

PIPER-PLUS

3 Year
Warranty
Made in USA

The New Most Advanced Mechanized Pipe Welding System from Bug-O!

The Piper-Plus integrated with Lincoln Power Wave® S350,
utilizes the latest in advanced digital weld process control.



Bug-O Systems is guided by honesty,
integrity and ethics in service to our
customers and in all we do.

412-331-1776 www.bugo.com

Photo taken at New Industries, Inc. - Morgan City, Louisiana



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

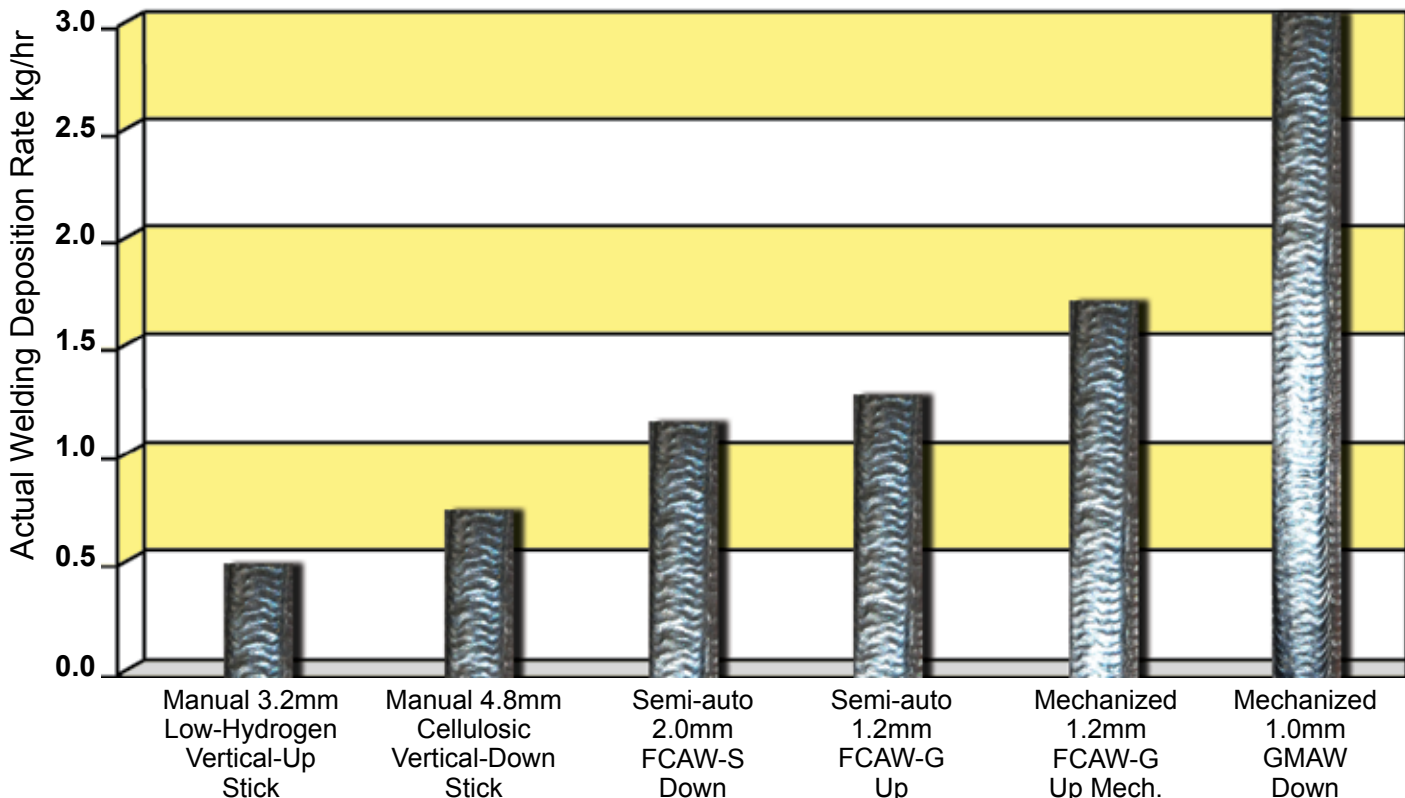


The **PIPER-PLUS** is a self contained, digitally controlled, mechanized pipe welding system, producing high deposition rates with excellent weld quality to reduce pipe welding costs. Increased duty cycle and arc-on time provide significant improvements in productivity. All welding parameters, including voltage, wire feed speed, current, travel and oscillation are programmable and digitally controlled with the Piper-Plus.

Manual pipe welding requires a high level of training and skill. As skilled pipe welders become more difficult to find, mechanized welding is an economical alternative. Less welder skill and physical effort are required using mechanized welding. Handheld wire welding results in a

typical operating factor (or percent arc-on time) of 40-50%, mechanizing increases the operating factor to 70% or higher. The increased arc-on time reduces the number of welders and welding stations required. Also, the precise procedure control and excellent repeatability ensures consistent weld quality around each pipe joint and from one joint to the next.

Actual Welding Deposition Rate
(Deposition Rate x Operating Factor)



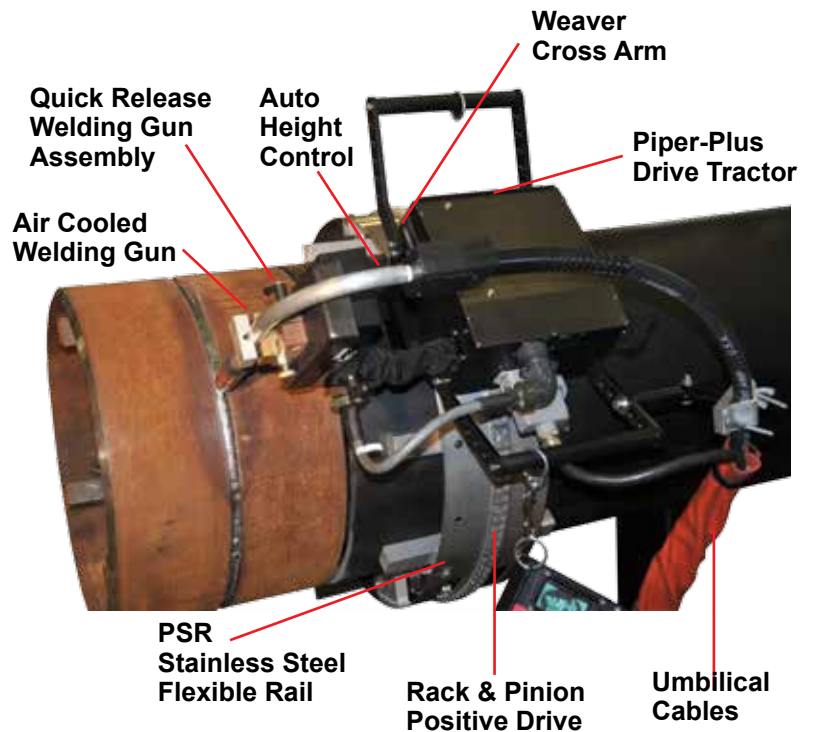


PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Piper-Plus Overview

The **BUG-O PIPER-PLUS** is a complete Pipe Welding System integrated with the Lincoln Electric Welding Power Source and Wire Feeder.

- Unique digital control box
- Microprocessor controlled panel with graphic and pendant user interfaces
- Two pendant user options
- Two rail and tractor carriage options
 - Quick attached custom-bent Aluminum Rigid Ring Rail with spring loaded spacer bars
 - Bug-O PSR Piper Flex Band Rails made of Flexible Stainless Steel Rail to provide versatility and flexibility
- Lincoln Electric Power Wave® S350 Advanced Process Welder
- Lincoln Electric AutoDrive® 4R220 WireFeeder with AutoDrive® 19 Controller
- Lincoln Electric supported welding procedures
- Supports GMAW, GMAW-Pulse, FCAW and STT® welding processes
- Full digital control of all welding parameters and waveforms offered in Lincoln Electric's Power Wave® S350 Advanced Process Welder
- Active monitoring and display of real time welding status
- Built tough for demanding environments. Rated for operating temperatures from -20°C (-4°F) to 50°C (122°F) and up to 100%RH



Features:

- Closed loop feedback of travel, height control and all motion parameters
- Distinctive on-board current monitoring and adjustments
- Programmed for exact multi-parameter output
- Supervisor set operating limits to every adjustable parameter
- Pre-programming of an infinite number of procedures and weld passes
- Air-cooled or optional water-cooled welding guns available
- Automatic Height Control provides constant tip to work distance control. Total travel of 4" (100 mm)

Benefits:

- Travel speed can be calibrated to provide actual travel speed at pipe surface
- Automatic Height Control maintains constant torch height, ensuring stable welding arc and consistent heat input
- Accurate process control
- Allows for many different geometries and material thicknesses
- Water cooled torch can be used for heavy wall applications

Bug-O's Piper Series of machines, Piper-Bug and Piper-Plus, were originally designed and built for the Pipe Industry. However, like all Bug-O products they are lightweight, portable and adaptable for use anywhere the weld process control must be tightly controlled and monitored.



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Bug-O Rail

Bug-O rail systems are lightweight and durable providing versatility for all kinds of applications beyond Pipeline applications. All rail and tractors utilize rack and pinion positive drives. All carriages can be installed and removed from any point of the rail. Our Aluminum Rigid Rail design was first developed in 1948, and it has stood the test of time serving clients around the world for over 60 years. We also offer the new stainless steel rail which provides even more stability and durability.



Features:

- Quick attach ring rail mounts quickly and easily to the pipe
- Spacer bars adjust and center the ring to the pipe surface
- Powerful latches lock the rail into position
- Machine mounts quickly to the rail using standoffs and a split carriage
- Accommodates pipes with a minimum outside diameter of 16" (45.72 cm) or larger

Benefits:

- Lightweight and easy to move from pipe to pipe
- Fast, repeatable setup
- Fast removal
- Large surface area on spacer bars protects the pipe surface

PSR-2000-XX (Piper Steel Rail)

Flexible stainless steel 6" in width designed for specific pipe outside diameters. Equipped with Rigidly Adjustable Feet and Latch Assembly. (XX= Diameter specified by customer including coating if applicable.)



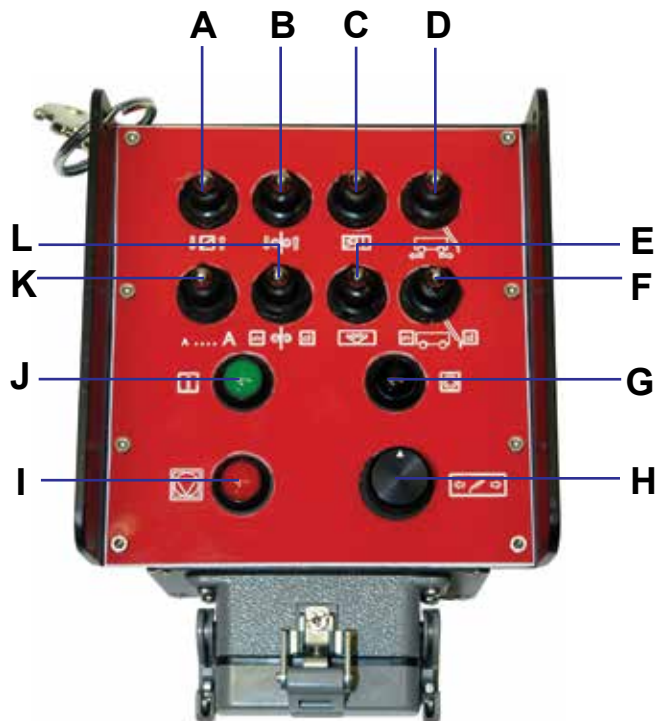
BRR-3250-XX (Bent Rigid Rail)

Aluminum extrusion rolled to custom dimensions for a specific pipe outside diameter for your specific application, utilizes a hinge and locking clamps with spring loaded stand offs for quick removal and relocation. (XX= Diameter specified by customer including coating if applicable.)



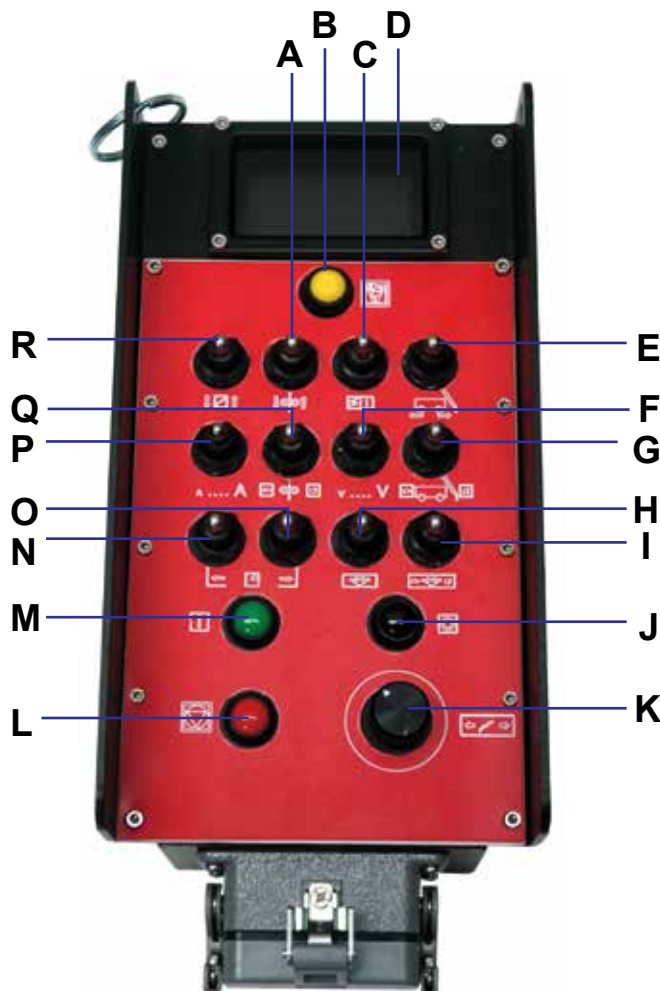


PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM



Limited Function Pendant:

- A. Torch Jog - Up/Down
- B. Wire Feed Jog – In/Out
- C. Oscillation Check
- D. Travel Jog – Forward/Reverse
- E. Welding Voltage – Increase/Decrease
- F. Tractor Travel Speed – Increase/Decrease
- G. Cycle Stop (Gas Purge in Jog Mode)
- H. Torch Position Steering
- I. Emergency Stop
- J. Cycle Start
- K. Welding Current – Increase/Decrease (Adjusts torch height while welding)
- L. Wire Feed Speed – Increase/Decrease



Full Function Pendant:

- A. Wire Feed Jog – In/Out
- B. Welding Pass Select
- C. Oscillation Check
- D. Display Screen - Provides selected welding parameter information to the operator
- E. Travel Jog – Forward/Reverse
- F. Welding Voltage – Increase/Decrease
- G. Tractor Travel Speed – Increase/Decrease
- H. Oscillation Width – Increase/Decrease
- I. Oscillation Speed - Increase/Decrease
- J. Cycle Stop (Gas Purge in Jog Mode)
- K. Torch Position Steering
- L. Emergency Stop
- M. Cycle Start
- N. Oscillation Dwell Time Left - Increase/Decrease
- O. Oscillation Dwell Time Right - Increase/Decrease
- P. Welding Current – Increase/Decrease (Adjusts torch height while welding)
- Q. Wire Feed Speed – Increase/Decrease
- R. Torch Jog - Up/Down



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Control Box



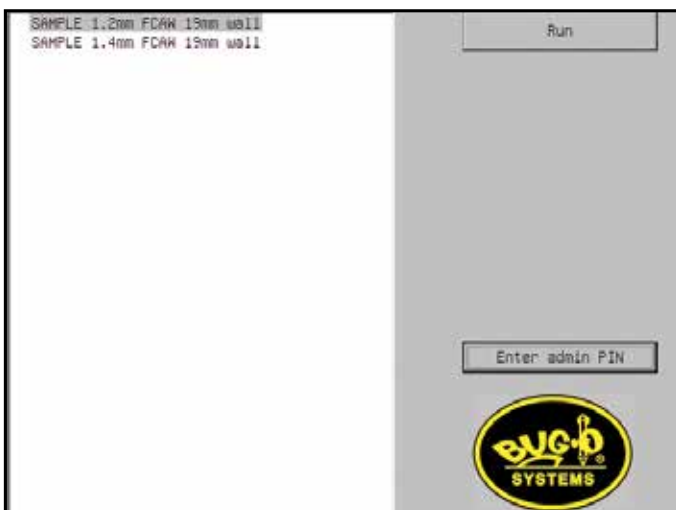
Features:

1. Microprocessor controlled panel with graphic and pendant user interfaces.
2. The large LCD panel allows quick viewing of large groups of related information.
3. Intuitive parameter input using a touch mouse and keypad.
4. USB port for program transport between systems.



Control Box Programming:

Note: Numbers shown on the following screenshots are for display purposes only and are not intended for actual welding procedures.



Primary Organization Screen—Allows project managers the ability to organize and modify information for each application. This information is password protected. Limited access ensures repeatability and accountability.



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Heave | Travel | Search | Welding

Wire Trim UtlimArc Current

INCH/MIL

Run In: 125

Startup: 110 1 0 95

Welding: 155 1 0 118

Welding Max: 600 1.5 300

Welding Min: 50 0.5 50

Welding Step: 1 .01 1

Crater: 110 1 0 75

Prepurge: 1

Start Time: 0.8

Crater Time: 0.4

Burnback: 0.03

English Metric

Save Cancel

Parameter Input Screen – All data for the weld pass is input here. Unique tabs are supplied in this screen for Weave Data, Drive Travel Data, Welding Power Source Data Search and Welding Parameter Data. Data is input with upper and lower limits for each individual parameter thus ensuring that the resulting weld is within specifications.

Heave | Travel | Search | Welding

Process Type: GMAW Ignore

Wire Type: Steel Ignore

Wire Size: .045 in Ignore

Search

Weid: 22

#	Description	Type	Wire	Size	Gas
18	RapidArc ArMix	GMAW	Steel	.045 in	CarbonDioxide, Argon
20	CV CO2	GMAW	Steel	.045 in	Carbon dioxide
21	CV ArMix	GMAW	Steel	.045 in	CarbonDioxide, Argon
22	Pulse ArMix	GMAW	Steel	.045 in	CarbonDioxide, Argon
23	VerticalUp Pulse	GMAW	Steel	.045 in	CarbonDioxide, Argon
274	Rapid X	GMAW	Steel	.045 in	CarbonDioxide, Argon
308	STT CO2	GMAW	Steel	.045 in	Carbon dioxide
309	STT ArMix	GMAW	Steel	.045 in	CarbonDioxide, Argon
328	STT Syn CO2	GMAW	Steel	.045 in	Carbon dioxide
329	STT Syn ArMix	GMAW	Steel	.045 in	CarbonDioxide, Argon

English Metric

Save Cancel

Search Function – Located within the Parameter Input Screen is the welding waveform program chart. This data resides in the Power Wave® S350 welding power source. This table of data, displayed on the Piper Plus Control Box Screen, allows for easy standard program selection. Delivering an unprecedented level of arc control, the Piper Plus interfaced with the Power Wave® S350, includes a number of preset welding waveform programs for applications on a variety of materials, including stainless steel, nickel alloys and silicon bronze. Lincoln Electric can add or design custom waveform programs for those customers requiring targeted solutions for other materials, join configurations, welding procedures, shielding gasses or other variables.

Note: STT® Parameters, if displayed, do not function unless Lincoln Electric Power Wave® STT® Module is installed.

Default

D.Left SECONDS	D.Right SECONDS	Hv.Speed IN/MIN	Hv.Ampl INCHES	Hi.Speed IN/MIN	Current AMPS	Trim	Travel Sp IN/MIN
1	1	70	0.29	155	118	1	20

Running

D.Left SECONDS	D.Right SECONDS	Hv.Speed IN/MIN	Hv.Ampl INCHES	Hi.Speed IN/MIN	Current AMPS	Trim	Travel Sp IN/MIN
1	1	70	0.29	155	118	1	20

Arclink Volts 19.7 Amps 118 Mode 22

11:00:55 Height control will stop on dwell

11:00:55 Pulse ArMix

11:00:55 True Speed:3.98

11:00:55 WFS:155, Trim:1.00, UtlimArc:0.0

11:00:55 Pass load complete: 1 Fill

11:00:55 CAUTION Live switch is ON

11:00:55 Date logging enabled.

11:00:55 Arc Status Monitor enabled.

Very bad welds will cause an ESTOP.

Reverse

Height off

Exit

Operating Screen – This screen is displayed during operation. The pre-set points for the pass are displayed along with the actual data being used. The message screen in the lower left corner displays the operation sequences as they occur, displays error messages as needed and provides detailed information about welding wave form data. The lower right screen displays the weld pass that is active along with all other passes that are available to be selected.



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Interfaced Power Source

Features:

Lincoln Electric's Power Wave® S350 Advanced Process Welder System.

- Multi-process inverter, MIG, Stick, TIG, Arc Gouging
- 425 amp power source; 300 amps 100% duty cycle
- Smart robust design
- Portable

PowerConnect™ Technology (Patent-Pending) – Automatically adjusts to input power from 200-600V, 50 or 60Hz, single phase or three phase. Welding output remains constant through the entire input voltage range.

Tribid™ Power Module – Exceptional welding performance with high power factor and efficiency.

Production Monitoring™ 2 – Track equipment usage, store weld data and configure fault limits to aid in production analysis and process improvements.

Optional 115V (10A) AC Duplex Auxiliary Power Receptacle – Features patent-pending Surge Blocker™ Technology to ensure simultaneous welding performance is not compromised by high starting current devices such as grinders (typically requiring 60A or more peak surge current).

Compact and Durable Case – IP23 rated to withstand harsh environments.

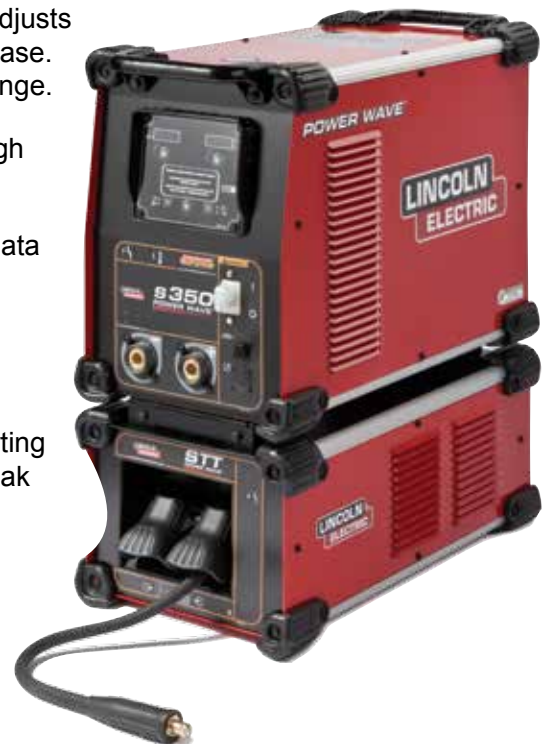
Standard Ethernet – Allows for effortless software upgrades through powerwavesoftware.com

Power Wave® STT® Module – Add STT® (Surface Tension Transfer®) process capability to any compatible Power Wave® S-Series power source to gain outstanding puddle control for critical sheet metal or pipe root pass welding. The compact STT® module seamlessly integrates with the power using the high speed Lincoln Electric ArcLink® digital communications protocol.

The Lincoln Electric brand name, logo, likeness and any associated technologies are protected by copyright, trademark and other applicable laws, and may not be used without permission.

Benefits:

- Flexibility with processes when not used on the pipeline
- Energy efficient
- Rough handling - tried and tested all over the pipeline world
- Easy to use controls





PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Piper-Plus Pipe Welding Kit



PWS-5260-AC (shown above)

Each Piper Plus System Includes:

- Tractor Drive Unit
- Control Box
- Operator Control Pendants (2)
- Gas Regulator
- Lincoln Electric Power Wave® S350
- Power Wave® STT® Module (Optional)
- PWS-4100 Wire Feed Assembly
- Welding Gun, 450 AMP Capacity

Requires Consumable Parts Kit (see p.11 for details) which defines and consists of wire size, drive roll type, nozzle opening diameter, tip extension, and tip shape.





PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM



PWS-4100 Wire Feeder

PWS-4100 Wire Feed Assembly is an integrated package of Lincoln Electric Wire Drive and feed components that are mounted to a frame so you can place it for convenience.

PWS-4100 Wire Feed Assembly consists of:

Lincoln Electric AutoDrive® 4R220 4-Roll Wire Drive.

Wire Size Range:

Solid: .023 – 1/16" (0.6 – 1.6mm)

Cored: .035 – 5-64" (0.9 - 2.0mm)

Wire Feed Speed Range:

30 – 1200 in/min (0.8 – 30.5 m/min)

Lincoln Electric Spindle Kit

Accepts all standard spool sizes.

Lincoln Electric Wire Reel Enclosure

Covers welding wire providing basic protection from environmental contamination and physical damage.



Lincoln Electric AutoDrive® 19

Provides digital communication linking Lincoln Electric's Power Wave® S350 Welding Power Source, BUG-O's Wire Feed Assembly and PIPER-BUG Controller. This digital control system is fully integrated, providing unprecedented control of all welding parameters and waveforms with active monitoring and display of real time welding status.

BUG-O designed frame with four (4) key-hole slots to facilitate mounting the entire Wire Feed Assembly in a convenient location.

Includes remote "Purge" and "Wire Jog" functions on feeder frame.





PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

PIPER-BUG and PIPER-PLUS

PART NUMBER CONVENTION

PWS-ABCD-EF

- **Cooling Type**
AC = Air Cooled
WC = Water Cooled
- **D = European Conformance***
0 = 120 VAC control box, NON-CE power source
2 = 240 VAC control box, NON-CE power source
5 = CE 240 VAC
- **C = Wire Feeder & Power Source**
0 = Wire Feeder – NO Welding Power System
5 = Wire Feeder & Welding Power System
6 = Wire Feeder + Power Source + STT Module
- **B = Rail Type**
1 = BRR – bent rigid
2 = PSR – stainless
- **A = System**
2 = Piper
5 = Piper-Plus



CONSUMABLE KITS

PWS-ABCD-0.0-E00FG

- **Tip Shape**
T = Tapered
S = Standard
- **Tip Extension**
F = Flush
R = Recessed
- **Nozzle Opening Diameter**
13 – 1/2" (13 mm) opening
16 – 5/8" (16 mm) opening
19 – 3/4" (19 mm) opening
- **Drive Roll Type**
K = cored wire knurled V groove
V = solid wire V groove
- **Wire Diameter (mm)**
1.2, 1.4, 1.6
- 4600 Consumable Kit

RING RAILS

PSR-ABCD-XX

- Pipe O.D. (inches or mm)
16,18,20, etc
- 2000 Piper Stainless Rail

BRR-3250-XX

- Pipe O.D. (inches or mm)
16, 18, 20, etc.

*All of our Piper-Bug control boxes are CE compliant.



PIPER-PLUS MECHANIZED PIPE WELDING SYSTEM

Power Requirements:

120VAC or 240VAC / 50-60Hz / 1PH

Weights:

w/o cables- 24.72 lbs (12.44 kg)

15 ft cables- 47.56 lbs (20.72 kg)

Total cap.- 60 lbs (27 kg)

Operating Temperatures:

-4°F to 122°F (-20°C to 50°C)

Welding Process:

GMAW, GMAW-Pulsed, FCAW, STT®

Travel:

Fwd/Off/Rev (Selectable)

Steering:

50.8mm (2") Left & Right Of Center

101.6mm (4") Total

Drive / Brake:

Rack & Pinion Drive / Dynamic Braking

Speed:

Linear- 0 – 80 ipm (0-200 cm/m)

Weave- 5 – 130 ipm (12.7 – 330.2 cm/m)

Dwell Times:

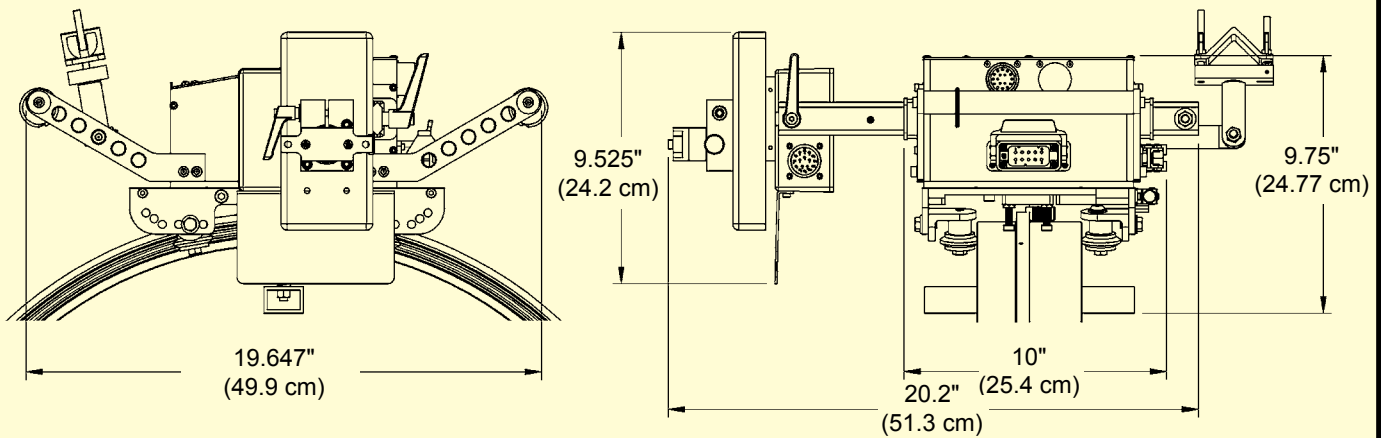
0 – 10 Seconds Left & Right, Independently Set

Weave Width:

.25 – 50 mm (.01 – 2")

Dimensions:

Piper Plus w/ BRR-3250-xx Rail & Legs



Piper Plus w/ PSR-2000-xx Rail & Legs

