatile and adaptable.

MRF Model SA-200 bell jar arc melting furnace specifications:

- **Operating temperature: over 3500 Deg. C.**
- **Bottom loading configuration.**
- **360° viewing through Pyrex glass between top and**
- **bottom brass base.**
- **Vacuum chamber construction**
- **Copper stinger with tungsten electrode.**
- **Copper hearth plate 2.0" dia. (51mm dia.) usable.**
- **Power Supply: 300 Amp @ 60% DS, 15Kva.**
- **Water-cooled power cables**
- **Inert gas system with relief valve.**
- **Pumping system with roughing pump, vacuum gauge and valve.**
- **Low cost**

Common Applications:

- Powder melting
- Creating alloys
- Metallic buttons
- Annealing
- Crucible welding
- Material densification

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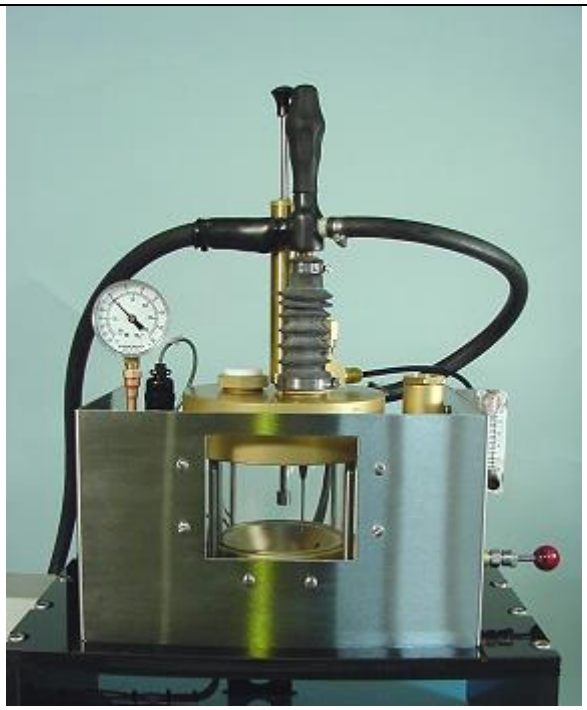
- Arc Casting
- High purity melts

Major system Components:

1. Furnace Chamber:

- The chamber consists of a brass bottom and top with a Pyrex viewing tube.
- The chamber top and base are water-cooled to maintain a chamber temperature below 50C (120F) during normal use.
- The chamber is rated for vacuum to 10^{-2} Torr (Mbar)
- The chamber top houses the stinger assembly
- Access to the furnace for loading and unloading is through the bottom cover.
- Clamps are provided to isolate and seal the chamber atmosphere
- Vacuum and gas port is supplied.
- Three welding glasses are provided, allowing arc viewing from three sides.



Arc melt chamber with stinger. The welding glass has been removed for visibility. This system houses a load lock, splat rod and single stinger.

Basic unit with gas and vacuum system. Welding glasses and shield have been removed for clarity.

2. Electrode stingers:

- The copper water-cooled stinger (cathode) with replaceable tungsten electrode provides the melting tip.
- A water-cooled power cable supplies power to the stinger.
- A ball joint allows the stinger to move easily around the chamber.
- The stinger is sealed and electrically isolated from the operator.
- The stinger tip is a 0.093” (2.38 mm) dia. thoriated tungsten rod

3. **Hearth Plate:**

- The hearth plate (anode) is copper and has an o-ring vacuum seal.
- Cavity dimensions: 2.0" (51mm) diameter
- Custom cavities in the bottom hearth plate are provided at no charge
- An optional rotating hearth is available (1- 60RPM)

4. **Inert gas system:**

- This furnace system was designed to operate in argon.
- A pump-out followed by a gas backfill provides a fast way to remove all oxygen from the chamber.
- The standard positive pressure for operation is .14 kg/cm sq (2PSIG).
- A relief valve and a 30/30 compound gauge (30 PSIG x 30 in. Hg) are located on the chamber.

5. **Vacuum System:**

- A 4CFM (113-LPM) evacuation pump is offered standard with a manual vacuum valve.
- A back-to-atmosphere valve and vibration isolators are provided.
- A vacuum level in the 10^{-2} Torr (Mbar) range can easily be attained.

6. **Power Supply:**

- 300 Amp Power Supply @ 60% DS, 15 Kva, 230/380/460/575V, 3ph, 50-60Hz standard.
- Foot control provided for modulating power.
- Power cables, water-cooled.

7. **Water Cooling System:**

- Supplies cooling water to the various parts of the furnace including the top and bottom flanges, power cables, and stinger rod.
- Water inlet and outlet manifold provided with flow indicator.

8. **Performance:**

- Maximum attainable temperature is above 3500^{O}C
- Operating pressure: 2PSI (.14kg/cm^2) and 10^{-2} Torr (Mbar) vacuum.
- Outer shell temperature: less than 50^{O}C.

9. **Testing:** All equipment is fully tested prior to shipment. The customer is invited to inspect the equipment, witness pre-delivery inspection testing and receive training.

10. **Documentation:** Two sets of Installation and Operating Instructions, component manuals and assembly drawings are included with the equipment - one hard copy, one copy on CD.

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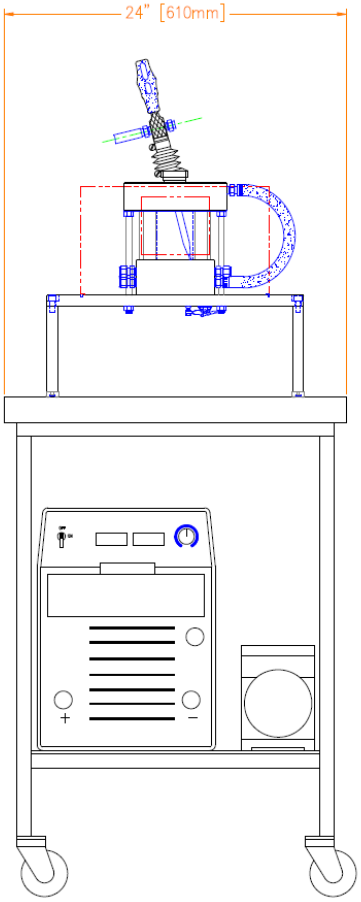
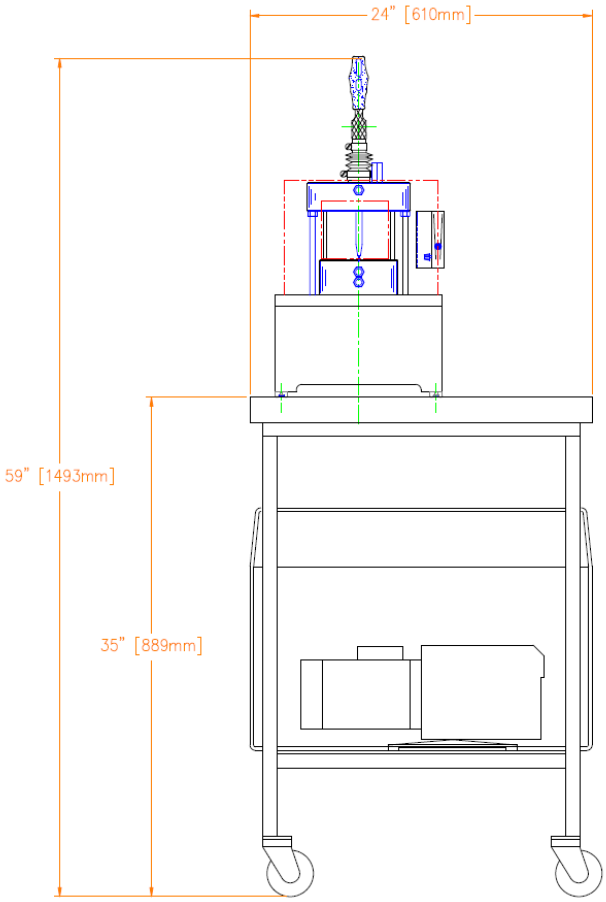
11. Options & Accessories

- Load Lock
- High Vacuum
- Oxygen Monitor
- Rotating Hearth
- Tri-arc (three stingers) (Model TA-200)





Utilities

- ***Electricity***: 15 Kva, 208-240/380-460V/575V/ 3 ph / 50-60 Hz.
- ***Water:*** 7.5 LPM flow (2GPM), inlet temperature 68F (20^{O}C) at 40PSI (3.5 kg/cm^{2})
- ***Gas***: 10 LPM Argon at 40PSI (3.5 kg/cm^{2}).

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