

FLEX LASE™

Handheld Laser Welding System

Fast. Easy. Precise.

The easy-to-use Flex Lase handheld laser welding system puts power, speed and precision at your fingertips. With 2kW of laser output power and a robust package, operators can tackle high-precision welding applications with faster travel speeds, helping to improve productivity without sacrificing quality.



View for more information



[Flex Lase Product Overview](#)



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Safety First:

Before you start welding, review all relevant Operator's Manuals and Safety Data Sheets, and make sure you have the right Personal Protective Equipment (PPE), which includes, at least, a laser rated welding helmet, laser rated safety glasses, appropriate welding gloves for the process you're using, and a flame-resistant shirt, jacket, or sleeves to protect from UV rays and burns. You should also keep a fire extinguisher close at hand. Use adequate ventilation when welding. Use an approved respirator if exposure to welding fumes cannot be controlled, or if welding outside and natural air movement is not sufficient to keep welding fumes out of your breathing zone.

The Flex Lase power source is a class IV laser product that requires careful attention to safety procedures. Read and follow all labels and the Operator's Manual before operating, installing or servicing the equipment.

Weld Settings

Focal Tube Length

The recommended position for the focal tube based on the base material and the optimal distance between the focal lens and the weld.

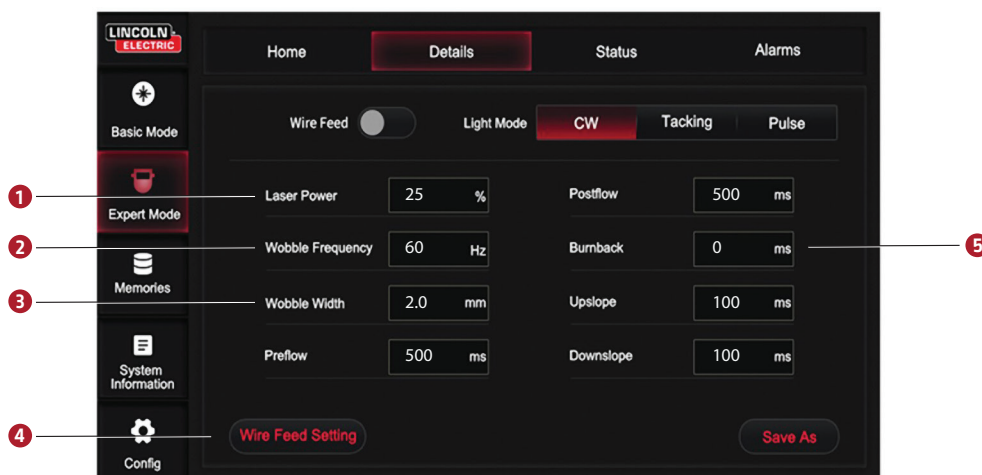


Gas Type

The recommended gas based on welding materials.

Wobble Mode

The controlled travel pattern of the laser beam through the wobble motion. The Memories in the Flex Lase 20 were developed using a parabolic wobble mode.



1. Laser Power [%]

The percent of the 2kW laser power output capability.

2. Wobble Frequency [Hz]

The frequency that the laser beam travels through the wobble path.

3. Wobble Width [mm]

The distance the laser beam oscillates, perpendicular to the center of the weld, during the weld process.

4. Wire Feed Speed

The rate at which wire is fed forward during the laser welding process. Wire feed speed is equal to travel speed for wire fed processes. This setting is adjusted on the Wire Feed Settings screen.

5. Burnback

The amount of time the laser emission will remain ON after the torch trigger is disengaged. This setting can assist with preventing wire from getting stuck in the weld pool.

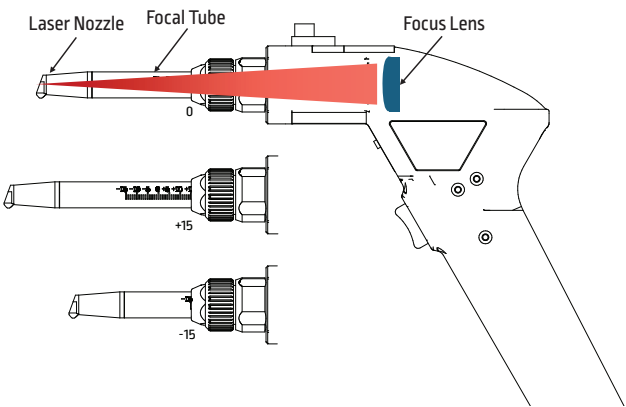
FLEX LASE™

Set-Up

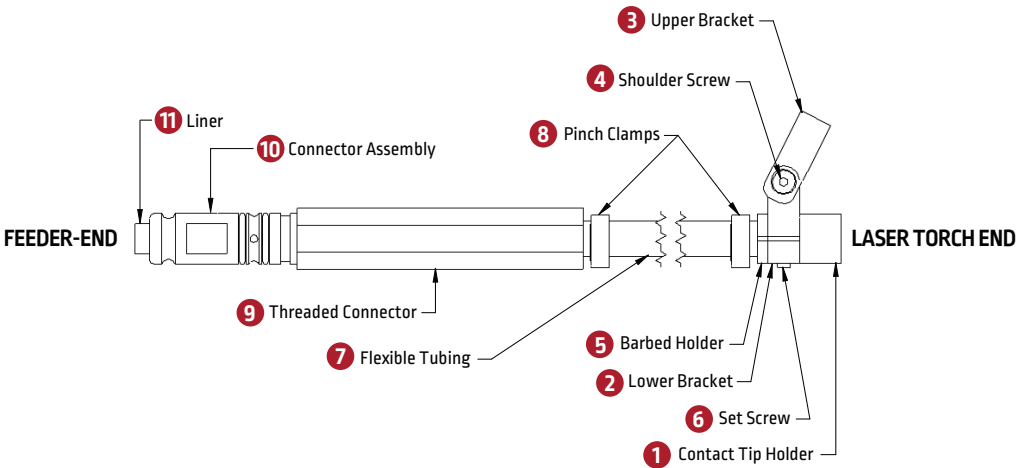
Focal Tube Adjustment

The Flex Lase 20 has a focal tube on the torch which can be adjusted +/- 0.591 in. (15 mm) in or out to shorten or lengthen the distance between the laser nozzle from the focus lens. At the nominal value of 0, the nozzle will be at the focal point of the beam. Depending on material and process, the focal tube can be adjusted to optimize how the energy from the laser is absorbed. As a general rule, shortening the focal tube will increase the amount of energy absorbed. Use the table as a starting point.

Focal Tube	Autogenous	Wire Type
0	Carbon Steel, Stainless, Galvanized	N/A
-2	Aluminum	Carbon Steel, Stainless, Galvanized
-4	N/A	Aluminum



Wire Feed Assembly



Welding Tip Selection

When it comes to wire-fed welding of workpieces, it's essential to choose a nozzle with a proper wire slot to ensure accurate welding wire direction and smooth wire feeding. Nozzle A is recommended for wire sizes of 0.030 in. (0.76 mm) or 0.035 in. (0.89 mm), while Nozzle B is suitable for wire sizes from 0.045 in. (1.14 mm) to 1/16 in. (1.57 mm).



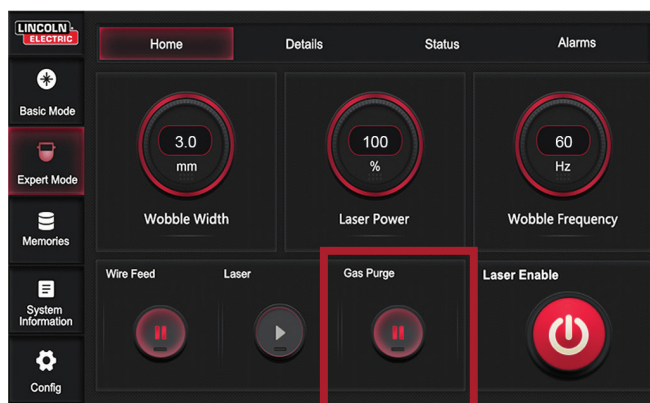
FlexLase™ Nozzle A



FlexLase™ Nozzle B

Gas Purge

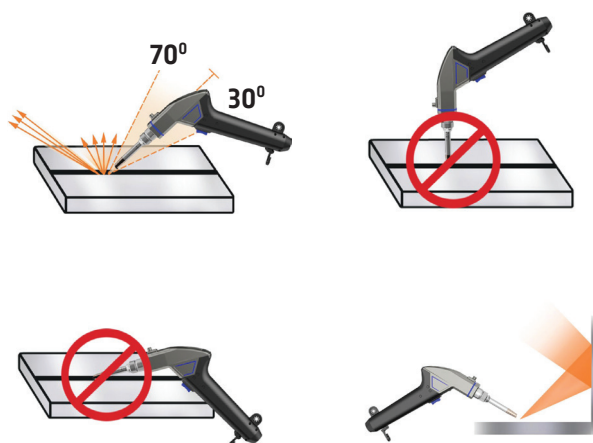
The gas solenoid valve will energize but neither the power source output nor the wire drive motor will be turned on. The Gas Purge switch is useful for setting the proper flow rate of shielding gas. Flow meters should always be adjusted while the shielding gas is flowing.



Gas Purge

Torch Angle

Never position yourself or flammable material in the anticipated path of a laser reflection. The proper travel angle is between 30° and 70°.



Applications

STAINLESS STEEL

Focal Tube Length		Gas Type	Gas Flow	Travel Angle	Work Angle
0 (autogenous)	-2 (welding with wire)	Nitrogen	32 - 75 CFH	30-70°	30 - 90° based on weld joint type

FlexLase™	Presets	Laser Power	Wobble Frequency	Wobble Width	Pre-flow	Post-flow	Burnback	Up-slope	Down-slope
		%	Hz	mm	ms	ms	mm	ms	ms
Autogenous	SS .04 (1) THK	25	60	2	500	500	0	100	100
	SS .08 (2) THK	55	60	2	500	500	0	100	100
	SS .12 (3) THK	70	60	2	500	500	0	100	100
Wire	SS .04 (1) THK + WIRE	20	50	3	500	500	150	100	100
	SS .08 (2) THK + WIRE	40	45	3	500	500	150	100	100
	SS .12 (3) THK + WIRE	45	35	3	500	500	150	100	100
	SS .16 (4) THK + WIRE	65	35	3	500	500	150	100	100

FlexLase™	Presets	Wire Feed Speed	Retract Speed	Feed Delay	Stickout Delay	Retract Length	Stickout Length	Pulse Duration*	Texture Smoothness*
		mm/s	mm/s	m/s	ms	mm	mm	ms	%
Autogenous	SS .04 (1) THK								
	SS .08 (2) THK								
	SS .12 (3) THK								
Wire	SS .04 (1) THK + WIRE	7	100	0	150	19	14	300	10
	SS .08 (2) THK + WIRE	6	100	0	150	19	14	300	10
	SS .12 (3) THK + WIRE	5	100	0	150	19	14	300	10
	SS .16 (4) THK + WIRE	5	100	0	150	19	14	300	10

*Only applicable if Fish Scale is enabled.

Note: Preset names include Material Type, Material Thickness, and Wire if applicable.

Material Types: SS = Stainless Steel, CS = Carbon Steel, GAL = Galvanized Steel, AL = Aluminum.

Example: "SS .04 (1) THK" = Stainless Steel, 0.04 in. (1 mm), autogenous weld (no wire).

Parameters developed using wire sizes from 0.045 in. (1.14 mm) to 1/16 in. (1.57 mm).

CARBON STEEL

Focal Tube Length		Gas Type	Gas Flow	Travel Angle	Work Angle
0 (autogenous)	-2 (welding with wire)	Nitrogen	32 - 75 CFH	30-70°	30 - 90° based on weld joint type

FlexLase™	Presets	Laser Power	Wobble Frequency	Wobble Width	Pre-flow	Post-flow	Burnback	Up-slope	Down-slope
		%	Hz	mm	ms	ms	mm	ms	ms
Autogenous	CS .04 [1] THK	25	60	2	500	500	0	100	100
	CS .08 [2] THK	55	60	2	500	500	0	100	100
	CS .12 [3] THK	70	30	2	500	500	0	100	100
Wire	CS .04 [1] THK + WIRE	20	45	3	500	500	150	100	100
	CS .08 [2] THK + WIRE	35	35	3	500	500	150	100	100
	CS .12 [3] THK + WIRE	45	30	3	500	500	150	100	100
	CS .16 [4] THK + WIRE	60	30	3	500	500	150	100	100

FlexLase™	Presets	Wire Feed Speed	Retract Speed	Feed Delay	Stickout Delay	Retract Length	Stickout Length	Pulse Duration*	Texture Smoothness*
		mm/s	mm/s	m/s	ms	mm	mm	ms	%
Autogenous	CS .04 [1] THK								
	CS .08 [2] THK								
	CS .12 [3] THK								
Wire	CS .04 [1] THK + WIRE	7	100	0	150	19	14	300	10
	CS .08 [2] THK + WIRE	5	100	0	150	19	14	300	10
	CS .12 [3] THK + WIRE	4	100	0	150	19	14	300	10
	CS .16 [4] THK + WIRE	4	100	0	150	19	14	500	10

*Only applicable if Fish Scale is enabled.

Note: Preset names include Material Type, Material Thickness, and Wire if applicable.

Material Types: SS = Stainless Steel, CS = Carbon Steel, GAL = Galvanized Steel, AL = Aluminum.

Example: "SS .04 [1] THK" = Stainless Steel, 0.04 in. (1 mm), autogenous weld (no wire).

Parameters developed using wire sizes from 0.045 in. (1.14 mm) to 1/16 in. (1.57 mm).

GALVANIZED (DEVELOPMENT PROJECT RECCOMENDED)

Focal Tube Length		Gas Type	Gas Flow	Travel Angle	Work Angle
0 (autogenous)	-2 (welding with wire)	Nitrogen	32 - 75 CFH	30-70°	30 - 90° based on weld joint type

FlexLase™	Presets	Laser Power	Wobble Frequency	Wobble Width	Pre-flow	Post-flow	Burnback	Up-slope	Down-slope
		%	Hz	mm	ms	ms	mm	ms	ms
Autogenous	GAL .04 (1) THK	25	60	2	500	500	0	100	100
	GAL .08 (2) THK	55	60	2	500	500	0	100	100
	GAL .12 (3) THK	70	60	2	500	500	0	100	100
Wire	GAL .04 (1) THK + WIRE	35	60	3	500	500	50	100	100
	GAL .08 (2) THK + WIRE	65	60	3	500	500	50	100	100
	GAL .12 (3) THK + WIRE	75	60	3	500	500	50	100	100

FlexLase™	Presets	Wire Feed Speed	Retract Speed	Feed Delay	Stickout Delay	Retract Length	Stickout Length	Pulse Duration*	Texture Smoothness*
		mm/s	mm/s	m/s	ms	mm	mm	ms	%
Autogenous	GAL .04 (1) THK								
	GAL .08 (2) THK								
	GAL .12 (3) THK								
Wire	GAL .04 (1) THK + WIRE	10	100	0	150	15	14	130	20
	GAL .08 (2) THK + WIRE	10	100	0	150	15	14	130	20
	GAL .12 (3) THK + WIRE	10	100	0	150	15	14	130	20

**Only applicable if Fish Scale is enabled.*

Note: Preset names include Material Type, Material Thickness, and Wire if applicable.

Material Types: SS = Stainless Steel, CS = Carbon Steel, GAL = Galvanized Steel, AL = Aluminum.

Example: "SS .04 (1) THK" = Stainless Steel, 0.04 in. (1 mm), autogenous weld (no wire).

Parameters developed using wire sizes from 0.045 in. (1.14 mm) to 1/16 in. (1.57 mm).

ALUMINUM

Focal Tube Length		Gas Type	Gas Flow	Travel Angle	Work Angle
-2 (autogenous)	-4 (welding with wire)	Argon	32 - 75 CFH	30-70°	30 - 90° based on weld joint type

FlexLase™	Presets	Laser Power	Wobble Frequency	Wobble Width	Pre-flow	Post-flow	Burnback	Up-slope	Down-slope
		%	Hz	mm	ms	ms	mm	ms	ms
Autogenous	AL .04 [1] THK	40	60	2	500	500	0	100	100
	AL .08 [2] THK	60	60	2	500	500	0	100	100
Wire	AL .04 [1] THK + WIRE	40	60	3	500	500	50	100	100
	AL .08 [2] THK + WIRE	55	60	3	500	500	50	100	100
	AL .12 [3] THK + WIRE	70	60	3	500	500	50	100	100
	AL .16 [4] THK + WIRE	75	60	3	500	500	50	100	100

FlexLase™	Presets	Wire Feed Speed	Retract Speed	Feed Delay	Stickout Delay	Retract Length	Stickout Length	Pulse Duration*	Texture Smoothness*
		mm/s	mm/s	m/s	ms	mm	mm	ms	%
Autogenous	AL .04 [1] THK								
	AL .08 [2] THK								
Wire	AL .04 [1] THK + WIRE	10	100	100	150	25	14	300	10
	AL .08 [2] THK + WIRE	10	100	100	150	25	14	300	10
	AL .12 [3] THK + WIRE	10	100	100	150	25	14	300	10
	AL .16 [4] THK + WIRE	6	100	100	150	25	14	300	10

*Only applicable if Fish Scale is enabled.

Note: Preset names include Material Type, Material Thickness, and Wire if applicable.

Material Types: SS = Stainless Steel, CS = Carbon Steel, GAL = Galvanized Steel, AL = Aluminum.

Example: "SS .04 [1] THK" = Stainless Steel, 0.04 in. (1 mm), autogenous weld (no wire).

Parameters developed using wire sizes from 0.045 in. (1.14 mm) to 1/16 in. (1.57 mm).

 **DANGER**



**CLASS 4 LASER PRODUCT
INVISIBLE LASER RADIATION**

Avoid eye or skin exposure to direct or scattered radiation IEC 60825-1:2014. Please refer to the operator's manual and labeling.

 **WARNING**



LASER SAFETY OFFICER

Establish a Laser Safety Program and appoint a Laser Safety Officer who is responsible for the safety of operators and observers.



LASER CONTROLLED AREA

Operate only in a laser controlled area with safety interlocks.



**PERSONAL PROTECTIVE
EQUIPMENT (PPE)**

Wear appropriate personal protective equipment in the laser controlled area.



LASER RADIATION EYE HAZARDS

Never look directly into the laser gun, even if wearing full eye protection. Never point the laser gun at another person.

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TEST RESULTS - Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

WELDING FUME CONTROL - The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, and the specific welding procedure and application involved. When equipment is used as designed - and when properly installed, operated and maintained - it can be a valuable and effective tool to help employers maintain adequate ventilation in the workplace. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits. Welding operations may produce hazardous gases such as carbon monoxide, oxides of nitrogen, and ozone. This equipment is designed to remove welding fume particulate, not gases. Ensure that adequate make-up air ventilation is provided to the workspace to prevent potential overexposure to these gases (See AWS Fact Sheet No. 36).

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