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waterjet

PASER® ECL *Plus*

Abrasive Waterjet Cutting System

Conversion Kit Guide & Instructions

Flow International Corporation

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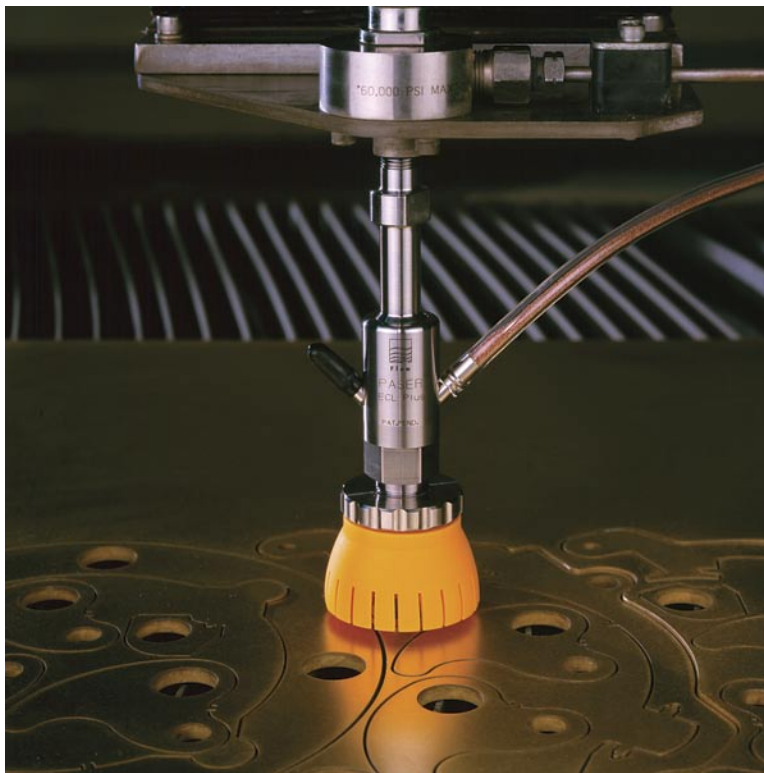
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PASER ECL *Plus* Redefines Peak Performance

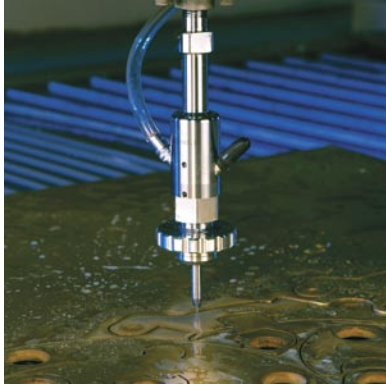
Since its introduction, Flow International Corporation's PASER 3 cutting system embodied peak performance within the abrasive waterjet industry. Now, Flow's PASER ECL *Plus* has redefined the metrics of peak performance—the fastest possible cutting speed and the lowest possible operating cost.

PASER ECL *Plus* combines the simple, yet sophisticated design of PASER 3, with newly refined and redesigned cutting head components. All PASER ECL *Plus* components are designed and manufactured within exceptionally tight tolerances. This results in more precise alignment of components and produces the most coherent and concentric waterjet stream achievable. The outcome is 30% greater concentricity in the waterjet stream as it passes through the cutting head and nozzle. More cutting power is directed at the work piece and less is deflected onto the cutting head components so that cutting is faster, more efficient, and parts last longer.

PASER ECL *Plus* is the fastest selling cutting head in the industry and is available for all Abrasive Waterjet XY Cutting Systems. This guide is designed to explain the many benefits of PASER ECL *Plus* as well as instruct you how to quickly take advantage of them with our easy-to-use Conversion Kits.



PASER ECL *Plus* Cutting Head - Standard Mounting



Benefits

- Component life increased by as much as 30% over previous generations of cutting heads
- Fast cut speeds and high-quality edges
- Optimized use of abrasive for the lowest possible cost of operation
- Easy operation and maintenance
- Consistent, smooth cutting
- Easy monitoring of cutting conditions

Features

- Highly-Efficient Cutting Head—designed to increase cut speed and component life
- Abrasive Metering System*
- Peak Performance Monitor*
- 500 lb. Abrasive Delivery Unit with Abrasive Level Indicator*

*Optional Accessories

The central feature of PASER ECL *Plus* is the cutting head. Each of the following components contributes to its remarkable performance:

PASER ECL *Plus* Nozzle Body

Designed with multiple contact points to provide greater stability to the cutting head, and secure precision engagement between nozzle body, orifice, and cutting head, thereby eliminating potential for stream deflection.

DuraFlow™ Orifice

Boasts an average life of 1000 hours. Its patented design provides optimum transference of pressure to velocity for a more precise and more powerful cutting stream. The jewel is installed in the mount and the two are finish-machined together to ensure exact alignment.

PASER ECL *Plus* Mixing Chamber

Anti-turbulence design reduces wear and optimizes abrasive entrainment. This translates into the most efficient use of abrasive, as needed to achieve optimum cutting speed.

ECL Premium™ Mixing Tube with Pre-Set Performance Ring

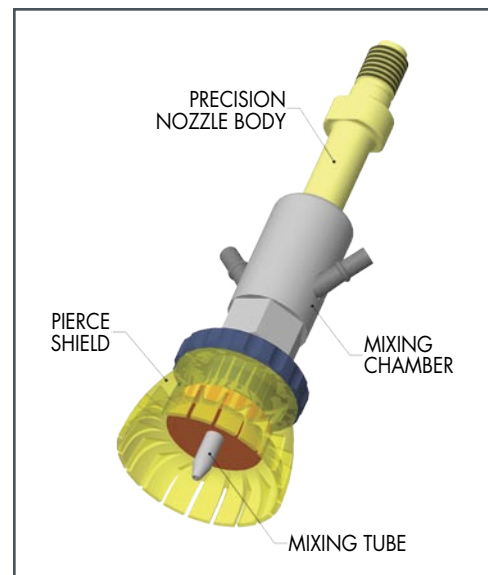
An extended-life carbide matrix mixing tube, featuring a new patent-pending performance ring. The performance ring provides a positive stop and seal to ensure the tube position is optimized for concentric wear and maximum cutting power. Carbide pins are not needed with ECL Premium mixing tubes.

PASER ECL *Plus* Precision Collet

ER style spring collet precisely centers the mixing tube radially and axially within the cutting head. Consequently, the waterjet stream is not deflected against the sides of the mixing tube, and the life of the tube is extended.

PASER ECL *Plus* Pierce Shield with Blast Disk

Dissipates back splash from the abrasive stream, and eliminates wear on the outside of the cutting head components and machine environment. The tough blast disk absorbs the majority of the jet's energy so that the life of the pierce shield is maximized. A carbide blast disk is also available for long piercing applications and cutting thicker or harder materials.



Conversion Kit Options

Basic Conversion Kit

The Basic Conversion Kit contains the key components necessary for conversion, including Flow's On/Off Valve II, PASER ECL Cutting Head, Inlet Collar, 1/4" High Pressure Adapter and Blue Lubricant.

Part Number: 014235-1

Performance Conversion Kit

The Performance Conversion Kit is designed for customers with pressurized delivery systems. This kit includes the above components plus Flow's Abrasive Metering System and Peak Performance Monitor. The abrasive metering system delivers the precise amount of abrasive to the cutting head that is needed to achieve maximum cut speed. Inordinate or insufficient amounts of abrasive reduce cut speed. But with Flow's abrasive metering system, not an ounce of abrasive is wasted on inefficient cutting. The peak performance monitor eliminates the need for operator adjustment of abrasive flow. It continually analyzes cutting performance, so there is no guesswork and operators stay informed of cutting conditions at a glance. When abrasive requirements change, the abrasive metering disk is easily accessible with a quick turn by hand.

Part Number: 014236-1

Complete Conversion Kit

The Complete Conversion Kit contains Flow's complete Paser ECL *Plus* Abrasive Delivery System. This system includes all components in the kits described above plus Flow's 500 lb. Abrasive Bulk Transfer Unit with Abrasive Level Indicator. Longer periods of uninterrupted cutting and increased productivity can be achieved with this larger capacity abrasive bulk transfer unit. Plus, its equipped with sensors to alert the operator when the abrasive level is low.

Part Number: 014237-1

Recommended Consumables

ECL Standard 3" Mixing Tube

Economical tube that is recommended for initial trial cuts and for cutting less precise parts.

Part Number: 014214-XX-30 Quantity: 2

ECL Premium 3" Mixing Tube

Offers the longest operating life and is designed for production and precision cutting.

Part Number: 014194-XX-30 Quantity: 2

ECL Ruby Orifice

Lower cost and life option that is ideal for initial trial cuts and if orifice size is changed frequently.

Part Number: 014201-XX Quantity: 2

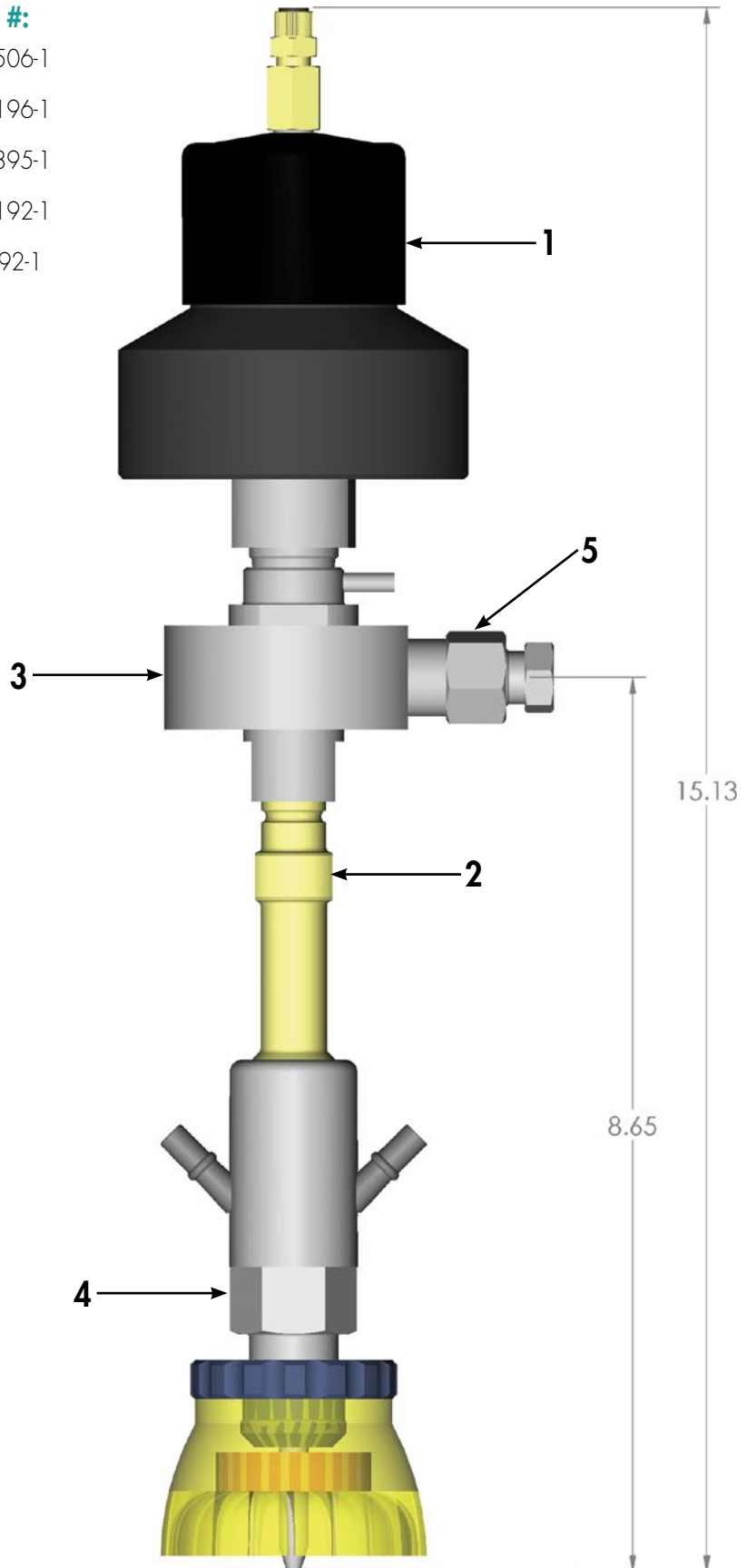
ECL DuraFlow™ Diamond Orifice

The BEST choice for longest life, which averages 1000 hours!. Enjoy the benefits of more uptime and greater peace of mind when you don't have to worry about changing orifices every week!

Part Number: 014155-XX Quantity: 1

NOTE: -XX will be replaced by numerical designations when the exact Orifice/Mixing Tube combination is known.

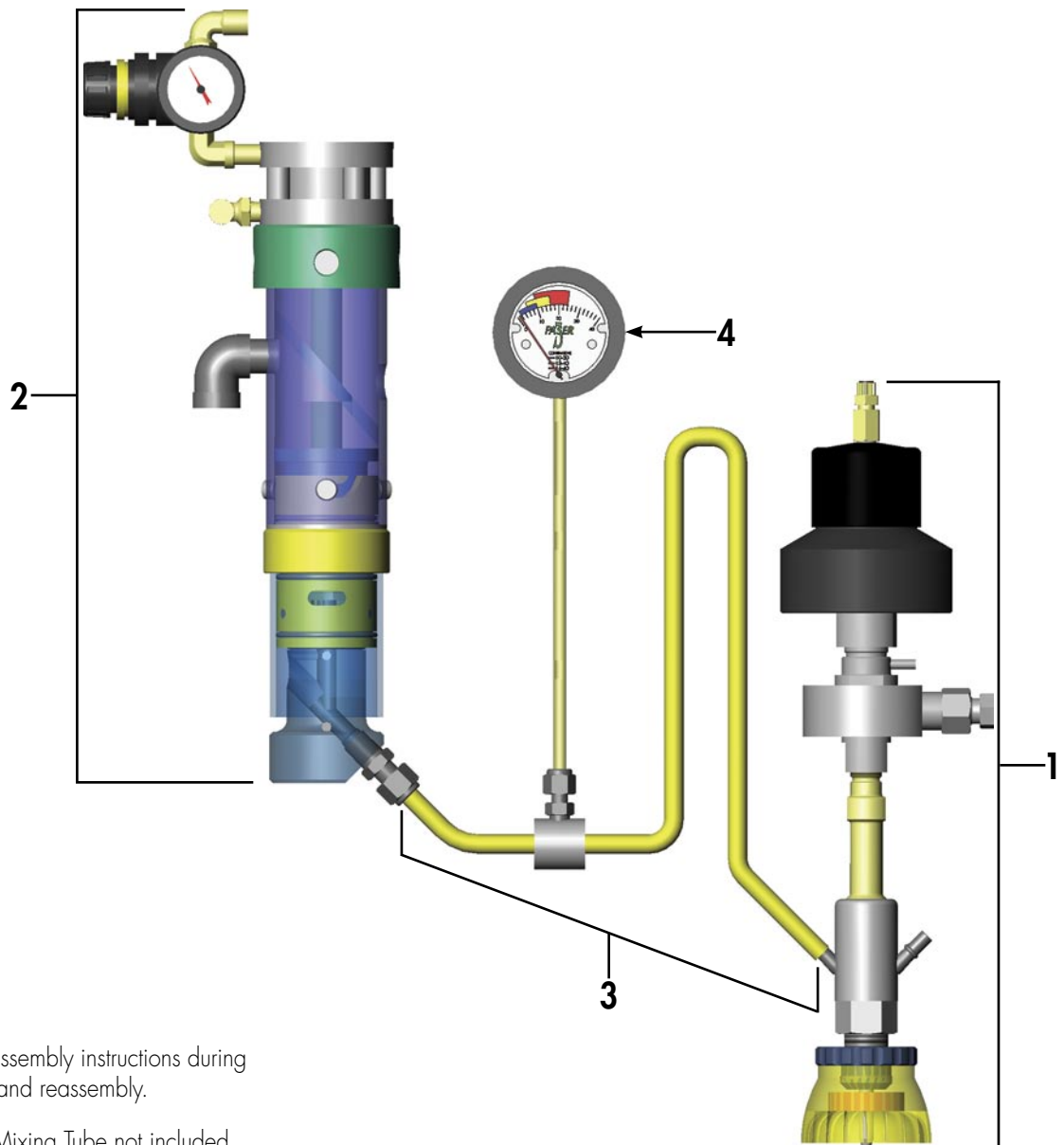
#	Component:	Part #:
1	On/Off Valve II	012506-1
2	Nozzle Body	014196-1
3	Inlet Collar	002895-1
4	PASER ECL Cutting Head	014192-1
5	1/4" High Pressure Adapter	A-0792-1



Use proper assembly instructions during disassembly and reassembly.

Orifice and Mixing Tube not included.

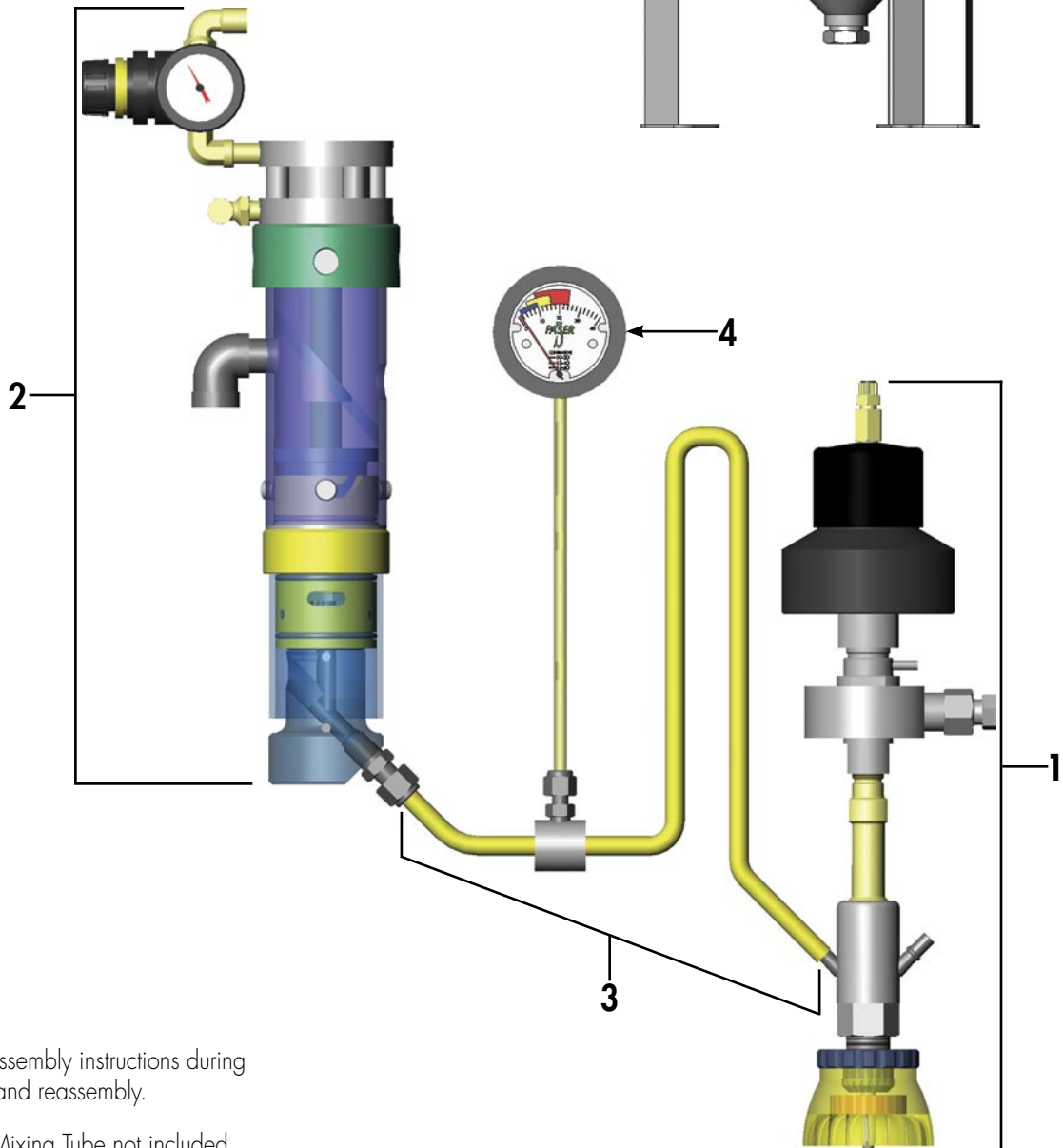
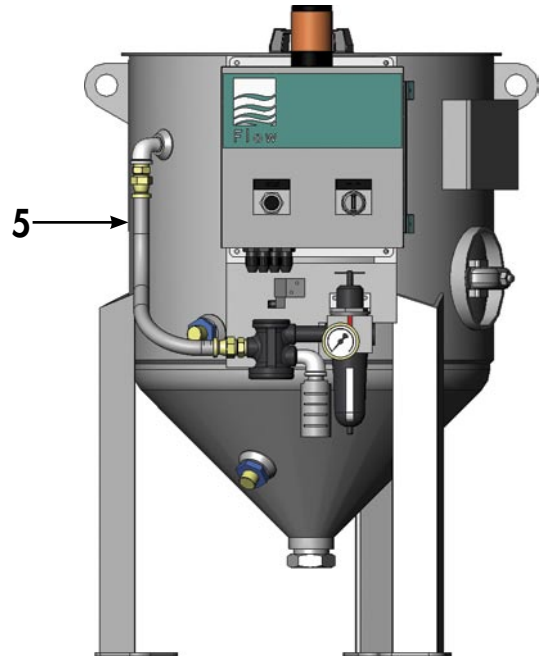
#	Component:	Part #:
1	Cutting Head Assembly with On/Off Valve II	014235-1
2	Abrasive Metering System	009930-1
3	Interconnect Assembly	009967-1
4	Peak Performance Monitor	002895-1



Use proper assembly instructions during disassembly and reassembly.

Orifice and Mixing Tube not included.

#	Component:	Part #:
1	Cutting Head Assembly with On/Off Valve II	014235-1
2	Abrasive Metering System	009930-1
3	Interconnect Assembly	009967-1
4	Peak Performance Monitor	002895-1
5	500 lb. Abrasive Bulk Transfer Unit	009950-1



Use proper assembly instructions during disassembly and reassembly.

Orifice and Mixing Tube not included.

Orifice Options

DuraFlow™ Orifice Assembly

0.010 in. (0.254 mm) internal diameter

0.013 in. (0.330 mm) internal diameter

0.014 in. (0.356 mm) internal diameter

0.016 in. (0.406 mm) internal diameter

Other sizes available on request.

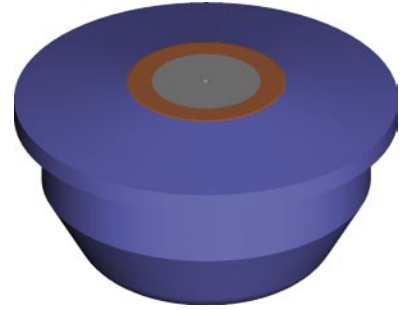
014155-X

014155-10

014155-13

014155-14

014155-16



Ruby Orifice Assembly

0.007 in. (0.178 mm) internal diameter

0.008 in. (0.203 mm) internal diameter

0.009 in. (0.229 mm) internal diameter

0.010 in. (0.254 mm) internal diameter

0.011 in. (0.279 mm) internal diameter

0.012 in. (0.305 mm) internal diameter

0.013 in. (0.330 mm) internal diameter

0.014 in. (0.356 mm) internal diameter

0.015 in. (0.381 mm) internal diameter

0.016 in. (0.406 mm) internal diameter

0.018 in. (0.457 mm) internal diameter

0.020 in. (0.508 mm) internal diameter

Other sizes available on request.

014201-X

014201-7

014201-8

014201-9

014201-10

014201-11

014201-12

014201-13

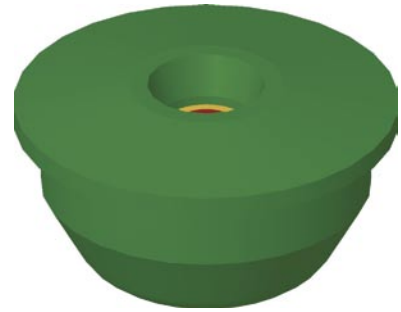
014201-14

014201-15

014201-16

014201-18

014201-20



Refer to the chart below for information on ruby orifice/mixing tube combinations and the resulting abrasive usage. Results may vary when using DuraFlow orifices.

Orifice/Mixing Tube Internal Diameter:	Pounds of Abrasive Used Per Minute:
0.016"/0.040"	1.5
0.014"/0.040"	1.4
0.013"/0.040"	1.3
0.010"/0.030"	0.9

Mixing Tube Options

PASER ECL Plus Premium Mixing Tube

With performance locating ring, standard sizes.

3 in. (76.20 mm) length, 0.030 in. (0.762 mm) internal diameter
Typically used with 80 and 120 mesh garnet

3 in. (76.20 mm) length, 0.040 in. (1.016 mm) internal diameter
Typically used with 80 mesh garnet

4 in. (101.6 mm) length, 0.030 in. (0.762 mm) internal diameter
Typically used with 80 and 120 mesh garnet

4 in. (101.6 mm) length, 0.040 in. (1.016 mm) internal diameter
Typically used with 80 mesh garnet

014194-XX-XX

014194-30-30

014194-40-30

014194-30-40

014194-40-40

PASER ECL Plus Standard Mixing Tube

With performance locating ring, standard sizes.

3 in. (76.20 mm) length, 0.030 in. (0.762 mm) internal diameter
Typically used with 80 and 120 mesh garnet

3 in. (76.20 mm) length, 0.040 in. (1.016 mm) internal diameter
Typically used with 80 mesh garnet

4 in. (101.6 mm) length, 0.030 in. (0.762 mm) internal diameter
Typically used with 80 and 120 mesh garnet

4 in. (101.6 mm) length, 0.040 in. (1.016 mm) internal diameter
Typically used with 80 mesh garnet

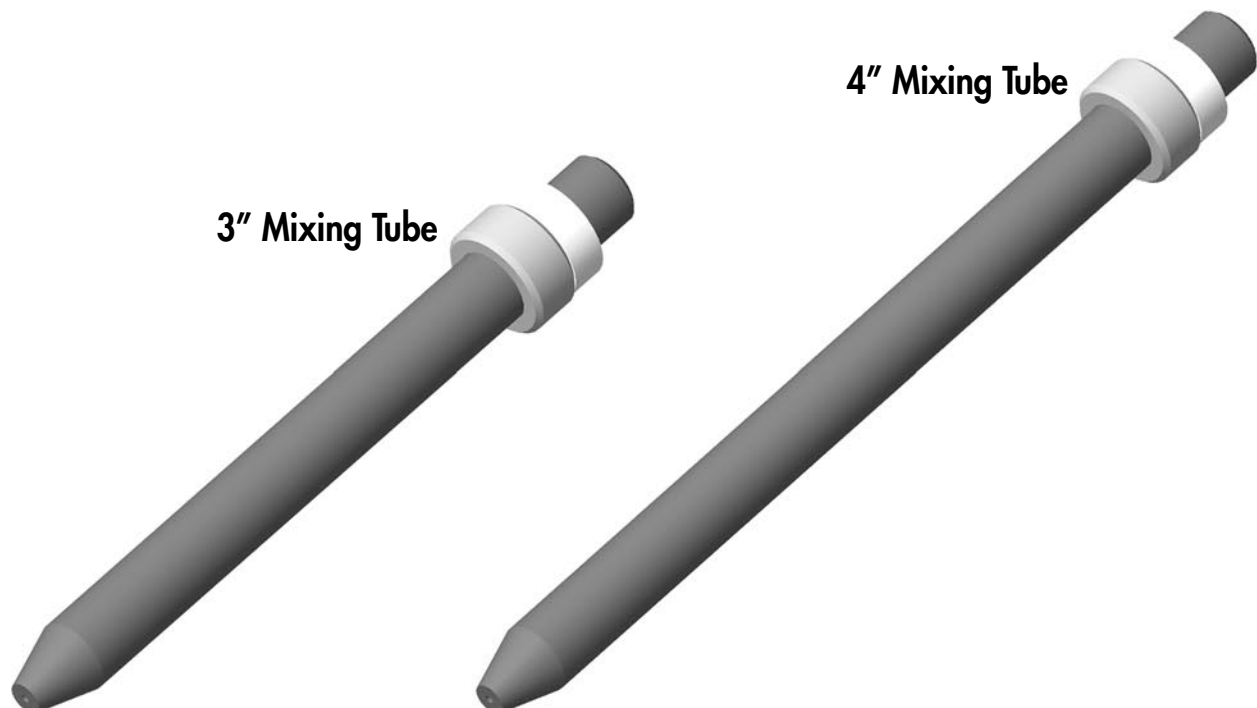
014214-XX-XX

014214-30-30

014214-40-30

014214-30-40

014214-40-40



Cutting Head Components



Cap **A-11080**

For use with mixing chamber 014197-1.



Precision Collet **710806-1**

Holds mixing tube.



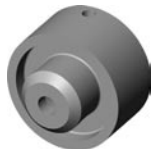
O-Ring **A-15034-1**

Used in nozzle nut to retain precision collet.



Narrow Nozzle Nut **014241-1**

Option for narrow cutting envelopes.



Nozzle Nut Extension **014266-1**

For use with 4 in. mixing tube.



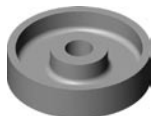
Spray Shield **711621-1**

Concentrates spray and contributes to cleaner cutting environment.



Blast Disk **711933-1**

Slides onto the mixing tube to deflect spray away from nozzle nut.



Carbide Blast Disk **014625-1**

Use for long piercings or cutting thicker/harder materials.



Set Screw **A-18248-6**

For extension 014266-1.



Service & Support

Flow is your single source, total solutions provider, with more abrasive waterjet systems installed around the world than all other manufacturers combined. We are dedicated to ultrahigh-customer commitment. From Project Management, to Technical Support — everyone at Flow is focused on one thing — YOU!

No one else offers everything you need for the life of your machine.

Project Management

- Single point of contact for efficient system startup from quote to installation
- Individualized project coordination and thorough presentation of utility requirements
- Assigned Project Manager for personal attention, and rapid response to special requirements

Training

- Classes available at our state-of-the-art regional facilities in Kent, WA and Wixom, MI
- Training programs on operating and maintaining your ultrahigh-pressure waterjet system
- Maintenance and service video to supplement hands-on training and manuals

Customer Service

- Largest and most highly-trained service department in the industry
- Available 24 hours a day, 7 days a week

Technical Support

- 24/7 service from America's largest most highly-trained waterjet service team
- Over 20 Flow Field Service Technicians located throughout the country
- On-site technical service calls anywhere in North America (within 24 hours if necessary)

Spare Parts

- The highest availability and widest selection of spare parts in the industry — our goal is simple — deliver all stocked parts when you need them
- All in-stock replacement parts shipped same day when order is entered by 4:00 PM PST

Warranty

- Warranty coverage for the first year on systems and select aftermarket options
- Flow stands behind our parts and will replace any components which do not perform to our rigid specifications

For Customer Service & Parts Orders:

800-526-4810 or 253-813-3339

For Technical Support & Warranty:

Western Regional Office
(253) 813-3318

Eastern Regional Office
(248) 669-4003

Basic Conversion Kit Installation Instructions

On a Flow Abrasive Waterjet System

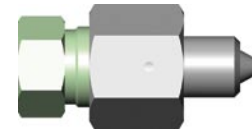
Simply remove your existing PASER 3 components and replace them with PASER ECL *Plus* components.

On an Abrasive Waterjet Systems Not Manufactured by Flow

The PASER ECL *Plus* Cutting Head is easily adaptable to most any abrasive cutting equipment, using 1/4" or 3/8" tubing. Installing the Basic Conversion Kit is as simple as 1, 2, 3:

Step 1

Design and manufacture the appropriate mounting bracket based on your required system setup, (required distance from end effector and stand-off from cutting surface.)



3/8" TUBING ADAPTER

Use the Inlet Collar Template on page 13 to properly size the location for the ECL Cutting Head on your bracket. The Inlet Collar is the portion of the cutting head that will attach directly to a custom bracket that will mount to your system's end effector.

Step 2

Verify your existing water delivery tubing fits the ECL Inlet Collar port. The standard port accepts 1/4" tubing. If you have 3/8" tubing, use Flow's Adapter, part number A-1267.

Step 3

Verify your existing pneumatic tubing fits the On/Off Valve II. Standard is 1/4". It is recommended that you do not adapt to a different size unless you replace the pneumatic fitting on top of the actuator with your required size.

Now you're ready to perform trial cuts using the Standard Mixing Tubes and Ruby orifices. For increased productivity, switch to Premium Mixing Tubes and DuraFlow Orifices!

Performance and Complete Conversion Kit Installation Instructions

If you need help installing the Performance Conversion Kit or Complete Conversion Kit, please contact Flow's Technical Service department.

Technical service engineers are available to assist you Monday through Friday 8:00 AM to 5:00 PM PST/EST. Technical service engineers are also on-call 24 hours a day, 7 days a week to ensure your system is up and running round-the-clock.

For more information, please contact the service location nearest you.

Western U.S. Technical Service

Flow International Corporation
23500 64th Avenue South · Kent, Washington 98064 USA
Tel: 253-813-3318 · Fax: 253-813-3282

Eastern U.S. Technical Service

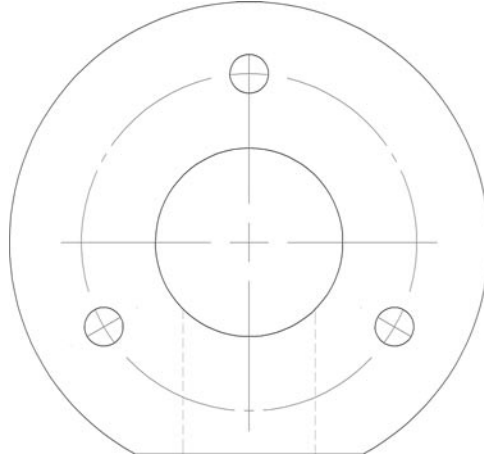
Flow International Corporation
30000 Beck Road · Wixom, Michigan 48393 USA
Tel: 248-669-4003 · Fax: 248-669-9008

Installation Templates

Inlet Collar

Cut out the Inlet Collar Template to help you locate point of installation for your PASER ECL *Plus* cutting head. The Inlet Collar is 2.5" in diameter. The center hole's internal diameter is 0.975". The three 0.25" -20 bolt hole centers are located at 12, 4 and 8 o'clock on a 1.75" diameter.

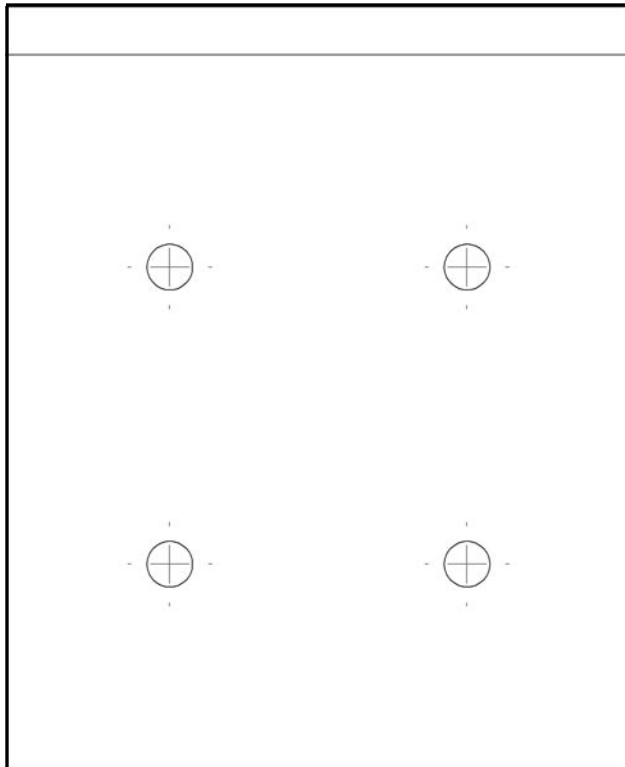
Part Number: 002895-1



Metering Valve Bracket

Cut out the Metering Valve Bracket Template to help you quickly mount your Abrasive Metering System.

Part Number: 010012-1



Gauge Bracket

Cut out the Gauge Bracket Template to help you quickly mount your Peak Performance Monitor.

Part Number: 010012-1

