

Rankin Automation MIG-Carbide Manual Vibratory Feeder Assembly

Reference Manual & Operating Instructions



Rankin Automation div. of Broco, Inc.
10868 Bell Ct.
Rancho Cucamonga, CA 91730
Tel: 909 483 3222 Fax: 909 483 32333
Sales@Brocoinc.com www.Brocoinc.com

MIG CARBIDE

Vibratory Feeder Assembly

This is a turnkey system for a Tungsten Carbide feeder which is capable of delivering all grades of carbide to a hand-held, semi-automatic MIG (GMAW) gun (not included).

Included in the system are the following:

- Vibratory feeder assembly with remote control
- Built-in Carbide hopper
- Five (5) feet of .625" I.D. drop hose
- One (1) aluminum metering funnel
- 4" metering tube
- 5" SS short guide tube w/clamp for MIG gun mounting (*MIG gun not included*)
- 115 VAC line cable with three-pronged plug (No plug on 230 VAC units)
- Current sensing reed with cable

Control functions and over-all description of system:

Power is supplied to this system via 115 VAC (1 Amp fuse) 60 cycle line cable with three-prong plug. An optional 230 VAC 50/60 cycle system is available. A red light indicates when the vibrator is on.

•**Automatic Mode:** A magnetic current-sensing relay cable with a reed switch assembly is used to provide an automatic start signal for semi-automatic, hand-held operation. When the function switch is in the **automatic mode** (up position), the start signal comes from the magnetic reed attached to one of the weld cables. **Important:** The magnetic reed must be mounted **90 degrees** across either weld cable with the **flat side against the cable. Do not mount the magnetic reed parallel with the cable.**

•**Manual Mode:** When the function switch is in the **manual mode** (down position), the system feeds continuously.

•**Carbide Feed Rate:** The carbide feed rate is controlled by a single-turn control pot, mounted on the cover panel of the remote control.

•**Mounting:** Use existing bolts to mount unit on your mount plate.

•**Carbide Feed:** The advantage of this trough-fed system is that it can accurately meter any size carbide granule, pellet or particle without the need to add any new system component or adjust any component of the system other than the speed pot. The feed-rate pot allows for a wide range of feed rates with a simple turn of the dial, while the unit is in full operation. There is no need to stop in order to make and test mechanical adjustments.

Additional Information On Welding With MIG Carbide

Preparation: Always try to grind the weld area to clean, white metal. Many shops do not clean to save time and money. The surface does not have to be perfect, but at least touch the surface.

Wire: The most versatile wire size is .045 DIA. wire. This wire can be used with the higher voltage and lower amps to make thinner weld beads with deep penetration. The best wires are triple or double de-oxidized (Aluminum, Zirconium, Titanium). They make a very clean puddle for the carbide to drop though and have a high tolerance for dirty base metal surfaces.

Other wires can be used, for example, high-Chrome/High Carbon, small-diameter hardfacing wires.

Carbide Depositions: A mixed carbide (15-30 mesh size) is recommended. Many MIG carbide users are now zeroing in on 12-25 mesh size or something close to this range—about the size of very coarse sand. For very fine particle abrasion use 20-30 mesh size—slightly coarser than beach sand. The best choice for general service is the 15-30 mesh size. For pure rock service use 5-10 or 8-12 mesh size. For pure fine sand service use 20-30 mesh size with hardfacing wire.

Screening Used Carbide: After several re-cycles, used carbide tends to pick up over-sized particles, splatter, dust, dirt, etc. This contamination will begin to affect the weldability. Screen the re-cycled carbide through 8" diameter Tyler sieve screens of the same mesh size as your carbide. For example, if you are using 15-30 carbide, buy two screens and one bottom pan. The top set would be 15 mesh. The middle set will be 30 mesh. Discard or recrush everything on top of the 15 screen and throw everything in the bottom pan. (We can furnish Tyler screens.)

Gases and Voltages: Argon/Oxygen (2%) is the most popular mix. Pure Argon can be used, however it is colder. 75/25 (75% Argon/ 25% Carbon Dioxide) is another choice. Pure CO₂ is the cheapest gas and can be used with higher voltage. In fact, the higher the voltage, the flatter will be the bead. All gases can be used with high or low voltage:

Low heat	24-26 volts
Medium heat	27-29 volts
Hot	30-33 volts

Minimizing Distortion: To minimize distortion (especially on thinner parts), use lower volts and amps with pure Argon. Use preheat on all parts to eliminate or minimize distortion. Most thick and wide ledges can be made almost flat with lower weld settings, medium preheat and use of clamps. Thinner parts must be pre-bowed and warped (along with pre-heat). Most thin parts are bowed .5 to .75 inches and warped about .5 to 1.0 inch.

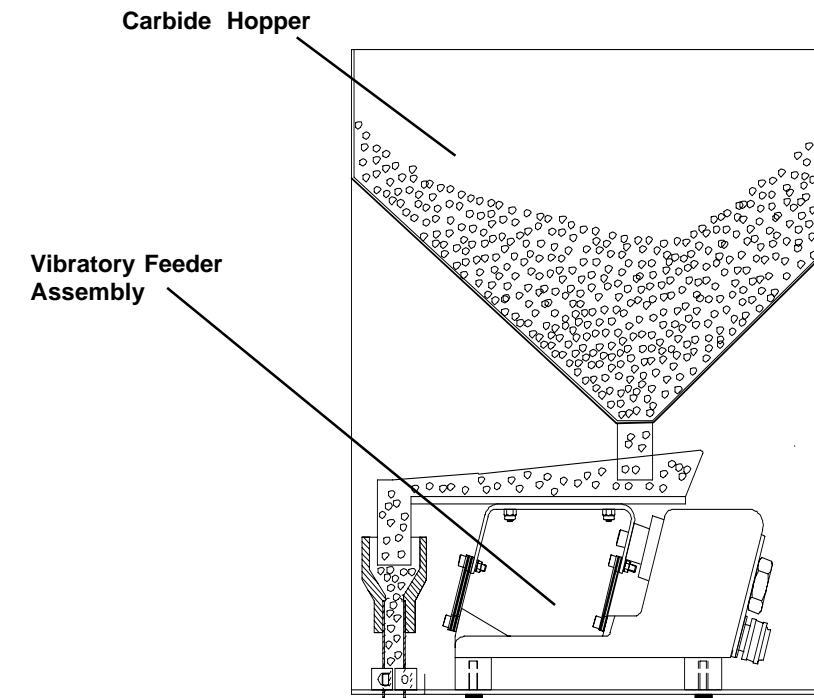
Typical Weld Settings: Weld settings for medium, hand-held weld speeds would be the following:

Wire Size	.045	.062	.093
Volts	29-30	29-31	30-32
Amps	230-245	290-300	325-360
Argon or Argon/O₂			
Low flat bead shape with medium penetration			

Welding Techniques: Single layer welds are recommended. Multiple layers tend to dissolve the carbide in the lower layer and produce a very hard deposit that will chip and spall off with only light impact. Use oscillated beads about 5/8" - 1" wide (1.5" max). Oscillation frequency should be 70-85 cps (cycles per second). Aim carbide into the **trailing side** of the arc puddle. The aim point is critical for good carbide distribution. If these basic parameters are followed, reliable work can be readily produced by any weld shop.

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SYSTEM COMPONENTS



Carbide Hopper

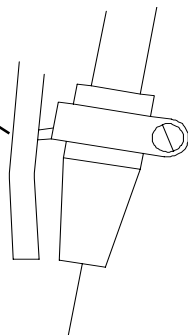
Vibratory Feeder Assembly

5' Drop Hose

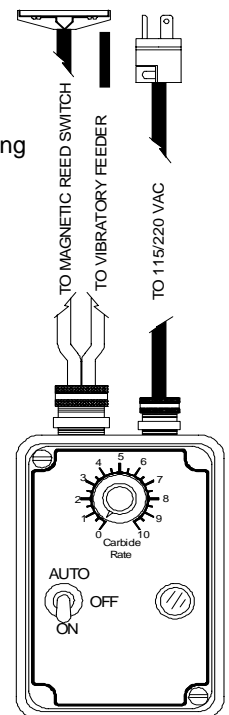
Guide Tube & clamp for Mounting on your MIG gun (MIG gun is not included)

INCLUDES:

- Vibratory feeder assembly with built-in control
- Carbide hopper
- Five (5) feet of .625" I.D. drop hose
- 6" SS short guide tube w/clamp for MIG gun mounting
- 115 VAC line cable with three-pronged plug
- Current sensing reed with cable
- All screws and nuts for assembly
- Remote table-mount control unit



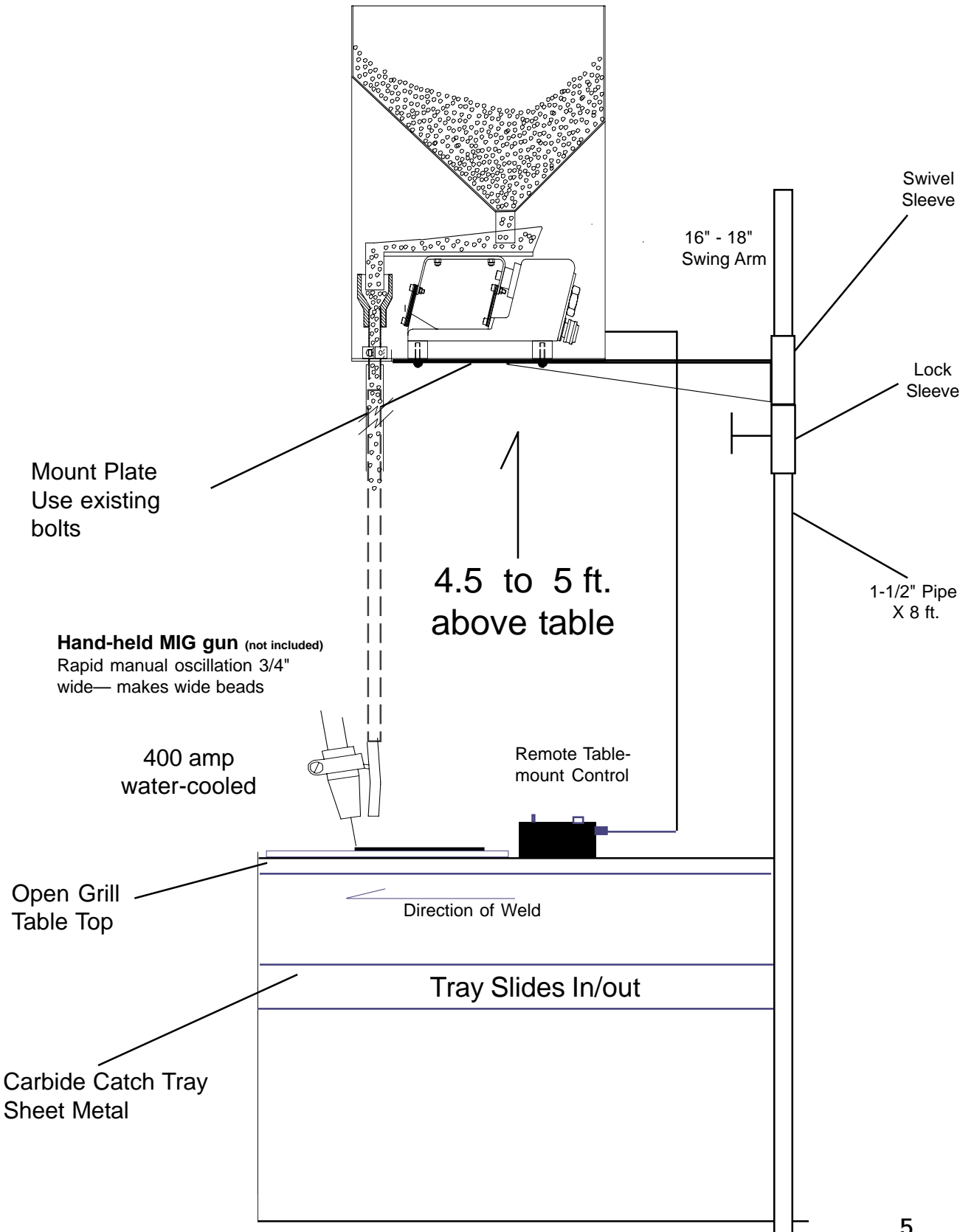
Remote Control Pendant

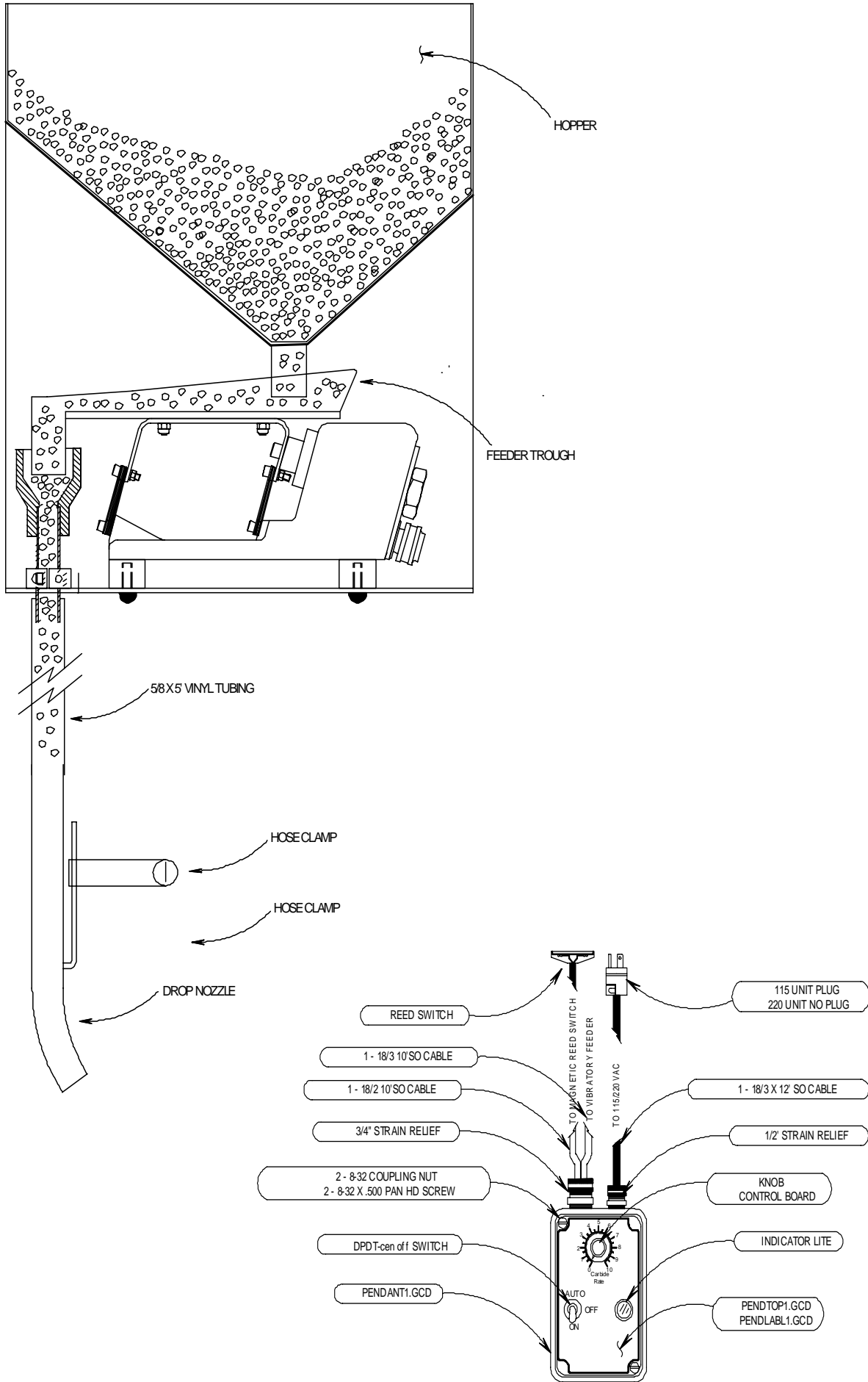


TYPICAL INSTALLATION

MIG CARBIDE

Vibratory Feeder Assembly





Reed Switch Connection

