BUG-O SYSTEMS
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Powerful Solutions for Welding and Cutting Automation with Precision and Versatility!

The Modular Drive System is a powerful machine that allows the operator to custom configure one machine for various applications and runs on standard BUG-O SYSTEMS Rail.

The modular design allows the user to quickly reconfigure the unit for straight line cutting or welding, stitch welding or weave welding, all with the same machine!



The Modular Drive System is the only product in the industry that allows the user to configure one machine for various automated applications, now and in the future!

Future development has been engineered into the system allowing its modular components to be easily upgraded. As tomorrow's technologies are introduced, the Modular Drive System can be enhanced to take advantage of new features and capabilities as they are perfected. Other systems will be obsolete as the Modular Drive System will remain "state of the art" in portable motion control!



The Modular Drive System produces precise, accurate cuts and welds.

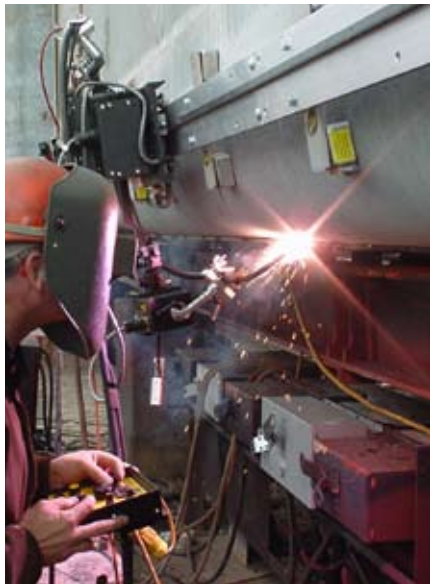
The Master Drive Unit has a high torque, low inertia motor for precise stops and starts and a dedicated fail-safe brake with three times the stopping and holding power of the motor. The unit is equipped with motor overload protection which turns the motor off and engages the brake whenever an excessive load is placed on the machine. In addition, the Master Drive features closed loop speed control for adjustable, repeatable control of critical welding or cutting parameters, and closed loop position control to prevent creep.



Shown Above - Vertical Weld with Linear Weaver



Shown Above - Vertical Weld



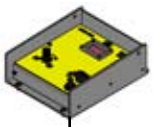
Shown Above - Overhead Weld with Pendulum Oscillator

Assembling a Modular Drive System is Easy!

Choose from the options below to fit your application.

1 Control Modules

MDS-1002
Straight Line Module



MDS-1004
Programmable Stitch Module

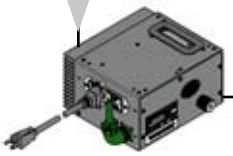


MDS-1005
Weaver Control Module



2 Master Drive Units

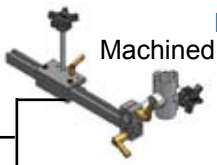
MPD-1000 120 VAC
MPD-1002 240 VAC



Choose from the following options:

Cutting

MDS-1050
Machined Rack Cutting Group



Welding

MDS-1040
Machined Rack Welding Group



Weave Welding (Use MDS-1005 Weaver Control Module)

WPD-1100
Linear Weaver

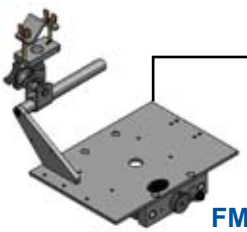


or

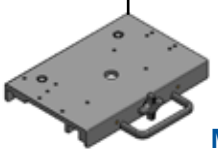
WPD-2100
Pendulum Weaver II



3 Carriages



FMD-1105
Hi-Flex Carriage

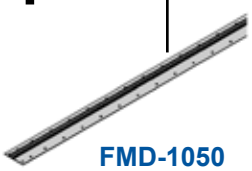


MPD-1065
12" Releasable Carriage



BUG-5910
Tube Carriage

4 Rails

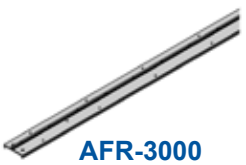


FMD-1050
Hi-Flex Rail



ARR-1080
Aluminum Rigid Rail 8'

ARR-1085
Aluminum Rigid Rail 4'



AFR-3000
Semi-Flex Rail



BRR-1180
Bent Rigid Rail

5 Attachments



FMD-
Vacuum Cups



FMD-
Magnets



ARV-
Vacuum Cups



ARM-
Magnets

For more information on vacuum cups, magnets and rails, please see the corresponding rail page in the "Rails and Attachments" brochure in order to match the correct attachments with your rails.

Control Modules

A Control Module plugs onto the top of the Master Drive Unit and operates various machine functions. Three Control Modules are available; for straight-line cutting and/or welding, programmable stitch welding and one for weave welding capability.

Control Modules

The **MDS-1002 Straight Control Module** provides direction and speed control for continuous cutting or welding.

The **MDS-1004 PROGRAMMABLE MODULE** provides stitch controls for welding or cutting with the Modular Drive System. All stitching parameters are set and displayed on a graphic screen. This allows each setting to be set exactly the same every time.

The **MDS-1005 Weaver Control Module** adds a pendulum weaving motion to the Modular Drive System. The Pendulum Weaver is particularly useful for weaving fillet welds in a corner joint.



MDS-1002 Straight Module



***MDS-1004 Programmable Stitch Module**



MDS-1005 Weaver Control Module

*MDS-1004: Program Stitch by distance, automatic stop and/or return to start at the end of the cycle, independent timers for puddle-buildup.

Master Drive Unit

At the heart of the Modular Drive System is the Master Drive Unit which houses the motor, speed control board, power supply, and clutch, that allows rapid manual positioning of the carriage anywhere along the track. The unit runs from 2-120 in/min (51-3048 mm/min) with a vertical load capacity of 60 lbs (27 kg) and a horizontal load capacity of 100 lbs (45 kg).

Order reference:

MPD-1000	120	VAC/50-60 Hz
MPD-1002	240	VAC/50-60 Hz
MPD-1004	42	VAC/50-60 Hz



MPD-1000 Master Drive Unit

Carriages

Aluminum Rigid and Semi-Flex Rail Carriages

Two carriages are available for the Modular Drive System when using BUG-O Aluminum Rigid and Semi-Flex Rails.* One is a releasable 12” carriage equipped with an engagement knob that allows the unit to be placed anywhere along the track. Also available is an 18” carriage which has an extended deck for mounting accessories, wire feeders, etc. (MPD-1055)

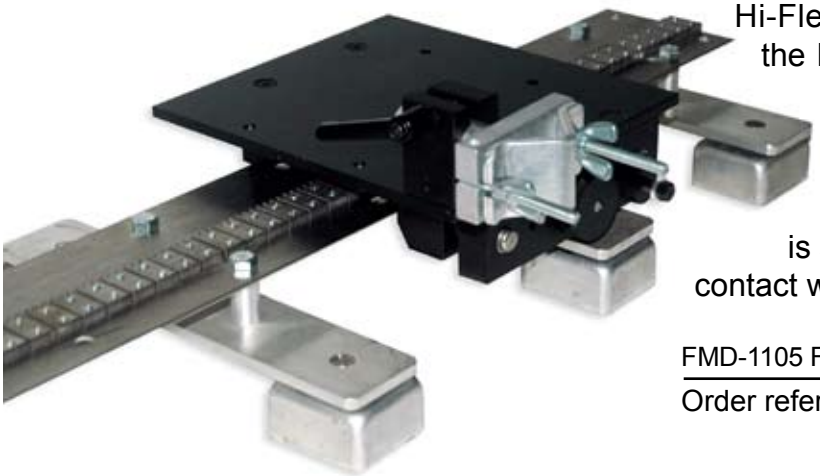


MPD-1065 Releasable Carriage 12" on Aluminum Rigid Rail.

Order reference: **MPD-1065** Releasable Carriage 12"

Hi-Flex Carriages

Hi-Flex carriages are designed for use with the Modular Drive System when running the equipment on BUG-O Hi-Flex Stainless Steel Rail.* Each carriage has a built-in quick release for mounting or removal at any point along the rail. A cable anchor is also included to keep welding cables and contact wires away from the work surface.



FMD-1105 Flex Rail Carriage w/Cable Anchor on Hi-Flex Rail.

Order reference: **FMD-1105** Drive Carriage

Bent Aluminum Rigid Rail Carriages

For applications using the Modular Drive System on BUG-O Bent Aluminum Rigid Rail,* a split carriage is available. This releasable carriage can be placed anywhere along the track and easily adjusts to various work diameters. (For outside radii only)



BUG-5910 Tube Carriage on Bent Aluminum Rigid Rail.

Order reference: **BUG-5910** Tube Carriage

* Note: see Rails and Attachments brochure for information on BUG-O Systems rails.

Weaver Control Module

The Weaver Control Module operates the Pendulum or Linear Weaver, and the Master Drive Unit. The Control Module features include: a digital readout and control knob for longitudinal travel speed; a switch for Forward/Stop/Reverse tractor control; an amplitude knob to set weave width from 1/8"-2" (3-50 mm); weave speed control up to 100 in/min (254 cm/min); controls for left and right dwell; a knob to control steering up to 2" (50 mm), either side of center; weld contact; and a power On/Off switch. One of four weld patterns can be chosen using the mode selector switch, as shown in the figure below.

Weaver Control Module

Order reference: **MDS-1005**

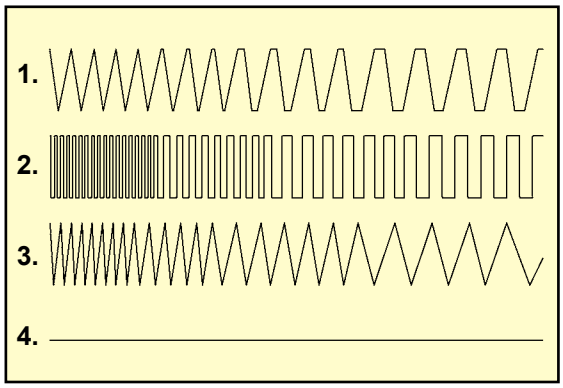
Features:



MDS-1005 Weaver Control Module

Digital display is factory set at cm/min; Field convertible to in/min.

Weld Patterns:



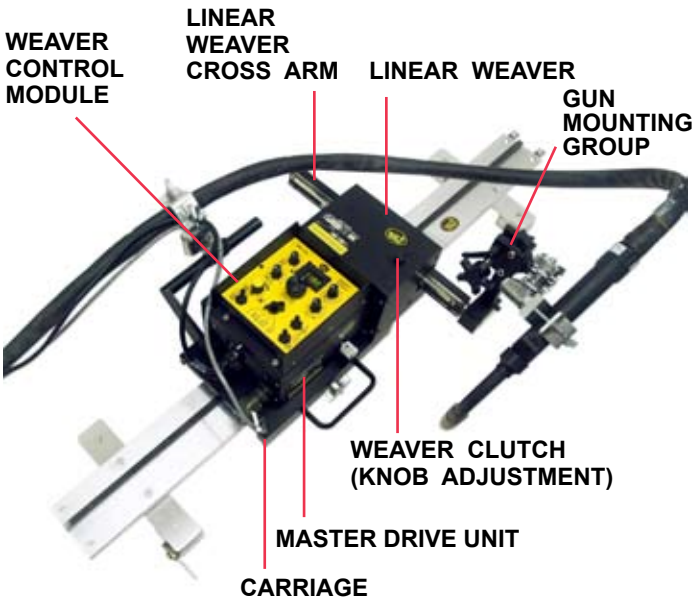
1. **RUN:** In this mode, power to the drive unit is always on and the machine travels continuously both during weave and dwell. Weave speed and dwell time both affect the weld pattern.
2. **STEP:** The unit travels only during dwell, and stops during the oscillator cross stroke. Changing weave speed does not effect the weld pattern – dwell time does.
3. **TRACTOR STOP ON DWELL:** The tractor travels during weave stroke; the tractor and weaver stop during dwell.
4. **NO WEAVE:** In this mode oscillation is stopped. Only the tractor is powered. This mode is used for stringer passes.

WPD-1100 Linear Weaver

The Linear Weaver and the Weaver Control Module give the Modular Drive System linear weave motion, producing welds from 1/8" to 2" (3-50 mm) wide. The Linear Weaver bolts onto the front of the Carriage and the Weaver Control Module plugs onto the top of the Master Drive Unit, as shown in the figure below. The Linear Weaver also has motor overload protection which turns off the motor when too much load is placed on the Linear Weaver.

Linear Weaver

Order reference: **WPD-1100**

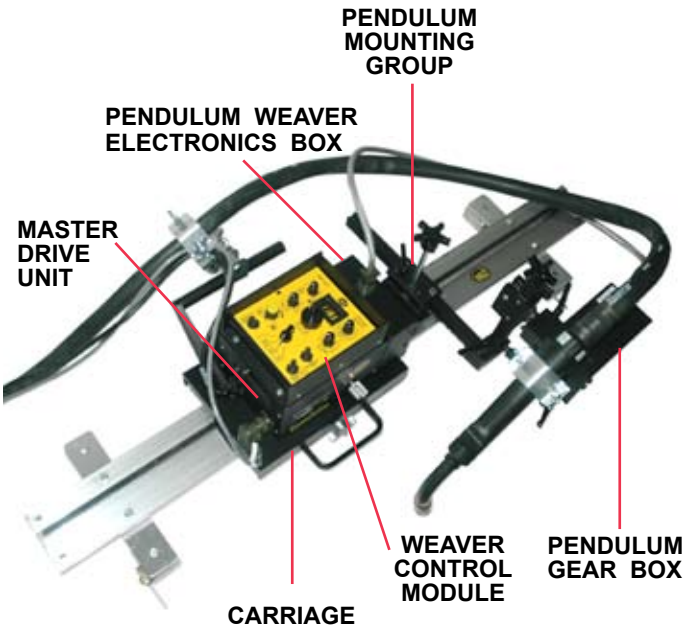


WPD-2100 Pendulum Weaver

The Pendulum Weaver and the Weaver Control Module add a pendulum weaving motion to the Modular Drive System. The Pendulum Weaver is particularly useful for weaving fillet welds in a corner joint. The Pendulum Weaver bolts onto the front of the carriage and the Weaver Control Module plugs onto the top of the Master Drive Unit, as shown in the figure below. The Pendulum Weaver has a heavy duty planetary gear box with powerful output for rotating welding gun and attachments.

Pendulum Weaver

Order reference: **WPD-2100**



Features:

The Linear/Pendulum Weaver and Weaver Control Module incorporate the following standard features:

- High torque, low inertia motor for precise starts and stops.
- High speed Linear/Pendulum Weaver for weaving, with independent control of right and left dwell times.
- High motor gearing which prevents the crossarm from moving when the unit is turned off.
- Closed loop speed control for adjustable and repeatable control of critical welding parameters.
- Closed loop position control to prevent drift from the weld center position.
- Clutch, to enable rapid installation or replacement of the weaver cross arm.



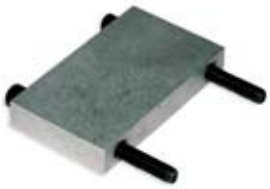
Accessories



Remote Control Cable

Installs between the Master Drive Unit and the Control Module, allowing the operator to perform work in confined areas where it would be difficult to reach the controls. Two sizes are available as shown below.

Order reference: **MDS-1060-10** 10 Ft (3 m)
MDS-1060-25 25 Ft (7.6 m)



Spacer w/Screws

Provides height required to position racking group for plasma cutting applications.

Order reference:
PAN-1001



Quick Action Manifold

Allows quick ON/OFF of preset torch and eliminates hose strain.

Order reference:
MDS-3025 2-Hose
MDS-9898 3-Hose

Hose Assemblies:
CIR-1010-3 2-Hose
MUG-1119-32 3-Hose

Weld Contact Cable

Order reference:

MDS-1085	10'
MDS-1085-25	25'
MDS-1085-50	50'

Extended Mounting Plate

Mounts to front of the carriage for use with dual cutting or welding groups, heavy duty racking, etc.

Order reference:
MDS-1045



Racking Groups

There are two machined rack torch mounting groups in the Modular Drive System, one for plasma or oxy-fuel cutting and the other for welding.



Machined Rack Cutting Group

Order reference: **MDS-1050**



Machined Rack Welding Group

Order reference: **MDS-1040**



Universal Limit Kit

Installs between the Master Drive Unit and any of the control modules. This limit kit adds the ability to cycle between limits, stop at limit, or rapid return. All existing functions of the control modules are maintained.

Order reference:

MDS-1055	For Rigid Rail Applications
FMD-1045	For Hi-Flex Rail Applications (not shown)



Handle with Cable Anchor

Keeps welding cables and contact wires away from the work surface, eliminating drag.

Order reference:
MPD-1035

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