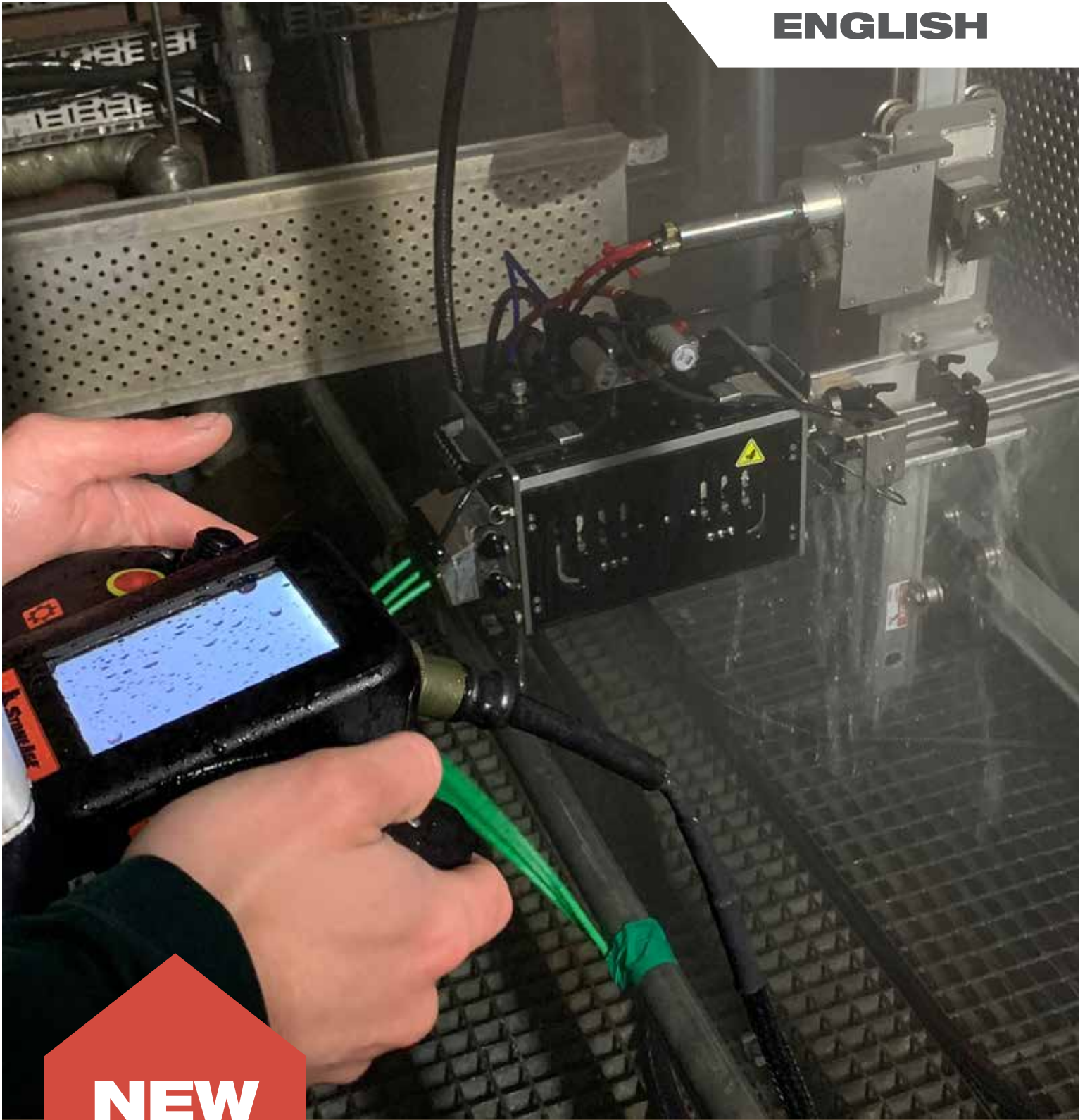


**ENGLISH**



**NEW**



**Sentinel**

**PAGE 2.1**

**2022**  
**WATERBLAST**

**STONEAGE**

# CATALOG

# CONTENTS

## 1. TRAINING

1.4

Online Resources .....	1.4
StoneAge Training .....	1.6

## 2. TUBE CLEANING

2.1

Sentinel .....	2.1
Sentinel Link .....	2.3
Triple & Dual Lance Cleaning .....	2.5
Single Lance Cleaning	
Compass .....	2.7
AutoPacks .....	2.9
AutoPack 3L Sentinel .....	2.10
AutoPack 3L .....	2.11
AutoPack 2L .....	2.12
AutoPack Compass .....	2.13
Hose Tractors .....	2.14
Lightweight Positioner .....	2.15
Accessories .....	2.16
Rigid Lance Machines .....	2.17
Bundle Blaster .....	2.19
Banshee Nozzles .....	2.21
Beetle .....	2.25
Gopher .....	2.26

## 3. PIPE CLEANING

3.1

AutoPack Pro .....	3.3
Hose Tractors .....	3.4
Navigator .....	3.5
Accessories .....	3.6
Badger .....	3.7
Beetle .....	3.10
BJV .....	3.11
Raptor .....	3.14

## 4. SURFACE CLEANING

4.1

Striker .....	4.2
Spitfire .....	4.3
Barracuda .....	4.4

## 5. TANK & VESSEL CLEANING

5.1

AutoBox ABX-500 .....	5.2
Positioning Booms .....	5.3
Torus .....	5.5
BJV .....	5.6
Tank & Vessel Cleaning .....	5.7
Speed Controlled Swivels .....	5.8

## 6. CUSTOM SOLUTIONS

6.1

Surface Cleaning .....	6.2
Furnace & Boiler Cleaning .....	6.3
Tunnel Cleaning .....	6.6
Stack Cleaning .....	6.6
Pipe Cleaning .....	6.7

## 7. ROTARY TOOLS

7.1

Tube Cleaning .....	7.1
Curved Pipe Cleaning .....	7.7
Straight Pipe Cleaning .....	7.11
Surface Cleaning .....	7.15
Swivels .....	7.17

## 8. WATERBLAST ACCESSORIES

8.1

Low/Medium Pressure Nozzles .....	8.2
Waterblast Accessories .....	8.3
Hose, Fittings & Accessories .....	8.5
Hoses 15k psi (1000 bar) .....	8.8
Fittings 15k psi (1000 bar) .....	8.9
Hoses/Lances 20k psi (1380 bar) .....	8.18
Fittings 20k psi (1380 bar) .....	8.19
Hoses/Lances 40k psi (2800 bar) .....	8.30
Fittings 40k psi (2800 bar) .....	8.32

## 9. REFERENCES

9.1

Thread Abbreviations .....	9.1
Standard Unit Abbreviations .....	9.1
Measurement Conversions .....	9.1
Pressure and Flow Equations .....	9.2
Fitting Assembly Guidelines .....	9.3
StoneAge Swivel Basics .....	9.8
Maintenance Kits .....	9.9
Safety Information .....	9.10
Customer Service .....	9.11
Terms & Conditions .....	9.12



“WHEN YOU PARTNER WITH STONEAGE,  
YOU HAVE OUR ENTIRE TEAM HELPING YOU  
COMPLETE YOUR CLEANING JOBS EASILY,  
SAFELY, ON-TIME AND ON-BUDGET.  
THAT’S THE STONEAGE ASSURANCE PROMISE.”

**KERRY SIGGINS**

**Waterjetting isn’t an easy job; you are putting out constant fires while being pulled in a million directions. It’s stressful, dangerous work. When the pressure is on, you need a steadfast partner who can help you solve problems, deliver exceptional waterjetting products and customer support, and aid you in keeping your customers satisfied. When you partner with StoneAge, you have our entire team helping you complete your cleaning jobs easily, safely, on-time and on-budget. That’s the StoneAge Assurance Promise.**

How do we deliver on this promise to help our customers succeed? I am glad you asked!

- **Experienced partner:** You can trust that in our 40+ years of helping waterjetters, we’ve seen your challenge and can help you solve your problem.
- **Trusted advice:** In a pinch? Call our technical sales team; they can answer all your questions, 24 hours a day. Need to talk to an engineer? We will put you through to one of our two dozen product engineers. Need help determining how to solve a challenging cleaning application or perform a job hands-free? We conduct job walks and provide "Most Effective Technology" reports to guide you in selecting the proper tooling for the job. If we can’t help you, we will recommend a competitor who can.
- **Risk reduction:** We stand behind our high-quality products with service, training and responsive support. If something goes wrong, we’ve got your back. Our goal is to help you minimize problems and reduce risk.
- **Fast access:** We understand that industrial cleaning is a NOW industry. You need a tool when you need it. We carry the most extensive inventory in the industry, have strategically located branch offices in the US, UK and Netherlands and an extensive global dealer network — all to ensure you have access to product fast.

- **Effective products:** We know that you don’t have time to deal with tooling that isn’t effective — or worse, it doesn’t work. Our tools are the best in the industry for a reason: they are easy to use, reliable, and work out of the box. Our engineering team is focused solely on developing industry-improving tooling and equipment, bringing you better jetting solutions year over year. We even acquired an IoT product development company called Breadware to help us develop connected, data-producing products to enable you to perform cleaning jobs faster, safer, better.
- **Custom solutions:** Off-the-shelf products aren’t always what you need to get the job done; that’s why our StoneAge Solutions team is here to partner with you to develop practical, custom systems that deliver exceptional value.
- **Industry training:** We know that one of your toughest challenges is training and retaining your workforce. StoneAge Training is a cost-effective way to increase workforce safety, productivity and retention — all while helping you meet industry safety requirements.
- **Great company:** We aren’t like most companies. We care deeply about our employees, our customers and industry. Our customers see this in every interaction they have with us because we are fun and easy to work with. Devoted to inspiring the industry, we are leading the way to develop global waterjetting safety standards. We are employee-owned and every one of us care about getting you what you need — because we OWN IT!

Thank you for being a StoneAge customer; we appreciate your business and loyalty over the past four decades and look forward to serving for the next four and beyond.

**Kerry Siggins**

Chief Executive Officer, StoneAge Inc.

# STAY INFORMED WITH EASY ONLINE RESOURCES

## VISIT OUR WEBSITE

- Updated product information
- Service literature and user manuals, news and much more
- Complete list of Authorized Dealers and Service Center locations

[www.stoneagetools.com](http://www.stoneagetools.com)



## JETTING APP

- Optimize your StoneAge Tool for faster cleaning
- Configure jetting, flow and pressure loss
- Dial in the exact working configurations for your nozzle



[jetting.stoneagetools.com](http://jetting.stoneagetools.com)



## PICK UP YOUR SMARTPHONE

- Our mobile website provides access to updated product information
- Complete library of instructional videos
- Searchable archive of user manuals in downloadable PDF format
- Contact details for all of our Branch Offices, Authorized Dealers and Repair Centers

## FOLLOW US ON SOCIAL MEDIA

- Never miss our latest updates!
- Get your application questions answered by StoneAge engineers
- See exclusive videos with tips and best practices for more effective cleaning



## SUBSCRIBE TO OUR YOUTUBE CHANNEL

- Check out our latest product videos
- Step-by-step maintenance and repair
- Videos of our tools and equipment in the field

[www.youtube.com/user/StoneAgeWaterTools](http://www.youtube.com/user/StoneAgeWaterTools)

## DOWNLOAD SUPPORT MANUALS

- The latest Repair Manuals and Product Guides to help you get the most out of your StoneAge product

### ***Our support team is here to help!***

We gladly respond to inquiries and provide advice on your cleaning challenges.



# STONEAGE TRAINING

FOR INDUSTRIAL CLEANING PROFESSIONALS

## BE THE SAFEST, BE THE BEST

StoneAge has a vision of creating training programs and facilities where we impart 40 years of technical and engineering expertise to operators, supervisors, asset owners and process engineers. Our goal is to help industry professionals become proficient and highly skilled.

Through training, we can bolster and grow the use of high-pressure water as a safe, environmentally friendly and effective method of cleaning across a wide range of industries.

“The training we received from StoneAge helped our employees better understand how to apply critical thinking and to troubleshoot the process problems that sometimes happen in the field. I would certainly recommend this training for anyone working in the water blasting industry.

**Ryan Newman**  
-Augusta Industrial Services



# COURSE OVERVIEW

Training can be customized to the specific needs of your company and delivered onsite, online or at StoneAge Facilities. Get more information and schedule training on our website: [www.stoneagetaining.com](http://www.stoneagetaining.com)

## WATERJETTING SAFETY

Basic jobsite safety when working with and around high-pressure systems

### COURSE CONTENTS

Safety overview
General waterjetting concepts
Safety legislation
High pressure equipment overview
Pump overview, safety systems, filtration
Gun types and precautions, jetting gun nozzles
Introduction to waterjet forces
Reaction force, standoff distance, speed of travel, jet angles, pressure loss
Hose safety
Calibration of jetting nozzles/jets
Equipment best practices, what to avoid
Hot & cold weather operation considerations
Job site considerations
Personal Protective Equipment (PPE)
Barricades
Team composition
Safety checks
Code of signals
Waterjet injury prevention
Nature of the injury - how waterjet cuts differ from other injuries
Waterjet cut prevention checklist
Incident examples and corrective actions

## EQUIPMENT TRAINING

Theoretical and hands-on training in the safe and effective use of rotary tools and automated equipment. Training ensures operators are set up for success on the job, covering equipment set up / tear down, operation, troubleshooting, maintenance, and storage.

## ACCREDITED INDUSTRY TRAINING

StoneAge is an accredited training provider for industry partners Water Jetting Association (WJA) and Waterjet Technology Association (WJTA).

### COURSE CONTENTS

WJTA Hydroblaster Training
WJA Safety Awareness
WJA Practical Water Jetting Training

## RECOMMENDED PRACTICES FOR WATERJET APPLICATIONS

Optimize cleaning applications and selecting the right equipment for the job

### COURSE CONTENTS

Drain and Sewer Cleaning
Pipe Cleaning
Tube Cleaning
Tank and Vessel Cleaning
Surface Cleaning and Preparation

## WATERJETTING SCIENCE & TECHNIQUE

Deepen your understanding of the physics and technology behind high-pressure waterjet cleaning

### COURSE CONTENTS

Understanding pressure for waterjetting
Material jettability
Optimizing waterjet power
Harnessing the power of the pump
Quality jetting: nozzle materials and design
Upstream conditions and jet impact
Managing pressure loss
Benefits of rotation
Fitting and hose identification

As a ratifying member and founding leader of the Global Industrial Cleaning Coalition, StoneAge's mission is to contribute towards the creation and adoption of basic industrial cleaning principles around the world. For more information and resources, visit [www.globalindustrialcleaningcoalition.org](http://www.globalindustrialcleaningcoalition.org). StoneAge training is aligned with the waterjetting safety, practical, and examination requirements of global industry associations and training partners with the goal of supporting a safer, more productive industry.



Global Industrial Cleaning Coalition



# TUBE CLEANING

Fully integrated systems for triple, dual and single flex lance exchanger tube cleaning. Designed to help contractors reduce cost, increase safety and maximize productivity.

**NEW**



## AUTOMATED TUBE CLEANING

Sentinel Automation Technology is a CE-certified system consisting of a modern controller, sensors, and a power hub that integrates with StoneAge's AutoBox 3L to enable automated exchanger tube cleaning. Sentinel improves efficiency and productivity by 30% to deliver consistent, high-quality cleaning results at every job.

- ✓ Breeze through tough conditions with unmatched cleaning performance
- ✓ Intuitive, easy to use system delivers consistent cleaning results from operators of any skill level
- ✓ Surpass customer expectations with market-leading performance and service

### SUPPLY HOSES

StoneAge carries a full line of supply hoses.

### DUMP VALVE

StoneAge carries a complete line of pneumatically operated Dump Valves ranging from 15–40k psi (1000–2800 bar).

### ERGONOMIC, INTUITIVE CONTROLLER

Inspired by modern video game controllers, the highly intuitive yet rugged controller is easy to learn and expertly operate.

### WATER-RESISTANT POWER HUB

Seamlessly converts electronic signals from the controller to drive the AutoBox 3L Sentinel system throughout operation. *Waterproof cover not shown.*

### HIGH PRESSURE WATER SENSOR

Provides the exact water pressure output during a cleaning application through Sentinel Link.



*It normally takes us 16 hours to clean one heat exchanger bundle. Now, with the Sentinel, the entire bundle was fully cleaned within 4 hours.*

**Hyle Poll,**  
**Industrial cleaning operator at Reym**

## TUBE CLEANING

### BANSHEE ROTARY TOOLS

Available in a wide variety of sizes to deliver optimal cleaning for any tube bundle.



### LIGHTWEIGHT POSITIONER

Versatile, portable and quick to setup.  
All new design for Sentinel Automation.

### TRACTOR AND POSITIONER SENSORS

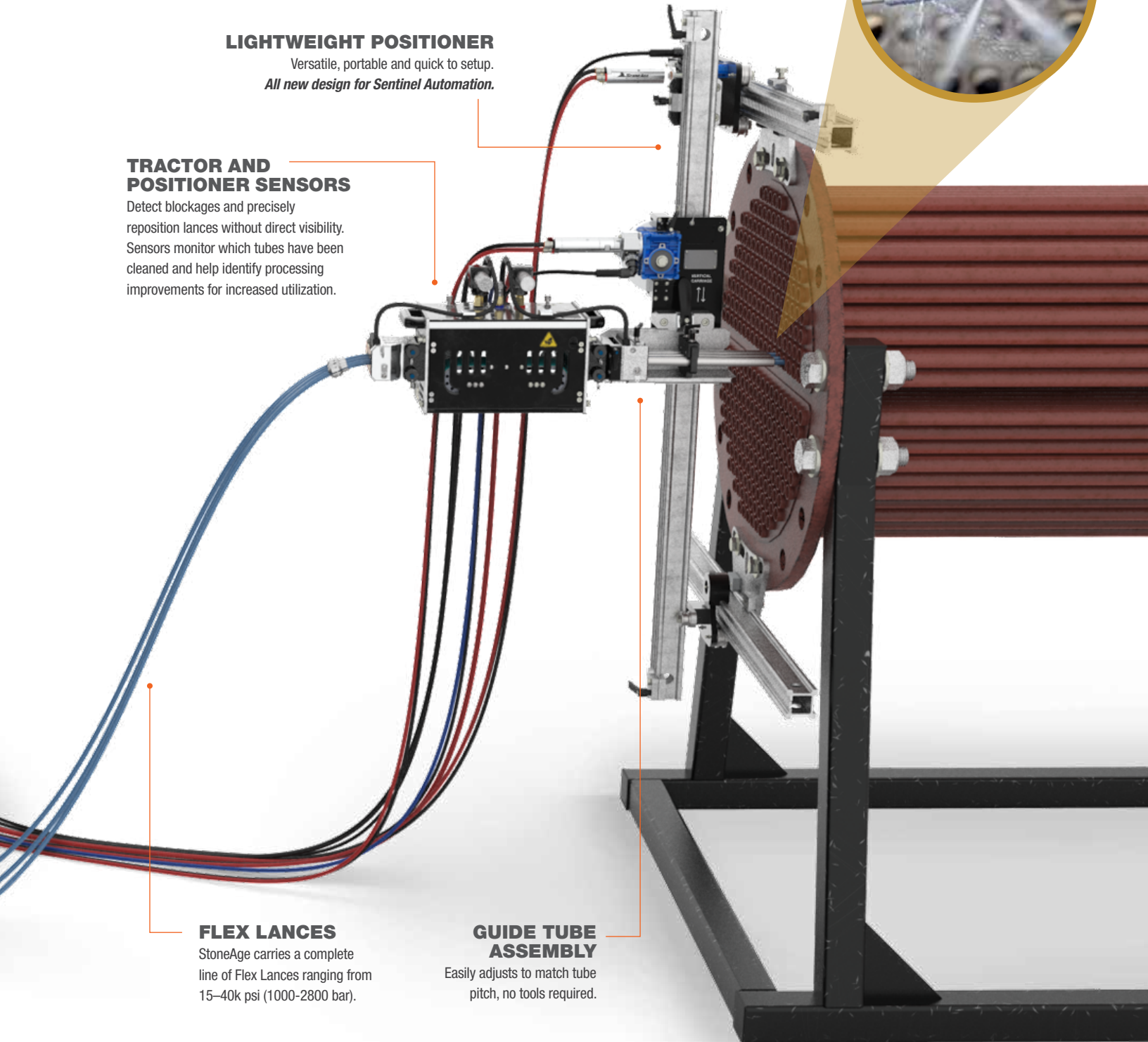
Detect blockages and precisely reposition lances without direct visibility. Sensors monitor which tubes have been cleaned and help identify processing improvements for increased utilization.

### FLEX LANCES

StoneAge carries a complete line of Flex Lances ranging from 15–40k psi (1000-2800 bar).

### GUIDE TUBE ASSEMBLY

Easily adjusts to match tube pitch, no tools required.



**NEW**



# SENTINEL LINK

WEB APPLICATION & MOBILE APP

Sentinel Automation Technology enables the capture, storage, and reporting of data for a specific asset being cleaned. This information gives contractors the ability to make incremental productivity improvements and when shared with asset owners, owners can be aware of the cleaning progress and trouble areas within the exchanger that may impact utilization.

Reduce costs and improve asset utilization with Sentinel Link job data.

- ✔ Real time job adjustments to optimize cleaning productivity and minimize downtime
- ✔ Reduce fuel, water consumption, and overall job costs
- ✔ Create consistent, repeatable results through data collection
- ✔ Identify opportunities for processing improvements
- ✔ Use historical data for accurate bidding and cost savings



## ACCESS DATA FROM SPECIFIC CLEANING APPLICATIONS WITH SENTINEL LINK:

- ✔ System usage and configuration
- ✔ Time range
- ✔ Cleaned tubes
- ✔ Tubes per hour
- ✔ Tube sheet face visualization
- ✔ Clamp and inlet pressure
- ✔ High-pressure water rate



# SENTINEL SYSTEM COMPONENTS

## CONTROLLER

The Sentinel controller was designed to withstand the toughest waterblasting environments and supports an increased level of workforce productivity. Inspired by modern video game controllers, the highly intuitive yet rugged controller is easy to learn and expertly operate.



- ✓ Intuitive & ergonomic design enables comfortable use while wearing PPE
- ✓ Durable water-tight seal with integrated electronics system
- ✓ Purpose-built with industrial-grade controls

## WATER PRESSURE SENSOR

Unlike anything on the market, the Sentinel water pressure sensor provides the exact water pressure output during a cleaning application through Sentinel Link.

Operators can now monitor pressure loss in real time, so they can replace worn rotary tools when needed for optimum performance and faster job completion.



- ✓ Durable, portable and easily connects to the powerhub with a single cable
- ✓ High-pressure water rate appears on the controller display and can be uploaded to Sentinel Link
- ✓ Provides exact water pressure output

## POWER HUB

The Power Hub seamlessly converts electronic signals from the controller to drive the AutoBox 3L Sentinel system throughout operation. Designed with maximum durability for harsh waterblasting conditions, the water-resistant Power Hub has a sealed design separating the electronic and pneumatic elements and comes with a custom-built shield that further protects the equipment.



- ✓ Eliminates caps and plugs with a door that covers fittings and connectors
- ✓ Provides designated compartment to securely store controller when not in use
- ✓ Features an integrated FRL (filter, regulator, and lubricator) to aid in valve pack and air motor life

## AUTOPACK (SEE PAGE 2.10)

Built around the AutoBox 3L triple lance tractor, the Sentinel-enabled AutoPack 3L is equipped with everything you need to successfully complete single, dual, or triple lance tube bundle heat exchanger cleaning. With the advanced productivity features and data analytics of Sentinel Automation Technology, you'll improve asset utilization and deliver consistent, high-quality cleaning results at every job.



- ✓ Intuitive, automated system improves crew safety and productivity
- ✓ Job box protects equipment and is easy to organize
- ✓ Standardized kit simplifies transport and minimizes setup time

# TRIPLE & DUAL LANCE CLEANING

**AUTOPACK 3L SHOWN FOR REFERENCE**

Fully integrated systems for triple, dual and single flex lance exchanger tube cleaning. Designed to help contractors reduce cost, increase safety and maximize productivity.

More information and product videos available here:

**[WWW.STONEAGETOOLS.COM/AUTOPACK-3L](http://WWW.STONEAGETOOLS.COM/AUTOPACK-3L)**



**ALREADY OWN A 3L SYSTEM?**  
**Sentinel Conversion** options available

## **FLEX LANCES**

StoneAge carries a complete line of Flex Lances ranging from 15–40k psi (1000–2800 bar).

## **HOSE CONTAINMENT**

Increases safety, prolongs life and simplifies transport.  
*New, simpler design.*

## **CONTROL BOX**

Durable, lightweight and easy to use.

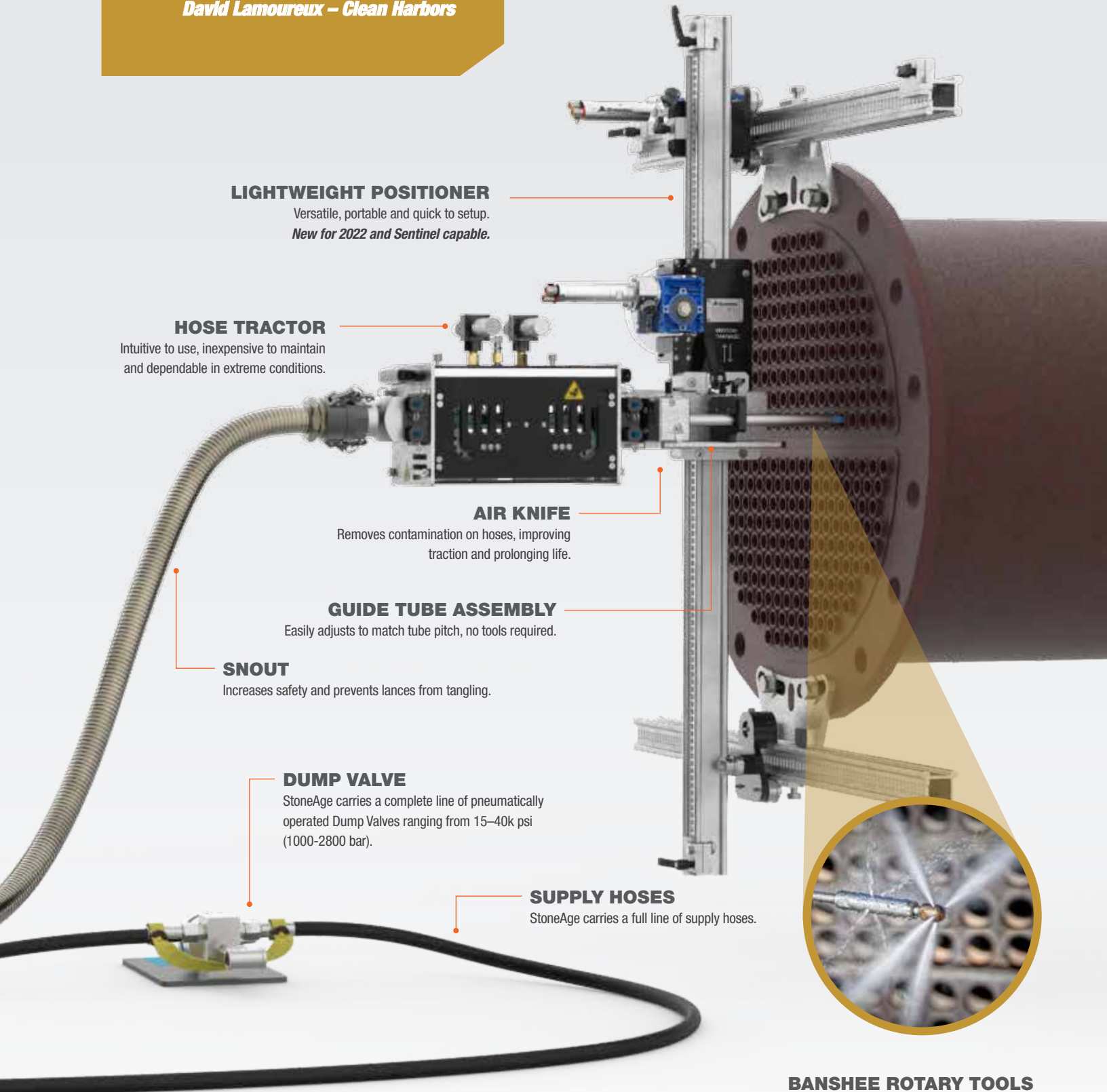




*The AutoBox ABX-3L enabled us to remove hard scale in a difficult vertical exchanger that hadn't been successfully cleaned in 20 years.*

**David Lamoureux – Clean Harbors**

## TUBE CLEANING



### LIGHTWEIGHT POSITIONER

Versatile, portable and quick to setup.  
*New for 2022 and Sentinel capable.*

### HOSE TRACTOR

Intuitive to use, inexpensive to maintain and dependable in extreme conditions.

### AIR KNIFE

Removes contamination on hoses, improving traction and prolonging life.

### GUIDE TUBE ASSEMBLY

Easily adjusts to match tube pitch, no tools required.

### SNOUT

Increases safety and prevents lances from tangling.

### DUMP VALVE

StoneAge carries a complete line of pneumatically operated Dump Valves ranging from 15–40k psi (1000–2800 bar).

### SUPPLY HOSES

StoneAge carries a full line of supply hoses.

### BANSHEE ROTARY TOOLS

Available in a wide variety of sizes to deliver optimal cleaning for any tube bundle.

# SINGLE LANCE CLEANING

**NEW**

AVAILABLE  
SPRING 2022

## COMPASS PREVIOUSLY KNOWN AS THE PROPOSITIONER

SINGLE LANCE CLEANING FOR VERTICAL,  
HORIZONTAL AND ENCLOSED BUNDLES

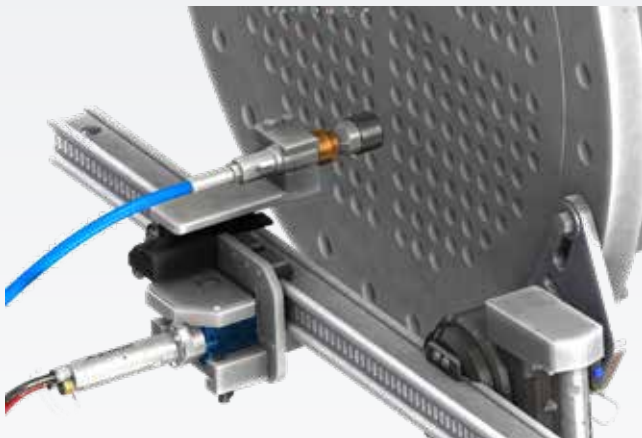
The Compass is a lightweight radial indexing device that pairs with the AUTOBOX ABX-PRO hose drive.

The system is engineered for portability and quick set-up with a single mounting point on the exchanger face. It is intended to allow the user to attach the device once and clean all tubes in most bundles without re-mounting.

- ✓ **Lightweight, compact and portable. All components weigh under 35 lbs (16 kg)**
- ✓ **Designed for quick setup with a single attachment point, push-to-connect hoses and quick clamps**
- ✓ **Ideal for cleaning small exchangers, 40k psi (2800 bar) flex lance work or reactor cleaning.**
- ✓ **Optional accessories include a shotgun mount for surface prep and a mounting kit for domed bundle cleaning**

TOOL MODEL	UP-COMPASS
HORIZONTAL LENGTH	Standard 45 in 1143 mm
WEIGHT COMPLETE	80 lb 36.2 kg

## OPTIONAL COMPASS ACCESSORIES



### SHOTGUN MOUNT

For surface prep and tube sheet cleaning.



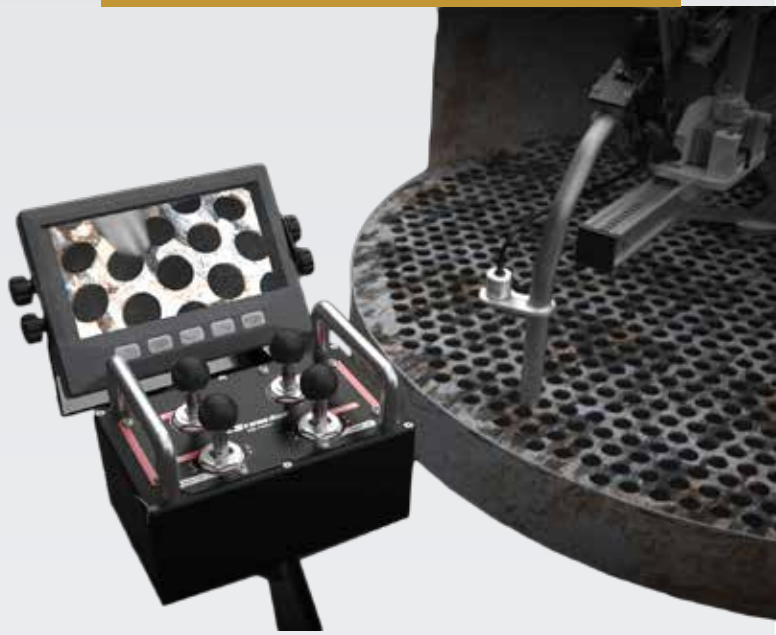
### UNIVERSAL REMOTE

Works for both pipe and tube cleaning applications.

# COMPASS FOR DOMED BUNDLE CLEANING

The industry's only system specifically designed for cleaning tubes inside of domed bundles and confined spaces. Perfect for ethanol evaporators, or pulp and paper industries. This configuration of the Compass adds a spider plate mount, a curved snout and a camera system to deliver fast and accurate tube cleaning while the operator remains safely outside the vessel.

- ✔ Remote lancing of tubes in confined-space applications improves operator safety and productivity
- ✔ Complete cleaning around circular tube bundles with fewer stops to remount equipment
- ✔ Modular design meets plant requirements for single man lift and manway access
- ✔ Camera system allows the operator to accurately clean tubes from safely outside the blast zone



**INTEGRATED CAMERA SYSTEM**  
 provides clear visibility without direct line of sight

**CURVED SNOOT**  
 Curved guide tube cleans around circular bundles and to the edge of a tube sheet face

**SPIDER PLATE**  
 easily attaches at a single connection point to clean all tubes in most bundles with minimal re-mounting

**EXPANSION PLUGS**  
 come in several sizes to fit any size tube. Customers can contact StoneAge with their specific needs.



# AUTOPACK

## COMPLETE TUBE CLEANING KITS

StoneAge AutoPack kits contain everything you need to tackle exchanger cleaning jobs and exceed hands-free safety requirements while increasing the productivity and organization of your workforce.

StoneAge offers four self-contained AutoPacks pre-configured with all the components and accessories needed for triple, dual or single lance tube cleaning.

- ✔ Simple and cost effective way to add automation to your equipment fleet
- ✔ Increase the safety and productivity of your crew
- ✔ Standardized kits keep your workforce organized and efficient
- ✔ Job box protects your equipment, simplifies transport and minimizes set-up time
- ✔ Customized storage inserts allow for quick visual inventory management

**CONTACT STONEAGE TO FIND OUT HOW YOU CAN CONVERT YOUR EXISTING EQUIPMENT INTO AN AUTOPACK.**



**NEW**

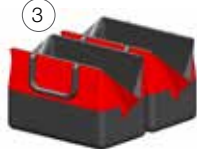
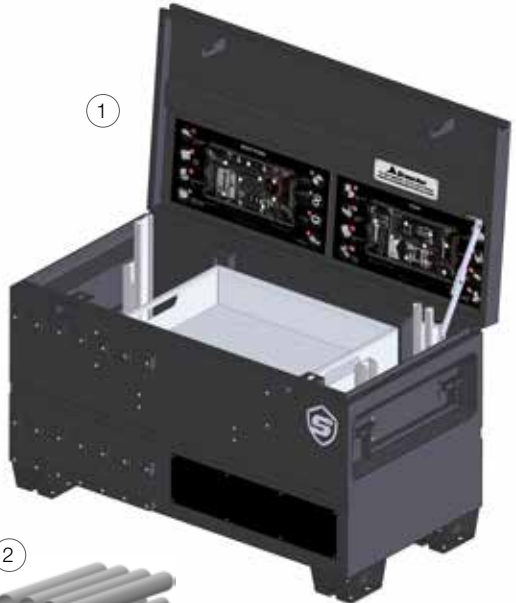


# AUTOPACK 3L SENTINEL

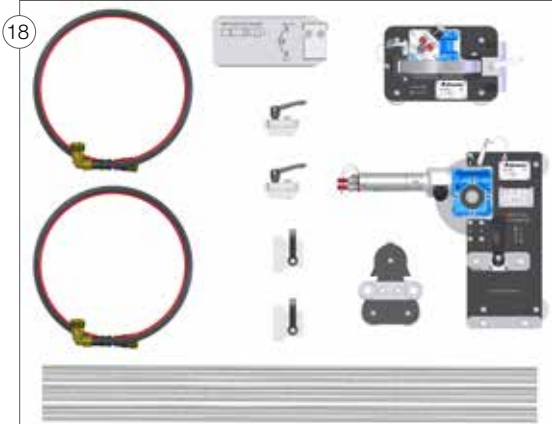
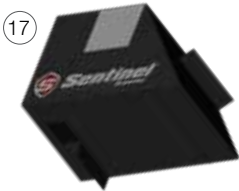


Built around the AutoBox 3L triple lance tractor, the Sentinel-enabled AutoPack 3L is equipped with everything you need to successfully complete single, dual, or triple lance tube bundle heat exchanger cleaning. With the advanced productivity features and data analytics of Sentinel Automation Technology, you'll improve asset utilization and deliver consistent, high-quality cleaning results at every job.

#	PART NUMBER	DESCRIPTION	QTY
1	GPT 071-3LS	CHEST, 3LS AND LWPS	1
2	ABX ???-12	KIT, 12IN GUIDE TUBES (3 EA ABX 115, 116, 117, 119)	1
3	GPT 310	TOOL BAG, 18IN	2
4	PH-A0302A00C20	POWER HUB	1
5	ABXS 628	SPARE PARTS KIT, 3LS AND LWPS W IPOD	1
6	GPT 108-S	KIT, HOSE STOP AND COLLET 3L	1
7	CTRL-101	CONTROLLER	1
8	ABXS-3L*	BELT TRACK DRIVE HOSE TRACTOR*	1
9	LWP 622	KIT, PLATE CLAMP ASSY (BOLTED TO FLANGE, 2 PCS.)	1
10	LWP 621	KIT, QUICK CLAMP ASSY (CLAMP TO FLANGE, 4 PCS.)	1
11	PT 641	PRESSURE TRANSDUCER & FITTINGS KIT	1
12	CBL E020F-1RB6PP	CABLE FOR CONTROLLER	1
13	CBL E050F-1RB3RP	POWER CABLE 50FT	1
14	CBL EA15F-1RB6PP-2PL10-1PL5	CABLE ASSY FOR ABXS TRACTOR	1
15	PHA 510-XX	POWER SUPPLY 12V AC-DC	1
16	PHA 520	POWER SUPPLY 12V DC-DC	1
17	PHA 112	SHIELD	1
18	LWPS-100-6	LIGHTWEIGHT POSITIONER, 6FT, WITH RAILS	1



**\*Sentinel Enabled**





# AUTOPACK 3L

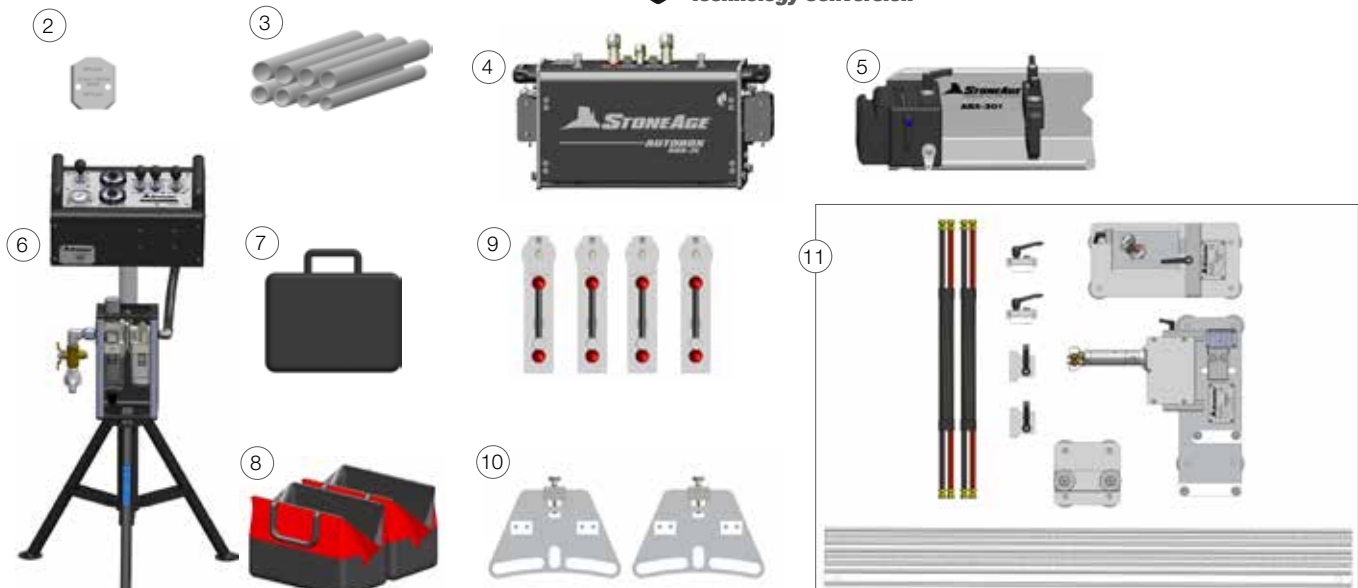
Built around the AutoBox 3L triple lance tractor, the AutoPack 3L is equipped with everything you need to successfully complete single, dual, or triple lance tube bundle heat exchanger cleaning.

 **Compatible with  
Sentinel Automation Technology Conversion**



#	PART NUMBER	DESCRIPTION	QTY
1	GPT 067-3L-001	CHEST, 3L AND LWPS	1
2	ABX 369-??-K	Y MANIFOLD WITH PLUGS AND GLANDS	1
3	ABX 631-12	KIT, 12IN GUIDE TUBES (3 EA ABX 115, 116, 117, 119)	1
4	ABX-3L-V3*	ABX-3L-V3 BELT TRACK DRIVE ASSY*	1
5	ABX-301	GUIDE ASSEMBLY, 3L, HIGH-VISIBILITY	1
6	CBX-ABX	CONTROL PANEL ASSY, CBX	1
7	GPT 108	KIT, HOSE STOP AND COLLET 3L	1
8	GPT 310	TOOL BAG, 18IN	2
9	LWP 621*	KIT, QUICK CLAMP ASSY (CLAMP TO FLANGE, 4 PCS.)	1
10	LWP 622*	KIT, PLATE CLAMP ASSY (BOLTED TO FLANGE, 2 PCS.)	1
11	LWPS-100*	LIGHTWEIGHT POSITIONER, 6FT, 48IN/1220MM FLANGE, (W/ROUND HOLES) 2 PIECE PART	1

**\*Compatible with  
Sentinel Automation  
Technology Conversion**





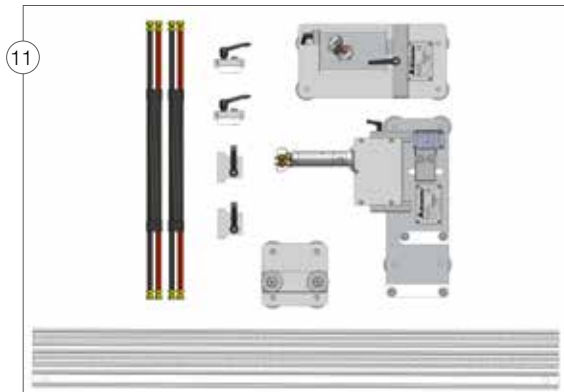
# AUTOPACK 2L

Built around the AutoBox 2L Belt version dual lance tractor, the AutoPack 2L B is equipped with everything you need to successfully complete tube bundle heat exchanger tube cleaning.

*Designed with an optional dual motor configuration to conquer difficult jobs and longer runs*



#	PART NUMBER	DESCRIPTION	QTY
1	GPT 067-2L-B-001	CHEST, 2L-B AND LWPS	1
2	ABX 369-???-K	Y MANIFOLD WITH PLUGS AND GLANDS	1
3	ABX 630-12	KIT, 12IN TUBES, (2 EA ABX 115, 116, 117, 119)	1
4	ABX-201	GUIDE ASSY, 2L, HIGH VISIBILITY	1
5	ABX-2L-B-V2	AUTOBOX ASSY, BELT DRIVE, 2L	1
6	CBX-ABX	CONTROL PANEL ASSY, CBX	1
7	GPT 107	KIT, HOSE STOP AND COLLET 2L	1
8	GPT 310	TOOL BAG, 18IN	2
9	LWP 621	KIT, QUICK CLAMP ASSY (CLAMP TO FLANGE, 4 PCS.)	1
10	LWP 622	KIT, PLATE CLAMP ASSY (BOLTED TO FLANGE, 2 PCS.)	1
11	LWPS-100	LIGHTWEIGHT POSITIONER, 6FT, 48IN/1220MM FLANGE, (W/ROUND HOLES) 2 PIECE PART	1



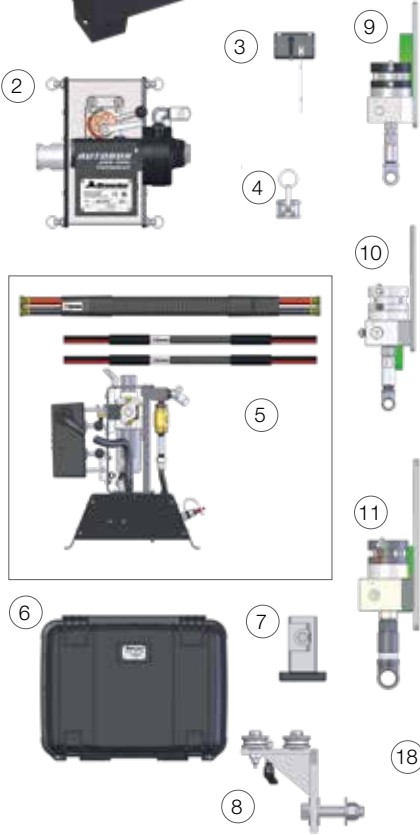


**NEW**

# AUTOPACK COMPASS

The AUTOPACK COMPASS pairs the versatile AUTOBOX ABX-PRO hose drive, with the new Compass radial indexing system and all the accessories you need to successfully complete single lance tube cleaning for vertical, horizontal and enclosed bundles. Everything comes neatly packed in one convenient job box to simplify transport and protect your equipment.

**ASK US HOW TO CONVERT YOUR EXISTING ABX-PRO EQUIPMENT INTO A FULLY EQUIPPED AUTOPACK COMPASS.**



#	PART NUMBER	DESCRIPTION	QTY
1	GPT 070-PROP-001	AUTOPACK PRO POSITIONER CHEST	1
2	ABX-PRO	AUTOBOX PRODRIVE TRACTOR ASSY	1
3	BOP 030	COLLET BLOCK ASSEMBLY	1
4	BOP 048	HOSE STOP ADAPTER, PRODRIVE	1
5	CB-PROP-?	CONTROL BOX, PRO POSITIONER PLACEHOLDER	1
6	CAM-COMPASS-??	ASSEMBLY, CAMERA W/ CASE	1
7	DBP 305	RAIL PLUG ASSY	1
8	DBP 330	DELTA T TROLLEY CLAMP ASSY	1
9	ACDA 61001007-K	DUMP VALVE 15K, BASE PLATE, AIR FITTINGS AND HOSE	1
10	ACDA 61040006-K	DUMP VALVE 40K, BASE PLATE, AIR FITTINGS AND HOSE	1
11	ACDA 610200342-K	DUMP VALVE 20K, HIGH FLOW 50GPM WITH BASE PLATE KIT	1
12	PROP 187-??-K	EXPANSION PLUG KIT	1
13	DBP 320	ICM TROLLEY CLAMP ASSY	1
14	PROP 430-001	SPIDER PLATE ASSY	1
15	FF 121-???	HOSE STOP, COLLET STYLE, PLACE HOLDER	1
16	PROP 337	HANDLE, ADJUSTABLE M8	1
17	PROP 339	WASHER, FLAT OVERSIZED M8	1
18	PROP-300	PRO POSITIONER ASSY	1
19	PROP 460-BN24	GUIDE WELDMENT BN24	1
20	PROP 580-1.33-001	2.5" BOX RAIL EXTENSION KIT, SLOTTED, 1.33 FT	1
21	PROP 490-L	GUIDE TUBE KIT, 12 INCH, BN24-BN33	1
22	PROP 490-S	GUIDE TUBE KIT, 12 INCH, BN9.5-BN18	1
23	CB 755-15-C	HOSE BUNDLE WITH CABLE FOR DBP	1
24	PROP 420	RAIL FLANGE MOUNT ASSY	1

# HOSE TRACTORS

TRIPLE, DUAL OR SINGLE  
LANCE OPERATION

- ✓ Lightweight, modular design allows a single operator to quickly move, set up and run
- ✓ Accommodates a wide range of hose sizes
- ✓ Hose clamp pressure and feed rates can be remotely adjusted for repeatable and consistent cleaning
- ✓ Proven reliability on the toughest jobs and most corrosive environments

## TUBE CLEANING



	<b>AUTOBOX 3L*</b> Triple Flex-Lance Tractor	<b>AUTOBOX 2L</b> Dual Flex-Lance Tractor	<b>AUTOBOX PRODRIVE</b> Single Flex-Lance Tractor
<b>HOSE SIZE</b>	3/2–8/4	3/2–8/4	3/2–8/4, 3/8 Rubber Covered
<b>HOSE FEED RATE</b>	0.3–3.0 ft/sec 0.09–0.9 m/sec	0.3–3.0 ft/sec 0.09–0.9 m/sec	1.0–32 in/sec 25–813 mm/sec
<b>OPERATING AIR PRESSURE</b>	100 psi 0.70 MPa	100 psi 0.70 MPa	100 psi 0.70 MPa
<b>DIMENSIONS</b>	8.3 x 16.9 x 8.2 in. 211 x 429 x 208 mm	8.3 x 16.9 x 8.2 in. 211 x 429 x 208 mm	7 in. x 9.25 in. x 10 in. 178 mm x 235 mm x 254 mm
<b>WEIGHT</b>	49 lbs 22 kg	43 lbs 20 kg	25 lb 11.3 kg
<b>-350 HP PUMP</b>	○	●	●
<b>+350 HP PUMP</b>	●	○	Not recommended
<b>PORTABILITY</b>	○	○	●
<b>SMALL EXCHANGERS</b>	○	●	●
<b>LARGE EXCHANGERS</b>	●	●	○
<b>U-TUBE (CURVED) EXCHANGERS</b>	●	●	●
<b>HORIZONTAL APPLICATIONS</b>	●	●	●
<b>VERTICAL APPLICATIONS</b>	●	●	●
<b>HIGHEST POWER DELIVERY</b>		○	●

**\*Compatible with**  
 **Sentinel Automation  
Technology Conversion**

● Optimized solution    ○ Capable solution but not optimal

*This product selector is only to be used as a guide. Please contact your StoneAge Sales Representative or Authorized StoneAge Dealer for more information.*

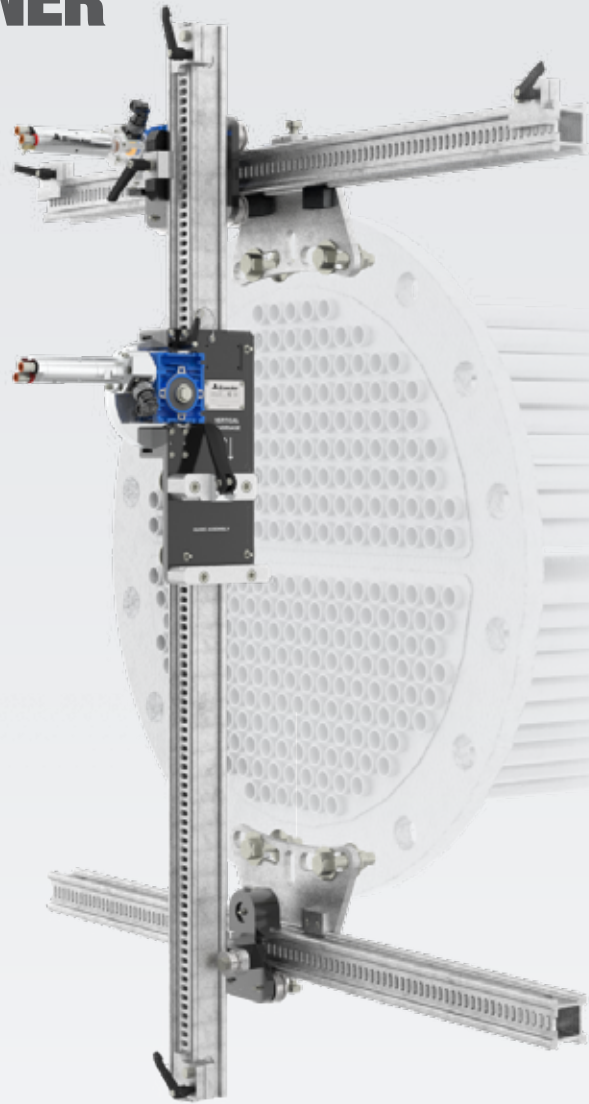
# LIGHTWEIGHT POSITIONER

The Lightweight Positioner (LWPS) is an indexing system that can be paired with a variety of StoneAge equipment for applications where controlled and repeatable movement is required.

This system is engineered for use with AutoBox tractors for safe and efficient cleaning of exchanger tubes and can also be paired with shotgun tools for tube sheet cleaning and surface preparation.

- ✓ **Modular and expandable**
- ✓ **Quick set-up**
- ✓ **Durable stainless steel air motors**

 **Compatible with  
Sentinel Automation Technology Conversion**

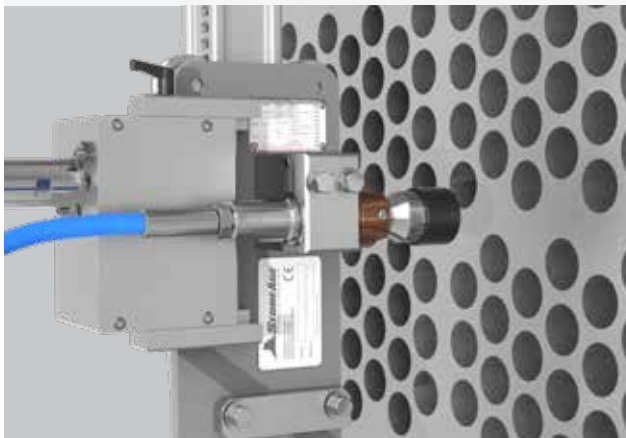


<b>TOOL MODEL</b>	LWPS-100
<b>HORIZONTAL LENGTH*</b>	Standard 6 ft 183 cm
<b>VERTICAL LENGTH*</b>	Standard 6 ft 183 cm
<b>WEIGHT COMPLETE</b>	120 lb 54.4 kg



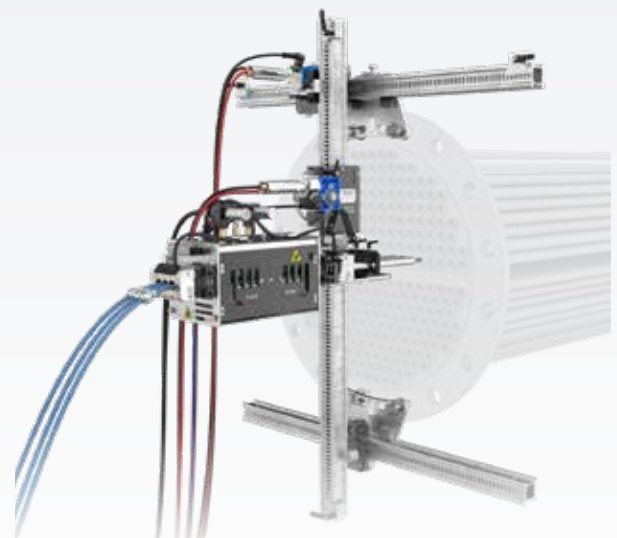
## MULTIPLE MOUNTING OPTIONS

Allows the LWPS to be configured to several different heat exchanger faces.



## OPTIONAL ACCESSORIES

Includes a shotgun mount for surface prep and tube sheet cleaning.



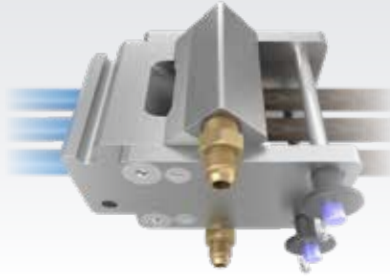
## VERSATILE DESIGN

Compatible with our entire line of AutoBox Tractors.

### AIR KNIFE - HOSE CLEANER

Blows a continuous “blade” of pressurized air across the hoses before they retract back into the tractor. Keeps effluent out of the equipment, preventing performance issues and increasing component life.

MODEL	AK-2L, AK-3L
MIN. AIR PRESSURE	90 psi (0.62 MPa)
MAX. AIR PRESSURE	125 psi (0.86 MPa)
NOMINAL AIR VOLUME	5 CFM at 100 PSI (8.5 m <sup>3</sup> /h at 0.69 MPa)



- ✓ Removes contamination on hoses, improves hose traction
- ✓ Allows the tractor to be run at lower clamp pressures
- ✓ Reduces operator cleaning time roller/belt wear in oily or slippery applications

### HOSE CONTAINMENT

Flex lance storage and hose management. Greatly increases job site safety by reducing trip hazards in the blast zone and eliminating the potential for high pressure hoses to snag on structure, valves, or other objects.

*New, simpler design released Spring 2022.*

MODEL	HCS-PRO, HCS-2L, HCS-3L
HOSE SIZE	3/2 to 8/4
STORAGE CAPACITY	1 x 8/4: 80 ft (24 m) 1 x 3/2: 300 ft (91 m)
WEIGHT	53.5 lb (24 kg)



- ✓ Increased job site safety
- ✓ Easily store and transport hoses between jobs
- ✓ Portable design with small footprint
- ✓ Reduces hose wear
- ✓ Lightweight and durable with good corrosion resistance

### CONTROL BOXES

StoneAge control boxes deliver best-in-class performance. All control boxes are designed to be durable, lightweight and cross-compatible.



**REMOTE DUMP**  
Allows the operator to have complete control of the pressure at all times

**EASY TO READ GAUGES**  
Allow the operator to quickly make adjustments at a glance.

**HOSE FEED AND CLAMP PRESSURE**

**COMPACT AND LIGHTWEIGHT**

## RIGID LANCE MACHINE

StoneAge Rigid Lance Machines are the industry standard for both horizontal and vertical rigid lance cleaning of heat exchangers. These systems operate up to three rotary lances and provide more forward jet power than flex-lancing to clean difficult deposits. Fully remote operation increases safety by removing the operator from the splash-back area.

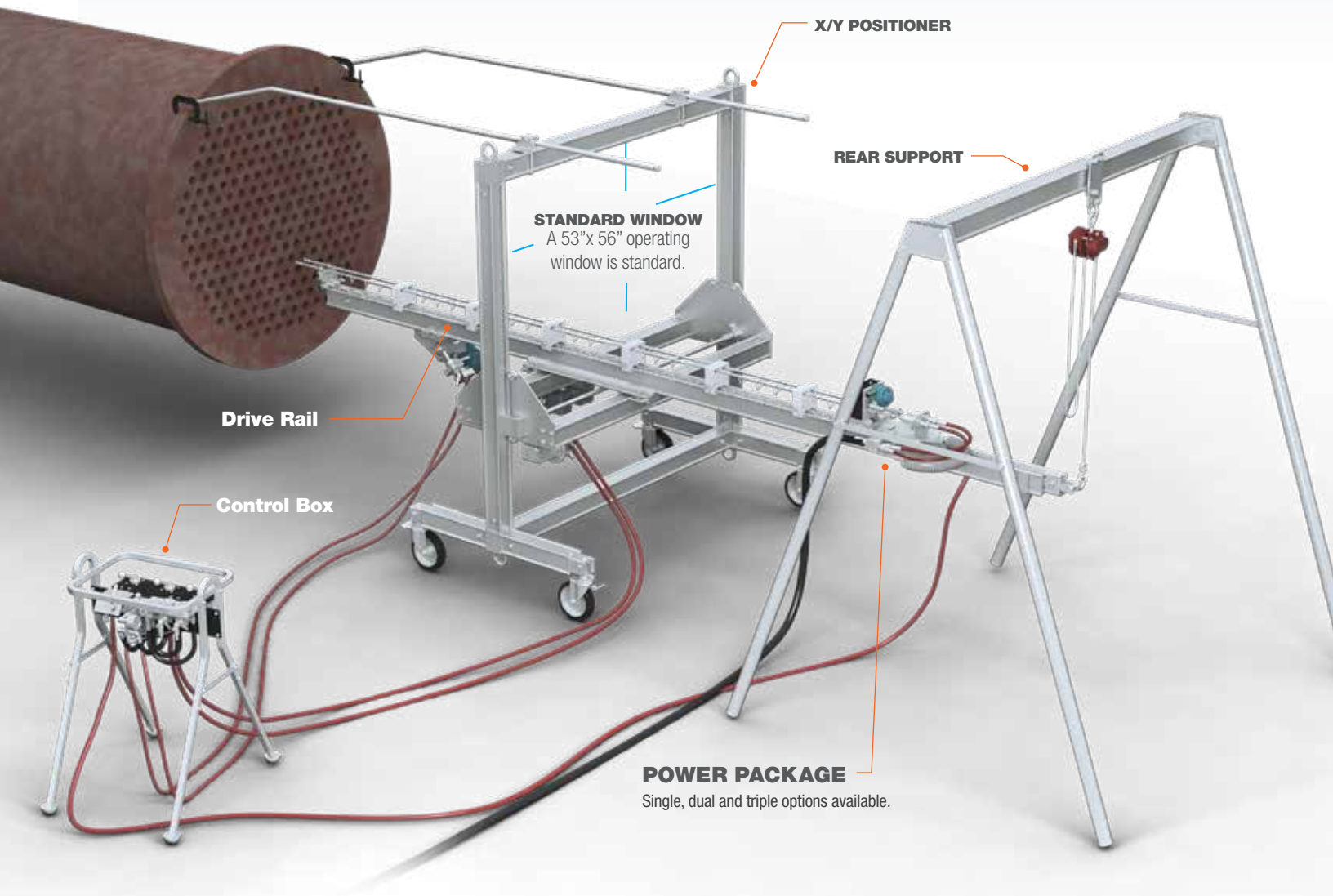
MODEL	BRLM
PRESSURE RANGE	Up to 44k psi 3000 bar
FLOW RANGE	Up to 60 gpm 227 l/min
MAX. RAIL LENGTH	60 ft 18 m
FEED RATE	0.3-1.2 ft/s 0.1-0.37 m/min

### FEATURES:

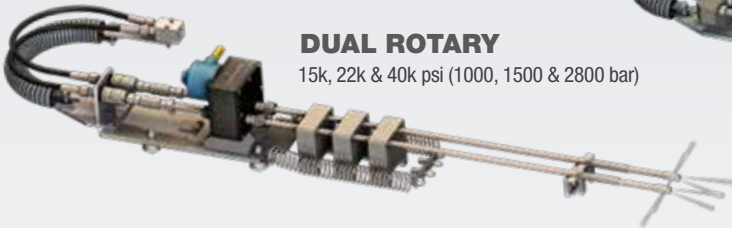
- ✔ Triple, dual, or single lance operation
- ✔ Adapts to any size bundle and can be configured for horizontal or vertical operations to maximize flexibility
- ✔ Operator is removed up to 25 ft (7.6m) away from the splash back area for increased safety
- ✔ Dual coil springs increase safety and stability of guide block
- ✔ Swivel wheels, jack stands and rear supports provide extra stability and support in key points of the system
- ✔ Air or hydraulic powered

### IDEAL FOR:

- ✔ Clearing and unplugging vertical and horizontal bundles
- ✔ Cleaning and polishing evaporator tubes
- ✔ Removing thin, hard scale, carbons, coke and polymers



**POWER PACKAGE OPTIONS**



**DUAL ROTARY**  
15k, 22k & 40k psi (1000, 1500 & 2800 bar)



**TRIPLE ROTARY**  
15k, 22k & 40k psi (1000, 1500 & 2800 bar)

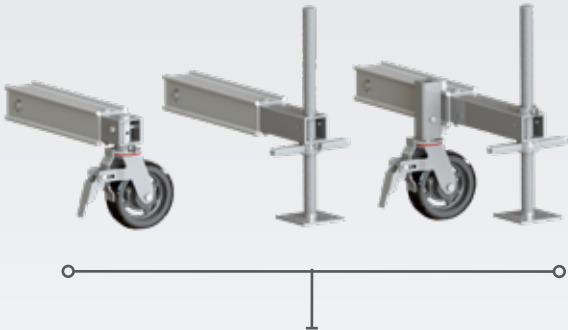
**POWER PACKAGE SPECIFICATIONS**

MODEL	PART NUMBER	MAXIMUM PRESSURE	INLET CONNECTION	LANCE CONNECTIONS	ROTATION SPEED
DUAL ROTARY	BRLM 351	15/22k psi    1000/1500 bar	3/4" MP	1/8" or 1/4" NPT, 3/8" or 9/16" MP	105-525 rpm
	BRLM 361	44k psi    3000 bar	9/16" HP	3/8" or 9/16" HP	105-525 rpm
TRIPLE ROTARY	BRLM 353-CS	15-22k psi    1000/1500 bar	3/4" MP	1/8" or 1/4" NPT, 3/8" or 9/16" MP	125-620 rpm
	BRLM 363-CS	44k psi    3000 bar	9/16" HP	3/8" or 9/16" HP	125-620 rpm

Single rotary systems are still available through StoneAge Solutions. Call for more information.



**VERTICAL APPLICATIONS**  
Excellent for vertical applications as well.



**SWIVEL WHEELS & JACK STANDS**  
There are several wheel kit and jack stand options available. Heavy-duty, locking swivel casters are standard equipment. Not required for vertical lancing applications.

# BUNDLE BLASTER

The Bundle Blaster system offers a powerful and affordable automated solution for external cleaning of heat exchangers. This system is ideal for contractors and plants interested in low maintenance, cost-effective, easy to use equipment. The Bundle Blaster is safer and more effective than traditional hand-held methods of shell side cleaning and 1/3 of the cost of truck mounted systems. The Bundle Blaster is offered in standard 24 ft (7.3m) and 36 ft (11m) lengths to accommodate the most common bundle sizes. The “A” frames are height adjustable to account for small and large diameters. The entire assembly is modular and can be taken apart for transportation or storage.

“ This equipment operates in the most difficult conditions predominantly on petrochemical refineries running consecutive shift patterns on time driven critical projects and performs consistently to a high standard without failure.

**Andrew Dobson – Veolia**

- ✓ **Designed for maneuverability on a blast pad and transport between job sites**
- ✓ **Multiple head options for delivering more concentrated power or covering a wider cleaning path**
- ✓ **Available in standard 24 ft (7.3m) and 36 ft (11m) lengths**
- ✓ **Adjustable “A” frames with locking wheels and anchor hooks**
- ✓ **Can be adapted to a variety of pressures and flows for highest level of cleaning efficiency**
- ✓ **Match the stroke length to each tube bundle with simple auto-stops for efficient cleaning with no wasted time**
- ✓ **Rotation and traverse speed are independently adjustable using remote control panel**
- ✓ **The entire assembly is modular and can be taken apart with simple hand tools for transportation**
- ✓ **Rollers are available to rotate the tube bundle for complete coverage**
- ✓ **Easy and cost-effective to maintain**



Contact StoneAge for rental availability or lead times to purchase.

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	LINEAR SPEED	POWER SUPPLY	RAIL LENGTH
BB-100	Up to 40k psi 2800 bar	Up to 110gpm 416 l/m	50–1000 rpm	7–40 ft/min 2.1–12 m/min	Air or Hydraulic	24 ft and 36 ft 7.3 m and 11 m



Durable I-beam construction easily handles 500 lbs of thrust with minimal deflection

**ADJUSTABLE FRAME HEIGHT**  
“A” frame height is adjustable between 5–9 ft (1.5–2.7m) to achieve optimal jet stand-off for different size tube bundles

**SEVERAL HEAD OPTIONS AVAILABLE**  
Maximize the Bundle Blaster’s cleaning capabilities for different applications

5–9 ft  
(1.5–2.7m)



**OPTIONAL HYDRAULIC ROLLERS**  
Rotate the tube bundle for maximum penetration and coverage



# BANSHEE TUBE CLEANING NOZZLES

The patented Banshee is the industry standard for exchanger cleaning. Each tool is easily configured to suit any tube cleaning application by choosing from a variety of replaceable heads and inlet options.

- ✓ Ideal for unplugging, cleaning and polishing tubes, such as those found in heat exchangers and industrial tube bundles
- ✓ Effectively removes thin, hard scale, carbons, coke and polymers
- ✓ Banshee Beetle models are designed to work around tight radiused bends



## 22K PSI (1500 BAR)



**BN33** 1.5-2.4 in. I.D. Tubes (38-60 mm)



**BN27-40K** 1.25-2.0 in. I.D. Tubes (32-51 mm)



**BN24** 1.1-1.8 in. I.D. Tubes (28-46 mm)



**BN18-44K** 0.87-1.3 in. I.D. Tubes (22-33 mm)



**BN18** 0.87-1.3 in. I.D. Tubes (22-33 mm)



**BN15** 0.75-1.2 in. I.D. Tubes (19-30 mm)



**BN13-44K** 0.60-1.0 in. I.D. Tubes (15-25 mm)

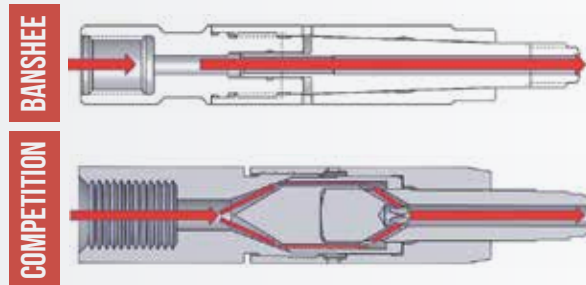


**BN13** 0.60-1.0 in. I.D. Tubes (15-25 mm)



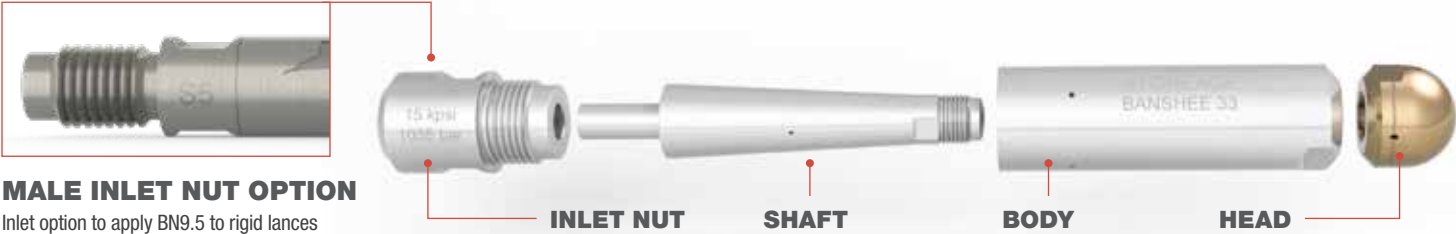
**BN9.5** 0.47-0.63 in. I.D. Tubes (12-16 mm)

Tube cleaning tools may look similar on the outside, but it's the engineering on the inside that matters. The patented StoneAge Banshee is the only tool in the industry with a direct path for water flow which is critical to reduce pressure loss and deliver more cleaning power.



**BANSHEE ROTARY TUBE CLEANING TOOLS**

The Stoneage Banshee has only four parts. Each part can be replaced individually to maximize the life of your tool.

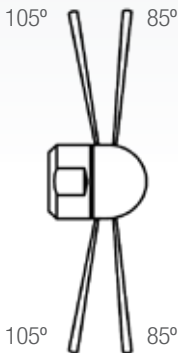


**MALE INLET NUT OPTION**

Inlet option to apply BN9.5 to rigid lances without an adapter

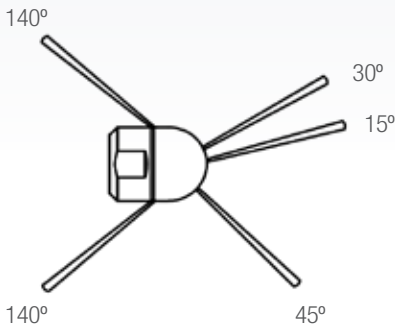
**BANSHEE SPECIFICATIONS 22K PSI (1500 BAR)**

	TUBE I.D. RANGE	MAX. PRESSURE	MAX. PRESSURE (BSPP INLET)	FLOW RANGE	INLET CONNECTIONS	DIAMETER	LENGTH
<b>BN9.5</b>	0.47-0.63 in. 12-16 mm	22k psi 1500 bar	N/A	4.5-8 gpm 17-30 l/min	M7, 1/16" NPT, 1/4" LH or RH, 5/16-24 RH	0.37 in. 9.5 mm	2.6 in. 65 mm
<b>BN13</b>	0.60-1.0 in. 15-25 mm	22k psi 1500 bar	18k psi 1250 bar	7-10 gpm 27-38 l/min	1/8" NPT, 1/8" BSPP, 1/4" LH, 1/4" RH, 3/8" LH or 3/8" RH	0.50 in. 13 mm	2.9 in. 74 mm
<b>BN15</b>	0.75-1.2 in. 19-30 mm	22k psi 1500 bar	18k psi 1250 bar	8-10 gpm 30-38 l/min	1/8" NPT, 1/8" BSPP, 3/8" LH/RH	0.6 in. 15 mm	3.0 in. 76 mm
<b>BN18</b>	0.87-1.3 in. 22-33 mm	22k psi 1500 bar	20k psi 1400 bar	8-14 gpm 30-53 l/min	1/4" NPT, 1/4" BSPP, 9/16" LH or 9/16" RH	0.69 in. 18 mm	3.8 in. 97 mm
<b>BN24</b>	1.1-2 in. 28-51 mm	22k psi 1500 bar	22k psi 1500 bar	12-25 gpm 45-95 l/min	3/8" NPT, 3/8" BSPP, 9/16" LH or 9/16" RH	0.93 in. 24 mm	5.1 in. 130 mm
<b>BN33</b>	1.5-2.4 in. 38-60 mm	22k psi 1500 bar	15k psi 1000 bar	12-49 gpm 45-190 l/min	1/2" NPT, 1/2" BSPP, or 9/16" MP	1.3 in. 33 mm	6.9 in. 180 mm
<b>BT12</b>	0.60-1.0 in. 15-25 mm	22k psi 1500 bar	N/A	Up to 8.5 gpm 32 l/min	P1, M7, MPL4, MPR4	0.50 in. 13 mm	1.3 in. 33 mm
<b>BT18</b>	0.87-1.3 in. 22-33 mm	22k psi 1500 bar	18k psi 1250 bar	Up to 11 gpm 42 l/min	P1, P2, BSPP2, MPL6, MPR6, MPL4, MPR4	0.69 in. 18 mm	1.5 in. 39 mm
<b>BT25</b>	1.2-3.0 in. 30-76 mm	8-22k psi 550-1500 bar	N/A	8-20 gpm 30-76 l/min	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	1.0 in. 26 mm	1.9 in. 48 mm



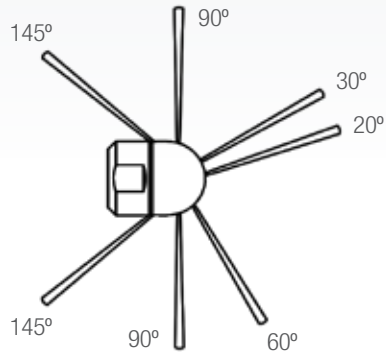
**POLISHER**

4 Ports: 2 @ 85°, 2 @ 105°



**UNPLUGGER**


5 Ports: 1 @ 15°, 1 @ 30°  
1 @ 45°, 2 @ 145°

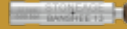



**UNIVERSAL**

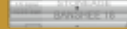
7 Ports: 1 @ 20°, 1 @ 30°  
1 @ 60°, 2 @ 90°, 2 @ 145°


# BANSHEE 22K (1500 BAR) HEAD OPTIONS


BN9.5 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN9.5 042-A	Polisher	4.5-5.5	17-21
	BN9.5 043-A	Unplugger	5-6	19-23
15-22k psi (1000-1500 bar)	BN9.5 042-B	Polisher	5-6	19-23
	BN9.5 043-B	Unplugger	5.5-6.5	21-25
	BN9.5 044-1	Universal	7.0-8.0	27-30

BN13 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN13 042-A	Polisher	7-9	27-34
	BN13 043-A	Unplugger	7-9	27-34
	BN13 044-A	Universal	8-10	30-38
15-22k psi (1000-1500 bar)	BN13 042-C	Polisher	7-9	27-34
	BN13 043-C	Unplugger	7-9	27-34
	BN13 044-C	Universal	8-10	30-38

BN15 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN15 042-A	Polisher	7-9	27-34
	BN15 043-A	Unplugger	7-9	27-34
	BN15 044-A	Universal	8-10	30-38
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
15-22k psi (1000-1500 bar)	BN15 042-C	Polisher	7-9	27-34
	BN15 043-C	Unplugger	7-9	27-34
	BN15 044-C	Universal	8-10	30-38

BN18 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN18 042-A	Polisher	11-14	42-53
	BN18 042-B	Polisher	8-10	30-38
	BN18 043-A	Unplugger	11-14	42-53
	BN18 043-B	Unplugger	8-10	30-38
	BN18 044-A	Universal	11-14	42-53
	BN18 044-B	Universal	8-10	30-38
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
15-22k psi (1000-1500 bar)	BN18 042-C	Polisher	11-14	42-53
	BN18 042-D	Polisher	8-10	30-38
	BN18 043-C	Unplugger	11-14	42-53
	BN18 043-D	Unplugger	8-10	30-38
	BN18 044-C	Universal	11-14	42-53

BN24 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN24 042-A	Polisher	20-25 gpm (76-95 l/min)	
	BN24 042-B	Polisher	15-19 gpm (57-72 l/min)	
	BN24 042-C	Polisher	12-14 gpm (45-53 l/min)	
	BN24 044-A	Universal	20-25 gpm (76-95 l/min)	
	BN24 044-B	Universal	15-19 gpm (57-72 l/min)	
	BN24 044-C	Universal	12-14 gpm (45-53 l/min)	
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
15-22k psi (1000-1500 bar)	BN24 042-D	Polisher	18-21	68-80
	BN24 042-E	Polisher	15-17	57-64
	BN24 042-F	Polisher	12-14	45-53
	BN24 044-D	Universal	18-21	68-80
	BN24 044-E	Universal	15-17	57-64
	BN24 044-F	Universal	12-14	45-53

BN33 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN33 044-A	Universal	40-49	150-190
	BN33 044-B	Universal	33-39	130-150
	BN33 044-C	Universal	26-32	98-120
	BN33 044-D	Universal	20-25	76-95
	BN33 044-E	Universal	15-19	57-72
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
15-22k psi (1000-1500 bar)	BN33 044-F	Universal	22-26	83-98
	BN33 044-G	Universal	18-21	68-80
	BN33 044-H	Universal	15-17	57-64
	BN33 044-I	Universal	12-14	45-53

## BANSHEE 44K (3000 BAR) OPTIONS

### BANSHEE SPECIFICATIONS 44K PSI (3000 BAR)

MODEL	BN13	BN18	BN27
TUBE I.D. RANGE*	0.60-1.0 in, 15-25 mm	0.87-1.3 in, 22-33 mm	1.25-2.0 in, 32-51 mm
MAX. PRESSURE	44k psi, 3000 bar	44k psi, 3000 bar	44k psi, 3000 bar
FLOW RANGE	4.5-6 gpm, 17-23 l/min	5-8.5 gpm, 19-32 l/min	5-8.5 gpm, 19-32 l/min
INLET CONNECTIONS	1/4"-28 LH or 3/8"-24 LH	3/8"-24 LH or M14 LH	9/16"-18 LH or M14 LH
DIAMETER	0.52 in, 13 mm	0.69 in, 18 mm	1.06 in, 27 mm
LENGTH	3.5 in, 89 mm	4.7 in, 120 mm	5.5 in, 140 mm



**BN13-44K** 0.60-1.0 in. I.D. Tubes (15-25 mm)



**BN18-44K** 0.87-1.3 in. I.D. Tubes (22-33 mm)



**BN27-44K** 1.25-2.0 in. I.D. Tubes (32-51 mm)

\*When cleaning 5/8" diameter tubes at 44k psi please contact our Technical Support team for hose specifications.

## BANSHEE 44K (3000 BAR) HEAD OPTIONS

### BN13 44K HEAD SELECTION



PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN13 442-C	Polisher	5.5-6	21-23
	BN13 442-D	Polisher	4.5-5	17-19
	BN13 443-C	Unplugger	5.5-6	21-23
	BN13 443-D	Unplugger	4.5-5	17-19

### BN27 44K HEAD SELECTION



PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN27 442-A	Polisher	8-8.5	30-32
	BN27 442-B	Polisher	7-7.5	27-28
	BN27 442-C	Polisher	6-6.5	23-25
	BN27 442-D	Polisher	5-5.5	19-21
	BN27 443-A	Unplugger	8-8.5	30-32
	BN27 443-B	Unplugger	7-7.5	27-28
	BN27 443-C	Unplugger	6-6.5	23-25
	BN27 443-D	Unplugger	5-5.5	19-21

### BN18 44K HEAD SELECTION



PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN18 442-A	Polisher	8-8.5	30-32
	BN18 442-B	Polisher	7-7.5	27-28
	BN18 442-C	Polisher	6-6.5	23-25
	BN18 442-D	Polisher	5-5.5	19-21
	BN18 443-A	Unplugger	8-8.5	30-32
	BN18 443-B	Unplugger	7-7.5	27-28
	BN18 443-C	Unplugger	6-6.5	23-25
	BN18 443-D	Unplugger	5-5.5	19-21

### IMPORTANT



All Banshee tube cleaning tools require the use of a correctly sized open-end wrench to fit the flats provided on the inlet nut when attaching the tool to the lance.

***DO NOT USE A PIPE WRENCH OR PLIERS WITH TEETH!***

This can crush and crack the hardened steel body, leading to tool breakage during operation. It is also recommended to flush the tool with WD-40® for storage.

## BEETLE™ BT25, BT18, BT12, BT9.5

The small diameter and short length of the Beetle nozzles make them ideal for cleaning process piping, drain lines, u-tube bundles and other small ID tubes with bends and elbows that may have been inaccessible in the past.

- ✔ Navigates tight curves in small diameter pipes
- ✔ Low cost, low maintenance design
- ✔ Easy to pair with automated flex lance machines



**BT25**

**BT18**

**BT12**

**BT9.5**

**NEW BEETLE BT9.5**  
Designed specifically for cleaning curved tubes/pipes from 0.37 in. (9.5 mm) I.D.

	BT25	BT18	BT12	<b>NEW</b> BT9.5
<b>TUBE ID RANGE</b>	1.2–3.0 in. (30–76 mm)	0.9–1.3 in. (22–33 mm)	0.6–1.0 in. (15–25 mm)	0.47–0.63 in. (2–16 mm)
<b>PRESSURE RANGE</b>	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–15k psi 550 (1035 bar) 8–22k psi 550 (1500 bar)
<b>FLOW RANGE</b>	8–20 gpm (30–76 l/min)	8.5–11 gpm (32–42 l/min)	6.5–8.5 gpm (25–32 l/min)	5–6 GPM (19–23 l/min)
<b>INLET CONNECTIONS</b>	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	P1, P2, BSPP2, MP6L, MP6R, MP4L, MP4R	P1, M7, MP4L, MP4R	P1, M7
<b>DIAMETER</b>	1.0 in. (26 mm)	0.7 in. (18 mm)	0.5 in. (12 mm)	0.37 in. (9.5 mm)
<b>LENGTH</b>	1.9 in. (48 mm)	1.5 in. (39 mm)	1.3 in. (39 mm)	1.4 in. (35 mm)



### STONEAGE RENTS

Rely on us to meet your surge capacity needs



### STONEAGE DEMO TRAILER

Experience the power of StoneAge equipment at your location



### STONEAGE TRAINING

Expert training for the safe and effective use of waterjetting equipment



### WARRANTY

StoneAge warrants its products to be free from defects in workmanship and material for a period of one (1) year from the date of purchase

**GOPHER™**

Speed Controlled Rotary Cleaning for Tubes 2–6 Inches (51–152 mm) in Diameter

The Gopher self-rotary tool is ideal for cleaning evaporator tubes and a variety of process lines. It excels at cutting through coke, polymers, coatings and latex. The Gopher is offered in two pressure ranges up to 40,000 psi (2800 bar).



- ✓ Head rotation provides complete internal coverage while speed control delivers optimum jet dwell time
- ✓ Two head options available: 7 port unplugging option for forward hitting power and a 6 port polishing head for IRIS inspection polishing
- ✓ Easily re-jet the Gopher for more pulling force or forward hitting power depending on the needs of the job.

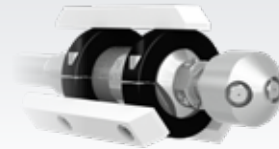
TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT	MAX. OPERATING TEMPERATURE
GO-MP9	2–22k psi 140–1500 bar	18–25 gpm 30–95 l/min	9/16" MP	600–1000 rpm	3.0 lb 1.36 kg	160 °F 70 °C
GO-H9-C	22k–40k psi 1500–2800 bar	4–10 gpm 15–40 l/min	9/16" HP	600–1000 rpm	3.3 lb 1.5 kg	160 °F 70 °C

**GO 075 SKID CENTRALIZERS**



PIPE SIZE	CENTRALIZER	WEIGHT
3 in. 76 mm	GO 075-3	0.3 lb 0.1 kg
4.5 in. 114 mm	GO 075-4.5	0.4 lb 0.2 kg

**GO 070 SKID CENTRALIZERS**

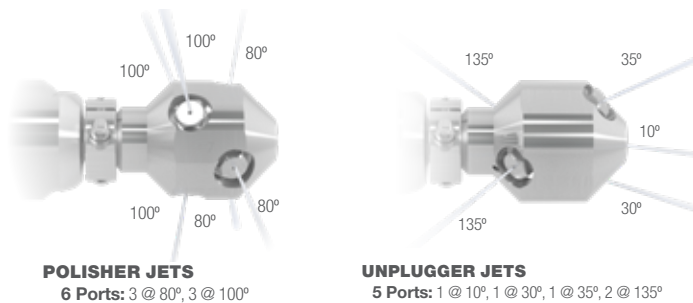


PIPE SIZE	CENTRALIZER	WEIGHT	COLLAR*	SKID**
4 in. 100 mm	GO 070-4	1.4 lb 0.6 kg	GO 070.1	RJ 070.2-4
5 in. 127 mm	GO 070-5	1.6 lb 0.7 kg	GO 070.1	RJ 070.2-5
6 in. 152 mm	GO 070-6	1.9 lb 0.9 kg	GO 070.1	RJ 070.2-6
8 in. 203 mm	GO 070-8	2.2 lb 1.0 kg	GO 070.1	RJ 070.2-8
12 in. 305 mm	GO 070-12	4.0 lb 1.8 kg	GO 070.1	RJ 070.2-12

\*Set of 2 collars

\*\*Set of 3 skids with 6 screws

**TWO STANDARD HEAD CONFIGURATIONS**



**GOPHER HEAD SELECTION**

MODEL	GO-MP9	GO-H9-C
POLISHER LF	7-14 gpm (27-53 l/min)	4-7 gpm (20-27 l/min)
MODEL	GO 042-R.14	GO 342-R.14
POLISHER HF	14-25 gpm (53-95 l/min)	7-12 gpm (27-45 l/min)
MODEL	GO 042-R.07	GO 342-R.08
UNPLUGGER LF	8-15 gpm (30-57 l/min)	4-7 gpm (20-27 l/min)
MODEL	GO 043-R.17	GO 343-R.18
UNPLUGGER HF	15-25 gpm (57-95 l/min)	7-12 gpm (27-45 l/min)
MODEL	GO 043-R.08	GO 343-R.08

**MAINTENANCE RESOURCES**

SWIVEL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT	MANUAL
GO-MP9	GO 600	GO 602	GO 610	GO 612	GP 044	PL 511
GO-H9-C	GO 600-H9-C	BC 602-H9-C	GO 610-H9-C	GO 612	GP 044	PL 510

# PIPE CLEANING

Complete systems to automate the cleaning of industrial pipes and drains. Designed for adaptability in a wide range of applications for straight and curved pipes in all sizes.

## CONTROL BOX

Lightweight, durable and easy to use.

## FLEX LANCES

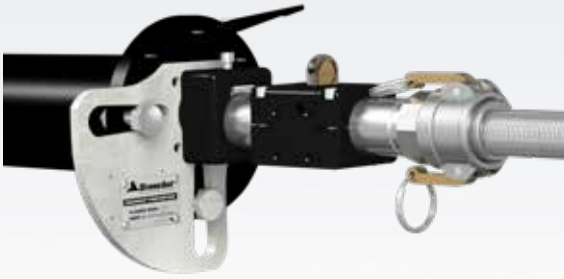
StoneAge carries a complete line of Flex Lances ranging from 15–40k.

## DUMP VALVE

StoneAge supplies a complete line of Dump Valves ranging from 15–40k.

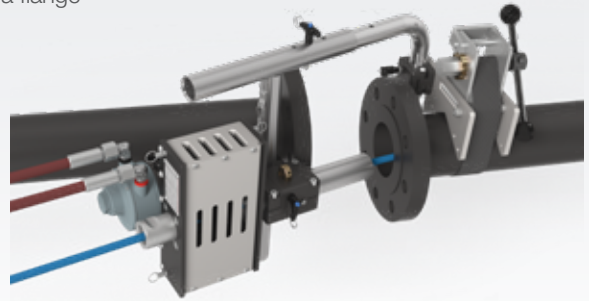
**MULTIPLE MOUNTING OPTIONS**

For pipes with or without a flange



**FLANGE MOUNT**

Versatile mount with cam-lock attachment for quick setup.



**STRAP MOUNT**

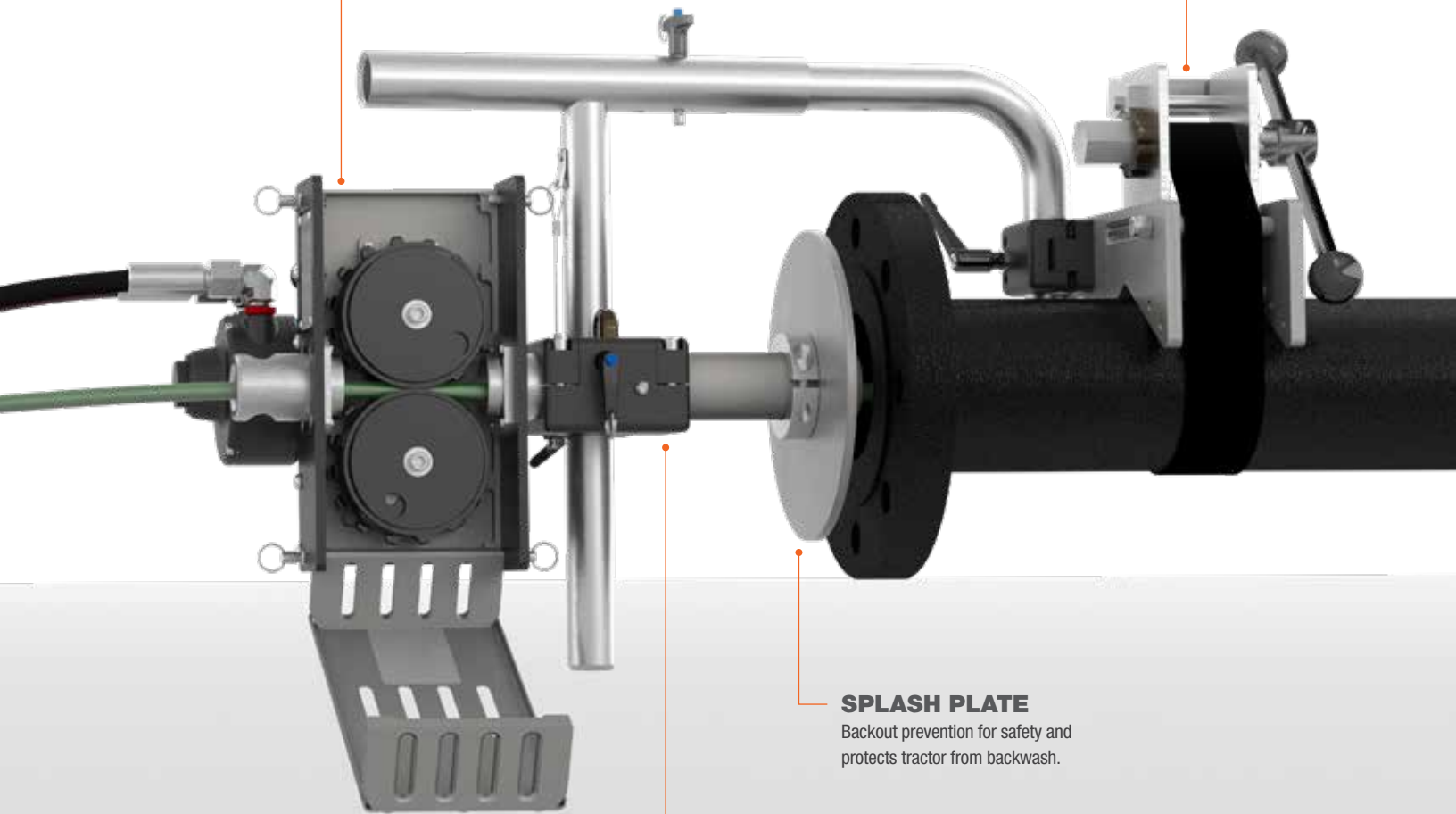
For pipes without a flange or off-axis mounting.

**HOSE TRACTOR**

Intuitive to use, inexpensive to maintain and extremely versatile.

**STRAP MOUNT**

Quickly and securely fastens the ABX-PRO tractor to a wide variety of pipe sizes.



**SUPPLY HOSE**

StoneAge carries a full line of supply hoses.

**SPLASH PLATE**

Backout prevention for safety and protects tractor from backwash.

**COLLET BLOCK**

Safety collets are available for every hose size.



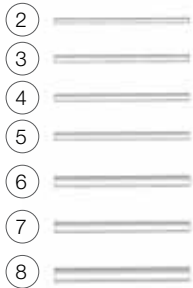
# AUTOPACK PRO

Built around the AutoBox ABX-PRODRIVE, a versatile hose drive that can be adapted to a wide range of cleaning applications, the AutoPack-PRO is equipped with everything you need to successfully complete jobs spanning pipe, drain and tube cleaning.



#	PART NUMBER	DESCRIPTION	QTY
1	GPT 063-APP-001	AUTOPACK PRODRIVE CHEST	1
2	ABX 115-16	GUIDE TUBE, .459ID, 16 IN/406.4MM L (BN9.5)	1
3	ABX 116-16	GUIDE TUBE, .546ID, 16IN/406.4MM L (BN13)	1
4	ABX 117-16	GUIDE TUBE, .674ID, 16IN/406.4MM L (BN15)	1
5	ABX 119-16	GUIDE TUBE, .745 ID, 16IN/406.4MM L (BN18)	1
6	ABX 125-16	GUIDE TUBE, 1.010 ID, 16IN/406.4MM L (BN24)	1
7	ABX 126-16	GUIDE TUBE, 1.120 ID, 16IN/406.4MM L (BN27/BN24)	1
8	ABX 127-16	GUIDE TUBE, 1.380 ID, 16IN/406.4MM L (BN33)	1
9	ABX-PRO	AUTOBOX PRODRIVE TRACTOR ASSY, 20-1 (.46 ROLLER INSTALLED)	1
10	BOP 010-2-4-QTR	QUARTER PLATE ASSY, 2IN-4IN	1
11	BOP 010-4-8	FLANGE MOUNT PLATE ASSY, 4IN-8IN	1
12	BOP 012	WELDMENT, SPLASH PLATE	1
13	BOP 030	COLLET BLOCK ASSEMBLY	1
14	BOP 035-16	GUIDE TUBE COLLET BLOCK ASSY (FIN FAN) (DOES NOT INCLUDE GUIDE TUBES)	1
15	BOP 048	HOSE STOP ADAPTOR, PRO DRIVE	1
16	BOP 050	STRAP MOUNT ASSEMBLY	1
17	BOP 081-6	TUBE, SNOOT, SS, 1.75 X 6IN	1
18	BOP 082-9-45	SNOOT TUBE, GALVANIZED, 1.5 EMT CONDUIT 45DEG	1
19	BOP 085-K	KIT, SNOOT TUBE AND CAM LOCK	1
20	BOP 086-K	SNOOT TUBE AND CAM LOCK	1
21	CB 870-K	KIT, ADAPTERS, 1EA FWD AND REV	1
22	CB-ABX-PRO-100-S	AUTOBOX PRODRIVE CONTROL BOX ASSY, SIDE LATCH	1
23	GPT 105	TOOLBOX ASSEMBLY, PROPAK	1
24	GPT 106	KIT, COLLET-ROLLER-HOSE STOP W/CASE, PRODRIVE	1
25	GPT 310	TOOL BAG, 18IN	1
26	PRO-700-V3	PRODRAIN ASSEMBLY W/LANYARD ASSY	1

1



13



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25



26





# HOSE TRACTORS

StoneAge hose tractors eliminate the need for hand lancing, increasing safety and delivering consistent repeatable results for greater productivity.

- ✔ Automate lance and hose feeding jobs for safety and efficiency
- ✔ Eliminate operator fatigue for greater productivity
- ✔ Remotely adjust feed rates and clamp pressure to match job conditions
- ✔ Proven reliability on the toughest jobs and most corrosive environments



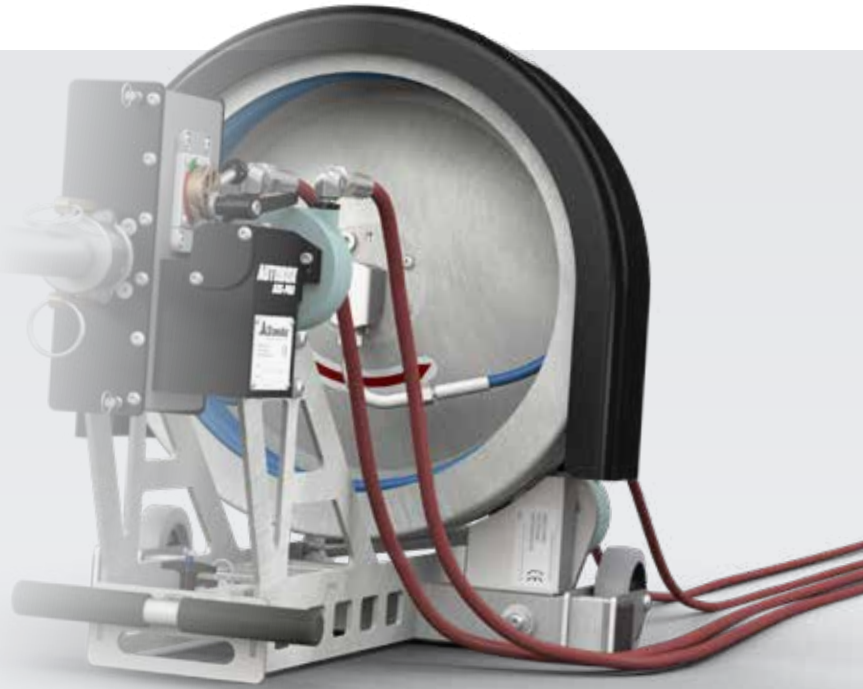
	<b>AUTOBOX ABX-PRO</b> Single Flex-Lance Tractor	<b>AUTOBOX ABX-500</b> Single Hose Tractor
<b>HOSE SIZE</b>	3/2-8/4, 3/8 Rubber Covered	0.56–1.75 in. 14–45 mm OD
<b>MAX. HOSE CRIMP</b>	0.74 in. 19 mm	1.75 in. 45 mm OD
<b>HOSE FEED RATE</b>	0.2–2.5 ft/sec 61–762 mm/sec	1–30 ft/min 0.3–9.1 m/min
<b>PUSH/PULL FORCE</b>	15–150 lb 6–68 kg	Up to 200 lbs 90 kg
<b>MAX. AIR PRESSURE</b>	125 psi 0.86 MPa	100 psi 0.7 MPa
<b>DIMENSIONS</b>	7 x 9.5 x 10 in. 178 x 235 x 254 mm	13 x 12 x 19 in. 330 x 305 x 483 mm
<b>WEIGHT</b>	22 lbs 10 kg	90 lbs 41 kg

# SMALL PROCESS PIPE CLEANING

## NAVIGATOR

The only automated rotary hose device in the industry specifically engineered to clean small diameter process pipe with bends. The Navigator uses an Autobox ABX-PRO tractor to feed the hose in and out of the pipe and a spinning drum to rotate the hose. This unique hose rotation allows the Navigator to work past multiple elbows/bends in process piping that may have been inaccessible in the past.

Ideal for cleaning piping, drain lines and other small pipes with bends. The ABX-PRO tractor can be removed and used independently for pipe, tube and drain cleaning where hose rotation is not required.



MODEL	NAV-100
MAX. PRESSURE	20k psi (1400 bar)
MAX. FEED RATE	2.0 ft/sec ( 609mm/sec)
MIN. FEED RATE	0.2 ft/sec (61mm/sec)
HOSE SIZE	4/4, 5/4 and 6/4
USABLE HOSE LENGTH	Up to 90 ft (27.5 m)*
COMPLETE WEIGHT	100lb (45kg)

\* dependent on hose diameter

## HOSE DRUM

Holds up to 100 ft (30 m) of hose. Keeps job site clear of trip hazards. Also protects the hose during transport and storage.

- ✔ Small and lightweight with a wheeled base for portability
- ✔ Quick disassembly into modular components for single man lift and manway access
- ✔ Continuous rotation of the hose allows the nozzle to pass up to eight bends in small pipe
- ✔ Keeps the high pressure hose safely contained and protected
- ✔ Can hold up to 100 ft (30 m) of hose for approximately 90 ft (26 m) of reach based on hose diameter
- ✔ The ABX-PRO tractor can be removed and used independently for pipe cleaning where hose rotation is not required.

## AUTOBOX ABX-PRO TRACTOR

Can be removed and used independently for pipe, tube and drain cleaning where hose rotation is not required.



## SNOUT

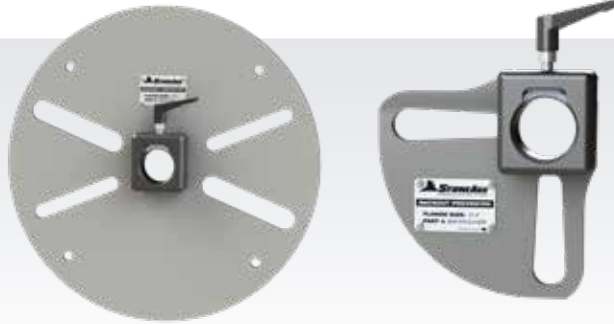
Allows quick, easy setup and increases safety with integrated backout preventer.

# AUTOBOX PRO ACCESSORIES

## PIPE CLEANING

### FULL & QUARTER FLANGE PLATE

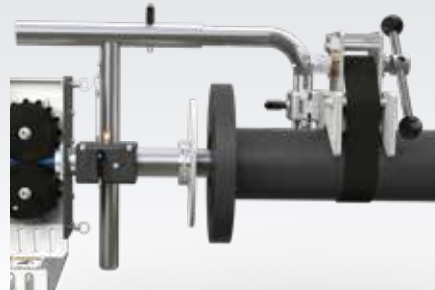
Mounts directly to the pipe flange and guide tube. Helps to prevent the tool from backing out of the pipe during cleaning operations.



- ✓ Increased job site safety
- ✓ Protects the operator from a flex lance exiting a pipe during cleaning operations
- ✓ Hard anodized aluminum construction is extremely durable and lightweight with excellent corrosion resistance

### STRAP MOUNT ASSEMBLY

The BOP 050 Strap Mount Assembly is designed for pipes that do not have flanges. Allows operators quick, easy setup for challenging or unique applications.



- ✓ Ultra portable
- ✓ Quick, easy setup for challenging or unique applications
- ✓ Ideal for limited access applications

### DRAIN CLEANING

The ProDrain PRO-700-V3 is a specialized stand designed to position the ABX-PRO hose tractor vertically for safe and easy drain cleaning. The stand allows the operator to setup quickly when moving between drains and has built in safeguards to prevent tipping.



- ✓ Portable, easy to set up
- ✓ Integrated splash plate
- ✓ Anti-tipping design does not require additional tethering

# AUTOBOX 500 ACCESSORIES

### FLEXIBLE SNOOT

The AutoBox BOP-622 snout assembly is used for hose management in limited access situations and enables the ABX-500 to exert push force on the hose.



- ✓ Increased job site safety
- ✓ Includes ABX-500 adapter, snout and backout preventer
- ✓ Enables the ABX-500 tractor to exert up to 200 ft-lb (271 Nm) of push/pull force on the hose

# CURVED PIPE CLEANING

**BADGER AND BEETLE COMPACT SELF-ROTARY NOZZLES ARE SPECIFICALLY ENGINEERED FOR THE TOUGHEST CLEANING JOBS IN PIPES WITH ELBOWS AND BENDS.**

## 2" BADGER

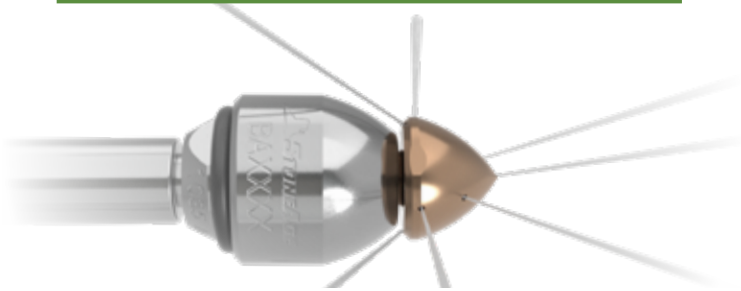
The 2" Badger is a self-rotating tool designed for cleaning 2–4 in. (51–102 mm) pipes with bends and long radius elbows such as U-Tubes and process lines.

### NEW UPGRADES:

The head design of the 2" Badger has been recently updated, replacing the nozzle inserts with pre-drilled heads which greatly simplifies the jetting options and eliminates the need to repair inserts in the field. It also delivers the same cleaning performance and longevity as the original tool.



- ✓ New drilled heads improve reliability while delivering the same power and life
- ✓ Three pre-drilled heads available, covering all required pressure and flow configurations
- ✓ Engineered for long term use with low cost head replacements and no bearings, seals or lubricants to maintain



## 2" BADGER JETS

**7 Ports:** 1 @ 15°, 1 @ 30°, 1 @ 45°, 2 @ 90°, 2 @ 132°

TOOL	TOOL KIT	MANUAL
2" Badger	BA 612-LK	PL 593

## BA-530 FAIRING

Specifically designed to be attached to the hose behind a 2" Badger rotary pipe cleaning tool.

The tapered sides of the fairing prevent the rear edge of the Badger from getting caught on obstructions when being removed from a pipe.



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
BA-LKD-P4 BA-LKD-BSPP4	8–15k psi 552–1034 bar	7–16 gpm 26–61 LPM	1/4" NPT or 1/4" BSPP	0.45 lb 0.20 kg	250 °F 120 °C
BA-LKD-MP6R BA-LKD-MP9RL BA-LKD-MP9R	15–22k psi 1034–1500 bar	9.5–18.5 gpm 36–70 LPM	9/16" MP, 3/8" MP	0.45 lb 0.20 kg	250 °F 120 °C

**4" BADGER**

The 4" Badger is a compact self-rotary nozzle with adjustable speed control capable of navigating 90 degree elbows in pipes as small as 4" (102 mm) in diameter.



- ✓ 5X longer run time
- ✓ New MP9R inlet reduces length for better navigation of bends
- ✓ Higher flow at 20K (1400 bar) increases cleaning power
- ✓ Redesigned shape reduces hangups in the pipe

**NEW UPGRADES:**

- 5X LONGER RUNTIME between maintenance intervals
- Redesigned braking system maintains consistent speed over longer duration
- Simplified overhaul and assembly
- New body shape allows for more effective navigation of bends and elbows and minimizes tool hangup during removal

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT
BAE-P6	5–15k psi 345–1034 bar	13–27 gpm 50–102 LPM	3/8" NPT	20–100 rpm (Slow Fluid) 75–250 rpm (Fast Fluid)	3.0 lbs 1.4 kg
BAE-BSPP6, BAE-MP9R, BAE-M24	5–22k psi 345–1500 bar	12–25 gpm 45–95 LPM	3/8" BSPP, 9/16" MP, M24	20–100 rpm (Slow Fluid) 75–250 rpm (Fast Fluid)	3.0 lbs 1.4 kg
BA-H6	22–44k psi 1500–3000 bar	4.5–12 gpm 17–45.5 l/min	3/8" HP Female	100–400 rpm	4.0 lbs 1.8 kg

**BACKOUT PREVENTERS**

Increase safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters and adapters for pipes with no-flange entry.



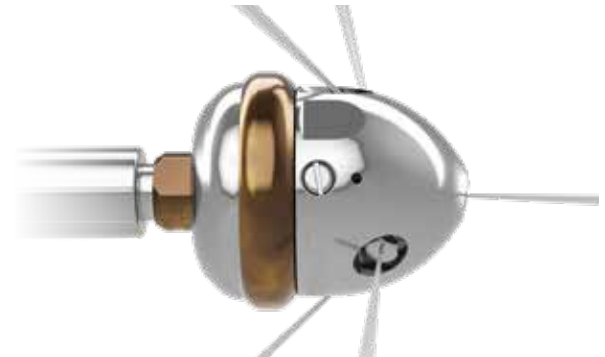
**BJ 305**



**BJ 310**

**NOZZLES AND PLUGS**

The 4" Badger can be jetted in different configurations depending on the application. The image below shows the standard nozzle/plug configuration for the 4" Badger tool.



**4" BADGER JETS**

1 @ 15°, 2 @ 100°, 2 @ 135°

**MAINTENANCE RESOURCES**

TOOL	ROTATION SPEED	SEAL KIT	SERVICE KIT	OVERHAUL KIT	DISK KIT	TOOL KIT
BA-P6 BAE-BSPP6 BAE-MP9R BAE-M24	Slow	BA 602	BAE 600-S	BAE 610-S	BAE 604	BAE 612
	Fast	BA 602	BAE 600-F	BAE 610-F	BAE 604	BAE 612
BA-H6	N/A	N/A	BAE 600-H6	BA 610-H6	N/A	BA 612-H6

# CURVED PIPE CLEANING

## 6" BADGER

The 6" Badger is a compact self-rotary nozzle with adjustable speed control capable of navigating 90 degree elbows in pipes as small as 6" (152 mm) in diameter.

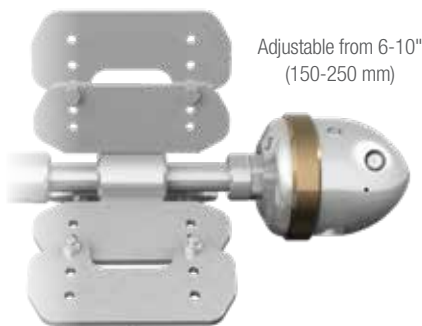
- ✔ Different jetting configurations allow for more or less pull and forward hitting power
- ✔ Navigates elbows down to 6 in. (152 mm)
- ✔ Speed controlled rotary tools provide complete internal cleaning coverage and optimum jet delivery
- ✔ Maximize cleaning by choosing slower speeds for hard to clean or plugged pipes and faster speeds for polishing easy to clean pipes with a single tool
- ✔ Optimize the tool for a variety of pumps pressures and flows with multiple jetting options
- ✔ Pair with the ABX-500 for hands-free pipe cleaning



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. OPERATING TEMPERATURE
BA-MP9/BA-M24	12–22k psi 840–1500 bar	14–43 gpm 53–163 l/min	50–300 rpm (Adjustable)	9/16" MP, M24	8.0 lbs 3.6 kg	250 °F 120 °C
BA-P8	2–15k psi 140–1000 bar	15–55 gpm 57–208 l/min	50–300 rpm (Adjustable)	1/2" NPT	8.0 lbs 3.6 kg	250 °F 120 °C

### OPTIONAL CENTRALIZERS

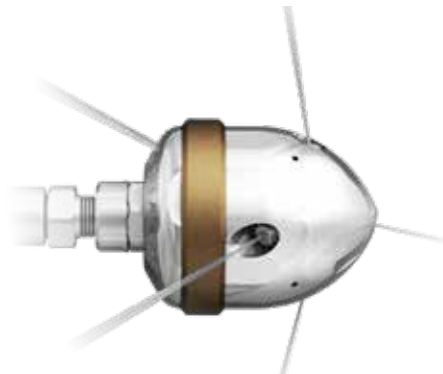
Helps protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe.



**BA 385 M9/P8**

### NOZZLES AND PLUGS

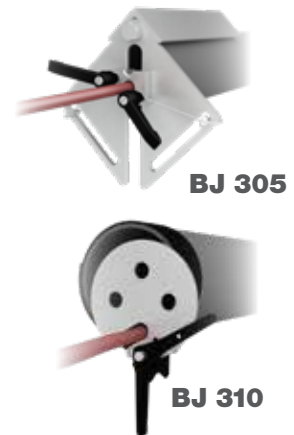
The 6" Badger can be jetted in different configurations depending on the application. The image below shows the standard nozzle/plug configuration for the 6" Badger tool.



**6" BADGER JETS**  
5 Ports: 1 @ 15°, 2 @ 100°, 2 @ 135°

### BACKOUT PREVENTERS

Increase safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters and adapters for pipes with no-flange entry.



**BJ 305**

**BJ 310**

### MAINTENANCE RESOURCES

TOOL	SEAL KIT	SERVICE KIT	OVERHAUL KIT	DISK KIT	TOOL KIT	LUBRICANT	MANUAL
BA-P8	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503
BA-M24	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503
BA-MP9	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503

**BEETLE™  
BT25, BT18, BT12, BT9.5**

The small diameter and short length of the Beetle models make them ideal for cleaning process piping, drain lines, u-tube bundles and other small ID tubes with bends and elbows that may have been inaccessible in the past.

- ✔ Navigates tight curves in small diameter pipes
- ✔ Low cost, low maintenance design
- ✔ Easy to pair with the ProDrive and Navigator



**NEW BEETLE BT9.5**  
Designed specifically for cleaning curved tubes/pipes from 0.37 in. (9.5 mm) I.D.

	BT25	BT18	BT12	<b>NEW</b> BT9.5
<b>TUBE ID RANGE</b>	1.2–3.0 in. (30–76 mm)	0.9–1.3 in. (22–33 mm)	0.6–1.0 in. (15–25 mm)	0.47–0.63 in. (2–16 mm)
<b>PRESSURE RANGE</b>	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–15k psi 550 (1035 bar) 8–22k psi 550 (1500 bar)
<b>FLOW RANGE</b>	8–20 gpm (30–76 l/min)	8.5–11 gpm (32–42 l/min)	6.5–8.5 gpm (25–32 l/min)	5–6 GPM (19–23 l/min)
<b>INLET CONNECTIONS</b>	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	P1, P2, BSPP2, MP6L, MP6R, MP4L, MP4R	P1, M7, MP4L, MP4R	P1, M7
<b>DIAMETER</b>	1.0 in. (26 mm)	0.7 in. (18 mm)	0.5 in. (12 mm)	0.37 in. (9.5 mm)
<b>LENGTH</b>	1.9 in. (48 mm)	1.5 in. (39 mm)	1.3 in. (39 mm)	1.4 in. (35 mm)

**OPERATING WATERBLASTING EQUIPMENT CAN BE POTENTIALLY HAZARDOUS.**



See page 9.10 for important safety information

# STRAIGHT PIPE CLEANING

THE MOST VERSATILE AND DURABLE FAMILY OF ROTARY PIPE CLEANING NOZZLES IN THE INDUSTRY. ENGINEERED FOR CUSTOMIZATION WITH AN EXTENSIVE RANGE OF ACCESSORIES TO MATCH ANY APPLICATION.

## BJVE

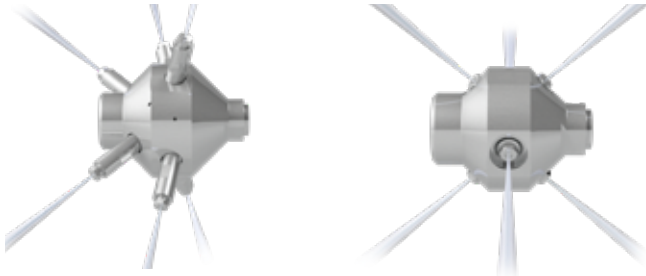
Designed for a wide range of pipe diameters, pressures, flows and configurations, BJVE controlled rotary nozzles are the industry standard for cleaning medium to large pipes and vessels.



- ✔ Clean 6 in. (152 mm) pipes to 15 ft (4.5 m) diameter tanks with simple modifications
- ✔ Interchangeable heads allow the tool to be used with any type of pump
- ✔ Multiple head options to allow for flush mounted nozzles, extension arms, plugs and pulling rings
- ✔ Simple nozzle changes allow operators to configure for multiple cleaning applications
- ✔ Easy to pair with AutoBox ABX-500 for hands-free pipe or tank cleaning

## NEW UPGRADES:

- Backed by the industry's only **THREE YEAR WARRANTY** for maintenance free speed control
- New high pressure seal geometry extends life 3X and can now be replaced in the field in under 3 minutes
- New inlet cartridge design enables quick change from 15K to 20K on the fly
- New long life body is compatible with most existing heads



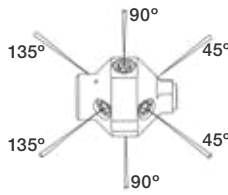
## OPTIONAL HEAD-TYPES

There are several head configurations for the BJVE. The correct head specification is based on the pressure and flow of the pump and the required port size.

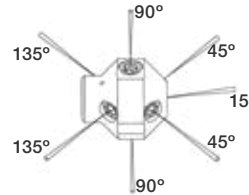
TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
BJVE-P16	2–10k psi (140–700 bar)	20–200 gpm (76–757 l/min)	25–95 rpm (Slow) 50–200 rpm (Medium) 85–300 rpm (Fast)	1" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-P12	2–15k psi (140–1000 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	3/4" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-M24	2–22k psi (140–1500 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	M24	(8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-MP12	2–22k psi (140–1500 bar)	10–60 gpm (38–230 l/min)	20–95 rpm (Slow) 40–190 rpm (Medium) 70–275 rpm (Fast)	3/4" MP	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJV-H9	20–40k psi (1400–2800 bar)	3.4–20 gpm (13–76 l/min)	20–60 rpm (Slow Fluid) 90–250 rpm (Fast Fluid)	9/16" HP	9.3 lbs (4.4 kg)	160 °F (70 °C)

**HEAD OPTIONS PER SWIVEL TYPE:**

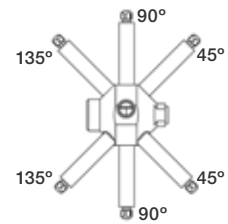
There are four standard head configurations, with custom heads available on request. The correct head specification is based on the pressure and flow of the pump and the required port size. Heads with P8 or G12 ports require extension arms or plugs.



**BJ 144-P4-6-Rxx  
6-PORT**  
2 @ 45°  
2 @ 90°  
2 @ 135°



**BJ 144-P4-7-Rxx  
7-PORT**  
1 @ 15°  
2 @ 45°  
2 @ 90°  
2 @ 135°



**BJ 145-G12-6-Rxx  
or  
BJVE 145-P8-6-Rxx  
6-PORT**  
2 @ 45°  
2 @ 90°  
2 @ 135°

**PACKAGE HEAD OPTIONS**

The following table shows head selection by desired flow for each package:

PRESSURE	PACKAGE	FLOW	R-VALUE	HEAD
10K PSI 700 BAR	BJVE-P16-P4-6-PKG	15–25 gpm 57–95 LPM	R60	BJ 144-P4-6-R60
		20–45 gpm 76–170 LPM	R35	BJ 144-P4-6-R35
		35–80 gpm 133–303 LPM	R20	BJ 144-P4-6-R20
		55–140 gpm 208–530 LPM	R12	BJ 144-P4-6-R12
	BJVE-P16-P4-7-PKG	15–25 gpm 57–95 LPM	R60	BJ 144-P4-7-R6
		20–45 gpm 76–170 LPM	R35	BJ 144-P4-7-R35
		35–80 gpm 133–303 LPM	R20	BJ 144-P4-7-R20
		55–140 gpm 208–530 LPM	R12	BJ 144-P4-7-R12
15K PSI 1000 BAR	BJVE-P12-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–40 gpm 76–151 LPM	R35	BJ 144-P4-6-R35
		30–70 gpm 114–265 LPM	R20	BJ 144-P4-6-R20
		50–120 gpm 189–454 LPM	R12	BJ 144-P4-6-R12
	BJVE-P12-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6
		20–40 gpm 76–151 LPM	R35	BJ 144-P4-7-R35
		30–70 gpm 114–265 LPM	R20	BJ 144-P4-7-R20
		50–120 gpm 189–454 LPM	R12	BJ 144-P4-7-R12
22K PSI 1500 BAR	BJVE-MP12-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-6-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-6-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-6-R12
	BJVE-MP12-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-7-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-7-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-7-R12
	BJVE-M24-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-6-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-6-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-6-R12
BJVE-M24-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6	
	20–35 gpm 76–133 LPM	R35	BJ 144-P4-7-R35	
	30–65 gpm 114–246 LPM	R20	BJ 144-P4-7-R20	
	50–110 gpm 189–416 LPM	R12	BJ 144-P4-7-R12	
44K PSI 3000 BAR	BJV-H9-S6-8-PKG	6–10 gpm 23–38 LPM	R40	BJ 444-S6-R40
		9–17 gpm 34–64 LPM	R25	BJ 444-S6-R25

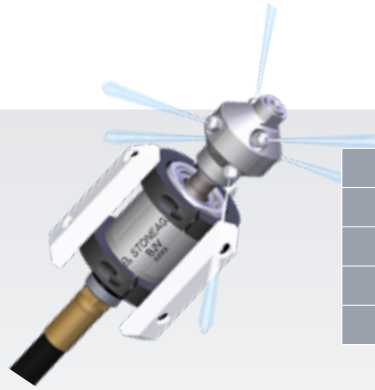
# STRAIGHT PIPE CLEANING

## BJV CENTRALIZERS

### BJ 070 SKID STYLE

Utilizes interchangeable plastic runners which can be easily replaced. Works well in elbows and can effectively clean up to 12 in. (305 mm) diameter pipes and works with all BJV models.

*Tool not included.*



SKID SIZES (DIAMETER)	
BJ 070-6	6 in. 150 mm
BJ 070-8	8 in. 200 mm
BJ 070-10	10 in. 250 mm
BJ 070-12	12 in. 300 mm

### STRAIGHT PIPE CENTRALIZER

Designed for straight pipe runs only, these six-wheel centralizers feature an adjustable, scissor-style aluminum frame and tough plastic wheels. They are compatible with the entire BJV line of rotary tools.

*Tool not included.*



CENTRALIZER SIZES (DIAMETER)		WEIGHT
BJ 286-S	9–18 in. 230–460 mm	20 lb 9 kg
BJ 286-M	13–40 in. 330–1000 mm	32 lb 15 kg
BJ 286-L	16–60 in. 410–1500 mm	40 lb 18 kg

### CURVED PIPE CENTRALIZER

With adjustable, telescopic steel legs and tough plastic wheels, these eight-wheel centralizers are designed to travel through elbows and are compatible with the entire BJV line of rotary tools.

*Tool not included.*

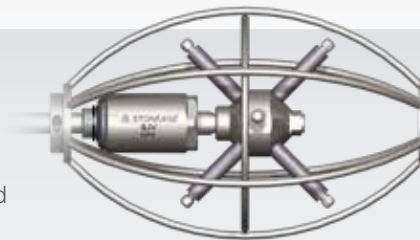


CENTRALIZER SIZES (DIAMETER)		WEIGHT
BJ 288-S	16–21 in. 410–530 mm	12 lb 5.5 kg
BJ 288-M	22–29 in. 560–740 mm	13 lb 5.9 kg
BJ 288-L	30–37 in. 770–940 mm	16 lb 7.3 kg

### CAGE-STYLE CENTRALIZERS

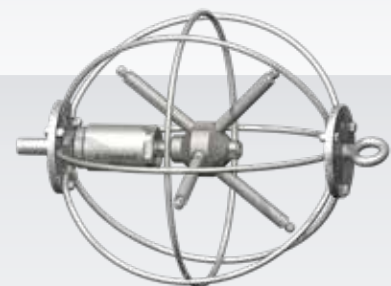
Stainless steel centralizers are used when negotiating complex piping arrangements and removing buildup debris while maintaining jet rotation.

*Tool not included.*



Different inlet plates are available for all models.

**BJ 408-MP12/H9**  
**BJ 408-P12/M24**



Different collar sizes are available for all models.

**BJ 100-SS**  
**BJ 100-SS-MP**

PART ID	BJ 408-MP12/H9	BJ 408-P12/M24*	BJ 100-SS	BJ 100-SS-MP
DIAMETER	12 in. 300 mm	12 in. 300 mm	20 in. 510 mm	20 in. 510 mm
LENGTH	20 in. 510 mm	20 in. 510 mm	24 in. 610 mm	24 in. 610 mm
WEIGHT	10 lb 4.5 kg	10 lb 4.5 kg	11 lb 5.0 kg	11 lb 5.0 kg

**RAPTOR**

Speed Controlled Rotary Cleaning for Small to Medium Pipes  
2–6 Inches (51–152 mm) in Diameter

The versatile Raptor combines slower rotation speeds from 15-250 rpm with a flow range up to 60gpm (230 lpm) to effectively remove difficult deposits in straight pipe and process drains.

Customizable heads and accessories also make the Raptor ideal for cleaning totes, closed head drums, water well screens, ducts and exhaust stacks.



- ✓ High flow range aids in removing thick, tough deposits
- ✓ Controlled rotation for longer jet dwell times help remove hard material
- ✓ Multiple head and jetting options enable flexible customization to optimize cleaning
- ✓ Optional pull ring connection aids in jobs where tool needs to be pulled through the pipe
- ✓ Optional centering devices available to optimize standoff distance

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	LENGTH	WEIGHT
RPT	Up to 22k psi 1500 bar	Up to 60 gpm 230 l/min	15-60 rpm (Slow Fluid) 50-250 rpm (Fast Fluid)	1/2" NPT, 9/16" MP or M24	9.5 in. 240 mm	5.5 lbs 2.5 kg



**RPT 075**  
For 3" or 4.5" pipes.



**RPT 070**  
For 4", 5", 6", 8", 10" and 12" pipes.

**RAPTOR CENTRALIZERS**

A centralizer helps to protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where the pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe.



**OPTIONAL HEAD TYPES**

The Raptor head can be configured with a front jet or a pull ring depending on the needs of your job.

	RPT 043-P2-6		RPT 044-P4-6	
DIAMETER	2.0 in.	51 mm	2.5 in.	64 mm
NOZZLES	6 or 7 x AP2		6 x AP4	

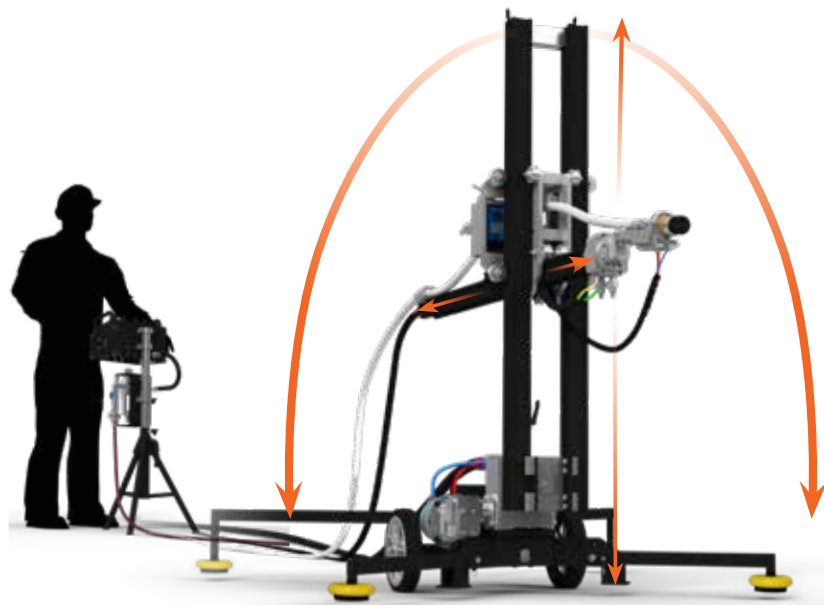
**RAPTOR HEAD SELECTION**

	HEAD OFFSET		R30		R18		R11	
PRESSURE	5k psi	350 bar	10-23 gpm	38-87 l/min	16-38 gpm	60-140 l/min	25-60 gpm	95-230 l/min
	10k psi	700 bar	10-18 gpm	38-68 l/min	15-31 gpm	57-120 l/min	25-51 gpm	95-190 l/min
	15k psi	1000 bar	10-17 gpm	38-64 l/min	16-28 gpm	60-110 l/min	26-47 gpm	98-180 l/min
	22k psi	1500 bar	10-16 gpm	38-60 l/min	17-26 gpm	64-100 l/min	27-43 gpm	100-160 l/min

# SURFACE CLEANING

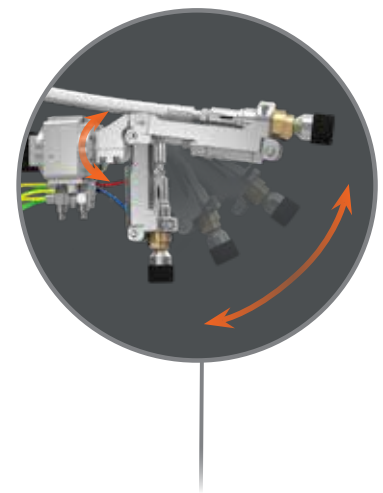
The Striker family of automated surface cleaning systems has been engineered to replace the difficult and dangerous practice of manual shotgunning.

These hands-free systems allow the operator precise control of the equipment from safely outside the blast zone. The advantages of automation include uninterrupted run time at greater thrust and more productive cleaning rates.



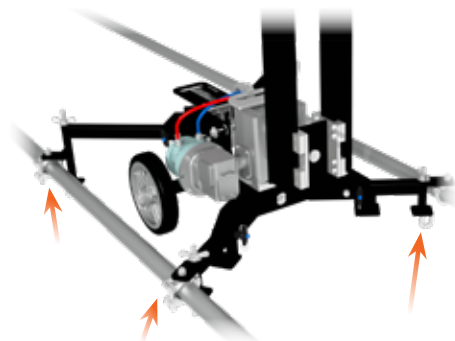
## 3-D CLEANING CAPABILITY

60 in. H x 84 in. W x 54 in. D  
(1525 mm x 2134 mm x 1372 mm)



## FULL WRIST ARTICULATION

Flex 80 degrees and rotate up to 270 degrees.



## OPTIONAL SCAFFOLD & J-HOOK MOUNTS

Can be mounted to scaffolding or grating.



## CONTROL BOX

Allows safe, remote operation of high pressure waterblast equipment.




## MODULAR SYSTEM

Designed for portability and easy assembly.

**LIGHTWEIGHT STRIKER  
SKRL-100**

**BEST FOR:** IN SITU CLEANING IN HARD TO ACCESS LOCATIONS

The Lightweight Striker is designed for automated shotgunning in hard to access locations. The system can be quickly disassembled into modular components that fit through standard manway openings and meet plant requirements for single man lift.

<b>MODEL</b>	SKRL-100
<b>PRESSURE RANGE</b>	Up to 20k psi ( 1380 bar)
<b>JET REACTION RANGE</b>	up to 50 lbs (23 kg)
<b>TOTAL WEIGHT</b>	140 lbs (64 kg)
<b>CONTROL BOX</b>	Tethered
<b>CLEANING WINDOW DIMENSIONS</b>	 47 in. H x 68 in. W x 40 in. D 1194 mm x 1727 mm x 1016 mm



- ✓ Modular system designed for portability
- ✓ Can be fully assembled in less than five minutes
- ✓ Fits through 21 in. (534 mm) manway
- ✓ Custom 10k and 20k nozzles, engineered to ensure safe operation while delivering maximum thrust
- ✓ Affordable alternative to complicated robotic system


**CUSTOM 10K AND 20K NOZZLES**

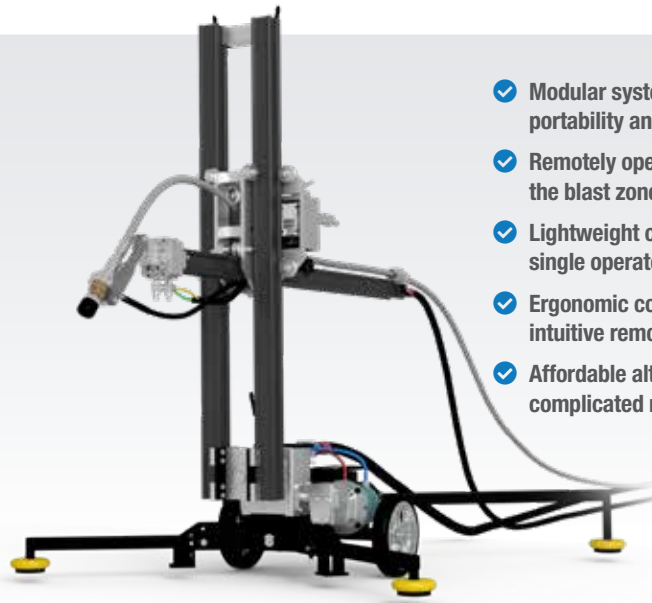
Engineered to ensure safe operation while delivering maximum thrust.

**STANDARD STRIKER  
SKR-STD**

**BEST FOR:** IN SITU/PAD CLEANING THAT REQUIRES HIGHER PSI

The Standard Striker is the perfect entry point for contractors who want to add a remote shotgun system to their fleet. The system offers a unique combination of portability and higher thrust capacity for maximum flexibility on the job site.

<b>MODEL</b>	SKR-STD
<b>PRESSURE RANGE</b>	Up to 40k psi ( 2800 bar)
<b>JET REACTION RANGE</b>	Up to 70 lbs ( 32 kg)
<b>TOTAL WEIGHT</b>	260 lbs ( 118 kg)
<b>CONTROL BOX</b>	Tethered
<b>CLEANING WINDOW DIMENSIONS</b>	 60 in. H x 84 in. W x 54 in. D 1525 mm x 2134 mm x 1372 mm



- ✓ Modular system designed for portability and easy assembly
- ✓ Remotely operated from outside the blast zone for safety
- ✓ Lightweight components for single operator setup and use
- ✓ Ergonomic control box offers intuitive remote operation
- ✓ Affordable alternative to complicated robotic systems

# SURFACE CLEANING TOOLS

STONEAGE OFFERS TWO SELF-ROTARY SHOTGUN TOOL OPTIONS, THE SPITFIRE AND THE BARRACUDA. THE TOOLS ARE ENGINEERED TO GIVE OPERATORS A CHOICE OF FASTER OR SLOWER ROTATION SPEEDS TO MEET THE UNIQUE APPLICATION NEEDS OF THE JOB.

## SPITFIRE

The Spitfire rotary shotgun tool is engineered for rotation speeds up to 5000 rpm and is ideal for removing thin hard coatings like epoxy, paint or rust. The extra lightweight Spitfire requires little maintenance, reducing down time and increasing productivity.

- ✔ Covers a wide range of pressure ratings from 2–22k psi (140–1500 bar)
- ✔ High speed rotation for removing thin coatings
- ✔ Angled jets allow for broader impact for quicker, more effective cleaning of large surfaces and odd shapes
- ✔ Fewer parts and no seals to stock or replace, reducing costs and maintenance downtime
- ✔ Short overall tool length and light weight makes for easy handling, reducing operator fatigue
- ✔ External shield option protects the tool from damage caused by lateral impacts



### SHIELDED HEAD OPTION

Protects the head from damage caused by lateral swinging of the tool



### BUMPER HEAD OPTION

Alternative head for jobs when debris gets lodged in the shield, preventing head rotation, inexpensive bumper protects tool and is easily replaceable



### HIGH SPEED ROTATION

Excellent for removing hardened paint and thin coatings



### ANGLED JETS

AP2 nozzles provide more effective cleaning of large surfaces and odd shapes

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
SPFR-P8-S/ SPFR-P8-B	5–15k psi 340–1000 bar	2–15 gpm 8–58 l/min	3000–5000 rpm	1/2" NPT	1.5 lb / 0.7 kg (S) 1.7 lb / 0.8 kg (B)	250 °F 120 °C
SPFR-MP9-S/ SPFR-MP9-B	5–22k psi 340–1500 bar	4–13 gpm 16–49 l/min	3000–5000 rpm	9/16" MP	1.5 lb / 0.7 kg (S) 1.7 lb / 0.8 kg (B)	250 °F 120 °C

OPERATING WATERBLASTING EQUIPMENT CAN BE POTENTIALLY HAZARDOUS.



See page 9.10 for important safety information

## BARRACUDA

The Barracuda is a speed controlled rotary shotgun tool designed for speeds ranging from 1000 to 2000 rpm, making it ideal for cleaning thick, hard-to-remove materials like coke or rubber. The Barracuda can be used on automated and hands-free equipment.



- ✓ Handles a wide range of pressure ratings from 2–44k psi (140–3000 bar)
- ✓ Simple maintenance for long term use
- ✓ New cartridge seal doubles runtime
- ✓ Can be configured for 2 or 4 port application
- ✓ Angled jets allow for broader impact for quicker, more effective cleaning of large surfaces and odd shapes

### NEW UPGRADES:

- New BC 705 cartridge seal is designed as a drop-in replacement to the BC 505-S cartridge seal for 44k psi Barracuda Shotgun tool
- Field and in-house testing has shown the new cartridge effectively doubles the life of the seal

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMP.
BC-K	2–22k psi (140–1500 bar)	4.4–13.3 gpm (17–50 l/min)	1000-2000 rpm	9/16" MP	2.7 lb (1.2 kg)	160 °F (70 °C)
BC-K-P2	5–22k psi (340–1500 bar)	4.3–12.1 gpm (16–46 l/min)	1000-2000 rpm	9/16" MP	2.7 lb (1.2 kg)	160 °F (70 °C)
BC-H9-C	20–44k psi (1400–3000 bar)	5.6–8.8 gpm (21-23 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9LF-C	20–44k psi (1400–3000 bar)	4.3–6.7 gpm (16-25 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9XLF-C	20–44k psi (1400–3000 bar)	3.5–5.6 gpm (13-21 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9XXLF-C-TI	20–44k psi (1400–3000 bar)	2.3–3.8 gpm (9-14 l/min)	1000-2000 rpm	9/16" HP	3.2 lb (1.45 kg)	160 °F (70 °C)



### BC 705 CARTRIDGE SEAL

Effectively doubles the life of the previous BC 505-S Cartridge Seal. For Barracuda rotary shotgun tools rated up to 44k psi (3000 bar).

### NOZZLES AND PLUGS

Come in 2-port and 4-port configurations. Two jets deliver more concentrated power for heavy, thick deposits while four jets are ideal for removing thin, hard deposits.

### IMPACT RESISTANT SHIELD

Inexpensive and easily replaceable shield protects working parts of the tool from debris and impacts.

### MAINTENANCE RESOURCES

TOOL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT	MANUAL
BC-K	BC 600	BC 602	BC 610	BC 612	GP 042	PL 514
BC-K-P2	BC 600	BC 602	BC 610	BC 612	GP 042	PL 514
BC-H9-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9LF-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9XLF-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9-XXLF-C-TI	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C-TI	BC 612	GP 042	PL 566

# TANK & VESSEL CLEANING

A full selection of 2D and 3D nozzles, positioning tractors and booms for cleaning tanks and vessels without requiring operator entry.

## AUTOBOX ABX-500 HOSE TRACTOR

Rugged hose feed tractor for accurate positioning of tank cleaning nozzles.

## TORUS 3D TANK CLEANING TOOL

Gearing rotation of body and arms provides complete cleaning coverage of tank surface.

## CONTROL BOX

StoneAge control boxes are designed to be durable, lightweight and cross-compatible.

## DUMP VALVE

StoneAge supplies a complete line of Dump Valves ranging from 15–40k.



**LARGE DIAMETER TANKS THAT HAVE AN ACCESSIBLE CENTER OPENING CAN EFFECTIVELY BE CLEANED USING A 2-D ROTATING TOOL THAT IS SLOWLY RAISED OR LOWERED WITH THE ABX-500 TO ACHIEVE COMPLETE COVERAGE. WHEN THIS IS NOT POSSIBLE, DUE TO CENTRAL OBSTRUCTIONS SUCH AS AGITATORS, THE BEST SOLUTION IS TO USE A 3-D TANK CLEANING TOOL AND A POSITIONING BOOM (SEE PAGES 5.3-5.5).**



## AUTOBOX ABX-500

- ✔ Remote hose feed tractor increases productivity and reduces operator fatigue
- ✔ Handles hose sizes from 0.56-1.75 in (14-4 mm OD) with no modifications
- ✔ Hose clamp pressure and feed rates can be remotely adjusted
- ✔ Operates in horizontal or vertical position for tank and pipe cleaning
- ✔ Passes hose couplings up to 1.75 in (45 mm OD) for long runs

HOSE SIZE	0.56–1.75 in. 14–45 mm OD
MAX. HOSE CRIMP	1.75 in. 45 mm OD
HOSE FEED RATE	1–30 ft/min 0.3–9.1 m/min
PUSH/PULL FORCE	Up to 200 lbs 90 kg
MAX. AIR PRESSURE	125 psi 0.86 MPa
DIMENSIONS	8.3 x 16.9 x 8.2 in. 211 x 429 x 208 mm
WEIGHT	90 lbs 22 kg

# POSITIONING BOOMS

## POSITIONING BOOMS

Large tanks and vessels can be among the most difficult cleaning challenges due to their size, limited access and internal geometries. StoneAge offers several positioning booms that pair with our 3D tools to clean tanks without requiring operator entry.

The use of a positioning boom allows you to safely place the tool closer to the surface to be cleaned and away from obstructions for optimal results.

## SIMPLE BOOMS

Positioners provide up to 19 ft (5.8 m) of reach for the Torus 3-D tank cleaner in addition to tilt and rotation adjustments. Intended for vertical or near vertical applications.

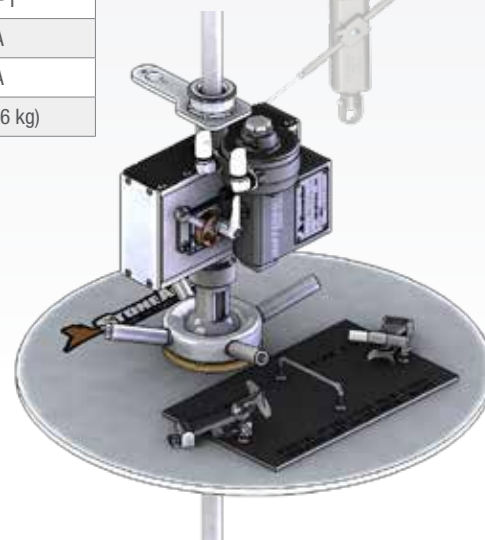
- ✔ Easily adjustable extension/retraction lengths means the cleaning nozzle can be extended or retracted to a variety of insertion depths for better cleaning coverage
- ✔ 24 in. (610 mm) aluminum mounting plate secures to the vessel during cleaning operation, increasing operator safety
- ✔ Inspection hatch allows for line of sight placement of cleaning head to check cleaning progress
- ✔ Portable and easy setup; no special tools required to position head

## SIMPLE BOOM SPECIFICATIONS

	SB-H	SB-P16
MAX. PRESSURE	N/A	10k psi (700 bar)
MAX. FLOW	50 gpm (190 l/min)	150 gpm (570 l/min)
INLET CONNECTIONS	3/4" NPT or 1-12 "M"	1" NPT
MAX. HOSE I.D.	0.5 in. (13 mm)	N/A
MAX. END FITTING	1.5 in. (38 mm)	N/A
WEIGHT	80 lb (36 kg)	80 lb (36 kg)



*TORUS sold separately*



## HANDS-FREE OPTION

Add a Pro-Drive tractor to the simple boom to automate the hose feed for increased safety.

**TELEBOOM**

The TeleBoom is designed to hold and position most types of waterblast cleaning nozzles. It is particularly useful for placing rotary nozzle heads inside tanks and vessels. It is intended only for vertical or near vertical applications.

- ✔ **Lightweight and compact for portability**
- ✔ **Three positioning functions: Telescope, Angle and Rotate**
- ✔ **All of the functions are driven by hand operated wheel cranks**
- ✔ **Attaches to various size manway openings by means of custom made adapter plates**



**TELEBOOM SPECIFICATIONS**

MODEL	TB-6-TR		TB-8-TR		TB-10-TR	
MAX. PRESSURE	22k psi	1500 bar	22k psi	1500 bar	22k psi	1500 bar
MAX. FLOW	100 gpm	380 l/min	100 gpm	380 l/min	100 gpm	380 l/min
INLET CONNECTIONS	3/4" NPT, 3/4" MP or M24		3/4" NPT, 3/4" MP or M24		3/4" NPT, 3/4" MP or M24	
MAX. HOSE I.D.	3/4 in.	19 mm	3/4 in.	19 mm	3/4 in.	19 mm
COLLAPSED LENGTH	6.5 ft	2.0 m	8.5 ft	2.6 m	10.5 ft	3.2 m
MAX. REACH	13 ft	4.0 m	19 ft	5.8 m	25 ft	7.6 m
WEIGHT	120 lb	55 kg	130 lb	59 kg	140 lb	63 kg

**EXTENSION BOOM**

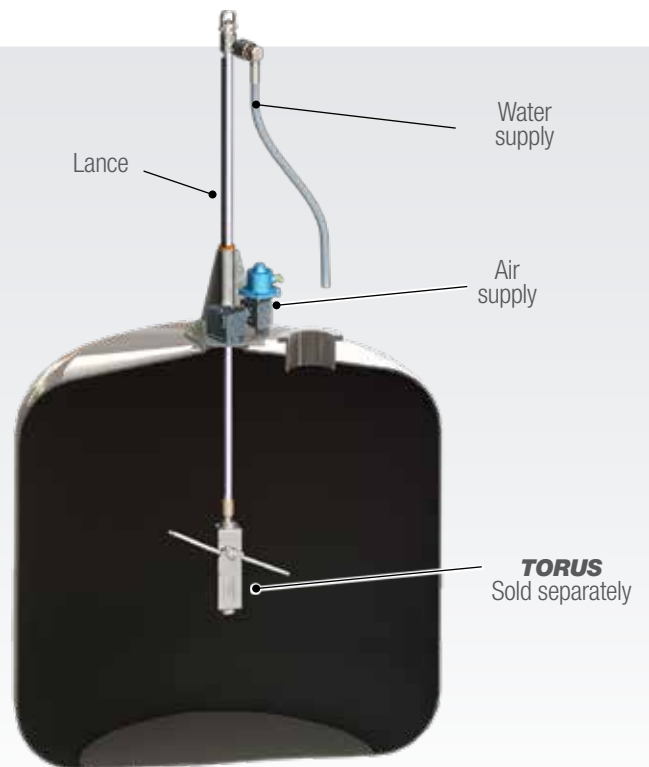
This Extension Boom allows the operator to raise and lower a 3D tool at different speed rates. The EB-100 boom utilizes a durable rack and pinion drive to position the vertical lance. The lance can be stopped at any height and offers a maximum stroke length of 12 feet, and the mounting flange can be customized to fit your tank opening.

**OPTIONAL CONTROL BOX**

We also offer a dual function Control Box which manages the air supply to the boom. The CB-2S™ controls the vertical position and linear speed of the lance. This Control Box can be modified to fit your specific application.

**EXTENSION BOOM SPECIFICATIONS**

	EB-100
MAX. PRESSURE	12k psi (830 bar)
LINEAR SPEED	8-45 in./min (0.2-1.1 m/min)
MAX. STROKE LENGTH	12 ft (3.7 m)
INLET CONNECTION	3/4" NPT



# 3D TANK CLEANING

## TORUS TR-130

The Torus TR-130 is a powerful and highly adaptable 3-D cleaning tool designed to easily adjust to a wide range of pump capacities, working pressures and cleaning applications. The body of the TR-130 rotates in one axis while the arms rotate in another, providing full cleaning coverage of all tank surfaces without requiring operator entry.

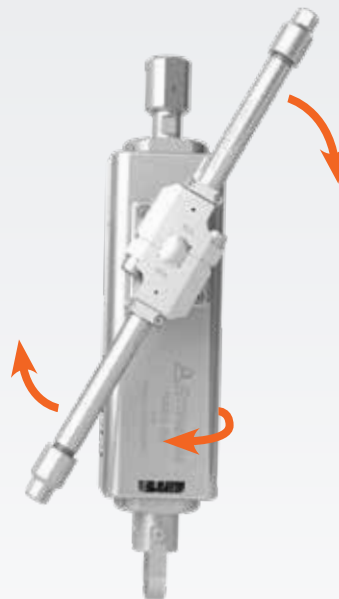
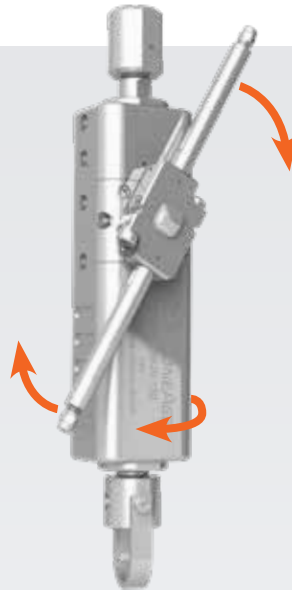
MODEL	TR-130
PRESSURE RANGE	2–22k psi (138–1500 bar)
FLOW RANGE	10–81 gpm (38–307 l/min)
TOTAL WEIGHT	35 lbs (16 kg)
TOOL WIDTH	130 mm

## TORUS TR-200

The Torus TR-200 is the industry's most powerful 3-D tool. It is capable of delivering flows up to 220 gpm (830 l/min) with minimal pressure loss. Applying higher flows allows contractors to remove thicker deposits and deliver longer and harder hitting jets from further distances. Ideal for cleaning hard applications such as large tanks and difficult materials such as coke deposits.

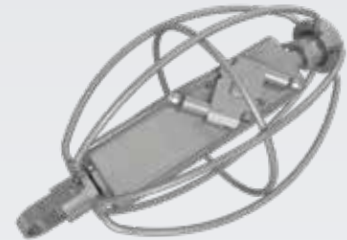
MODEL	TR-200
PRESSURE RANGE	8–15k psi (550–1000 bar)
FLOW RANGE	50–220 gpm (190–830 l/min)
TOTAL WEIGHT	100 lbs (45 kg)

- ✓ Small entry diameter enables access to more tanks and vessels
- ✓ If the arms hit an internal obstruction while in operation, the Torus simply stops rotating without damaging the gear mechanism
- ✓ Minimal pressure loss which provides more power delivery than other tools on the market
- ✓ Interchangeable manifolds and couplings allow the operator to use the Torus on different pumps ranging from 10k psi (700 bar) to 20k psi (1500 bar)
- ✓ Wide range of accessories are available including positioning devices, cage centralizers and extensions help adapt the Torus to specific needs and jobs



## TR 408-SS – CAGE CENTRALIZER

The Torus TR-130 cage-style centralizer. Ideal for applications where debris or internal structures may interfere with the cleaning operation.



## EXTENSION NIPPLES

Includes two standard 8 in. (203 mm) extension nipples. Longer nipples can be used up to 48 in. (1200 mm). Custom lengths are available on request.



## LIFTING ASSEMBLY

The Torus TR-200 comes with a heavy lifting assembly. Includes two quick release pins, two ring attachments and a choice of P16 or MP16 coupling.



## MAINTENANCE RESOURCES

TOOL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	MANUAL
TR-130	TR130 600	TR 602	TR130 610	PL 556
TR-200	TR200 600	TR200 602	TR200 610	PL 557

# 2D TANK CLEANING

## BJVE

The BJVE is our most versatile line of controlled rotary tools. The highly configurable design makes them ideal for cleaning tanks or large pipes. A variety of head and jetting options can be combined with extension arms to easily customize the tool for cleaning large diameter vessels.

### NEW UPGRADES:

- Backed by the industry's only **THREE YEAR WARRANTY** for maintenance free speed control
- New high pressure seal geometry extends life 3X and can now be replaced in the field in under 3 minutes
- New inlet cartridge design enables quick change from 15K to 20K on the fly
- New long life body is compatible with most existing heads



- ✓ Easy to pair with AutoBox ABX-500 for hands-free tank cleaning
- ✓ Add extension arms to reduce stand off distance in large vessels
- ✓ Can be configured for fast or slow rotation speed depending on the material being cleaned
- ✓ Interchangeable heads allow the tool to be used with any type of pump
- ✓ Simple nozzle changes allow operators to configure for multiple cleaning applications

### EXTENSION ARMS

Add custom length extension arms to reduce stand off distance and deliver maximum cleaning power in any size tank or vessel.



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
BJVE-P16	2–10k psi (140–700 bar)	20–200 gpm (76–757 l/min)	25–95 rpm (Slow) 50–200 rpm (Medium) 85–300 rpm (Fast)	1" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-P12	2–15k psi (140–1000 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	3/4" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-M24	2–22k psi (140–1500 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	M24	(8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-MP12	2–22k psi (140–1500 bar)	10–60 gpm (38–230 l/min)	20–95 rpm (Slow) 40–190 rpm (Medium) 70–275 rpm (Fast)	3/4" MP	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJV-H9	20–40k psi (1400–2800 bar)	3.4–20 gpm (13–76 l/min)	20–60 rpm (Slow Fluid) 90–250 rpm (Fast Fluid)	9/16" HP	9.3 lbs (4.4 kg)	160 °F (70 °C)

**OPERATING WATERBLASTING EQUIPMENT CAN BE POTENTIALLY HAZARDOUS.**



See page 9,10 for important safety information

# CUSTOM SOLUTIONS

# TANK & VESSEL CLEANING

## SM-AIR • LARGE TANK CLEANER

The SM-AIR offers air powered rotation at high flows for effective jet power over long distances. Different head options allow cleaning irregular surfaces.

- ✓ Versatile and durable gearbox can be used with a variety of head designs for many different applications
- ✓ Air-powered rotation provides uniform coverage over a large area
- ✓ Variable speed control maximizes efficiency for heavy or light applications
- ✓ Ideal for cleaning boilers, furnaces, cyclones and cokers



### HIGHLY ADAPTABLE

Extension nipples adapt the tool to various vessel sizes by reducing stand-off distance

### MULTIPLE HEAD OPTIONS

Allows the tool to be configured to clean a wide range of applications



### OC8 CARBIDE NOZZLES

Can be used where filtration is poor, abrasive solids are present, or for very high flow applications

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT
SM-AIR	Up to 12k psi 830 bar	Up to 300 gpm 1140 l/min	1" NPT	10-70 rpm	78 lb 35 kg



### STONEAGE RENTS

Rely on us to meet your surge capacity needs



### STONEAGE DEMO TRAILER

Experience the power of StoneAge equipment at your location



### STONEAGE TRAINING

Expert training for the safe and effective use of waterjetting equipment



### WARRANTY

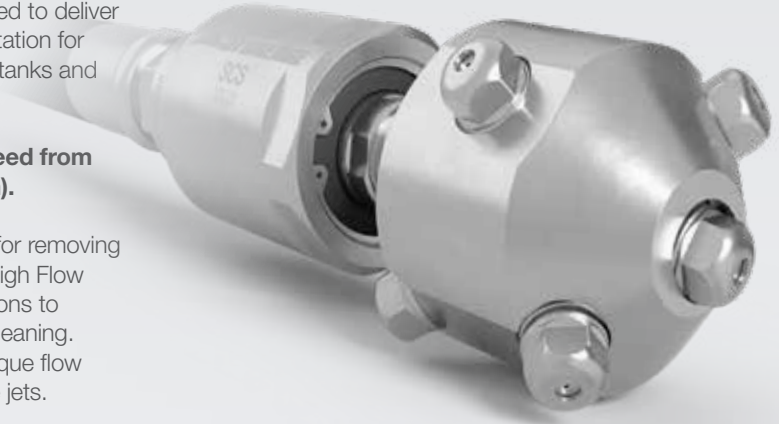
StoneAge warrants its products to be free from defects in workmanship and material for a period of one (1) year from the date of purchase

### SPEED CONTROLLED SWIVEL (SCS)

The StoneAge SCS High Flow Tank Cleaner is engineered to deliver extremely high flow while maintaining slow controlled rotation for optimal cleaning of difficult deposits in medium to large tanks and vessels.

**The SCS allows the operator to adjust rotation speed from 5-60 rpm while delivering up to 300 gpm (1136 lpm).**

This combination of high flow and slow rotation is ideal for removing difficult materials such as coke or refractory. The SCS High Flow Tank Cleaner can be customized with several head options to adapt for large pipe cleaning, tunnel cleaning or stack cleaning. We also offer newly designed high flow nozzles with unique flow straighteners to increase the precision and power of the jets.



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT
SCS-100	10–22k psi 700–1500 bar	10-300 gpm 151–1136 lpm	1" MP (MP16), 1" NPT (P16), 1.25" NPT (P20)	5–50 rpm	12lbs (5 kg) Swivel only, no head

- ✓ High flow, slow rotation
- ✓ Adjustable speed control
- ✓ Multiple head options
- ✓ Uniquely designed high flow nozzles with flow straighteners
- ✓ Adaptable to large pipe cleaning, tunnel cleaning or stack cleaning

#### CONTROLLED ROTATION

Rotation speed is controlled by a combination of viscous fluid and a speed control adjustment



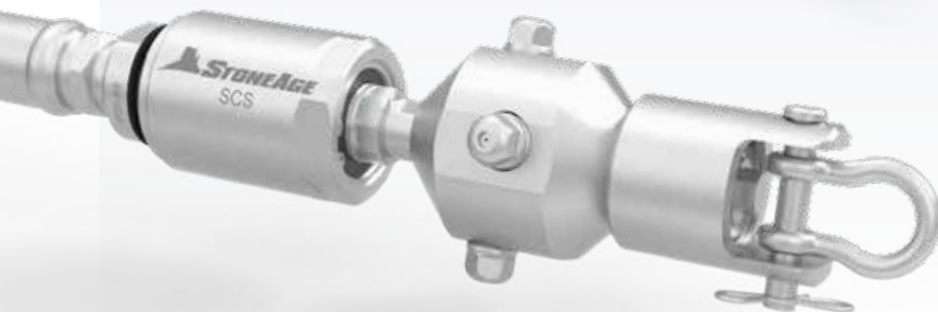
#### EXTENSION ARMS

Optional extension arms allow the standoff distance to be customized for specific tank size



#### MULTIPLE HEAD OPTIONS

Allow the SCS to be customized to adapt to multiple applications



# CUSTOM SOLUTIONS

Custom engineered waterblasting solutions for your most challenging jobs.



**Coke and refractory removal**



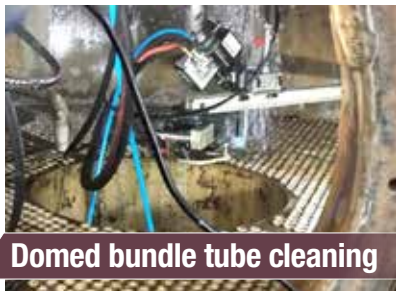
**Drill pipe cleaning**



**Condenser tube cleaning**



**Tunnel cleaning**



**Domed bundle tube cleaning**



**Boiler tube cleaning**

The StoneAge Solutions team can design custom engineered solutions. From simple product modifications, to comprehensive turnkey packages, we help contractors and plants clean the most difficult applications.

## The StoneAge Solutions team offers:

- ✓ Custom Engineered Equipment
- ✓ Safety, product and application training
- ✓ Technical support on hard-to-clean applications
- ✓ Most Effective Technology (MET) reports

**FOR MORE ABOUT HOW TO CUSTOMIZE THESE TOOLS PLEASE CONTACT OUR SOLUTIONS DEPARTMENT**

**970.403.1437**

**SOLUTIONS@STONEAGETOOLS.COM**

# CUSTOM SOLUTIONS SURFACE CLEANING

The StoneAge Solutions team can customize the components of our versatile Blastrack system to handle surface cleaning applications and eliminate the need for manual shotgunning.

Tell us what you need to clean and we'll tailor the system exactly for your job.

- ✔ Clean any large horizontal or vertical surface
- ✔ Configure for any pressure and flow
- ✔ Ideal for cleaning the external side of boiler tubes and pipes, as well as conveyors, tunnel walls, stacks, and even concrete scarification.



CUSTOM SOLUTIONS

## COMPONENTS OF THE BLASTRACK SYSTEM

### TRACTOR

Choose from Air or Hydraulic powered tractors to drive traverse and rotation functions.

### BOX RAIL

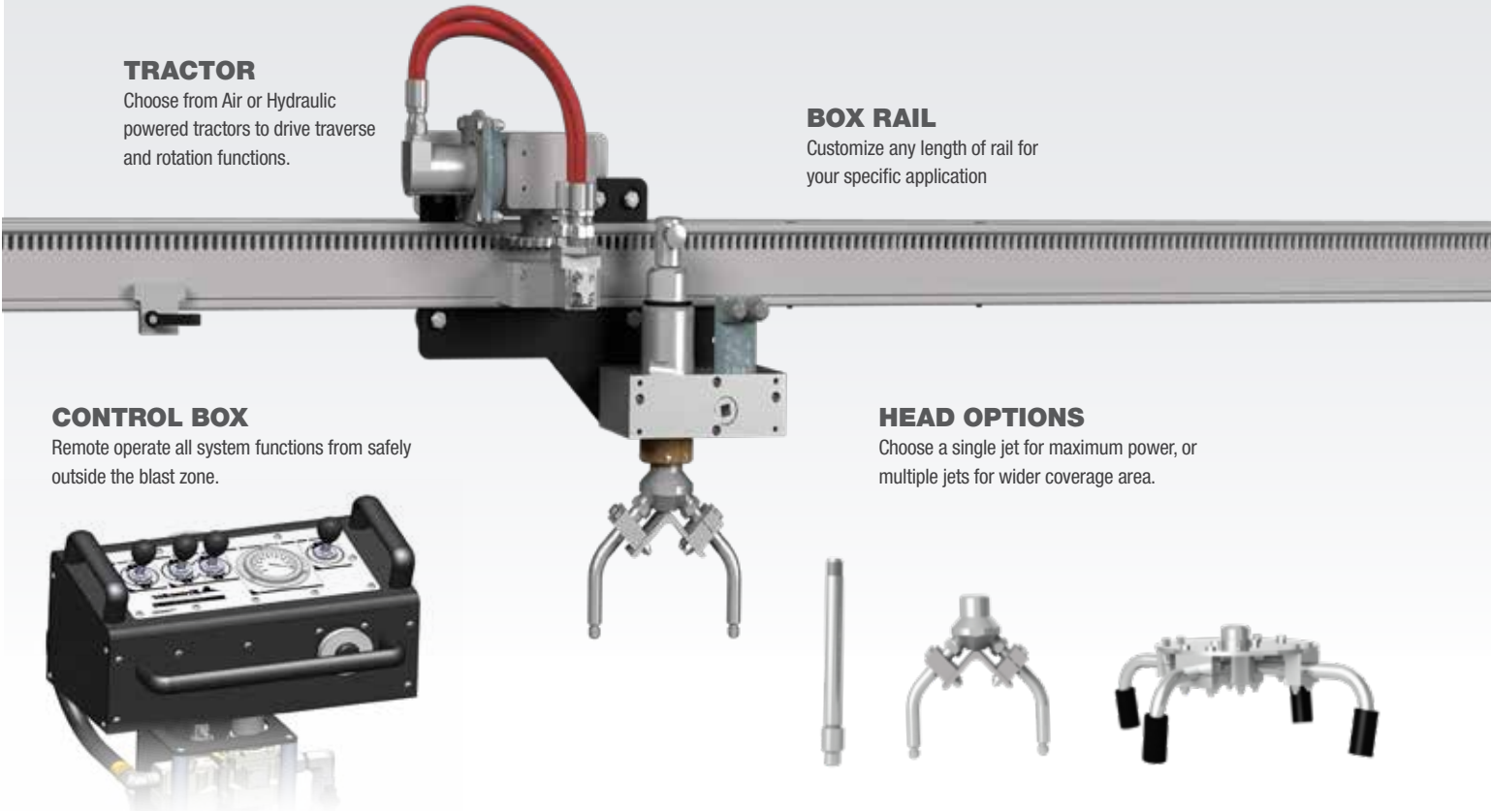
Customize any length of rail for your specific application

### CONTROL BOX

Remote operate all system functions from safely outside the blast zone.

### HEAD OPTIONS

Choose a single jet for maximum power, or multiple jets for wider coverage area.



## BLASTRACK SYSTEM IN ACTION



**COKE AND REFRACTORY  
REMOVAL**



**CONDENSER TUBE  
CLEANING**



**DRILL PIPE CLEANING**



**TUNNEL CLEANING**

# CUSTOM SOLUTIONS

# FURNACE & BOILER CLEANING

## BOILER TUBE CLEANER

The StoneAge BTC-200 Boiler Tube Cleaner cleans radial tubes found in the mud and steam drums of package boilers. It fits through a standard manway and cleans boiler tubes without the need for an operator to enter the vessel.

- ✓ Eliminates confined space entry
- ✓ Can be adapted to other types of boilers
- ✓ Hose containment drum increases safety and hose life
- ✓ Integrated camera system simplifies tube indexing
- ✓ The ABX-PRO tractor can be removed and used independently for pipe cleaning



## PRECISE, CONTROLLED HOSE FEED

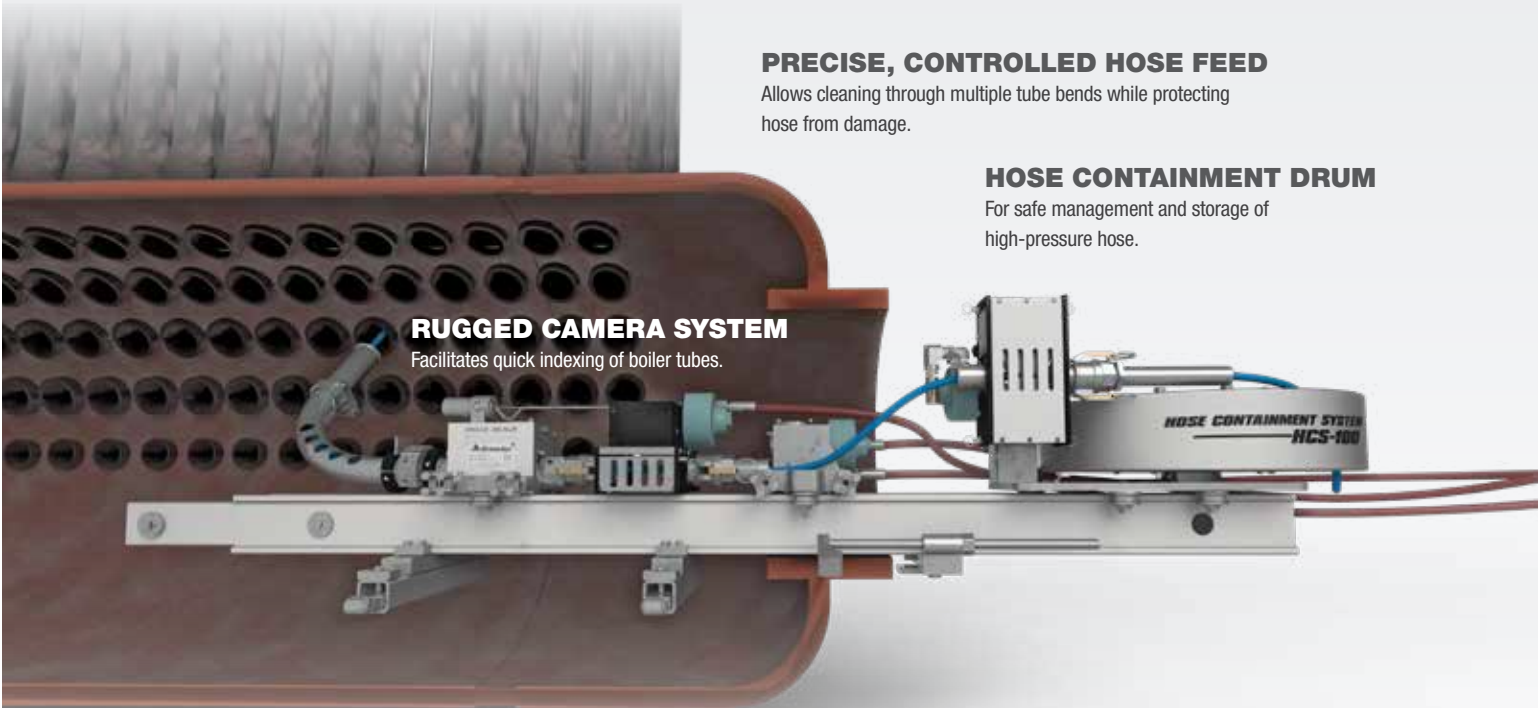
Allows cleaning through multiple tube bends while protecting hose from damage.

## HOSE CONTAINMENT DRUM

For safe management and storage of high-pressure hose.

## RUGGED CAMERA SYSTEM

Facilitates quick indexing of boiler tubes.



TOOL MODEL	MAX. PRESSURE	FLOW RANGE	HOSE I.D.	FEED RATE	MAX. HOSE LENGTH	MAX. TUBE LENGTH
BTC-200	20k psi (1400 bar)	5–12 gpm (19–45l/min)	5–6mm	9–50 ft/min (2.7–15.2 m/min)	75 ft (22 m)	50 ft (15 m)

## BA-530 FAIRING

Specifically designed to be attached to the hose behind a 2" Badger rotary pipe cleaning tool.

The tapered sides of the fairing prevent the rear edge of the Badger from getting caught on obstructions when being removed from a pipe.



**CABLE SWIVEL TOOL (CST)**

The patented CST-AIR has a unique hollow-shaft design allowing it to slide on a 3/8 in. (9.5 mm) diameter stretched cable (not supplied) for cleaning hard to access equipment like furnaces and boilers. The CST uses a separate pulling cable or an Autobox PRO tractor for propulsion, and head rotation is powered by an air motor.

- ✔ **Extension nipples adapt the tool to various vessel sizes and improve jet quality by reducing stand-off distance**
- ✔ **Ideal for cleaning Direct Fired Furnaces, Superheaters, Economizers, Boilers, Reformers, Cokers and Precipitators**

**FLEXIBLE 6-PORT HEAD**

Configured with 2 ports @ 90°, 2 ports @ 80°, 1 port @ 70° and 1 port @ 110°. Simply select the ports needed for the job and plug the others. Extension nipples further adapt the tool to various vessel sizes and improve jet quality by reducing stand-off distance.



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	ROTATION RANGE	WEIGHT
CST-AIR	Up to 10k psi (700 bar)	Up to 170 gpm (640 l/min)	2 x 1" NPT	5-60 rpm	360°	46 lb (21 kg)

**OPERATING WATERBLASTING EQUIPMENT CAN BE POTENTIALLY HAZARDOUS.**



See page 9.10 for important safety information

# CUSTOM SOLUTIONS FURNACE & BOILER CLEANING

## BIG FLOW WATERLANCER

The BFW-100 is an automated system designed for hands-free online boiler cleaning that enables contractors to reduce down time by cleaning at high temperatures. With a 300 gpm (1140 l/min) flow capability, the BFW-100 can effectively clean any large vessel with limited entry access.

The BFW-100 features an adjustable cart with an air-powered boom positioner and provides excellent cleaning for pulp plant boilers, refinery and chemical plant vessels, as well as furnace radiant sections.

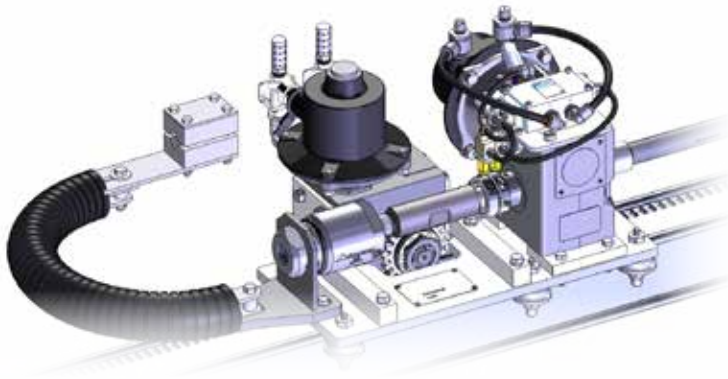
- ✓ Temperature resistant design reduces downtime by allowing cleaning operation while online
- ✓ Remote Control Box controls linear and rotation speeds from a safe distance
- ✓ Adjustable rail and cart allows for easy tool positioning, including elevation and angle of the lance
- ✓ Cantilever option available for lengths up to 24 ft (7.3 m)

### IDEAL FOR:

- ✓ Pulp plant boilers
- ✓ Refinery and chemical plant vessels
- ✓ Furnace radiant sections
- ✓ Boiler floors

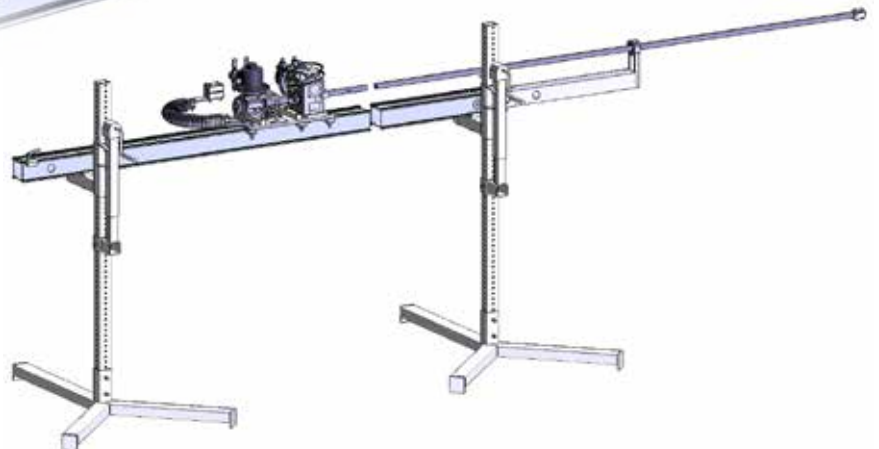


TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	LINEAR SPEED	STROKE LENGTH
BFW-100	10k psi (700 bar)	300 gpm (1140 l/min)	1" NPT	10–50 rpm	8–35 ft/min (2.4–11 m/min)	Up to 24 ft (7.3 m)



**OPTIONAL GEAR DRIVEN TRACTOR AVAILABLE**

**CAN BE MOUNTED ON EXISTING STANDS IF MOBILE CART IS NOT REQUIRED**

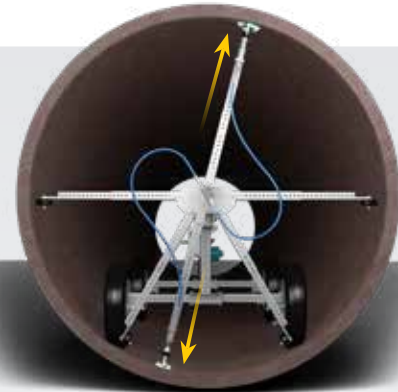


# CUSTOM SOLUTIONS TUNNEL CLEANING

## TUNNEL CLEANER

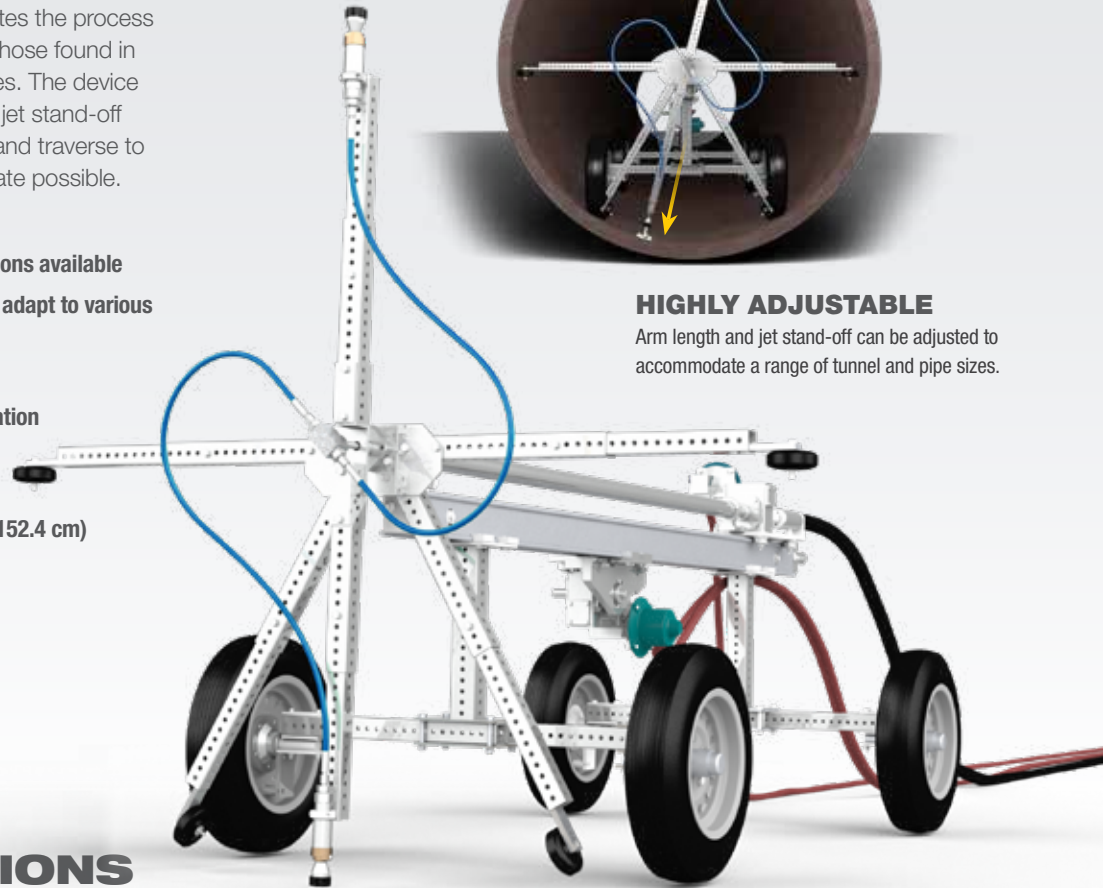
The StoneAge Tunnel Cleaner automates the process of cleaning large tunnels or pipes like those found in city sewers and power plant intake lines. The device can be configured to maintain optimal jet stand-off distance and uses controlled rotation and traverse to achieve the highest material removal rate possible.

- ✔ Two arm, four arm and six arm variations available
- ✔ Different arm lengths are available to adapt to various sizes of tunnel diameters
- ✔ Air, hydraulic or self-rotary powered
- ✔ Use higher flows for better jet penetration
- ✔ Adjustable jet rotation and traverse speeds
- ✔ Available size ranges are from 60 in (152.4 cm) up to 12 ft. (3.65 m)



### HIGHLY ADJUSTABLE

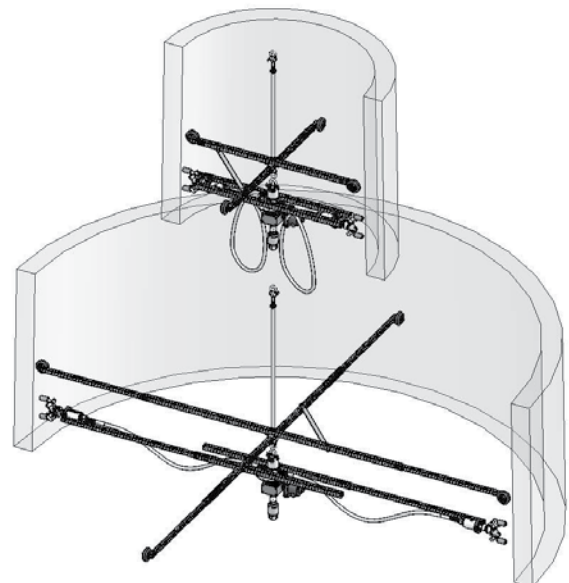
Arm length and jet stand-off can be adjusted to accommodate a range of tunnel and pipe sizes.



# CUSTOM SOLUTIONS STACK CLEANING

## STACK CLEANERS

The StoneAge Solutions team offers a wide range of devices to meet the most challenging stack cleaning requirements. Each design is built to be lowered from the top center of the stack. They can be made to operate at any pressure, offer different jet patterns, be either self-rotary or air powered and include adjustable arm lengths to meet the inner stack diameter.



# CUSTOM SOLUTIONS PIPE CLEANING

## INSIDE DIAMETER PIPE CLEANER

The StoneAge I.D. Pipe Cleaner is an automated rigid lance system designed to clean the interior surface of drill pipes used in the oil and gas industry. The I.D. Pipe Cleaner can run pressures up to 40K psi (2800 bar) and has adjustable rotation and stroke controls to optimize blast settings for any deposit including cement, drill mud, paraffin and NORM.

This system is also ideal for use in the descaling or pickling process used in many steel foundries.



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	STROKE LENGTH	WEIGHT
I.D. PIPE CLEANER	Up to 40k psi 2800 bar	Up to 60 gpm 227 l/min	50–300 rpm	Up to 55 ft 16.7 m	275 lb + 5 lb/ft 125kg + 7.4kg/m *Jack Stand Assemblies 65lb (29.5kg) each

### REMOTE OPERATION

Lance rotation and stroke speed are independently managed from the control box

### CUSTOM LENGTHS AVAILABLE

Configurable to clean pipes up to 55 ft (16.67m) in length, at pressures up to 40k psi (2800 bar)

### ADJUSTABLE JACK STANDS

Leg height adjusts up or down to create 3 ft (914 mm) of adjustability.

- ✓ Affordable modular design is configurable to clean pipes up to 55 ft (16.7 m) in length
- ✓ Can be adapted to a variety of pressures and flows up to 60 gpm (227 l/min) and 40k psi (2800 bar) for the highest level of cleaning efficiency
- ✓ Rigid rotating lance allows all power or flow to be concentrated for cleaning rather than pulling or rotation
- ✓ Independently adjustable rotation and feed controls can be set for optimal dwell to match any type of deposit
- ✓ Heavy-duty carriage assembly adapts to large diameter lances
- ✓ Rugged pipe vice attachment helps stabilize pipe movement
- ✓ Automated operation delivers consistent and repeatable results when cleaning thousands of linear feet (or meters) of pipe
- ✓ Complete package includes adjustable jack stands, control box, rigid lance and cleaning heads

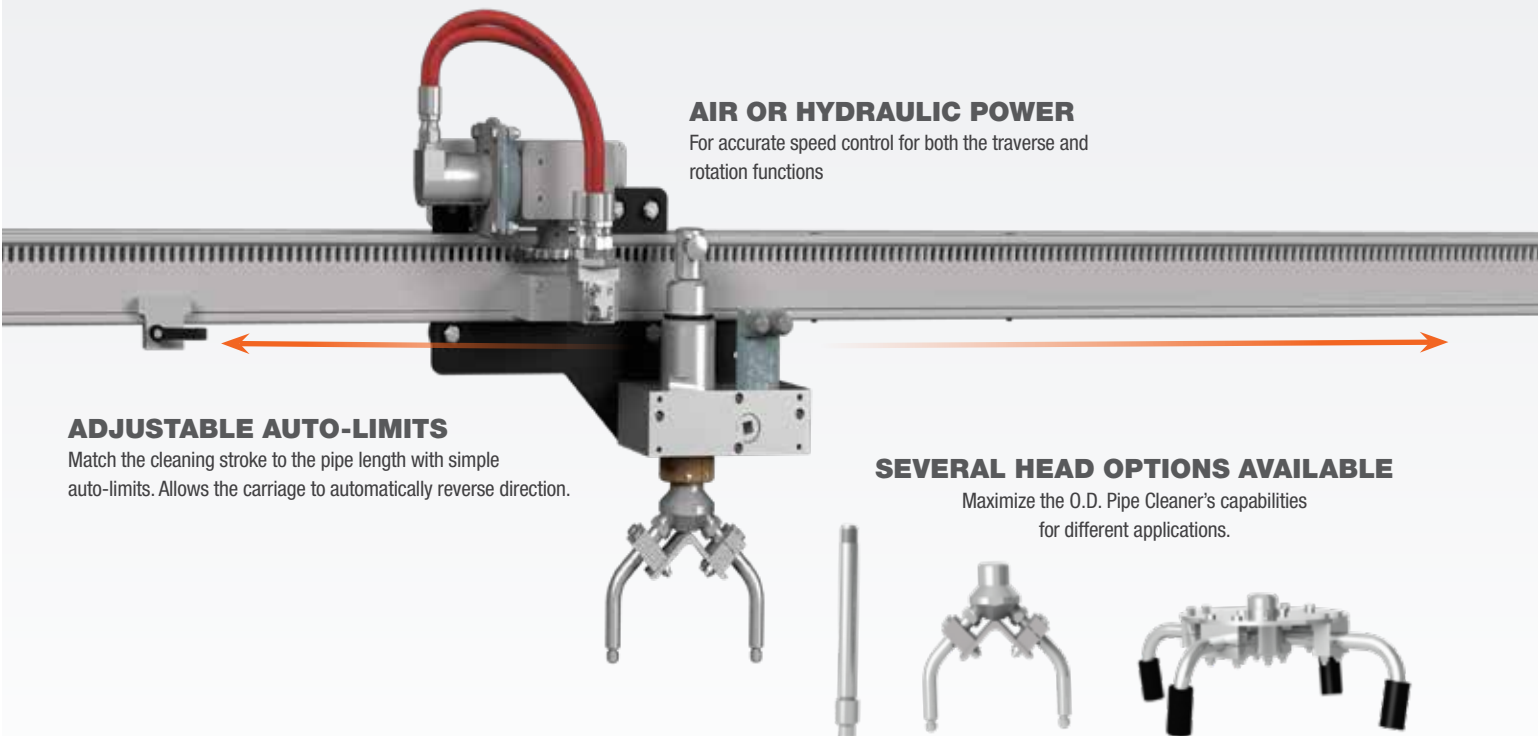
**OUTSIDE DIAMETER PIPE CLEANER**

The StoneAge O.D. Pipe Cleaner is a powerful and affordable automated solution for cleaning the outer surface of drill pipes used in the oil and gas industry. The length of the system can be easily customized for permanent installation into pipe cleaning facilities providing consistent and efficient removal of drill mud, concrete, slag, or other exterior deposits on large volumes of pipe.

- ✔ Can be adapted to a variety of pressures and flows for highest level of cleaning efficiency
- ✔ Rotation and traverse speed are independently adjustable to customize dwell time
- ✔ Several head options available for delivering more concentrated power or covering a wider cleaning path
- ✔ Match the stroke length to the pipe sections being cleaned with simple auto-limits for efficient cleaning with no wasted time
- ✔ Modular rail allows the assembly to be customized to any length
- ✔ Fully automated operation delivers consistent and repeatable results when cleaning thousands of linear feet of pipe lengths



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	LINEAR SPEED	AIR SUPPLY	RAIL LENGTH
O.D. PIPE CLEANER	Up to 40k psi 2800 bar	Up to 50 gpm 190 l/min	50-1000 rpm	7-40 ft/min 2.1-12 m/min	60 cfm @ 80 psi 100 m/hr @ 5.5 bar	Up to 60 ft 18.3 m



**AIR OR HYDRAULIC POWER**

For accurate speed control for both the traverse and rotation functions

**ADJUSTABLE AUTO-LIMITS**

Match the cleaning stroke to the pipe length with simple auto-limits. Allows the carriage to automatically reverse direction.

**SEVERAL HEAD OPTIONS AVAILABLE**

Maximize the O.D. Pipe Cleaner's capabilities for different applications.

# ROTARY TOOLS TUBE CLEANING

## BANSHEE TUBE CLEANING NOZZLES

High pressure water acts as a liquid bearing, thereby eliminating ball bearings, seals or lubricant used in conventional rotary tools. Each tool is easily configured to suit any application by choosing from a variety of replaceable heads and inlet options.

### IDEAL FOR:

- ✓ Unplugging, cleaning and polishing tubes, such as those found in heat exchangers and industrial tube bundles
- ✓ Effectively removes thin, hard scale, carbons, coke and polymers
- ✓ Banshee Beetle models are designed to work around tight radiused bends



### 22K PSI (1500 BAR)



**BN33** 1.5-2.4 in. I.D. Tubes (38-60 mm)



**BN27-40K** 1.25-2.0 in. I.D. Tubes (32-51 mm)



**BN24** 1.1-1.8 in. I.D. Tubes (28-46 mm)



**BN18-44K** 0.87-1.3 in. I.D. Tubes (22-33 mm)



**BN18** 0.87-1.3 in. I.D. Tubes (22-33 mm)



**BN15** 0.75-1.2 in. I.D. Tubes (19-30 mm)



**BN13-44K** 0.60-1.0 in. I.D. Tubes (15-25 mm)

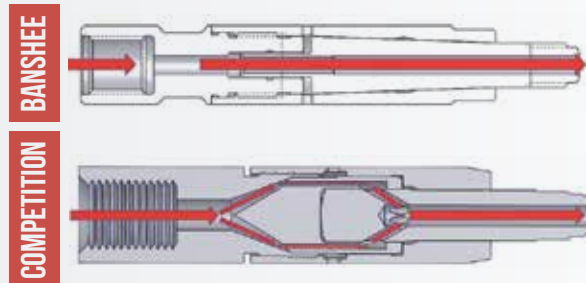


**BN13** 0.60-1.0 in. I.D. Tubes (15-25 mm)



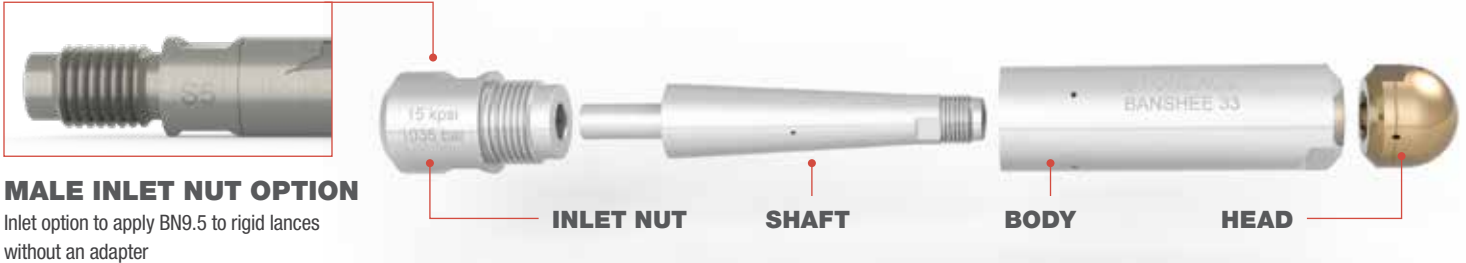
**BN9.5** 0.47-0.63 in. I.D. Tubes (12-16 mm)

Tube cleaning tools may look similar on the outside, but it's the engineering on the inside that matters. The patented StoneAge Banshee is the only tool in the industry with a direct path for water flow which is critical to reduce pressure loss and deliver more cleaning power.



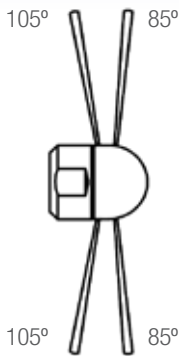
## BANSHEE ROTARY TUBE CLEANING TOOLS

The Stoneage Banshee has only four parts. Each part can be replaced individually to maximize the life of your tool.



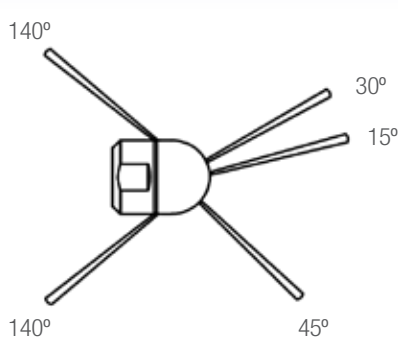
## BANSHEE SPECIFICATIONS 22K PSI (1500 BAR)

	TUBE I.D. RANGE	MAX. PRESSURE	MAX. PRESSURE (BSPP INLET)	FLOW RANGE	INLET CONNECTIONS	DIAMETER	LENGTH
BN9.5	0.47-0.63 in. 12-16 mm	22k psi 1500 bar	N/A	4.5-8 gpm 17-30 l/min	M7, 1/16" NPT, 1/4" LH or 1/4" RH	0.37 in. 9.5 mm	2.6 in. 65 mm
BN13	0.60-1.0 in. 15-25 mm	22k psi 1500 bar	18k psi 1250 bar	7-10 gpm 27-38 l/min	1/8" NPT, 1/8" BSPP, 1/4" LH, 1/4" RH, 3/8" LH or 3/8" RH	0.50 in. 13 mm	2.9 in. 74 mm
BN15	0.75-1.2 in. 19-30 mm	22k psi 1500 bar	18k psi 1250 bar	8-10 gpm 30-38 l/min	1/8" NPT, 1/8" BSPP, 3/8" LH/RH	0.6 in. 15 mm	3.0 in. 76 mm
BN18	0.87-1.3 in. 22-33 mm	22k psi 1500 bar	20k psi 1400 bar	8-14 gpm 30-53 l/min	1/4" NPT, 1/4" BSPP, 9/16" LH or 9/16" RH	0.69 in. 18 mm	3.8 in. 97 mm
BN24	1.1-2 in. 28-51 mm	22k psi 1500 bar	22k psi 1500 bar	12-25 gpm 45-95 l/min	3/8" NPT, 3/8" BSPP, 9/16" LH or 9/16" RH	0.93 in. 24 mm	5.1 in. 130 mm
BN33	1.5-2.4 in. 38-60 mm	22k psi 1500 bar	15k psi 1000 bar	12-49 gpm 45-190 l/min	1/2" NPT, 1/2" BSPP, or 9/16" MP	1.3 in. 33 mm	6.9 in. 180 mm
BT12	0.60-1.0 in. 15-25 mm	22k psi 1500 bar	N/A	Up to 8.5 gpm 32 l/min	P1, M7, MPL4, MPR4	0.50 in. 13 mm	1.3 in. 33 mm
BT18	0.87-1.3 in. 22-33 mm	22k psi 1500 bar	18k psi 1250 bar	Up to 11 gpm 42 l/min	P1, P2, BSPP2, MPL6, MPR6, MPL4, MPR4	0.69 in. 18 mm	1.5 in. 39 mm
BT25	1.2-3.0 in. 30-76 mm	8-22k psi 550-1500 bar	N/A	8-20 gpm 30-76 l/min	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	1.0 in. 26 mm	1.9 in. 48 mm



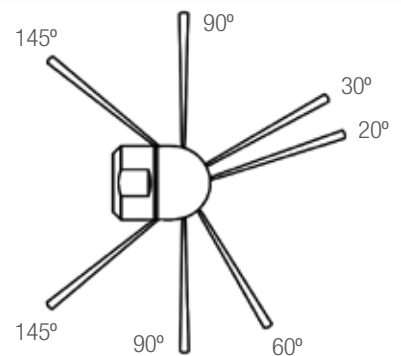
### POLISHER

4 Ports: 2 @ 85°, 2 @ 105°



### UNPLUGGER

5 Ports: 1 @ 15°, 1 @ 30°  
1 @ 45°, 2 @ 145°



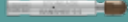
### UNIVERSAL


7 Ports: 1 @ 20°, 1 @ 30°  
1 @ 60°, 2 @ 90°, 2 @ 145°

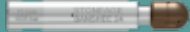
Custom heads available upon request


# ROTARY TOOLS TUBE CLEANING


## BANSHEE 22K (1500 BAR) HEAD OPTIONS

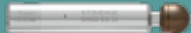
BN9.5 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN9.5 042-A	Polisher	4.5-5.5	17-21
	BN9.5 043-A	Unplugger	5-6	19-23
15-22k psi (1000-1500 bar)	BN9.5 042-B	Polisher	5-6	19-23
	BN9.5 043-B	Unplugger	5.5-6.5	21-25
	BN9.5 044-1	Universal	7.0-8.0	27-30

BN15 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN15 042-A	Polisher	7-9	27-34
	BN15 043-A	Unplugger	7-9	27-34
	BN15 044-A	Universal	8-10	30-38
15-22k psi (1000-1500 bar)	BN15 042-C	Polisher	7-9	27-34
	BN15 043-C	Unplugger	7-9	27-34
	BN15 044-C	Universal	8-10	30-38

BN24 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN24 042-A	Polisher	20-25	76-95
	BN24 042-B	Polisher	15-19	57-72
	BN24 042-C	Polisher	12-14	43-53
	BN24 043-A	Unplugger	19-24	72-91
	BN24 043-B	Unplugger	14-18	53-68
	BN24 043-C	Unplugger	11-13	42-49
	BN24 044-A	Universal	20-25	76-95
	BN24 044-B	Universal	15-19	57-72
15-22k psi (1000-1500 bar)	BN24 044-C	Universal	12-14	45-53
	BN24 042-D	Polisher	18-21	68-80
	BN24 042-E	Polisher	15-17	57-64
	BN24 042-F	Polisher	12-14	45-53
	BN24 043-D	Unplugger	17-20	64-76
	BN24 043-E	Unplugger	14-16	53-61
	BN24 043-F	Unplugger	11-13	42-49
	BN24 044-D	Universal	18-21	68-80
	BN24 044-E	Universal	15-17	57-64
	BN24 044-F	Universal	12-14	45-53

BN13 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN13 042-A	Polisher	7-9	27-34
	BN13 043-A	Unplugger	7-9	27-34
	BN13 044-A	Universal	8-10	30-38
15-22k psi (1000-1500 bar)	BN13 042-C	Polisher	7-9	27-34
	BN13 043-C	Unplugger	7-9	27-34
	BN13 044-C	Universal	8-10	30-38

BN18 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN18 042-A	Polisher	11-14	42-53
	BN18 042-B	Polisher	8-10	30-38
	BN18 043-A	Unplugger	11-14	42-53
	BN18 043-B	Unplugger	8-10	30-38
	BN18 044-A	Universal	11-14	42-53
	BN18 044-B	Universal	8-10	30-38
15-22k psi (1000-1500 bar)	BN18 042-C	Polisher	11-14	42-53
	BN18 042-D	Polisher	8-10	30-38
	BN18 043-C	Unplugger	11-14	42-53
	BN18 043-D	Unplugger	8-10	30-38
	BN18 044-C	Universal	11-14	42-53

BN33 HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
10-15k psi (700-1000 bar)	BN33 044-A	Universal	40-49	150-190
	BN33 044-B	Universal	33-39	130-150
	BN33 044-C	Universal	26-32	98-120
	BN33 044-D	Universal	20-25	76-95
	BN33 044-E	Universal	15-19	57-72
15-22k psi (1000-1500 bar)	BN33 044-F	Universal	22-26	83-98
	BN33 044-F-1	Universal	22	83
	BN33 044-G	Universal	18-21	68-80
	BN33 044-H	Universal	15-17	57-64
	BN33 044-I	Universal	12-14	45-53

## BANSHEE 44K (3000 BAR) OPTIONS

BANSHEE SPECIFICATIONS 44K PSI (3000 BAR)			
MODEL	BN13	BN18	BN27
TUBE I.D. RANGE*	0.60-1.0 in, 15-25 mm	0.87-1.3 in, 22-33 mm	1.25-2.0 in, 32-51 mm
MAX. PRESSURE	44k psi, 3000 bar	44k psi, 3000 bar	44k psi, 3000 bar
FLOW RANGE	4.5-6 gpm, 17-23 lpm	5-8.5 gpm, 19-32 lpm	5-8.5 gpm, 19-32 lpm
INLET CONNECTIONS	1/4"-28 LH or 3/8"-24 LH	3/8"-24 LH or M14 LH	9/16"-18 LH or M14 LH
DIAMETER	0.52 in, 13 mm	0.69 in, 18 mm	1.06 in, 27 mm
LENGTH	3.5 in, 89 mm	4.7 in, 120 mm	5.5 in, 140 mm



**BN13-44K** 0.60-1.0 in. I.D. Tubes (15-25 mm)




**BN18-44K** 0.87-1.3 in. I.D. Tubes (22-33 mm)





**BN27-44K** 1.25-2.0 in. I.D. Tubes (32-51 mm)

\*When cleaning 5/8" diameter tubes at 44k psi please contact our Technical Support team for hose specifications.

## BANSHEE 44K (3000 BAR) HEAD OPTIONS

BN13 44K HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN13 442-C	Polisher	5.5-6	21-23
	BN13-442-C-1	Polisher	3.9-4.4	15-17
	BN13 442-D	Polisher	4.5-5	17-19
	BN13 443-C	Unplugging	5.5-6	21-23
	BN13 443-D	Unplugging	4.5-5	17-19
	BN13 433-D-1	Unplugging	3.4-3.9	13-15

BN18 44K HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN18 442-A	Polisher	8-8.5	30-32
	BN18 442-B	Polisher	7-7.5	27-28
	BN18 442-C	Polisher	6-6.5	23-25
	BN18 442-D	Polisher	5-5.5	19-21
	BN18 443-A	Unplugging	8-8.5	30-32
	BN18 443-B	Unplugging	7-7.5	27-28
	BN18 443-C	Unplugging	6-6.5	23-25
	BN18 443-D	Unplugging	5-5.5	19-21

BN27 44K HEAD SELECTION 				
PRESSURE	PART #	STYLE	FLOW RANGE	
			GPM	LPM
30-44k psi (2100-3000 bar)	BN27 442-A	Polisher	8-8.5	30-32
	BN27 442-B	Polisher	7-7.5	27-28
	BN27 442-C	Polisher	6-6.5	23-25
	BN27 442-D	Polisher	5-5.5	19-21
	BN27 443-A	Unplugging	8-8.5	30-32
	BN27 443-B	Unplugging	7-7.5	27-28
	BN27 443-C	Unplugging	6-6.5	23-25
	BN27 443-D	Unplugging	5-5.5	19-21

### IMPORTANT



All Banshee tube cleaning tools require the use of a correctly sized open-end wrench to fit the flats provided on the inlet nut when attaching the tool to the lance.

***DO NOT USE A PIPE WRENCH OR PLIERS WITH TEETH!***

This can crush and crack the hardened steel body, leading to tool breakage during operation. It is also recommended to flush the tool with WD-40® for storage.

# ROTARY TOOLS TUBE CLEANING

## BEETLE™ BT25, BT18, BT12, BT9.5

The small diameter and short length of the Beetle models make them ideal for cleaning process piping, drain lines, u-tube bundles and other small ID tubes with bends and elbows that may have been inaccessible in the past.

- ✔ Navigates tight curves in small diameter pipes
- ✔ Low cost, low maintenance design
- ✔ Easy to pair with automated flex lance machines



### NEW BEETLE BT9.5

Designed specifically for cleaning curved tubes/pipes from 0.37 in. (9.5 mm) I.D.

	BT25	BT18	BT12	NEW BT9.5
TUBE ID RANGE	1.2–3.0 in. (30–76 mm)	0.9–1.3 in. (22–33 mm)	0.6–1.0 in. (15–25 mm)	0.47–0.63 in. (2–16 mm)
PRESSURE RANGE	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–15k psi 550 (1035 bar) 8–22k psi 550 (1500 bar)
FLOW RANGE	8–20 gpm (30–76 l/min)	8.5–11 gpm (32–42 l/min)	6.5–8.5 gpm (25–32 l/min)	5–6 GPM (19–23 l/min)
INLET CONNECTIONS	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	P1, P2, BSPP2, MP6L, MP6R, MP4L, MP4R	P1, M7, MP4L, MP4R	P1, M7
DIAMETER	1.0 in. (26 mm)	0.7 in. (18 mm)	0.5 in. (12 mm)	0.37 in. (9.5 mm)
LENGTH	1.9 in. (48 mm)	1.5 in. (39 mm)	1.3 in. (39 mm)	1.4 in. (35 mm)



### STONEAGE RENTS

Rely on us to meet your surge capacity needs



### STONEAGE DEMO TRAILER

Experience the power of StoneAge equipment at your location



### STONEAGE TRAINING

Expert training for the safe and effective use of waterjetting equipment



### WARRANTY

StoneAge warranties its products to be free from defects in workmanship and material for a period of one (1) year from the date of purchase

## GOPHER™

Speed Controlled Rotary Cleaning for Tubes  
2–6 Inches (51–152 mm) in Diameter

The Gopher self-rotary tool is ideal for cleaning evaporator tubes and a variety of process lines. It is ideal for cutting through coke, polymers, coatings and latex. The Gopher is offered in two pressure ranges up to 40,000 psi (2800 bar).



- ✓ Head rotation provides complete internal coverage while speed control delivers optimum jet dwell time
- ✓ Two head options available: 7 port unplugging option for forward hitting power and a 6 port polishing head for IRIS inspection polishing
- ✓ Easily re-jet the Gopher for more pulling force or forward hitting power depending on the needs of the job

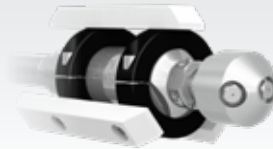
TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT	MAX. OPERATING TEMPERATURE
GO-MP9	2–22k psi 140–1500 bar	18–25 gpm 30–95 l/min	9/16" MP	600–1000 rpm	3.0 lb 1.36 kg	160 °F 70 °C
GO-H9-C	22k–40k psi 1500–2800 bar	4–10 gpm 15–40 l/min	9/16" HP	600–1000 rpm	3.3 lb 1.5 kg	160 °F 70 °C

## GO 075 SKID CENTRALIZERS



PIPE SIZE	CENTRALIZER	WEIGHT
3 in. 76 mm	GO 075-3	0.3 lb 0.1 kg
4.5 in. 114 mm	GO 075-4.5	0.4 lb 0.2 kg

## GO 070 SKID CENTRALIZERS

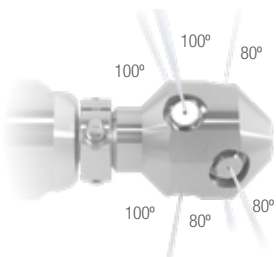


PIPE SIZE	CENTRALIZER	WEIGHT	COLLAR*	SKID**
4 in. 100 mm	GO 070-4	1.4 lb 0.6 kg	GO 070.1	RJ 070.2-4
5 in. 127 mm	GO 070-5	1.6 lb 0.7 kg	GO 070.1	RJ 070.2-5
6 in. 152 mm	GO 070-6	1.9 lb 0.9 kg	GO 070.1	RJ 070.2-6
8 in. 203 mm	GO 070-8	2.2 lb 1.0 kg	GO 070.1	RJ 070.2-8
12 in. 305 mm	GO 070-12	4.0 lb 1.8 kg	GO 070.1	RJ 070.2-12

\*Set of 2 collars

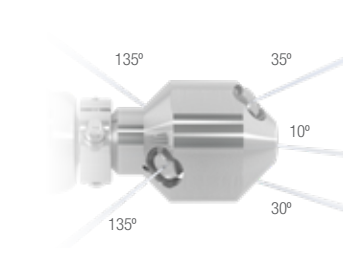
\*\*Set of 3 skids with 6 screws

## TWO STANDARD HEAD CONFIGURATIONS



### POLISHER JETS

6 Ports: 3 @ 80°, 3 @ 100°



### UNPLUGGER JETS

5 Ports: 1 @ 10°, 1 @ 30°, 1 @ 35°, 2 @ 135°

## GOPHER HEAD SELECTION

MODEL	GO-MP9	GO-H9-C
POLISHER LF	7-14 gpm (27-53 l/min)	4-7 gpm (20-27 l/min)
MODEL	GO 042-R.14	GO 342-R.14
POLISHER HF	14-25 gpm (53-95 l/min)	7-12 gpm (27-45 l/min)
MODEL	GO 042-R.07	GO 342-R.08
UNPLUGGER LF	8-15 gpm (30-57 l/min)	4-7 gpm (20-27 l/min)
MODEL	GO 043-R.17	GO 343-R.18
UNPLUGGER HF	15-25 gpm (57-95 l/min)	7-12 gpm (27-45 l/min)
MODEL	GO 043-R.08	GO 343-R.08

## MAINTENANCE RESOURCES

SWIVEL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT	MANUAL
GO-MP9	GO 600	GO 602	GO 610	GO 612	GP 044	PL 511
GO-H9-C	GO 600-H9-C	BC 602-H9-C	GO 610-H9-C	GO 612	GP 044	PL 510

# ROTARY TOOLS CURVED PIPE CLEANING

## 2" BADGER

The 2" Badger is a self-rotating tool designed for cleaning 2–4 in. (51–102 mm) pipes with bends and long radius elbows such as U-Tubes and process lines.

### NEW UPGRADES:

The head design of the 2" badger has been updated, replacing the nozzle inserts with pre-drilled heads which greatly simplifies the jetting options and eliminates the need to repair inserts in the field while delivering the same cleaning performance and longevity as the original tool.



- ✓ New drilled heads improve reliability over inserts while delivering the same power and life
- ✓ Three pre-drilled heads available – covering all of the pressure and flow configurations that contractors require
- ✓ Engineered for long term service with low cost head replacements and no bearings, seals or lubricants to maintain

## BA-530 FAIRING

Specifically designed to be attached to the hose behind a 2" Badger rotary pipe cleaning tool.

The tapered sides of the fairing prevent the rear edge of the Badger from getting caught on obstructions when being removed from a pipe.



## 2" BADGER JETS

7 Ports: 1 @ 15°, 1 @ 30°, 1 @ 45°, 2 @ 90°, 2 @ 132°

TOOL	TOOL KIT	MANUAL
2" Badger	BA 612-LK	PL 593

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
BA-LKD-P4 BA-LKD-BSPP4	8–15k psi 552–1034 bar	7–16 gpm 26–61 LPM	1/4" NPT or 1/4" BSPP	0.45 lb 0.20 kg	250 °F 120 °C
BA-LKD-MP6R BA-LKD-MP9RL BA-LKD-MP9R	15–22k psi 1034–1500 bar	9.5–18.5 gpm 36–70 LPM	9/16" MP, 3/8" MP	0.45 lb 0.20 kg	250 °F 120 °C

## 4" BADGER

The 4" Badger is a compact self-rotary nozzle with adjustable speed control capable of navigating 90 degree elbows in pipes as small as 4" (102 mm) in diameter.



- ✓ 5X longer run time
- ✓ New MP9R inlet reduces length for better navigation of bends
- ✓ Higher flow at 20K increases cleaning power
- ✓ Redesigned shape reduces hang-ups in the pipe

### NEW UPGRADES:

- 5X LONGER RUNTIME between maintenance intervals
- Redesigned braking system maintains consistent speed over longer duration
- Simplified overhaul and assembly
- New body shape allows for more effective navigation of bends and elbows and minimizes tool hang-up during removal

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	INLET CONNECTION	ROTATION SPEED	WEIGHT
BAE-P6	5–15k psi 345-1034 bar	13–27 gpm 50–102 LPM	3/8" NPT	20–100 rpm (Slow Fluid) 75–250 rpm (Fast Fluid)	3.0 lbs 1.4 kg
BAE-BSPP6, BAE-MPRL BAE-MP9R, BAE-M24	5–22k psi 345–1500 bar	12–25 gpm 45–95 LPM	3/8" BSPP, 9/16" MP, M24	20–100 rpm (Slow Fluid) 75–250 rpm (Fast Fluid)	3.0 lbs 1.4 kg
BA-H6	22–44k psi 1500-3000 bar	4.5–12 gpm 17–45.5 l/min	3/8" HP Female	100–400 rpm	4.0 lbs 1.8 kg

### BACKOUT PREVENTERS

Increase safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters and adapters for pipes with no-flange entry.



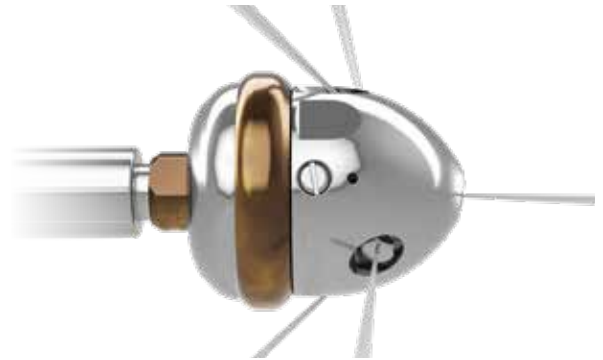
**BJ 305**



**BJ 310**

### NOZZLES AND PLUGS

The 4" Badger can be jetted in different configurations depending on the application. The image below shows the standard nozzle/plug configuration for the 4" Badger tool.



### 4" BADGER JETS

1 @ 15°, 2 @ 100°, 2 @ 135°

### MAINTENANCE RESOURCES

TOOL	ROTATION SPEED	SEAL KIT	SERVICE KIT	OVERHAUL KIT	DISK KIT	TOOL KIT
BA-P6 BAE-BSPP6 BAE-MP9R BAE-M24	Slow	BA 602	BAE 600-S	BAE 610-S	BAE 604	BAE 612
	Fast	BA 602	BAE 600-F	BAE 610-F	BAE 604	BAE 612
BA-H6	N/A	N/A	BAE 600-H6	BA 610-H6	N/A	BA 612-H6

# ROTARY TOOLS CURVED PIPE CLEANING

## 6" BADGER

The 6" Badger is a compact self-rotary nozzle with adjustable speed control capable of navigating 90 degree elbows in pipes as small as 6" (152 mm) in diameter.

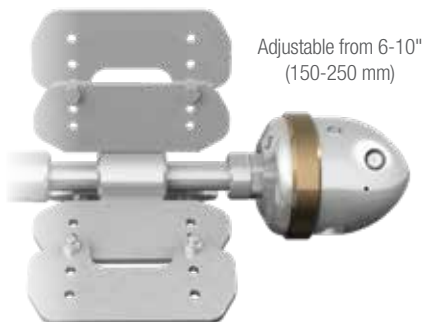
- ✔ Different jetting configurations allow for more or less pull and forward hitting power
- ✔ Navigates elbows down to 6 in. (152 mm)
- ✔ Speed controlled rotary tools provide complete internal cleaning coverage and optimum jet delivery
- ✔ Maximize cleaning by choosing slower speeds for hard to clean or plugged pipes and faster speeds for polishing easy to clean pipes with a single tool
- ✔ Optimize the tool for a variety of pumps pressures and flows with multiple jetting options
- ✔ Pair with the ABX-500 for hands-free pipe cleaning



TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. OPERATING TEMPERATURE
BA-MP9/BA-M24	12–22k psi 840–1500 bar	14–43 gpm 53–163 l/min	50–300 rpm (Adjustable)	9/16" MP, M24	8.0 lbs 3.6 kg	250 °F 120 °C
BA-P8	2–15k psi 140–1000 bar	15–55 gpm 57–208 l/min	50–300 rpm (Adjustable)	1/2" NPT	8.0 lbs 3.6 kg	250 °F 120 °C

### OPTIONAL CENTRALIZERS

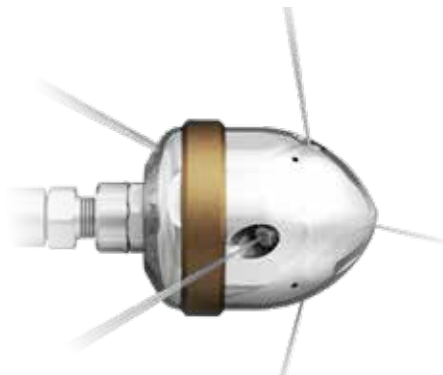
Helps protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe.



**BA 385 M9/P8**

### NOZZLES AND PLUGS

The 6" Badger can be jetted in different configurations depending on the application. The image below shows the standard nozzle/plug configuration for the 6" Badger tool.

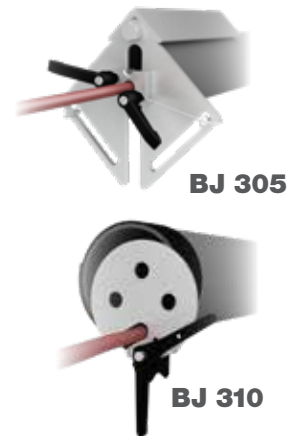


#### 6" BADGER JETS

5 Ports: 1 @ 15°, 2 @ 100°, 2 @ 135°

### BACKOUT PREVENTERS

Increase safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters and adapters for pipes with no-flange entry.



**BJ 305**

**BJ 310**

### MAINTENANCE RESOURCES

TOOL	SEAL KIT	SERVICE KIT	OVERHAUL KIT	DISK KIT	TOOL KIT	LUBRICANT	MANUAL
BA-P8	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503
BA-M24	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503
BA-MP9	BA 602-P8/MP9	BA 600-P8/MP9	BA 610-P8/M9	BA 606	BA 612-P8/MP9	BJ 048-F	PL 503

**BEETLE™  
BT25, BT18, BT12, BT9.5**

The small diameter and short length of the Beetle models make them ideal for cleaning process piping, drain lines, u-tube bundles and other small ID tubes with bends and elbows that may have been inaccessible in the past.

- ✔ Navigates tight curves in small diameter pipes
- ✔ Low cost, low maintenance design
- ✔ Easy to pair with automated flex lance machines



**NEW BEETLE BT9.5**  
Designed specifically for cleaning curved tubes/pipes from 0.37 in. (9.5 mm) I.D.

	BT25	BT18	BT12	<b>NEW</b> BT9.5
<b>TUBE ID RANGE</b>	1.2–3.0 in. (30–76 mm)	0.9–1.3 in. (22–33 mm)	0.6–1.0 in. (15–25 mm)	0.47–0.63 in. (2–16 mm)
<b>PRESSURE RANGE</b>	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–22k psi (550–1500 bar)	8–15k psi 550 (1035 bar) 8–22k psi 550 (1500 bar)
<b>FLOW RANGE</b>	8–20 gpm (30–76 l/min)	8.5–11 gpm (32–42 l/min)	6.5–8.5 gpm (25–32 l/min)	5–6 GPM (19–23 l/min)
<b>INLET CONNECTIONS</b>	1/8" NPT, 1/4" NPT, 1/4" BSPP, 3/8"-28 LH/RH, 9/16"-18 LH/RH	P1, P2, BSPP2, MP6L, MP6R, MP4L, MP4R	P1, M7, MP4L, MP4R	P1, M7
<b>DIAMETER</b>	1.0 in. (26 mm)	0.7 in. (18 mm)	0.5 in. (12 mm)	0.37 in. (9.5 mm)
<b>LENGTH</b>	1.9 in. (48 mm)	1.5 in. (39 mm)	1.3 in. (39 mm)	1.4 in. (35 mm)

# ROTARY TOOLS STRAIGHT PIPE CLEANING

## BJVE

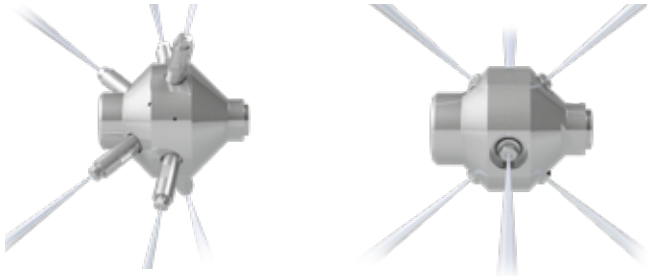
Designed for a wide range of pipe diameters, pressures, flows and configurations, BJVE controlled rotary nozzles are the industry standard for cleaning medium to large pipes and vessels.

### NEW UPGRADES:

- Backed by the industry's only **THREE YEAR WARRANTY** for maintenance free speed control
- New high pressure seal geometry extends life 3X and can now be replaced in the field in under 3 minutes
- New inlet cartridge design enables quick change from 15k to 20k on the fly
- New long life body is compatible with most existing heads



- ✓ Clean 6 in. (152 mm) pipes to 15 ft (4.5 m) diameter tanks with simple modifications
- ✓ Interchangeable heads allow the tool to be used on any type of pump
- ✓ Multiple head options to allow for flush mounted nozzles, extension arms, plugs and pulling rings
- ✓ Simple nozzle changes allow operators to configure for many cleaning applications
- ✓ Easy to pair with AutoBox ABX-500 for hands-free pipe or tank cleaning



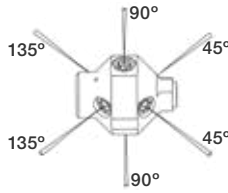
### OPTIONAL HEAD-TYPES

There are several head configurations for the BJV/BJVE. The correct head specification is based on the pressure and flow of the pump and the required port size.

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
BJVE-P16	2–10k psi (140–700 bar)	20–200 gpm (76–757 l/min)	25–95 rpm (Slow) 50–200 rpm (Medium) 85–300 rpm (Fast)	1" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-P12	2–15k psi (140–1000 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	3/4" NPT	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-M24	2–22k psi (140–1500 bar)	12–100 gpm (45–380 l/min)	20–95 rpm (Slow) 40–190 (Medium) 70–275 rpm (Fast)	M24	(8.5 lbs (3.9 kg)	160 °F (70 °C)
BJVE-MP12	2–22k psi (140–1500 bar)	10–60 gpm (38–230 l/min)	20–95 rpm (Slow) 40–190 rpm (Medium) 70–275 rpm (Fast)	3/4" MP	8.5 lbs (3.9 kg)	160 °F (70 °C)
BJV-H9	20–40k psi (1400–2800 bar)	3.4–20 gpm (13–76 l/min)	20–60 rpm (Slow Fluid) 90–250 rpm (Fast Fluid)	9/16" HP	9.3 lbs (4.4 kg)	160 °F (70 °C)

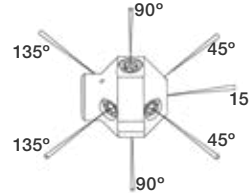
## HEAD OPTIONS PER SWIVEL TYPE:

There are four standard head configurations, with custom heads available on request. The correct head specification is based on the pressure and flow of the pump and the required port size. Heads with P8 or G12 ports require extension arms or plugs.



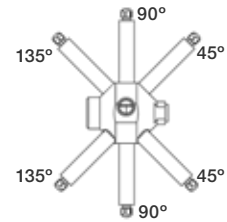
**BJ 144-P4-6-Rxx  
6-PORT**

2 @ 45°  
2 @ 90°  
2 @ 135°



**BJ 144-P4-7-Rxx  
7-PORT**

1 @ 15°  
2 @ 45°  
2 @ 90°  
2 @ 135°



**BJ 145-G12-6-Rxx  
or  
BJVE 145-P8-6-Rxx  
6-PORT**

2 @ 45°  
2 @ 90°  
2 @ 135°

## PACKAGE HEAD OPTIONS

The following table shows head selection by desired flow for each package:

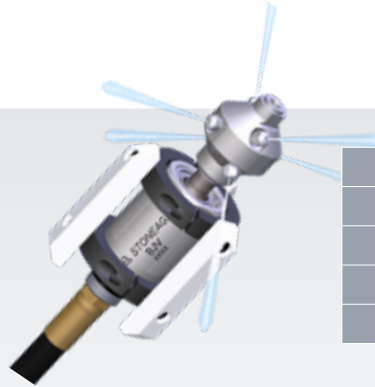
PRESSURE	PACKAGE	FLOW	R-VALUE	HEAD
10K PSI 700 BAR	BJVE-P16-P4-6-PKG	15–25 gpm 57–95 LPM	R60	BJ 144-P4-6-R60
		20–45 gpm 76–170 LPM	R35	BJ 144-P4-6-R35
		35–80 gpm 133–303 LPM	R20	BJ 144-P4-6-R20
		55–140 gpm 208–530 LPM	R12	BJ 144-P4-6-R12
	BJVE-P16-P4-7-PKG	15–25 gpm 57–95 LPM	R60	BJ 144-P4-7-R6
		20–45 gpm 76–170 LPM	R35	BJ 144-P4-7-R35
		35–80 gpm 133–303 LPM	R20	BJ 144-P4-7-R20
		55–140 gpm 208–530 LPM	R12	BJ 144-P4-7-R12
15K PSI 1000 BAR	BJVE-P12-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–40 gpm 76–151 LPM	R35	BJ 144-P4-6-R35
		30–70 gpm 114–265 LPM	R20	BJ 144-P4-6-R20
		50–120 gpm 189–454 LPM	R12	BJ 144-P4-6-R12
	BJVE-P12-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6
		20–40 gpm 76–151 LPM	R35	BJ 144-P4-7-R35
		30–70 gpm 114–265 LPM	R20	BJ 144-P4-7-R20
		50–120 gpm 189–454 LPM	R12	BJ 144-P4-7-R12
22K PSI 1500 BAR	BJVE-MP12-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-6-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-6-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-6-R12
	BJVE-MP12-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-7-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-7-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-7-R12
	BJVE-M24-P4-6-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-6-R60
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-6-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-6-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-6-R12
	BJVE-M24-P4-7-PKG	10–20 gpm 38–76 LPM	R60	BJ 144-P4-7-R6
		20–35 gpm 76–133 LPM	R35	BJ 144-P4-7-R35
		30–65 gpm 114–246 LPM	R20	BJ 144-P4-7-R20
		50–110 gpm 189–416 LPM	R12	BJ 144-P4-7-R12
44K PSI 3000 BAR	BJV-H9-S6-8-PKG	6–10 gpm 23–38 LPM	R40	BJ 444-S6-R40
		9–17 gpm 34–64 LPM	R25	BJ 444-S6-R25

# ROTARY TOOLS STRAIGHT PIPE CLEANING

## BJV CENTRALIZERS

### BJ 070 SKID STYLE

Utilizes interchangeable plastic runners which can be easily replaced. Works well in elbows and can effectively clean up to 12 in. (305 mm) diameter pipes and works with all BJV models. *Tool not included.*



SKID SIZES (DIAMETER)		
BJ 070-6	6 in.	150 mm
BJ 070-8	8 in.	200 mm
BJ 070-10	10 in.	250 mm
BJ 070-12	12 in.	300 mm

### STRAIGHT PIPE CENTRALIZER

Designed for straight pipe runs only, these six-wheel centralizers feature an adjustable, scissor-style aluminum frame and tough plastic wheels. They are compatible with the entire BJV line of rotary tools. *Tool not included.*



CENTRALIZER SIZES (DIAMETER)		WEIGHT
BJ 286-S	9–18 in. 230–460 mm	20 lb 9 kg
BJ 286-M	13–40 in. 330–1000 mm	32 lb 15 kg
BJ 286-L	16–60 in. 410–1500 mm	40 lb 18 kg

### CURVED PIPE CENTRALIZER

With adjustable, telescopic steel legs and tough plastic wheels, these eight-wheel centralizers are designed to travel through elbows easily and are compatible with the entire BJV line of rotary tools. *Tool not included.*

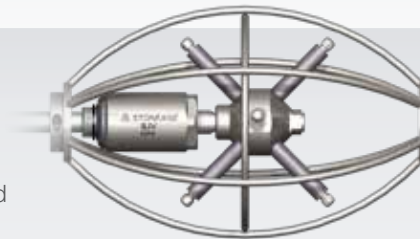


CENTRALIZER SIZES (DIAMETER)		WEIGHT
BJ 288-S	16–21 in. 410–530 mm	12 lb 5.5 kg
BJ 288-M	22–29 in. 560–740 mm	13 lb 5.9 kg
BJ 288-L	30–37 in. 770–940 mm	16 lb 7.3 kg

### CAGE-STYLE CENTRALIZERS

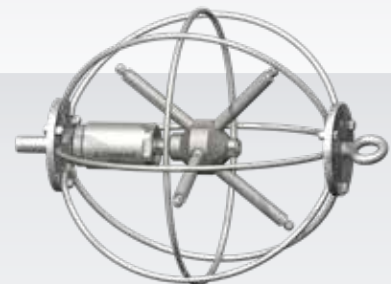
Stainless steel centralizers are used when negotiating complex piping arrangements and removing built-up debris while maintaining jet rotation.

*Tool not included.*



Different inlet plates are available for all models.

**BJ 408-MP12/H9**  
**BJ 408-P12/M24**



Different collar sizes are available for all models.

**BJ 100-SS**  
**BJ 100-SS-MP**

PART ID	BJ 408-MP12/H9	BJ 408-P12/M24*	BJ 100-SS	BJ 100-SS-MP
DIAMETER	12 in. 300 mm	12 in. 300 mm	20 in. 510 mm	20 in. 510 mm
LENGTH	20 in. 510 mm	20 in. 510 mm	24 in. 610 mm	24 in. 610 mm
WEIGHT	10 lb 4.5 kg	10 lb 4.5 kg	11 lb 5.0 kg	11 lb 5.0 kg

**RAPTOR**

Speed Controlled Rotary Cleaning for Small to Medium Pipes  
2–6 Inches (51–152 mm) in Diameter

The versatile Raptor combines slower rotation speeds from 15-250 rpm with a flow range up to 60gpm (230 lpm) to effectively remove difficult deposits in straight pipe and process drains.

Easily customizable heads and accessories also make the Raptor ideal for cleaning totes, closed head drums, water well screens, ducts and exhaust stacks.



- ✓ High flow range aids in removing thick, tough deposits
- ✓ Controlled rotation for longer jet dwell times help remove hard material
- ✓ Multiple head and jetting options enable flexible customization to optimize cleaning
- ✓ Optional pulling connection aids in jobs where tool needs to be pulled through the pipe
- ✓ Optional centering devices available to optimize stand-off distance

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	LENGTH	WEIGHT
RPT	Up to 22k psi 1500 bar	Up to 60 gpm 230 l/min	15-60 rpm (Slow Fluid) 50-250 rpm (Fast Fluid)	1/2" NPT, 9/16" MP or M24	9.5 in. 240 mm	5.5 lbs 2.5 kg



**RPT 075**  
For 3" or 4.5" pipes.



**RPT 070**  
For 4", 5", 6", 8", 10" and 12" pipes.

**RAPTOR CENTRALIZERS**

A centralizer helps to protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where the pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe.



	RPT 043-P2-6		RPT 044-P4-6	
DIAMETER	2.0 in.	51 mm	2.5 in.	64 mm
NOZZLES	6 or 7 x AP2		6 x AP4	

**RAPTOR HEAD SELECTION**

	HEAD OFFSET		R30		R18		R11	
PRESSURE	5k psi	350 bar	10-23 gpm	38-87 l/min	16-38 gpm	60-140 l/min	25-60 gpm	95-230 l/min
	10k psi	700 bar	10-18 gpm	38-68 l/min	15-31 gpm	57-120 l/min	25-51 gpm	95-190 l/min
	15k psi	1000 bar	10-17 gpm	38-64 l/min	16-28 gpm	60-110 l/min	26-47 gpm	98-180 l/min
	22k psi	1500 bar	10-16 gpm	38-60 l/min	17-26 gpm	64-100 l/min	27-43 gpm	100-160 l/min

# ROTARY TOOLS SURFACE CLEANING

## SPITFIRE

The Spitfire rotary shotgun tool is engineered for rotation speeds up to 5000 rpm and is ideal for removing thin hard coatings like epoxy, paint or rust. The extra lightweight Spitfire requires little maintenance, reducing down time and increasing productivity.

- ✔ Handles a wide range of pressure ratings from 2–22k psi (140–1500 bar)
- ✔ High speed rotation for removing thin coatings
- ✔ Angled jets allow for broader impact for quicker, more effective cleaning of large surfaces and odd shapes
- ✔ Fewer parts and no seals to stock or replace – reduced costs and maintenance downtime
- ✔ Short overall tool length and light weight makes for easy handling, reducing operator fatigue
- ✔ External shield option protects the tool from damage caused by lateral impacts



### SHIELDED HEAD OPTION

Protects the head from damage caused by lateral swinging of the tool



### BUMPER HEAD OPTION

Alternative head for jobs when debris gets lodged in the shield, preventing head rotation, inexpensive bumper protects tool and is easily replaceable



### HIGH SPEED ROTATION

Excellent for removing hardened paint and thin coatings



### ANGLED JETS

AP2 nozzles provide more effective cleaning of large surfaces and odd shapes

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMPERATURE
SPFR-P8-S/ SPFR-P8-B	5–15k psi 340–1000 bar	2–15 gpm 8–58 l/min	3000–5000 rpm	1/2" NPT	1.5 lb / 0.7 kg (S) 1.7 lb / 0.8 kg (B)	250 °F 120 °C
SPFR-MP9-S/ SPFR-MP9-B	5–22k psi 340–1500 bar	4–13 gpm 16–49 l/min	3000–5000 rpm	9/16" MP	1.5 lb / 0.7 kg (S) 1.7 lb / 0.8 kg (B)	250 °F 120 °C

## BARRACUDA

The Barracuda is a speed controlled rotary shotgun tool designed for speeds ranging from 1000 to 2000 rpm, making it ideal for cleaning thick, hard-to-remove materials like coke or rubber. The Barracuda can be used on automated and hands-free equipment.

### NEW UPGRADES:

- New BC 705 cartridge seal is designed as a drop-in replacement to the BC 505-S cartridge seal for 44k psi Barracuda Shotgun tool
- Field and in-house testing has shown the new cartridge effectively doubles the life of the seal



- ✓ Handles a wide range of pressure ratings from 2–44k psi (140–3000 bar)
- ✓ Simple maintenance for long term use
- ✓ New cartridge seal doubles runtime
- ✓ Can be configured for 2 or 4 port application
- ✓ Angled jets allow for broader impact for quicker, more effective cleaning of large surfaces and odd shapes

TOOL MODEL	PRESSURE RANGE	FLOW RANGE	ROTATION SPEED	INLET CONNECTION	WEIGHT	MAX. WATER TEMP.
BC-K	2–22k psi (140–1500 bar)	4.4–13.3 gpm (17–50 l/min)	1000-2000 rpm	9/16" MP	2.7 lb (1.2 kg)	160 °F (70 °C)
BC-K-P2	5–22k psi (340–1500 bar)	4.3–12.1 gpm (16–46 l/min)	1000-2000 rpm	9/16" MP	2.7 lb (1.2 kg)	160 °F (70 °C)
BC-H9-C	20–44k psi (1400–3000 bar)	5.6–8.8 gpm (21-23 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9LF-C	20–44k psi (1400–3000 bar)	4.3–6.7 gpm (16-25 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9XLF-C	20–44k psi (1400–3000 bar)	3.5–5.6 gpm (13-21 l/min)	1000-2000 rpm	9/16" HP	2.9 lb (1.3 kg)	160 °F (70 °C)
BC-H9XXLF-C-TI	20–44k psi (1400–3000 bar)	2.3–3.8 gpm (9-14 l/min)	1000-2000 rpm	9/16" HP	3.2 lb (1.45 kg)	160 °F (70 °C)



### BC 705 CARTRIDGE SEAL

Effectively doubles the life of the previous BC 505-S Cartridge Seal. For Barracuda rotary shotgun tools rated up to 44k psi (3000 bar).

### NOZZLES AND PLUGS

Come in 2-port and 4-port configurations. Two jets deliver more concentrated power for heavy, thick deposits while four jets are ideal for removing thin, hard deposits.

### IMPACT RESISTANT SHIELD

Inexpensive and easily replaceable shield protects working parts of the tool from debris and impacts.

### MAINTENANCE RESOURCES

TOOL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT	MANUAL
BC-K	BC 600	BC 602	BC 610	BC 612	GP 042	PL 514
BC-K-P2	BC 600	BC 602	BC 610	BC 612	GP 042	PL 514
BC-H9-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9LF-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9XLF-C	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C	BC 612	GP 042	PL 515
BC-H9-XXLF-C-TI	BC 600-H9-C	BC 607-H9-C	BC 610-H9-C-TI	BC 612	GP 042	PL 566

# ROTARY TOOLS SWIVELS

## ROTARY SWIVELS

Stainless steel construction, heavy duty bearings and long lasting high pressure seals. Either 0° or 90° inlet connections are available.

- ✓ Heavy-duty stainless steel construction
- ✓ Unique, leak-free seal design requires very little torque for rotation
- ✓ Multiple inlet options available mean the tool can be used at different pressures
- ✓ External grease fittings for easy maintenance

### IDEAL FOR:

- ✓ Floor cleaners, hose reels and shot guns
- ✓ Preventing hose kink
- ✓ Conveying high pressure water from a stationary line to a powered rotating or twisting assembly



### EXTERNAL GREASE FITTINGS

Easy maintenance



### LEAK-FREE SEAL DESIGN

Requires very little torque for rotation

PRESSURE RANGE	FLOW RANGE	LENGTH	DIAMETER	WEIGHT	ROTATION
2-40k psi 138-2800 l/min	Up to 400 gpm 1500 l/min	2.6-6.9 in. 792-2103 mm	0.37-1.3 in. 9.4-33 mm	3-15 lbs 1.4-6.8 kg	Up to 1000 rpm

## SG SWIVEL

SG Swivels are reliable, easy to maintain and are widely used in our surface preparation tools. Heavy-duty ball bearings with external grease fittings, stainless steel construction and long lasting high pressure seals combine to make these the best swivels in the industry.



SG-P12P12-62

SG-MP12AV12

SG-CCN MP12K

	SG-P8P8		SG-P12P12-62		SG-MP12AV12		SG-MP16MP16		SG-CCN P12K		SG-CCN MP12K	
MAX. PRESSURE	15k psi	1000 bar	15k psi	1000 bar	22k psi	1500 bar	22k psi	1500 bar	15k psi	1000 bar	22k psi	1500 bar
MAX. FLOW	50 gpm	190 l/min	110 gpm	420 l/min	50 gpm	190 l/min	110 gpm	420 l/min	50 gpm	190 l/min	50 gpm	190 l/min
ROTATION SPEED	0-600 rpm		0-600 rpm		0-600 rpm		0-600 rpm		0-2000 rpm		0-2000 rpm	
FLOW COEFFICIENT	2.3 Cv		4.6 Cv		2.0 Cv		4.6 Cv		2.3 Cv		2.0 Cv	
INLET CONNECTION	1/2" NPT		3/4" NPT		3/4" MP		1" MP		3/4" NPT		3/4" MP	
SHAFT CONNECTION	1/2" NPT		3/4" NPT		3/4" MP		1" MP		1-1/8" K		1-1/8" K	
DIAMETER	3.0 in.	76 mm	3.0 in.	76 mm	3.0 in.	76 mm	3.0 in.	76 mm	3.0 in.	76 mm	3.0 in.	76 mm
LENGTH	6.6 in.	170 mm	6.6 in.	170 mm	7.9 in.	200 mm	9.0 in.	230 mm	7.0 in.	180 mm	7.0 in.	180 mm
WEIGHT	8.4 lb	3.8 kg	8.4 lb	3.8 kg	8.8 lb	4.0 kg	8.8 lb	4.0 kg	8.4 lb	3.8 kg	8.4 lb	3.8 kg



## UH SWIVEL

Ultra High Pressure Rotation

Considered the benchmark of high pressure rotary couplings, UH Swivels lead the industry in durability. The UH-H9H6 is available in either a 0° or 90° inlet connection.

	UHS-H9H9	UH-H9H6
MAX. PRESSURE	40k psi 2800 bar	44k psi 3000 bar
MAX. FLOW	10 gpm 38 l/min	20 gpm 76 l/min
ROTATION SPEED*	0-1500 rpm	0-1000 rpm
INLET CONNECTION	9/16" HP	9/16" HP
SHAFT CONNECTION	9/16" HP	3/8" HP, G12
DIAMETER	1.75 in. 45 mm	2.5 in. 64 mm
LENGTH	5.9 in. 130 mm	8.8 in. 220 mm
WEIGHT	2.0 lb 0.90 kg	7.5 lb 3.4 kg



## SL SWIVEL

Lightweight and Compact

SL swivels feature replaceable seals, smooth ball bearings, stainless steel construction and low static torque for easy rotation. They are installed standard on our Lancing Machines and are available with either 0° or 90° inlets.

	SL-P8P4	SL-MP9AV9
MAX. PRESSURE	15k psi 1000 bar	22k psi 1500 bar
MAX. FLOW	35 gpm 130 l/min	25 gpm 95 l/min
ROTATION SPEED	0-1000 rpm	0-800 rpm
FLOW COEFFICIENT	1.6 Cv	1.1 Cv
INLET CONNECTION	1/2" NPT	9/16" MP
SHAFT CONNECTION	1/4" NPT	9/16" MP
DIAMETER	1.75 in. 45 mm	1.75 in. 45 mm
LENGTH	4.6 in. 120 mm	5.9 in. 130 mm
WEIGHT	1.63 lb 0.74 kg	2.0 lb 0.89 kg



## SM SWIVEL

High Flow Rotation

Built to handle up to 3500 hp. Stainless steel, heavy duty bearings and long lasting seals make SM Swivels excellent for boilers, tube bundles, large tank and vessel cleaning applications. 0° or 90° inlet connections are available.

	SM-P16	SM-P20
MAX. PRESSURE	12k psi 830 bar	10k psi 700 bar
MAX. FLOW	300 gpm 1100 l/min	600 gpm 2300 l/min
ROTATION SPEED	0-300 rpm	0-300 rpm
INLET CONNECTION	1" NPT	1-1/4" NPT
SHAFT CONNECTION	1" NPT	1-1/4" NPT
DIAMETER	3.5 in. 8.9 mm	3.5 in. 8.9 mm
LENGTH	7.3 in. 190 mm	*7.3 in. *190 mm
WEIGHT	10 lb 4.5 kg	*11 lb *5.0 kg



## SH SWIVEL

Prevents Hose Twist

SH swivels can be installed between a tool's inlet connection and the high pressure hose to prevent hose twist and ease hose handling. They can also provide compact rotary motion for a variety of low speed applications.

	SH-P8P8
MAX. PRESSURE	15k psi 1000 bar
MAX. FLOW	50 gpm 190 l/min
ROTATION SPEED	0-250 rpm
INLET CONNECTION	1/2" NPT
SHAFT CONNECTION	1/2" NPT
DIAMETER	2.25 in. 57 mm
LENGTH	4.13 in. 105 mm
WEIGHT	1.9 lb 0.86 kg

# HOSE, FITTINGS & ACCESSORIES

StoneAge is your complete solution.  
Hoses, Fittings, Tools, Accessories,  
All in one location!

## SAFETY

ACCESSORIES TO HELP ENSURE JOB SITE SAFETY.

- Pneumatic Dumps
- Cartridges
- Diffusers
- Rupture Discs
- Pressure Gauges
- Pressure Relief Valves
- Whip Checks
- Safety Guards



## LANCES/STINGERS

FOR PRESSURES UP TO 40K PSI/2800 BAR.



## ADAPTERS/FITTINGS

A FULL RANGE OF PRODUCTS FOR APPLICATIONS UP TO 40K PSI/2800 BAR.

- Hose Connectors
- Gland Nuts & Collars
- Couplers
- Bushings



## SUPPLY HOSES

A FULL RANGE OF PRODUCTS FOR APPLICATIONS UP TO 40K PSI/2800 BAR.



# LOW/MEDIUM PRESSURE NOZZLES

## ATTACK TIPS™

For Low/Medium Pressure Applications

StoneAge Attack Tips are the highest quality, longest lasting nozzles available for low and medium pressure applications (up to 22k psi - 1500 bar). Flow straighteners correct turbulence, ensuring excellent jetting results.

- Pressure Range: 2–22k psi (140–1500 bar)
- Flow Range: 0.6–46 gpm (2.27–174 l/min)

**STAINLESS STEEL OR CARBIDE AVAILABLE**



**AP2**  
1/8" NPT



**APF4**  
1/4" NPT  
Flush mount



**AP4**  
1/4" NPT

## ATTACK TIP NOZZLE FLOW CHART (GPM)

ORIFICE I.D.		PRESSURE - KPSI & (BAR)											FLOW RATING	
		2 (140)	4 (280)	6 (410)	8 (550)	10 (700)	12 (830)	14 (970)	15 (1000)	16 (1100)	18 (1200)	20 (1400)		22 (1500)
in.	mm													
.018	(0.46)	0.39	0.55	0.68	0.78	0.87	0.96	1.0	1.1	1.1	1.2	1.2	1.3	0.6
.020	(0.51)	0.48	0.68	0.83	0.96	1.1	1.2	1.3	1.3	1.5	1.5	1.5	1.6	0.7
.022	(0.56)	0.58	0.82	1.0	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	0.8
.024	(0.61)	0.69	0.98	1.2	1.4	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	1.0
.026	(0.66)	0.81	1.2	1.4	1.6	1.8	2.0	2.1	2.2	2.3	2.4	2.6	2.7	1.1
.029	(0.74)	1.0	1.4	1.7	2.0	2.3	2.5	2.7	2.8	2.9	3.0	3.2	3.4	1.4
.032	(0.81)	1.2	1.7	2.1	2.5	2.8	3.0	3.3	3.4	3.5	3.7	3.9	4.1	1.7
.035	(0.89)	1.5	2.1	2.6	3.0	3.3	3.6	3.9	4.0	4.2	4.4	4.7	4.9	2.1
.038	(0.97)	1.7	2.5	3.0	3.5	3.9	4.3	4.6	4.8	4.9	5.2	5.5	5.7	2.5
.042	(1.07)	2.1	3.0	3.7	4.2	4.7	5.2	5.6	5.8	6.0	6.4	6.7	7.0	3.0
.047	(1.19)	2.7	3.8	4.6	5.3	5.9	6.5	7.0	7.3	7.5	8.0	8.4	8.8	3.8
.052	(1.32)	3.3	4.6	5.6	6.5	7.3	8.0	8.6	8.9	9.2	9.8	10	11	4.6
.057	(1.45)	3.9	5.5	6.8	7.8	8.7	9.6	10	11	11	12	12	13	5.5
.063	(1.60)	4.8	6.8	8.3	9.6	11	12	13	13	14	14	15	16	6.8
.069	(1.78)	5.7	8.1	9.9	12	13	14	15	16	16	17	18	19	8.1
.075	(1.91)	6.8	9.6	12	13	15	17	18	19	19	20	21	23	9.6
.082	(2.08)	8.1	12	14	16	18	20	21	22	23	24	26	27	12
.090	(2.29)	9.8	14	17	20	22	24	26	27	28	29	31	32	14
.098	(2.49)	12	16	20	23	26	28	31	32	33	35	37	38	16
.106	(2.69)	14	19	23	27	30	33	36	37	38	41	43	45	19
.115	(2.92)	16	23	28	32	36	39	42	44	45	48	50	53	23
.125	(3.18)	17	27	33	38	42	46	50	52	53	56	60	62	27
.135	(3.43)	22	31	38	44	49	54	58	60	62	66	69	73	31
.145	(3.68)	25	36	44	51	57	62	67	69	72	76	80	84	36
.155	(3.94)	29	41	50	58	65	71	77	79	82	87	92	96	41
.165	(4.19)	33	46	57	66	73	80	87	90	93	98	104	109	46

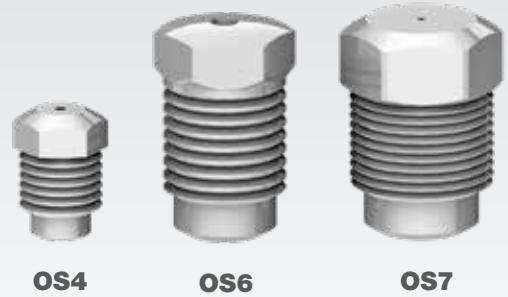
# WATERBLAST ACCESSORIES

## SAPPHIRE NOZZLES

For High Pressure Applications

These nozzles are used for high pressure jetting applications where water filtration of 10 micron or better is required. Jeweled orifices make the best quality, longest lasting jets possible, especially for ultra-high pressures.

- Pressure Range: 20–40k psi (1400–2800 bar)
- Flow Range: 0.2–4.8 gpm (0.75–18 l/min)



Shown larger than actual size.

## SAPPHIRE NOZZLE FLOW CHART (GPM)

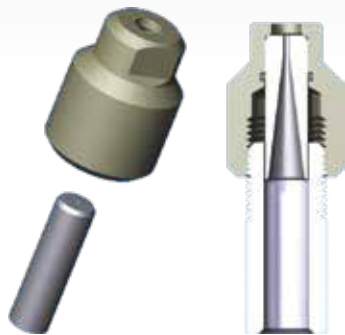
ORIFICE I.D.  in. mm	PRESSURE KPSI & (BAR)											AVAILABILITY		
	20 (1400)	22 (1500)	24 (1700)	26 (1800)	28 (1900)	30 (2100)	32 (2200)	34 (2300)	36 (2500)	38 (2600)	40 (2800)	OS4	OS6	OS7
.009 (0.23)	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		•	
.010 (0.25)	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	•	•	
.011 (0.28)	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5		•	•
.012 (0.30)	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	•	•	•
.013 (0.33)	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	•	•	•
.014 (0.36)	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	•	•	•
.015 (0.38)	0.6	0.7	0.7	0.7	0.7	0.8	0.9	0.8	0.8	0.9	0.9	•	•	•
.016 (0.41)	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	•	•	•
.017 (0.43)	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	•	•	•
.018 (0.46)	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	•	•	•
.019 (0.48)	1.0	1.0	1.1	1.1	1.9	1.2	1.3	1.3	1.3	1.4	1.4	•	•	•
.020 (0.51)	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.6	•	•	•
.021 (0.53)	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.7	•	•	•
.022 (0.56)	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	•	•	•
.023 (0.58)	1.5	1.5	1.6	1.7	1.7	1.7	1.8	1.9	1.9	2.0	2.0	•	•	•
.024 (0.61)	1.6	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	•	•	•
.025 (0.64)	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.4	2.4	•	•	•
.026 (0.66)	1.9	1.9	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.6	•	•	
.027 (0.69)	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.8	•	•	
.028 (0.71)	2.2	2.3	2.4	2.5	2.6	2.5	2.7	2.8	2.9	3.0	3.1	•	•	•
.029 (0.74)	2.3	2.4	2.5	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	•	•	
.031 (0.79)	2.6	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	•	•	•
.033 (0.84)	3.0	3.1	3.3	3.4	3.5	3.7	3.8	3.9	4.0	4.1	4.2			•
.034 (0.86)	3.2	3.3	3.5	3.6	3.8	3.9	4.0	4.2	4.3	4.4	4.5	•	•	
.035 (0.89)	3.4	3.5	3.7	3.8	4.0	4.1	4.3	4.4	4.5	4.6	4.8	•		•
.036 (0.91)	3.6	3.7	3.9	4.0	4.2	4.4	4.5	4.6	4.8	4.9	5.0	•	•	•
.037 (0.94)	3.7	3.9	4.1	4.3	4.4	4.6	4.8	4.9	5.0	5.2	5.3		•	•
.039 (0.99)	4.2	4.4	4.6	4.7	4.9	5.1	5.3	5.4	5.6	5.7	5.9	•	•	•
.047 (1.20)	6.1	6.4	6.6	6.9	7.2	7.4	7.7	7.9	8.1	8.4	8.6		•	•

**OC8 CARBIDE INSERTS**

We recommend using our OC8 Holders and OC8 Carbide Inserts where filtration is poor, abrasive solids are present or for very high flows. Replaceable carbide inserts are available in large orifice diameters to handle high flows and contain a long taper to provide excellent jet quality.

**FEATURES:**

- Pressure Range: 2–22k psi (138–1500 bar)    Flow Range: 7–106 gpm (26.5–401 l/min)



**OC8 P8 HOLDER  
& OC8 CARBIDE  
INSERTS**

For 15k psi (1000 bar)  
1/2" NPT female connection.



**OC8 P12 HOLDER  
& OC8 CARBIDE  
INSERTS**

For 15k psi (1000 bar)  
3/4" NPT female connection.



**OC8 G12 HOLDER  
& OC8 CARBIDE  
INSERTS**

For 22k psi (1500 bar)  
G12 female connection.

**OC8 NOZZLE FLOW CHART (GPM)**

ORIFICE I.D.	PRESSURE - KPSI & BAR												FLOW RATING
	2 (140)	4 (280)	6 (410)	8 (550)	10 (700)	12 (830)	14 (970)	15 (1000)	16 (1100)	18 (1200)	20 (1400)	22 (1500)	
in. mm													
.063 (1.60)	4.8	6.7	8.2	9.5	11	12	13	13	14	14	15	16	7
.075 (1.91)	6.8	9.6	12	14	15	17	18	19	19	20	21	22	10
.085 (2.16)	8.7	12	15	17	19	21	23	24	25	26	28	29	12
.095 (2.41)	11	15	19	22	24	27	29	30	31	33	33	36	15
.105 (2.67)	13	19	23	27	30	33	35	36	38	40	42	44	19
.125 (3.18)	19	27	33	38	42	46	50	52	53	56	60	62	27
.145 (3.68)	25	36	44	50	57	62	67	69	72	76	80	84	36
.165 (4.19)	33	46	56	66	73	80	87	90	93	98	104	109	46
.175 (4.45)	37	52	64	74	82	90	98	101					52
.190 (4.83)	43	61	75	87	97	106	115	119					61
.200 (5.08)	48	68	83	96	108	118	127	132					68
.215 (5.46)	56	79	96	111	124								78
.235 (5.97)	66	94	115	133	149								94
.250 (6.35)	75	106	130	150	168								106

# HOSE, FITTINGS & ACCESSORIES

## BACKOUT PREVENTERS

Backout preventers increase safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters and adapters for pipes with no-flange entry.



### BJ 305

Pipe Sizes 2-6 in. (51-150 mm)  
Hose Sizes (I.D.) 0.12-0.32 in. (3-8 mm)



### BJ 310

Pipe Sizes 4-8 in. (100-200 mm)  
For Hose Sizes (I.D.) 0.32-0.75 in. (8-19 mm)

## VE-400™ BACKOUT PREVENTER

The VE-400 is designed to protect the operator from a flex-lance exiting the tube sheet during cleaning operations.

The VE-400 adapts to both horizontal and vertical applications and has a wide range of adjustments that easily accommodate different tube sheet sizes.

- **Weight Complete: 20 lb – (9.0 kg)**



### STONEAGE RENTS

Rely on us to meet your surge capacity needs



### STONEAGE DEMO TRAILER

Experience the power of StoneAge equipment at your location



### STONEAGE TRAINING

Expert training for the safe and effective use of waterjetting equipment



### WARRANTY

StoneAge warrants its products to be free from defects in workmanship and material for a period of one (1) year from the date of purchase

### PRESSURE GAUGES

- Stainless steel construction
- Easy to read
- Precision movement
- Color-coded gauge faces
- Glycerin-filled for vibration protection
- Built in Snubbers



PART NO.	DIAL SIZE		MOUNTING STYLE	CONNECTION TYPE	SCALE		GRADUATIONS		MAXIMUM OPERATING PRESSURE	
	in	mm			psi	bar	psi	bar	psi	bar
ACPG 35001003	4	100	Bottom	1/2" NPT Male	0-20k	1400	200	20	20k	1400
ACPG 35001005	4	100	Bottom	1/4" HP Female	0-40k	2750	500	50	40k	2750
ACPG 35001007	6	152	Bottom	1/4" HP Female	0-60k	4150	500	50	60k	4150
ACPG 35001025	4	100	Bottom	9/16" HP Male	0-40k	2750	500	50	40k	2750
ACPG 35001028	6	152	Bottom	9/16" HP Male	0-60k	4150	500	50	60k	4150

### THREAD LUBRICANTS

Protect NPT threads on water jetting connections from galling or seizing up.



#### PART NO. GP 047

Parker® ThreadMate™ Thread Lubricant  
2 oz. (57g) Tube

### TEFLON® TAPE

Seals NPT threads and helps prevent leaks. Excellent for both plastic and metal pipe fittings.



#### PART NO. GPT 049-050

1/2 x 520" (1.27 x 1320 cm) Roll

#### PART NO. GP 037-025

1/4 x 520" (5.08 x 1320 cm) Roll

# ACCESSORIES

## HOSE WHIP RESTRAINT

Perhaps the simplest and least expensive safety measure to implement, hose whip restraints prevent injury by restraining the hose in the event of an end fitting failure.

A hose whip restraint can be attached at any point where two hoses are joined, to a pump's fluid end at the discharge side, or where a hose attaches to any piece of waterjetting equipment.

**NOTE: Proper installation is essential. Never exceed safe working load. Follow manufacturer's recommendations and ratings.**



## STEEL WHIP RESTRAINT

Manufactured from stainless high tensile wire rope with spring-loaded retainers for easy installation and removal.

**21" (533 MM) • PART NO. ACWC SS-21**



**STEEL WHIP RESTRAINT**

## NYLON HOSE WHIP RESTRAINT

Made from durable strap with extra-heavy stitching. Fits any high pressure hose.

**31" (787 MM) • PART NO. ACWC NY-31**  
**44" (1118 MM) • PART NO. ACWC NY-44**



**NYLON HOSE WHIP RESTRAINT**

## LUBRICANTS

MSDS sheets are available for all lubricants.

LUBRICANT	PART NUMBER	QTY	DESCRIPTION
VISCOUS FLUID	BJ 048-X*	6 oz.	Synthetic Silicone Lubricant
AIR MOTOR OIL	GP 041	32 oz.	Almo 525/ISO 46/SAE 10
AUTO TRANS. FLUID	GP 042	32 oz.	Mercon®/Dexron® ATF
ANTI-SEIZE	GP 043	2 oz.	Blue Goop®
MOTOR OIL	GP 044	32 oz.	10W-40
GEARBOX LUBE	GP 046	32 oz.	80W-85W-90
THREAD SEALANT	GP 047	4 oz.	ThreadMate®
GREASE	GP 048	14 oz.	Synthetic Grease SHC 100



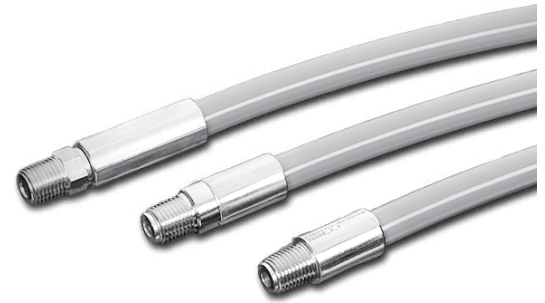
\* Please specify "fast" or "slow" for the type of viscous fluid needed.

# HOSES 15K PSI (1000 BAR)

## FLEX LANCES

Used for the cleaning of small diameter tubes such as those found in heat exchangers, condensers, and boilers.

- Flex lances have a small minimum bend radius which allows them to pass through bends in the tubes
- Stainless steel end fittings
- Custom lengths and end fitting combinations are available upon request



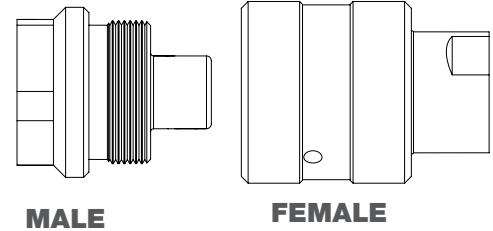
1/16 NPT THREADED LANCES	END FITTING 1	END FITTING 2	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP PSI / BAR		WEIGHT		MIN. BEND RAD	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H32025F1/16	1/16" NPT Male	1/16" NPT Male	25	7.62	0.13	3	0.27	7	0.35	9	14500	1000	0.048	0.072	2.36	60
ACHO H32035F1/16	1/16" NPT Male	1/16" NPT Male	35	10.7	0.13	3	0.27	7	0.35	9	14500	1000	0.048	0.073	2.36	60
ACHO H32050F1/16	1/16" NPT Male	1/16" NPT Male	50	15.25	0.13	3	0.27	7	0.35	9	14500	1000	0.048	0.074	2.36	60
ACHO H42025F1/16	1/16" NPT Male	1/16" NPT Male	25	7.62	0.16	4	0.31	8	0.39	10.1	15000	1000	0.074	0.110	2.95	75
ACHO H42035F1/16	1/16" NPT Male	1/16" NPT Male	35	10.7	0.16	4	0.31	8	0.39	10.1	15000	1000	0.074	0.111	2.95	75
ACHO H42050F1/16	1/16" NPT Male	1/16" NPT Male	50	15.25	0.16	4	0.31	8	0.39	10.1	15000	1000	0.074	0.112	2.95	75
1/8 NPT THREADED LANCES	END FITTING 1	END FITTING 2	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP PSI / BAR		WEIGHT		MIN. BEND RAD	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H42025F1/8	1/8" NPT Male	1/8" NPT Male	25	7.62	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.110	2.95	75
ACHO H42035F1/8	1/8" NPT Male	1/8" NPT Male	35	10.7	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.111	2.95	75
ACHO H42050F1/8	1/8" NPT Male	1/8" NPT Male	50	15.25	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.112	2.95	75
ACHO H52025F1/8	1/8" NPT Male	1/8" NPT Male	25	7.62	0.2	5	0.37	9.4	0.5	12.9	15080	1040	0.084	0.125	3.74	95
ACHO H52035F1/8	1/8" NPT Male	1/8" NPT Male	35	10.7	0.2	5	0.37	9.4	0.5	12.9	15080	1040	0.084	0.126	3.74	95
ACHO H52050F1/8	1/8" NPT Male	1/8" NPT Male	50	15.25	0.2	5	0.37	9.4	0.5	12.9	15080	1040	0.084	0.127	3.74	95
1/4 NPT THREADED LANCES	END FITTING 1	END FITTING 2	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP		WEIGHT		MIN. BEND RAD	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H62025F1/4	1/4" NPT Male	1/4" NPT Male	25	7.62	0.25	6.3	0.45	11.5	.54	13.9	14500	1000	0.117	0.175	4.3	110
ACHO H62035F1/4	1/4" NPT Male	1/4" NPT Male	35	10.7	0.25	6.3	0.45	11.5	.54	13.9	14500	1000	0.117	0.176	4.3	110
ACHO H62050F1/4	1/4" NPT Male	1/4" NPT Male	50	15.25	0.25	6.3	0.45	11.5	.54	13.9	14500	1000	0.117	0.177	4.3	110
3/8 NPT THREADED LANCES	END FITTING 1	END FITTING 2	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP		WEIGHT		MIN. BEND RAD	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H82025F3/8	3/8" NPT Male	3/8" NPT Male	25	7.62	0.32	8.1	.52	13.3	0.7	17.8	13500	900	0.134	0.200	5.12	130
ACHO H82035F3/8	3/8" NPT Male	3/8" NPT Male	35	10.7	0.32	8.1	.52	13.3	0.7	17.8	13500	900	0.134	0.201	5.12	130
ACHO H82050F3/8	3/8" NPT Male	3/8" NPT Male	50	15.25	0.32	8.1	.52	13.3	0.7	17.8	13500	900	0.134	0.202	5.12	130
TYPE M X NPT THREADED LANCES	END FITTING 1	END FITTING 2	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP PSI / BAR		WEIGHT		MIN. BEND RAD	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H32035FTM1/16	9/16" Type M	1/16" NPT Male	35	10.7	0.13	3	0.27	7	0.35	9	14500	1000	0.048	0.074	2.36	60
ACHO H42035FTM41/16	9/16" Type M	1/16" NPT Male	35	10.7	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.112	2.95	75
ACHO H42050FTMS1/8	9/16" Type M	1/8" NPT Male	50	15.25	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.112	2.95	75
ACHO H42035FTM4HPS	9/16" Type M	1/4"-28 Left Male	35	10.7	0.16	4	0.31	8	0.39	10.1	17400	1200	0.074	0.112	2.95	75
ACHO H42050FTM4HPS	9/16" Type M	1/4"-28 Left Male	50	15.25	.16	4	.31	8	.39	10.1	17400	1200	0.074	0.112	2.95	75

# FITTINGS

## 15K PSI (1000 BAR)

### SCREW TYPE QUICK CONNECT COUPLINGS - PARTEK

- Heavy duty stainless steel for high durability
- Easy-grip texturing for hand-tight connections
- Interchangeable 3/4 and 1" NPT coupling halves
- Seal kits with O-ring and backup ring available



**MALE**

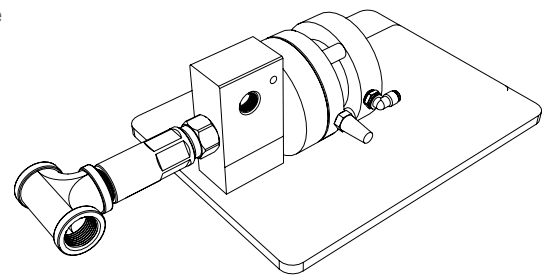
**FEMALE**

PART NO.	CONNECTION TYPE	COUPLING HALVES		SEAL KIT	RETAINING RING	MAX. OPERATING PRESSURE	
		Female	Male			psi	bar
GP 060-P6	3/8" NPT Female	GP 060-P6F	GP 060-P6M	GP 660-P8	GP 661-P8	15k	1000
GP 060-P8	1/2" NPT Female	GP 060-P8F	GP 060-P8M	GP 660-P8	GP 661-P8	15k	1000
GP 060-P12	3/4" NPT Female	GP 060-P12F	GP 060-P12M	GP 660-P12	GP 661-P12	12k	830
GP 060-P16	1" NPT Female	GP 060-P16F	GP 060-P16M	GP 660-P16	GP 661-P16	10k	700

### 15K AIR-OPERATED DUMP VALVES

The Air-Operated Dump Valve allows an operator to remotely control pressure in cleaning applications from 15k psi (1000 bar). When air is sent to the cylinder, the valve closes and allows the system to build pressure. The valve opens when the air is exhausted, reducing system pressure to near atmospheric.

PART NO.	DESCRIPTION
ACDA 61001007	Dump Assembly, 15K Air Actuated W/Base Plate
ACDA 61010012	Foot Gun Assembly, 15K 1/2 NPT Dump Style
ACDA 61050014	Foot Gun Assy, 15K Air Actuated, High Flow, w/Base Plate
ACDU 61001006	Air Diverter Valve, 15K 1/2 W/O Base Plate



**OPERATING WATERBLASTING EQUIPMENT CAN BE POTENTIALLY HAZARDOUS.**



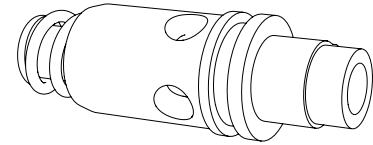
See page 9.10 for important safety information

# FITTINGS 15K PSI (1000 BAR)

## HIGH PRESSURE REPLACEMENT CARTRIDGES

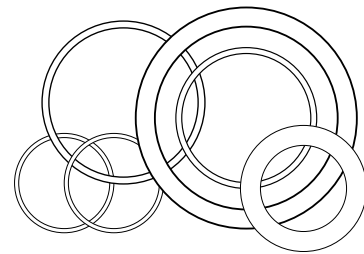
Cartridge Style Design allows dump valve to be rebuilt in under a minute with no special tools.

PART NO.	DESCRIPTION	PRESSURE	
		psi	bar
ACRC 60010020	APS 15k, Hand/Foot, J/S 50902	15k	1034
ACRC 60100004	15k GDWJ Hand/Foot, GDWJ 3102111	15k	1034
ACRC 61020030	CF H/F Mag, J/S 52750	11k	800
ACRC 61050012	10k, High Flow	10k	700
ACRC 61050026	C-15 1in, J/S 53915	15k	1034
ACRC 70010004	15k FDV/PRV, J/S 50234	15k	1034
ACRC 70025000	15k/20k PRV/FDV Repair	15k	1034



## ACCESSORY O-RINGS FOR CARTRIDGES

PART NO.	DESCRIPTION
ACOR 30001018	O-Ring 22-17046
ACOR 30001029	O-Ring
ACOR 30001120	O-Ring
ACOR 30001122	O-Ring J/S 26776
ACOR 30001218	O-Ring GDWJ 22-74207
ACOR 30003018BU	B/U Ring GDWJ 22-17047
ACOR 30003120BU	Back Up Ring
ACOR 30003122BU	Back Up Ring
ACOR 30003218BU	Back Up Ring



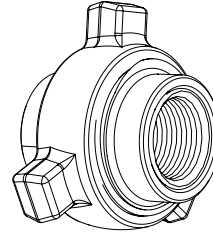
# FITTINGS

## 15K PSI (1000 BAR)

### HAMMER UNIONS — PIPE THREAD (NPT)

- Stainless steel
- Feature large screw threads and heavy duty O-rings

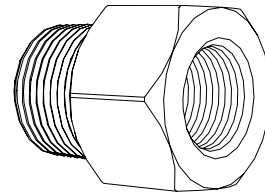
PART NO.	CONNECTION TYPE	SEAL	MAXIMUM OPERATING PRESSURE	
			psi	bar
GP 062-P12	3/4" NPT Female	GP 063-P12	10k	700
GP 062-P16	1" NPT Female	GP 063-P16	10K	700



### REDUCING BUSHINGS — PIPE THREAD (NPT)

- Stainless steel

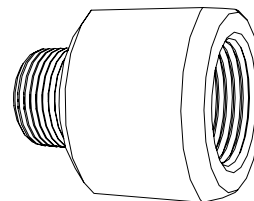
PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 051-P1P2	1/8" NPT Male	1/16" NPT Female	15k	1000
GP 051-P1P4	1/4" NPT Male	1/16" NPT Female	15k	1000
GP 051-P1P6	3/8" NPT Male	1/16" NPT Female	15k	1000
GP 051-P1P8	1/2" NPT Male	1/16" NPT Female	15k	1000
GP 051-P2P4	1/4" NPT Male	1/8" NPT Female	15k	1000
GP 051-P2P6	3/8" NPT Male	1/8" NPT Female	15k	1000
GP 051-P2P8	1/2" NPT Male	1/8" NPT Female	15k	1000
GP 051-P2P12	3/4" NPT Male	1/8" NPT Female	15k	1000
GP 051-P4P6	3/8" NPT Male	1/4" NPT Female	15k	1000
GP 051-P4P8	1/2" NPT Male	1/4" NPT Female	15k	1000
GP 051-P4P12	3/4" NPT Male	1/4" NPT Female	15k	1000
GP 051-P4P16	1" NPT Male	1/4" NPT Female	12k	830
GP 051-P6P8	1/2" NPT Male	3/8" NPT Female	15k	1000
GP 051-P6P12	3/4" NPT Male	3/8" NPT Female	15k	1000
GP 051-P6P16	1" NPT Male	3/8" NPT Female	12k	830
GP 051-P8P12	3/4" NPT Male	1/2" NPT Female	15k	1000
GP 051-P8P16	1" NPT Male	1/2" NPT Female	12k	830
GP 051-P12P16	1" NPT Male	3/4" NPT Female	12k	830
GP 051-P12P20	1-1/4" NPT Male	3/4" NPT Female	10k	700
GP 051-P16P20	1-1/4" NPT Male	1" NPT Female	10k	700



### SWAGE REDUCERS

- Stainless steel

PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 059-P4P2	1/4" NPT Female	1/8" NPT Male	15k	1000
GP 059-P6P4	3/8" NPT Female	1/4" NPT Male	15k	1000
GP 059-P8P4	1/2" NPT Female	1/4" NPT Male	15k	1000
GP 059-P8P6	1/2" NPT Female	3/8" NPT Male	15k	1000
GP 059-P12P8	3/4" NPT Female	1/2" NPT Male	15k	1000
GP 059-P16P8	1" NPT Female	1/2" NPT Male	10k	700
GP 059-P16P12	1" NPT Female	3/4" NPT Male	10k	700



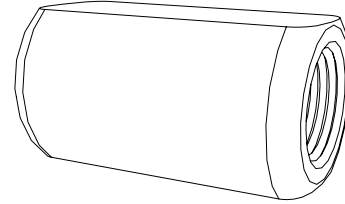
# FITTINGS

## 15K PSI (1000 BAR)

### HEAVY DUTY COUPLINGS — PIPE THREAD (NPT)

- Heat-treated stainless steel

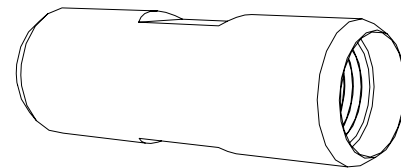
PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 052-P1P1	1/16" NPT Female	1/16" NPT Female	15k	1000
GP 052-P1P2	1/16" NPT Female	1/8" NPT Female	15k	1000
GP 052-P1P4	1/16" NPT Female	1/4" NPT Female	15k	1000
GP 052-P1P8	1/16" NPT Female	1/2" NPT Female	15k	1000
GP 052-P2P2	1/8" NPT Female	1/8" NPT Female	15k	1000
GP 052-P2P4	1/8" NPT Female	1/4" NPT Female	15k	1000
GP 052-P2P6	1/8" NPT Female	3/8" NPT Female	15k	1000
GP 052-P2P8	1/8" NPT Female	1/2" NPT Female	15k	1000
GP 052-P4P4	1/4" NPT Female	1/4" NPT Female	15k	1000
GP 052-P4P4-S	1/4" NPT Female	1/4" NPT Female	15k	1000
GP 052-P4P6	1/4" NPT Female	3/8" NPT Female	15k	1000
GP 052-P4P8	1/4" NPT Female	1/2" NPT Female	15k	1000
GP 052-P4P12	1/4" NPT Female	3/4" NPT Female	15k	1000
GP 052-P6P6	3/8" NPT Female	3/8" NPT Female	15k	1000
GP 052-P6P8	3/8" NPT Female	1/2" NPT Female	15k	1000
GP 052-P6P12	3/8" NPT Female	3/4" NPT Female	15k	1000
GP 052-P8P8	1/2" NPT Female	1/2" NPT Female	15k	1000
GP 052-P8P12	1/2" NPT Female	3/4" NPT Female	15k	1000
GP 052-P8P16	1/2" NPT Female	1" NPT Female	12k	830
GP 052-P12P12	3/4" NPT Female	3/4" NPT Female	15k	1000
GP 052-P12P16	3/4" NPT Female	1" NPT Female	12k	830
GP 052-P16P16	1" NPT Female	1" NPT Female	12k	830
GP 052-P20P20	1-1/4" NPT Female	1-1/4" NPT Female	7.5k	520



### SLIMLINE COUPLINGS

- Heat-treated stainless steel ideal for tube cleaning

PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 052-P1P1-SL	1/16" NPT Female	1/16" NPT Female	10k	700
GP 052-P1P4-SL	1/16" NPT Female	1/4" NPT Female	10k	700
GP 052-P2P2-SL	1/8" NPT Female	1/8" NPT Female	10k	700
GP 052-P4P4-SL	1/4" NPT Female	1/4" NPT Female	10k	700
GP 052-P6P6-SL	3/8" NPT Female	3/8" NPT Female	10k	700
GP 052-P8P8-SL	1/2" NPT Female	1/2" NPT Female	10k	700
AF 073-P1P1-SL	1/16" NPT Female	1/16" NPT Female	15k	1000
AF 073-P2P2-SL	1/8" NPT Female	1/8" NPT Female	15k	1000
AF 073-P4P4-SL	1/4" NPT Female	1/4" NPT Female	15k	1000
AF 073-P6P6-SL	3/8" NPT Female	3/8" NPT Female	15k	1000
AF 073-P8P8-SL	1/2" NPT Female	1/2" NPT Female	15k	1000

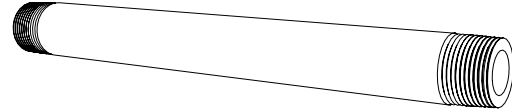


# FITTINGS

## 15K PSI (1000 BAR)

### NIPPLES/STINGERS — PIPE THREAD (NPT)

- Stainless steel
- Additional lengths available upon request



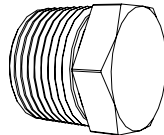
PART NO.	CONNECTION TYPE	O.D. IN/MM	I.D. IN/MM	MAXIMUM OPERATING PRESSURE		STOCK LENGTHS IN INCHES
				psi	bar	
SA 527-P1P1-XX	1/16" NPT	0.310/7.9	0.182/4.6	15k	1000	12, 18, 24, 36, 48
SA 325-P2P2-XX	1/8" NPT	0.405/10.3	0.215/5.5	15k	1000	12, 18, 24, 36, 49
SA 335-P4P4-XX	1/4" NPT	0.540/13.7	0.302/7.7	15k	1000	12, 18, 24, 36, 50
SA 347-P6P6-XX	3/8" NPT	0.675/17.1	0.415/10.5	15k	1000	4, 8, 10, 12, 18, 24, 36, 48
SA 356-P8P8-XX	1/2" NPT	0.640/21.3	0.534/13.6	15k	1000	3, 4, 6, 8, 10, 12, 18, 24, 36, 48
SA 366-P12P12-XX	3/4" NPT	1.05/26.7	0.614/15.6	15k	1000	3, 4, 5, 6, 12, 18, 22, 27, 30, 36, 40, 44, 53, 60
SA 376-P16P16-XX	1" NPT	1.315/33.4	0.599/15.2	12k	830	6, 8, 18

XX = Length in inches.

### PLUGS — PIPE THREAD (NPT)

#### HEX HEAD

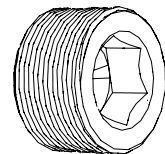
- Stainless steel



PART NO.	CONNECTION TYPE	MATERIAL	MAXIMUM OPERATING PRESSURE	
			psi	bar
AP2 002	1/8" NPT	Stainless	15k	1000
GP 026-P4SS	1/4" NPT	Stainless	15k	1000
GP 026-P6SS	3/8" NPT	Stainless	15k	1000
GP 025-P8C	1/2" NPT	Carbon	15k	1000
GP 026-P8SS	1/2" NPT	Stainless	15k	1000
GP 026-P12C	3/4" NPT	Carbon	15k	1000
GP 026-P12SS	3/4" NPT	Stainless	15k	1000
GP 026-P16SS	1" NPT	Stainless	15k	1000

#### SOCKET HEAD

- Stainless steel



PART NO.	CONNECTION TYPE	MATERIAL	MAXIMUM OPERATING PRESSURE	
			psi	bar
GP 025-P1SS	1/16" NPT	Stainless	15k	1000
GP 025-P2SS	1/8" NPT	Stainless	15k	1000
GP 025-P4C	1/4" NPT	Carbon	15k	1000
GP 025-P4SS	1/4" NPT	Stainless	15k	1000
GP 025-P6SS	3/8" NPT	Stainless	15k	1000
GP 025-P8C	1/2" NPT	Carbon	15k	1000
GP 025-P8SS	1/2" NPT	Stainless	15k	1000
GP 025-P12C	3/4" NPT	Carbon	15k	1000
GP 025-P12SS	3/4" NPT	Stainless	15k	1000

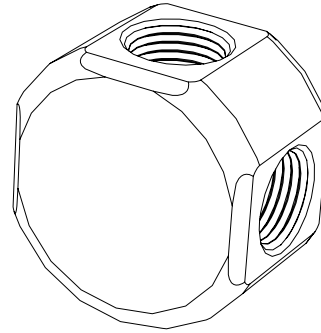
# FITTINGS

## 15K PSI (1000 BAR)

### WAFER TEES — PIPE THREAD (NPT)

- Stainless steel

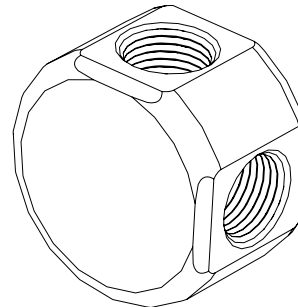
PART NO.	CONNECTION TYPE	MAXIMUM OPERATING PRESSURE	
		psi	bar
GP 030-P12	3/4" NPT Female	15k	1000
GP 030-P16	1" NPT Female	12k	830
GP 030-P8	1/2" NPT Female	15k	1000



### 90° WAFER ELBOWS — PIPE THREAD (NPT)

- Stainless steel

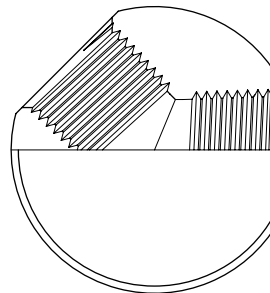
PART NO.	CONNECTION TYPE	MAXIMUM OPERATING PRESSURE	
		psi	bar
GP 050-P8P8	1/2" NPT Female	15k	1000
GP 050-P12P12	3/4" NPT Female	15k	1000
GP 050-P16P16	1" NPT Female	12k	830



### 45° WAFER ELBOWS — PIPE THREAD (NPT)

- Stainless steel

PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 050-P16P16-45	1" NPT Female	1" NPT Female	12k	830



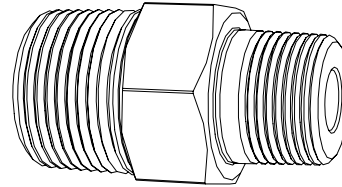
# FITTINGS

## 15K PSI (1000 BAR)

### HEX NIPPLES — PIPE THREAD (NPT)

- Stainless steel

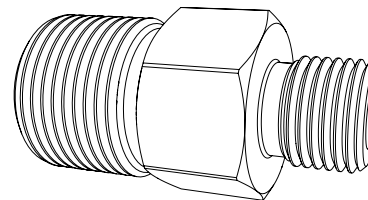
PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
GP 055-P1P1	1/16" NPT Male	1/16" NPT Male	15k	1000
GP 055-P1P2	1/8" NPT Male	1/16" NPT Male	15k	1000
GP 055-P1P4	1/4" NPT Male	1/16" NPT Male	15k	1000
GP 055-P2P2	1/8" NPT Male	1/8" NPT Male	15k	1000
GP 055-P2P4	1/4" NPT Male	1/8" NPT Male	15k	1000
GP 055-P2P6	3/8" NPT Male	1/8" NPT Male	15k	1000
GP 055-P2P8	1/2" NPT Male	1/8" NPT Male	15k	1000
GP 055-P4P4	1/4" NPT Male	1/4" NPT Male	15k	1000
GP 055-P4P6	3/8" NPT Male	1/4" NPT Male	15k	1000
GP 055-P4P8	1/2" NPT Male	1/4" NPT Male	15k	1000
GP 055-P4P12	3/4" NPT Male	1/4" NPT Male	15k	1000
GP 055-P6P6	3/8" NPT Male	3/8" NPT Male	12k	830
GP 055-P6P8	1/2" NPT Male	3/8" NPT Male	15k	1000
GP 055-P6P12	3/4" NPT Male	3/8" NPT Male	15k	1000
GP 055-P8P8	1/2" NPT Male	1/2" NPT Male	12k	830
GP 055-P8P12	3/4" NPT Male	1/2" NPT Male	15k	1000
GP 055-P8P16	1" NPT Male	1/2" NPT Male	12k	830
GP 055-P12P12	3/4" NPT Male	3/4" NPT Male	12k	830
GP 055-P12P16	1" NPT Male	3/4" NPT Male	10k	700
GP 055-P16P16	1" NPT Male	1" NPT Male	10k	700



### PIPE THREAD MALE (NPT MALE) TO TYPE M MALE ADAPTERS

- Stainless steel

PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 060-P4	9/16" Type M Male	1/4" NPT Male	15k	1000
AF 060-P6	9/16" Type M Male	3/8" NPT Male	15k	1000
AF 060-P8	9/16" Type M Male	1/2" NPT Male	15k	1000
AF 060-P12	9/16" Type M Male	3/4" NPT Male	15k	1000
AF 061-P4	3/4" Type M Male	1/4" NPT Male	15k	1000
AF 061-P8	3/4" Type M Male	1/2" NPT Male	15k	1000
AF 061-P12	3/4" Type M Male	3/4" NPT Male	15k	1000
AF 063-P8	1" Type M Male	1/2" NPT Male	15k	1000
AF 063-P12	1" Type M Male	3/4" NPT Male	15k	1000
AF 063-P16	1" Type M Male	1" NPT Male	12k	830
AF 064-P12	1-5/16" Type M Male	3/4" NPT Male	15k	1000
AF 064-P16	1-5/16" Type M Male	1" NPT Male	12k	830



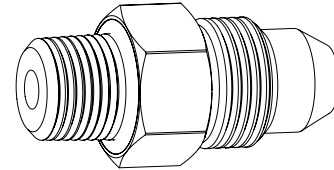
# FITTINGS

## 15K PSI (1000 BAR)

### PIPE THREAD MALE (NPT MALE) TO MEDIUM PRESSURE (MP) MALE ADAPTERS

- Stainless steel

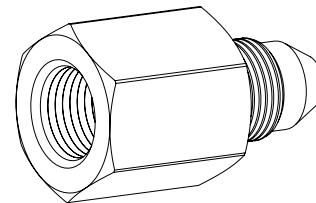
PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 068-MP6P4	3/8" MP Male	1/4" NPT Male	15k	1000
AF 068-MP6P6	3/8" MP Male	3/8" NPT Male	15k	1000
AF 068-MP6P8	3/8" MP Male	1/2" NPT Male	15k	1000
AF 068-MP9P4	9/16" MP Male	1/4" NPT Male	15k	1000
AF 068-MP9P6	9/16" MP Male	3/8" NPT Male	15k	1000
AF 068-MP9P8	9/16" MP Male	1/2" NPT Male	15k	1000
AF 068-MP9P12	9/16" MP Male	3/4" NPT Male	15k	1000
AF 068-MP9P16	9/16" MP Male	1" NPT Male	12k	830
AF 068-MP12P8	3/4" MP Male	1/2" NPT Male	15k	1000
AF 068-MP12P12	3/4" MP Male	3/4" NPT Male	15k	1000
AF 068-MP12P16	3/4" MP Male	1" NPT Male	12k	830
AF 068-MP16P8	1" MP Male	1/2" NPT Male	15k	1000
AF 068-MP16P12	1" MP Male	3/4" NPT Male	15k	1000
AF 068-MP16P16	1" MP Male	1" NPT Male	12k	830



### PIPE THREAD FEMALE (NPT FEMALE) TO MEDIUM PRESSURE (MP) MALE ADAPTERS

- Stainless steel

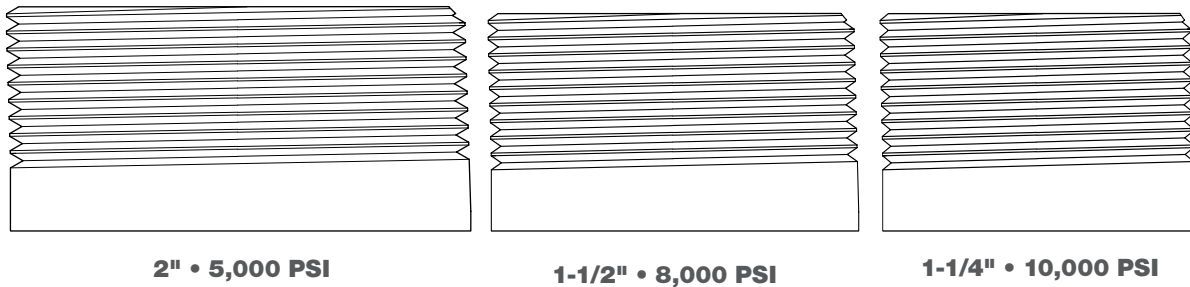
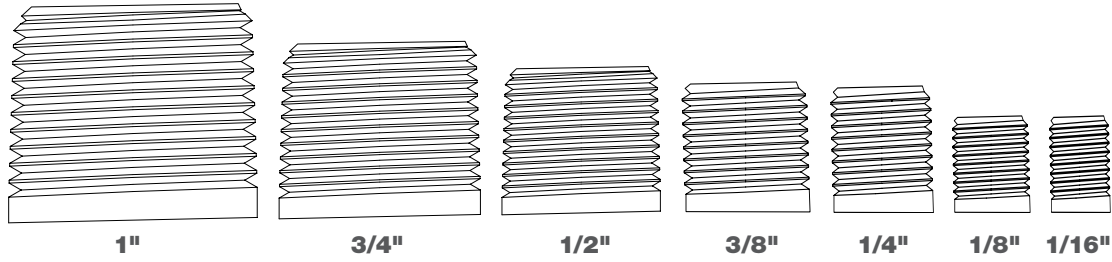
PART NO.	CONNECTION TYPES		MAXIMUM OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 065-MP6P6	3/8" MP Male	3/8" NPT Female	15k	1000
AF 065-MP6P8	3/8" MP Male	1/2" NPT Female	15k	1000
AF 065-MP9P2	9/16" MP Male	1/8" NPT Female	15k	1000
AF 065-MP9P4	9/16" MP Male	1/4" NPT Female	15k	1000
AF 065-MP9P6	9/16" MP Male	3/8" NPT Female	15k	1000
AF 065-MP9P8	9/16" MP Male	1/2" NPT Female	15k	1000
AF 065-MP12P8	3/4" MP Male	1/2" NPT Female	15k	1000
AF 065-MP12P12	3/4" MP Male	3/4" NPT Female	15k	1000
AF 065-MP16P8	1" MP Male	1/2" NPT Female	15k	1000
AF 065-MP16P12	1" MP Male	3/4" NPT Female	15k	1000



# TECHNICAL 15K PSI (1000 BAR)

## NATIONAL PIPE TAPER (NPT)

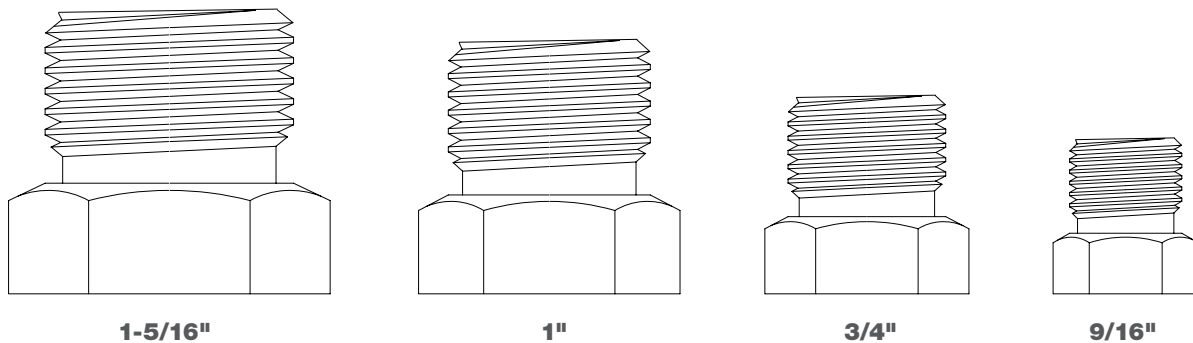
### SIZE REFERENCE CHART SINGLE PIECE MALE • ACTUAL SIZE



## TYPE M

### SIZE REFERENCE CHART SINGLE PIECE MALE • ACTUAL SIZE

SIZE	CONNECTION THREAD	RECOMMENDED TORQUE	
		ft-lb	N-m
9/16" Type M	9/16" – 18UNF	30	41
3/4" Type M	3/4" – 16UNF	45	61
1" Type M	1" – 12UNF	70	95
1-5/16" Type M	1-5/16" – 12UN	110	149

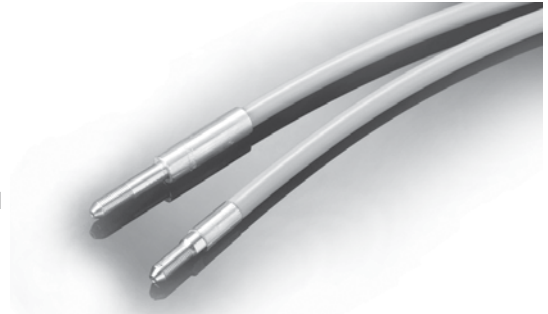


# HOSES/LANCES 20K PSI (1380 BAR)

## FLEX LANCES

Used for the cleaning of small diameter tubes such as those found in heat exchangers, condensers, and boilers.

- Stainless steel end fittings.
- Plastic core reinforced by four spiral layers of high tensile steel wire enclosed in a tough, flexible polyamide jacket.
- Small minimum bend radius.
- Custom lengths and end fittings available upon request.



1/4"-28 THREADED LANCES	TYPE M SWIVEL NUT	TOOL END CONNECTION	LENGTH		INSIDE DIA.		OUTER DIA.		CRIMP DIA.		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H34035FTM4NZLM	9/16"	1/4"-28 LH Male BP	35	10.7	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.135	4.33	110
ACHO H34035FTM4NZRF	9/16"	1/4"-28 RH Female	35	10.7	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.136	4.33	110
ACHO H34035FTM4NZRM	9/16"	1/4"-28 RH Male BP	35	10.7	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.137	4.33	110
ACHO H34050FTM4NZLM	9/16"	1/4"-28 LH Male BP	50	15.25	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.138	4.33	110
ACHO H34050FTM4NZRF	9/16"	1/4"-28 RH Female	50	15.25	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.139	4.33	110
ACHO H34050FTM4NZRM	9/16"	1/4"-28 RH Male BP	50	15.25	0.13	3	0.031	8	0.47	12.1	29000	2000	0.090	0.140	4.33	110
ACHO H42H035FTM4NZRM	9/16"	1/4"-28 RH Male BP	35	10.7	0.16	4	0.32	8	0.394	10	20300	1400	0.075	0.112	2.95	75
ACHO H42H050FTM4NZRM	9/16"	1/4"-28 RH Male BP	50	15.25	0.16	4	0.32	8	0.394	10	20300	1400	0.075	0.113	2.95	75
ACHO H44025FTM4NZLM	9/16"	1/4"-28 LH Male BP	25	7.62	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.234	5.12	130
ACHO H44025FTM4NZRM	9/16"	1/4"-28 RH Male BP	25	7.62	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.235	5.12	130
ACHO H44035FTM4NZLM	9/16"	1/4"-28 LH Male BP	35	10.7	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.236	5.12	130
ACHO H44035FTM4NZRF	9/16"	1/4"-28 RH Female	35	10.7	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.237	5.12	130
ACHO H44035FTM4NZRM	9/16"	1/4"-28 RH Male BP	35	10.7	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.238	5.12	130
ACHO H44050FTM4NZLM	9/16"	1/4"-28 LH Male BP	50	15.25	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.239	5.12	130
ACHO H44050FTM4NZRF	9/16"	1/4"-28 RH Female	50	15.25	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.240	5.12	130
ACHO H44050FTM4NZRM	9/16"	1/4"-28 RH Male BP	50	15.25	0.16	4	0.41	10.3	0.57	14.7	31900	2200	0.157	0.241	5.12	130
3/8"-24 THEADED LANCES	TYPE M SWIVEL NUT	TOOL END CONNECTION	LENGTH		INSIDE DIA.		OUTER DIA.		CRIMP DIA.		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H54035FTM6NZLM	9/16"	3/8"-24 LH Male BP	35	10.7	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.260	5.91	150
ACHO H54035FTM6NZRF	9/16"	3/8"-24 RH Female	35	10.7	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.261	5.91	150
ACHO H54035FTM6NZRM	9/16"	3/8"-24 RH Male BP	35	10.7	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.262	5.91	150
ACHO H54050FTM6NZLM	9/16"	3/8"-24 LH Male BP	50	15.25	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.263	5.91	150
ACHO H54050FTM6NZRF	9/16"	3/8"-24 RH Female	50	15.25	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.264	5.91	150
ACHO H54050FTM6NZRM	9/16"	3/8"-24 RH Male BP	50	15.25	0.2	5	0.44	11.2	0.59	15	26100	1800	0.174	0.265	5.91	150
ACHO H64035FTM6NZLM	9/16"	3/8"-24 LH Male BP	35	10.7	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.29	7.09	108
ACHO H64035FTM6NZRF	9/16"	3/8"-24 RH Female	35	10.7	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.296	7.09	108
ACHO H64035FTM6NZRM	9/16"	3/8"-24 RH Male BP	35	10.7	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.297	7.09	108
ACHO H64050FTM6NZLM	9/16"	3/8"-24 LH Male BP	50	15.25	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.298	7.09	108
ACHO H64050FTM6NZRF	9/16"	3/8"-24 RH Female	50	15.25	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.299	7.09	108
ACHO H64050FTM6NZRM	9/16"	3/8"-24 RH Male BP	50	15.25	0.25	6.3	0.5	12.6	0.64	16.4	21750	1500	0.198	0.300	7.09	108
TYPE M SUPPLY HOSES	TYPE M SWIVEL NUT	SWIVEL SIZE	LENGTH		INSIDE DIA.		OUTER DIA.		CRIMP DIA.		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H134H010FTMSC	1"	1" Type M	10	3.9	.5	12.8	0.87	22	1.07	27.4	20300	1400	0.536	0.800	7.87	200
ACHO H134H050FTMS	1"	1" Type M	10	3.9	.5	12.8	0.87	22	1.07	27.4	20300	1400	0.536	0.800	7.87	200
ACHO H134H050FTMSCL	1"	1" Type M	10	3.9	.5	12.8	0.87	22	1.07	27.4	20300	1400	0.536	0.800	7.87	200

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# FITTINGS

## 20K PSI (1380 BAR)

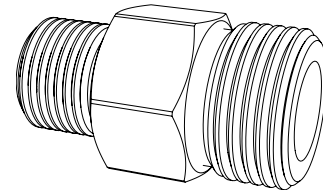
### FLEX LANCES

Continued from previous page

9/16-18 THREADED LANCES	TYPE M SWIVEL NUT	TOOL END CONNECTION	LENGTH		INSIDE DIA.		OUTER DIA.		CRIMP DIA.		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	lb/ft	kg/m	in	mm
ACHO H84035FTM9NZLM	3/4"	9/16"-18 LH Male BP	35	10.7	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.390	7.09	108
ACHO H84035FTM9NZRM	3/4"	9/16"-18 RH Male BP	35	10.7	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.391	7.09	108
ACHO H84035FTM9ZLM	3/4"	9/16"-18 LH Male BP	35	10.7	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.392	7.09	108
ACHO H84035FTM9ZRF	3/4"	9/16"-18 RH Female	35	10.7	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.393	7.09	108
ACHO H84050FTM9NZLM	3/4"	9/16"-18 LH Male BP	50	15.25	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.394	7.09	108
ACHO H84050FTM9NZRM	3/4"	9/16"-18 RH Male BP	50	15.25	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.395	7.09	108
ACHO H84050FTM9ZRF	3/4"	9/16"-18 RH Female	50	15.25	0.32	8.1	0.57	14.6	0.79	20.3	21750	1500	0.261	0.396	7.09	108

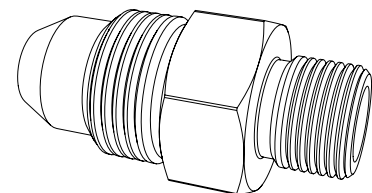
### TYPE M MALE CONNECTORS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 060-060	9/16" Type M Male	9/16" Type M Male	44k	3000
AF 060-061	9/16" Type M Male	3/4" Type M Male	22k	1500
AF 060-063	9/16" Type M Male	1" Type M Male	22k	1500
AF 061-061	3/4" Type M Male	3/4" Type M Male	22k	1500
AF 061-063	3/4" Type M Male	1" Type M Male	22k	1500
AF 061-064	3/4" Type M Male	1-5/16" Type M Male	22k	1500
AF 062-062	7/8" Type M Male	7/8" Type M Male	44k	3000
AF 062-063	7/8" Type M Male	1" Type M Male	22k	1500
AF 063-063	1" Type M Male	1" Type M Male	22k	1500
AF 063-064	1" Type M Male	1-5/16" Type M Male	22k	1500
AF 064-064	1-5/16" Type M Male	1-5/16" Type M Male	22k	1500



### TYPE M MALE TO MEDIUM PRESSURE MALE CONNECTORS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 060-MP4	9/16" Type M Male	1/4" MP Male	22k	1500
AF 060-MP6	9/16" Type M Male	3/8" MP Male	22k	1500
AF 060-MP9	9/16" Type M Male	9/16" MP Male	22k	1500
AF 060-MP12	9/16" Type M Male	3/4" MP Male	22k	1500
AF 060-MP16	9/16" Type M Male	1" MP Male	22k	1500
AF 061-MP6	3/4" Type M Male	3/8" MP Male	22k	1500
AF 061-MP9	3/4" Type M Male	9/16" MP Male	22k	1500
AF 061-MP12	3/4" Type M Male	3/4" MP Male	22k	1500
AF 061-MP16	3/4" Type M Male	1" MP Male	22k	1500
AF 063-MP9	1" Type M Male	9/16" MP Male	22k	1500
AF 063-MP12	1" Type M Male	3/4" MP Male	22k	3000
AF 063-MP16	1" Type M Male	1" MP Male	22k	1500
AF 064-MP9	1-5/16" Type M Male	9/16" MP Male	22k	1500
AF 064-MP12	1-5/16" Type M Male	3/4" MP Male	22k	1500
AF 064-MP16	1-5/16" Type M Male	1" MP Male	22k	1500



# FITTINGS 20K PSI (1380 BAR)

## THREAD LUBRICANTS

Protect the threads from galling or seizing up.



### PART NO. GP 043

Blue Goop Thread Lubricant 2 oz. Tube

## LUBRICANTS

MSDS sheets are available for all lubricants.

LUBRICANT	PART NUMBER	QTY	DESCRIPTION
VISCOUS FLUID	BJ 048-X	6 oz.	Synthetic Silicone Lubricant
AIR MOTOR OIL	GP 041	32 oz.	Almo 525/ISO 46/SAE 10
AUTO TRANS. FLUID	GP 042	32 oz.	Mercon®/Dexron® ATF
ANTI-SEIZE	GP 043	2 oz.	Blue Goop®
MOTOR OIL	GP 044	32 oz.	10W-40
GEARBOX LUBE	GP 046	32 oz.	80W-85W-90
THREAD SEALANT	GP 047	4 oz.	ThreadMate®
GREASE	GP 048	14 oz.	Synthetic Grease SHC 100

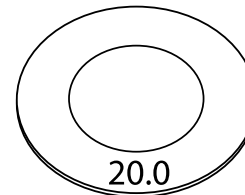


\* Please specify "fast" or "slow" for the type of viscous fluid needed.

## RUPTURE DISC

A Rupture Disc is an essential component in any system which contains a positive displacement pump. It provides protection against excessive pressure building up in the water blasting equipment connected to a pump.

PART NO.	DESCRIPTION
ACRD 35005125	Rupture Disc, 12.5k, 1/2 STD
ACRD 35005148	Rupture Disc, 14.8k, 1/2 STD
ACRD 35005175	Rupture Disc, 17.5k, 1/2 STD
ACRD 35006125	Rupture Disc, 12.5k Burst 1/4 A/S
ACRD 35006240	Rupture Disc, 24k, 1/4
ACRD 35006435	Rupture Disc, 43.5K Burst 1/4 A/S
ACRD 35006509	Rupture Disc, 50k, 1/4 W/TAG
ACRD 35008001	Ring 1/2 15K Rupture Disc Hold Down
ACRD 35008011	Ring 20/40K Rupture Disc Hold Down
ACRD 35009115	Rupture Disc, 11.5k, 3/4, NLB
ACRD 35009222	Rupture Disc, 22.25k, 3/4, NLB
ACRD 35015120	Rupture Disc, 12K J/S
ACRD 35017240	Rupture Disc, 24k, J/S



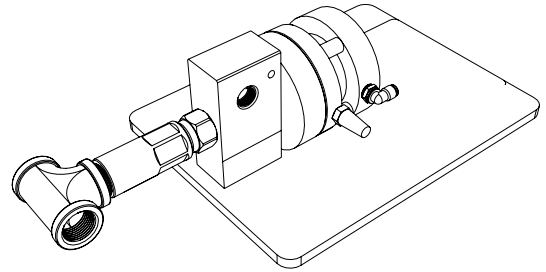
# FITTINGS

## 20K PSI (1380 BAR)

### 20K AIR-OPERATED DUMP VALVES

The Air-Operated Dump Valve allows an operator to remotely control pressure in cleaning applications from 20k psi (1400 bar). When air is sent to the cylinder, the valve closes and allows the system to build pressure. The valve opens when the air is exhausted, reducing system pressure to near atmospheric.

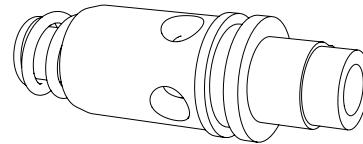
PART NO.	DESCRIPTION
ACDA 61020019-K	Kit, Dump Valve Assembly w/Air Hose and Fittings, 20k, w/Air Fittings
ACDA 610200342	Dump Assembly, Air Diverter Valve, 20k/50gpm, w/Base Plate
ACDA 610200342-K	Kit, Dump Valve Assembly w/Air Hose and Fittings, 20k/50gpm w/Base Plate



### HIGH PRESSURE REPLACEMENT CARTRIDGES

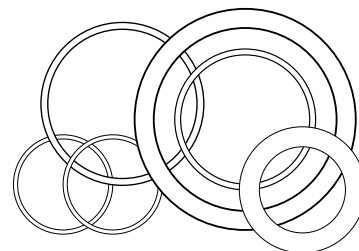
Cartridge Style Design allows dump valve to be rebuilt in under a minute with no special tools.

PART NO.	DESCRIPTION
ACRC 60020010	Cartridge Assy. APS 20K Hand/Foot, J/S 51869
ACRC 60200003	Cartridge Assy. 20k GDWJ Hand/ Foot, GDWJ 3102121
ACRC 61020030	Cartridge Assy. CF H/F Mag, J/S 52750
ACRC 61050026	Cartridge Assy. C-15 1", J/S 53915
ACRC 70020011	Cartridge Assy. 20k FDV/PRV, J/S 52255
ACRC 70025000	Kit, 15k/20k PRV/FDV Repair, GDWJ 77800030



### ACCESSORY O-RINGS FOR CARTRIDGES

PART NO.	DESCRIPTION
ACOR 30001018	O-Ring 22-17046
ACOR 30001029	O-Ring
ACOR 30001120	O-Ring
ACOR 30001122	O-RING J/S 26776
ACOR 30001218	O-Ring GDWJ 22-74207
ACOR 30003018BU	B/U Ring GDWJ 22-17047
ACOR 30003120BU	Back Up Ring
ACOR 30003122BU	Back Up Ring
ACOR 30003218BU	Back Up Ring



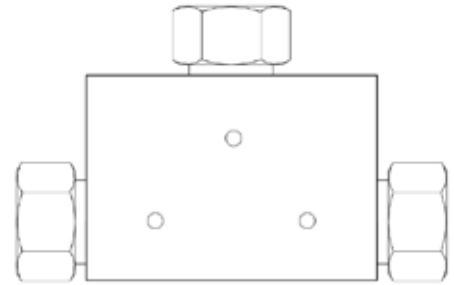
# FITTINGS

## 20K PSI (1380 BAR)

### MEDIUM PRESSURE TEES

All medium pressure tees include gland, nuts, and collars.

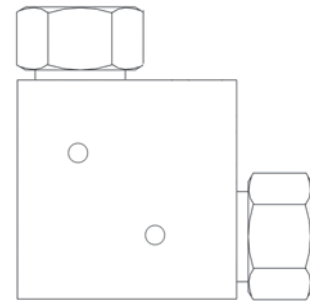
PART NO.	CONNECTION TYPE	MAX. OPERATING PRESSURE	
		psi	bar
AF 052-MP4	1/4" MP Female	22k	1500
AF 052-MP6	3/8" MP Female	22k	1500
AF 052-MP9	9/16" MP Female	22k	1500
AF 052-MP12	3/4" MP Female	22k	1500
AF 052-MP16	1" MP Female	22k	1500



### MEDIUM PRESSURE ELBOWS

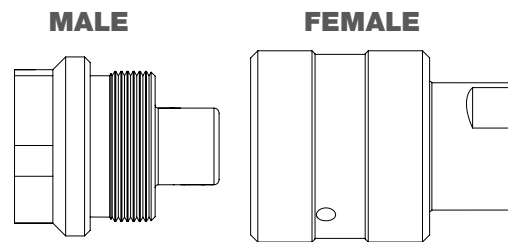
All medium pressure elbows include gland, nuts, and collars.

PART NO.	CONNECTION TYPE	MAX. OPERATING PRESSURE	
		psi	bar
AF 050-MP4	1/4" MP Female	22k	1500
AF 050-MP6	3/8" MP Female	22k	1500
AF 050-MP9	9/16" MP Female	22k	1500
AF 050-MP12	3/4" MP Female	22k	1500
AF 050-MP16	1" MP Female	22k	1500



# FITTINGS

## 20K PSI (1380 BAR)

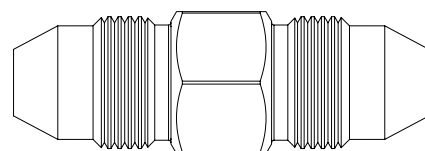


### SCREW TYPE QUICK CONNECT COUPLINGS

PART NO.	CONNECTION TYPE	COUPLING HALVES		SEAL KIT	RETAINING RING	MAX. OPERATING PRESSURE	
		Female	Male			psi	bar
GP 060-MP9	9/16 MP Female	GP 060-MP9F	GP 060-MP9M	GP 660-MP9	GP 661-MP9	22k	1500
GP 060-MP12	3/4 MP Female	GP 060-MP12F	GP 060-MP12M	GP 660-MP12	GP 661-MP12	22k	1500

### MEDIUM PRESSURE MALE CONNECTORS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 078-MP4MP4	1/4" MP Male	1/4" MP Male	22k	1500
AF 078-MP4MP6	1/4" MP Male	3/8" MP Male	22k	1500
AF 078-MP4MP9	1/4" MP Male	9/16" MP Male	22k	1500
AF 078-MP6MP6	3/8" MP Male	3/8" MP Male	22k	1500
AF 078-MP6MP9	3/8" MP Male	9/16" MP Male	22k	1500
AF 078-MP6MP12	3/8" MP Male	3/4" MP Male	22k	1500
AF 078-MP9MP9	9/16" MP Male	9/16" MP Male	22k	1500
AF 078-MP9MP12	9/16" MP Male	3/4" MP Male	22k	1500
AF 078-MP9MP16	9/16" MP Male	1" MP Male	22k	1500
AF 078-MP12MP12	3/4" MP Male	3/4" MP Male	22k	1500
AF 078-MP12MP16	3/4" MP Male	1" MP Male	22k	1500
AF 078-MP16MP16	1" MP Male	1" MP Male	22k	1500
AF 078-MP9H9	9/16" MP Male	9/16" MP Male	22k	1500

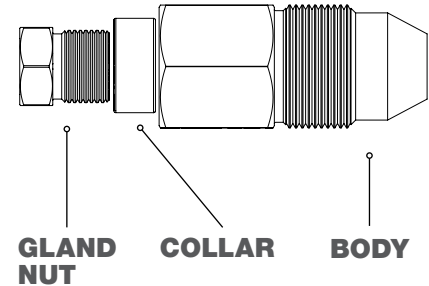


# FITTINGS 20K PSI (1380 BAR)

## MEDIUM PRESSURE MALE TO MEDIUM PRESSURE FEMALE CONNECTIONS

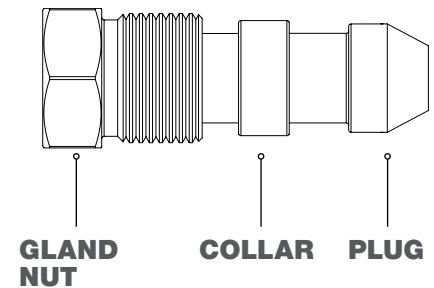
Fittings include gland nut and collar for female connection.

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 066-MP4MP6	1/4" MP Female	3/8" MP Male	22k	1500
AF 066-MP4MP9	1/4" MP Female	9/16" MP Male	22k	1500
AF 066-MP6MP9	3/8" MP Female	9/16" MP Male	22k	1500
AF 066-MP6MP12	3/8" MP Female	3/4" MP Male	22k	1500
AF 066-MP9MP12	9/16" MP Female	3/4" MP Male	22k	1500
AF 066-MP9MP16	9/16" MP Female	1" MP Male	22k	1500
AF 066-MP12MP16	3/4" MP Female	1" MP Male	22k	1500



## MEDIUM PRESSURE GLAND NUTS, COLLARS, AND PLUGS

CONNECTION TYPE	PART NUMBERS		
	GLAND NUT	COLLAR	PLUG
1/4" MP	AF 070-MP4	AF 071-MP4	AF 076-MP4
3/8" MP	AF 070-MP6	AF 071-MP6	AF 076-MP6
9/16" MP	AF 070-MP9	AF 071-MP9	AF 076-MP9
3/4" MP	AF 070-MP12	AF 071-MP12	AF 076-MP12
1" MP	AF 070-MP16	AF 071-MP16	AF 076-MP16

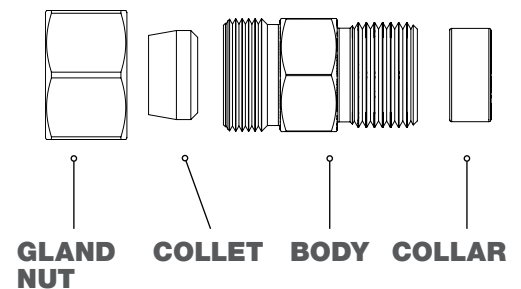


## MEDIUM PRESSURE ANTI-VIBRATION GLAND ASSEMBLIES

Used to reduce stress on tubing threads in conditions where bending or vibration are present, anti-vibration gland assemblies feature a collet that clamps onto the tubing when the connection is tightened to provide extra support and strength.

PART NO.	CONNECTION TYPE	COLLAR PART NUMBER
AF 072-MP4	1/4" MP Female	AF 071-MP4
AF 072-MP6	3/8" MP Female	AF 071-MP6
AF 072-MP9	9/16" MP Female	AF 071-MP9
AF 072-MP12	3/4" MP Female	AF 071-MP12
AF 072-MP16	1" MP Female	AF 071-MP16

NOTE: Collar is not included with Anti-Vibe assembly.



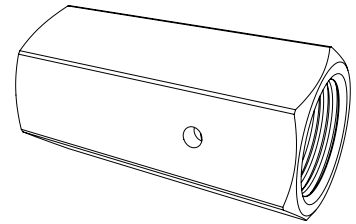
# FITTINGS

## 20K PSI (1380 BAR)

### MEDIUM PRESSURE STRAIGHT COUPLING BODY

Two coupler versions are available and can be supplied with or without collars and glands. Both versions are listed on this page. AF 073 does not have the gland and collar, AF 173 includes glands and collars.

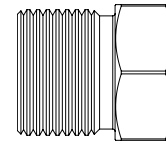
PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 073-MP4	1/4" MP Female	1/4" MP Female	22k	1500
AF 073-MP4MP6	1/4" MP Female	3/8" MP Female	22k	1500
AF 073-MP4MP9	3/8" MP Female	9/16" MP Female	22k	1500
AF 073-MP6	3/8" MP Female	3/8" MP Female	22k	1500
AF 073-MP6MP9	3/8" MP Female	9/16" MP Female	22k	1500
AF 073-MP6MP12	3/8" MP Female	3/4" MP Female	22k	1500
AF 073-MP9	9/16" MP Female	9/16" MP Female	22k	1500
AF 073-MP9MP12	9/16" MP Female	3/4" MP Female	22k	1500
AF 073-MP9MP16	9/16" MP Female	1" MP Female	22k	1500
AF 073-MP12	3/4" MP Female	3/4" MP Female	22k	1500
AF 073-MP12MP16	3/4" MP Female	1" MP Female	22k	1500
AF 073-MP16	1" MP Female	1" MP Female	22k	1500



**BODY ONLY**

### MEDIUM PRESSURE GLAND NUTS, COLLARS AND PLUGS

CONNECTION 1	GLAND PART NO.	COLLAR PART NO.
1/4" MP	AF 070-MP4	AF 071-MP4
3/8" MP	AF 070-MP6	AF 071-MP6
9/16" MP	AF 070-MP9	AF 071-MP9
3/4" MP	AF 070-MP12	AF 071-MP12
1" MP	AF 070-MP16	AF 071-MP16



**GLAND NUT**

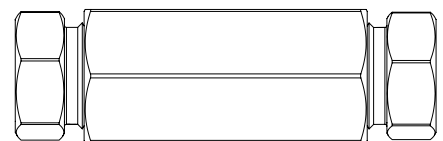


**COLLAR**

### MEDIUM PRESSURE STRAIGHT COUPLINGS

Two versions of the Coupler are available, they can be supplied with or without collars and glands. Both versions are listed on this page. AF 073 does not have the gland and collar, AF 173 includes glands and collars.

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 173-MP4	1/4" MP Female	1/4" MP Female	22k	1500
AF 173-MP4MP6	1/4" MP Female	3/8" MP Female	22k	1500
AF 173-MP4MP9	3/8" MP Female	9/16" MP Female	22k	1500
AF 173-MP6	3/8" MP Female	3/8" MP Female	22k	1500
AF 173-MP6MP9	3/8" MP Female	9/16" MP Female	22k	1500
AF 173-MP6MP12	3/8" MP Female	3/4" MP Female	22k	1500
AF 173-MP9	9/16" MP Female	9/16" MP Female	22k	1500
AF 173-MP9MP12	9/16" MP Female	3/4" MP Female	22k	1500
AF 173-MP9MP16	9/16" MP Female	1" MP Female	22k	1500
AF 173-MP12	3/4" MP Female	3/4" MP Female	22k	1500
AF 173-MP12MP16	3/4" MP Female	1" MP Female	22k	1500
AF 173-MP16	1" MP Female	1" MP Female	22k	1500



**WITH GLANDS AND COLLARS**

# FITTINGS

## 20K PSI (1380 BAR)

### NIPPLES

- Three connection types available
- Stainless steel
- Glands and collars not included

#### LEFT HAND • MEDIUM PRESSURE TUBING (MP TUBE LH):

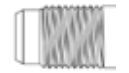
Available in 1/4" to 1". Used in standard medium pressure connections (using glands and collars) or with lance fittings (no glands and collars) or nozzles that have medium pressure left-handed female threads.

#### RIGHT HAND • MEDIUM PRESSURE TUBING (MP TUBE RH):

Used with lance fittings (no glands and collars) or nozzles that have medium pressure right-handed female threads. Available in 1/4" to 3/4" sizes.

#### LANCE CONNECTIONS:

Right-handed connections for use with nozzles and lance fittings. Available in 1/4", 3/8", and 9/16" sizes.



MP TUBE LH  
CONNECTION

MP TUBE RH  
CONNECTION

LANCE  
CONNECTION

PART NO. <i>Specify length in inches, in place of "XX"</i>	CONNECTION TYPES		MAX. WORKING PRESSURE		LENGTH	
	CONNECTION 1	CONNECTION 2	psi	bar	in	mm
SA 517-MP4LMP4L-XX	1/4" MP LH Male	1/4" MP LH Male	22k	1500	3-24	76-609
SA 517-MP4RMP4L-XX	1/4" MP RH Male	1/4" MP LH Male	22k	1500	3-24	76-609
SA 517-MP4RMP4R-XX	1/4" MP RH Male	1/4" MP RH Male	22k	1500	3-24	76-609
SA 537-MP6LMP6L-XX	3/8" MP LH Male	3/8" MP LH Male	22k	1500	3-24	76-609
SA 537-MP6RMP6L-XX	3/8" MP RH Male	3/8" MP LH Male	22k	1500	3-24	76-609
SA 537-MP6RMP6R-XX	3/8" MP RH Male	3/8" MP RH Male	22k	1500	3-24	76-609
SA 567-MP9LMP9L-XX	9/16" MP LH Male	9/16" MP LH Male	22k	1500	3-24	76-609
SA 567-MP9RMP9L-XX	9/16" MP RH Male	9/16" MP LH Male	22k	1500	3-24	76-609
SA 567-MP9RMP9R-XX	9/16" MP RH Male	9/16" MP RH Male	22k	1500	3-24	76-609
SA 577-MP12LMP12L-10.5	3/4" MP LH Male	3/4" MP LH Male	22k	1500	3-24	76-609
SA 577-MP12RMP12L-XX	3/4" MP RH Male	3/4" MP LH Male	22k	1500	3-24	76-609
SA 577-MP12RMP12R-XX	3/4" MP RH Male	3/4" MP RH Male	22k	1500	3-24	76-609
SA 577-G12P4-XX-0	3/4"-16 RH Male O-Ring	1/4" NPT Female	22k	1500	3-24	76-609
SA 587-MP16LMP16L-XX	1" MP LH Male	1" MP LH Male	22k	1500	3-24	76-609
SA 587-MP16RMP16L-XX	1" MP RH Male	1" MP LH Male	22k	1500	3-24	76-609
SA 587-MP16RMP16R-XX	1" MP RH Male	1" MP RH Male	22k	1500	3-24	76-609

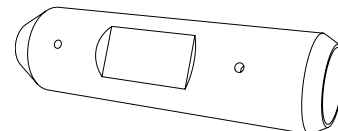
# FITTINGS

## 20K PSI (1380 BAR)

### SLIMLINE LANCE COUPLINGS

- Used to couple rigid and flex lances without the use of glands and collars to allow them to fit into tubes
- Additional couplings available upon request

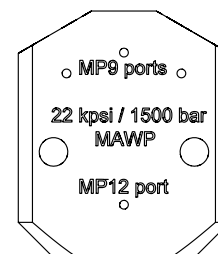
PART NO.	CONNECTION 1	CONNECTION 2	MAX. WORKING PRESSURE	
			psi	bar
AF 073-MP4LMP4L-SL	1/4" MPLH Female	1/4" MPLH Female	22k	1500
AF 073-MP4RMP4L-SL	1/4" MPRH Female	1/4" MPLH Female	22k	1500
AF 073-MP4RMP4R-SL	1/4" MPRH Female	1/4" MPRH Female	22k	1500
AF 073-MP4RMP6R-SL	3/8" MPLH Female	3/8" MPRH Female	22k	1500
AF 073-MP6LMP6L-SL	3/8" MPLH Female	3/8" MPLH Female	22k	1500
AF 073-MP6RMP6L-SL	3/8" MPRH Female	3/8" MPLH Female	22k	1500
AF 073-MP6RMP6R-SL	3/8" MPRH Female	3/8" MPRH Female	22k	1500
AF 073-MP6LMP9L-SL	3/8" MPLH Female	9/16" MPLH Female	22k	1500
AF 073-MP9RMP6R-SL	3/8" MPRH Female	9/16" MPRH Female	22k	1500
AF 073-MP9LMP9L-SL	9/16" MPLH Female	9/16" MPLH Female	22k	1500
AF 073-MP9RMP9L-SL	9/16" MPRH Female	9/16" MPLH Female	22k	1500
AF 073-MP9RMP9R-SL	9/16" MPRH Female	9/16" MPRH Female	22k	1500
AF 073-MP9LMP12L-SL	9/16" MPLH Female	3/4" MPLH Female	22k	1500
AF 073-MP9RMP12R-SL	9/16" MPRH Female	3/4" MPRH Female	22k	1500
AF 073-MP12LMP12L-SL	3/4" MPLH Female	3/4" MPLH Female	22k	1500
AF 073-MP12RMP12L-SL	3/4" MPRH Female	3/4" MPLH Female	22k	1500
AF 073-MP12RMP12R-SL	3/4" MPRH Female	3/4" MPRH Female	22k	1500



### MANIFOLDS

- Manifolds used in 2L, 3L, BRLM systems

PART NO.	OUTLET CONNECTION	INLET CONNECTION	MAWP PSI/BAR	
			psi	bar
ABX 369-MP12	9/16" MP Female	3/4" MP Female	22k	1500



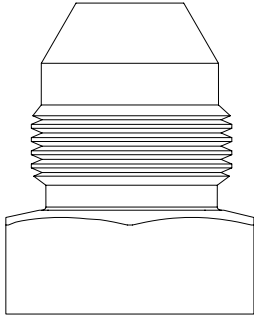
# FITTINGS

## 20K PSI (1380 BAR)

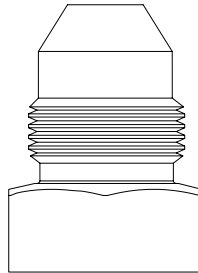
### MEDIUM PRESSURE (MP)

- Industry standard connection for 20k psi (1400 bar) applications.

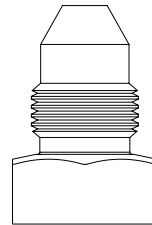
### SIZE REFERENCE CHART SINGLE PIECE MALE • ACTUAL SIZE



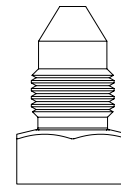
**3/4"**



**9/16"**



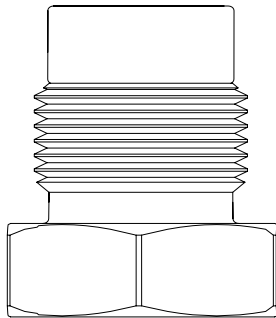
**3/8"**



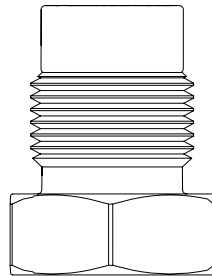
**1/4"**

### MEDIUM PRESSURE (MP)

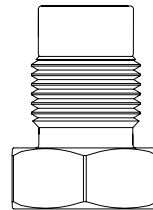
### SIZE REFERENCE CHART GLANDS AND COLLARS • ACTUAL SIZE



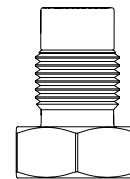
**3/4"**



**9/16"**



**3/8"**



**1/4"**

SIZE	GLAND CONNECTION THREAD	TUBING THREAD LEFT-HAND	RECOMMENDED TORQUE	
			ft-lbs	N-m
1/4" MP	7/16" - 20UNF	1/4" - 28UNF	20	27
3/8" MP	9/16" - 18UNF	3/8" - 24UNF	30	41
9/16" MP	13/16" - 16UNF	9/16" - 18UNF	85	15
3/4" MP	3/4" - 14NPSM	3/4" - 16UNF	90	122
1" MP	1-3/8 - 12UNF	1" - 14UNF	125	170

# FITTINGS

## 20K PSI (1380 BAR)

### TYPE M

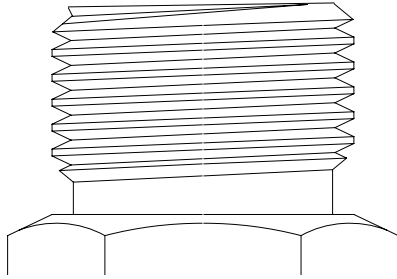
- Industry standard connection

### SIZE REFERENCE CHART

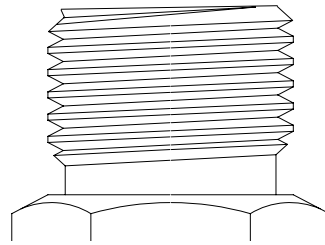
#### SINGLE PIECE MALE

#### ACTUAL SIZE

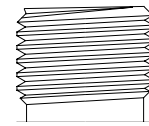
SIZE	CONNECTION THREAD	RECOMMENDED TORQUE	
		ft-lb	N-m
9/16" Type M	9/16" – 18UNF	30	41
3/4" Type M	3/4" – 16UNF	45	61
Type M	1" – 12UNF	70	95
1-5/16" Type M	1-5/16" – 12UN	110	149



1 5/16"



1"



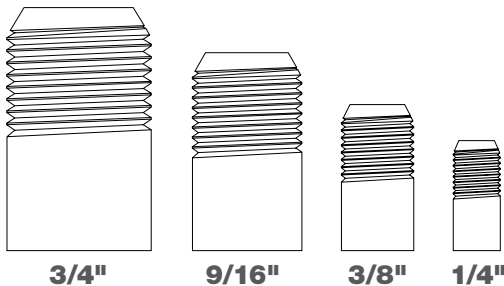
9/16"

### MEDIUM PRESSURE LANCE

- Industry standard connection for 20,000 psi applications.

### SIZE REFERENCE CHART

#### MALE • ACTUAL SIZE

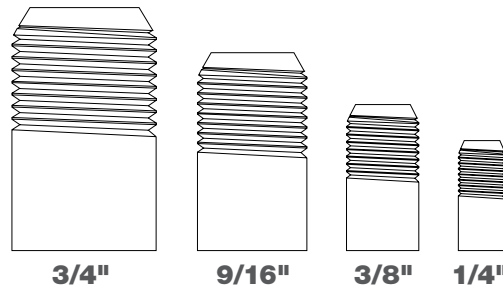


3/4"

9/16"

3/8"

1/4"



3/4"

9/16"

3/8"

1/4"

### RIGHT-HAND THREADS

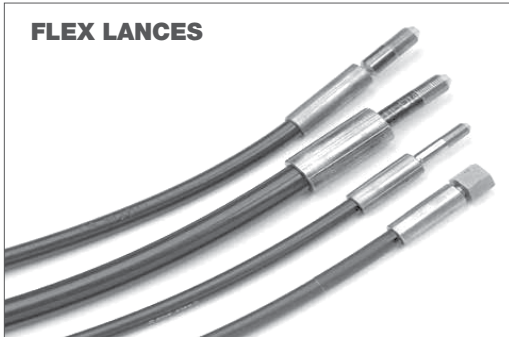
### LEFT-HAND THREADS

SIZE	TUBE CONNECTION THREAD	RECOMMENDED TORQUE	
		ft-lbs	N-m
1/4" MP Tube LH	1/4"-28UNF-LH	15	20
1/4" MP Tube RH	1/4"-28UNF-RH		
3/8" MP Tube LH	3/8"-24UNF-LH	25	34
3/8" MP Tube RH	3/8"-24UNF-RH		
9/16" MP Tube LH	9/16"-18UNF-LH	30	41
9/16" MP Tube RH	9/16"-18UNF-RH		
3/4" MP Tube LH	3/4"-16UNF-LH	45	61
3/4" MP Tube RH	3/4"-16UNF-RH		
1" MP Tube LH	1"-14UNF-LH	70	95

# HOSES/LANCES 40K PSI (2800 BAR)

## HOSES & FLEX LANCES

StoneAge provides a full arrangement of hoses and flex lances for ultra high pressure waterblasting.



1/4"-28 THREADED LANCES	TYPE M SWIVEL NUT	TOOL END CONN.	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	Lb/ft	KG/M	in	mm
ACHO H36035FTM4NZLM	9/16"	1/4"-28 LH Male BP	35	10.7	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
ACHO H36050FTM4NZLM	9/16"	1/4"-28 LH Male BP	50	15.25	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
3/8"-24 THREADED LANCES	TYPE M SWIVEL NUT	TOOL END CONN.	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	bs/Ft	KG/M	in	mm
ACHO H36035FTM6HPS	9/16"	3/8"-24 LH Male Long	35	10.7	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
ACHO H36050FTM6HPS	9/16"	3/8"-24 RH Female Long	35	10.7	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
ACHO H36035FTM6NZLM	9/16"	3/8"-24 RH Male BP	35	10.7	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
ACHO H36050FTM6NZLM	9/16"	3/8"-24 LH Male BP	50	15.25	0.13	3	0.36	9.1	0.6	15.3	40600	2800	0.149	0.222	5.91	150
ACHO H44UHPX035FTM6NZLM	9/16"	3/8"-24 LH Male BP	35	10.7	0.16	4	0.39	9.9	0.445	11.3	44008	3035	0.157	0.234	3.54	90
ACHO H44UHPX050FTM6NZLM	9/16"	3/8"-24 LH Male BP	50	15.25	0.16	4	0.39	9.9	0.445	11.3	44008	3035	0.157	0.234	3.54	90
ACHO H44UHPX075FTM6NZLM	9/16"	3/8"-24 LH Male BP	75	22.86	0.16	4	0.39	9.9	0.445	11.3	44008	3035	0.157	0.234	3.54	90
ACHO H46035FTM6HPS	9/16"	3/8"-24 RH Female Long	50	15.25	0.16	4	0.45	11.5	0.67	17.1	40600	2800	0.245	0.365	6.89	175
ACHO H46050FTM6HPS	9/16"	3/8"-24 RH Male Long	50	15.25	0.16	4	0.45	11.5	0.67	17.1	40600	2800	0.245	0.365	6.89	175
9/16"-18 THREADED LANCES	TYPE M SWIVEL NUT	TOOL END CONN.	LENGTH		INSIDE DIAMETER		OUTSIDE DIAMETER		CRIMP DIAMETER		MAWP		WEIGHT		MIN. BEND RAD.	
			ft	m	in	mm	in	mm	in	mm	psi	bar	bs/Ft	KG/M	in	mm
ACHO H56H035FTM9HPS	3/4"	9/16"-18 LH Male Long	35	10.7	0.2	5	0.52	13.2	0.68	17.5	36250	2500	0.302	0.450	7.87	200
ACHO H56H050FTM9HPS	3/4"	9/16"-18 RH Male Long	35	10.7	0.2	5	0.52	13.2	0.68	17.5	36250	2500	0.302	0.450	7.87	200

# HOSES/LANCES 40K PSI (2800 BAR)

## THREAD LUBRICANTS

Protect the threads on water jetting connections from galling or seizing up.

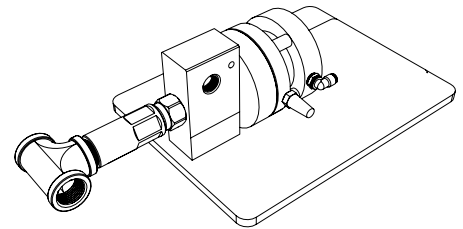


### PART NO. GP 043

Blue Goop Thread Lubricant 2 oz. Tube

## 40K AIR-OPERATED DUMP VALVES

The Air-Operated Dump Valve allows an operator to remotely control pressure in cleaning applications from 40k psi (2800 bar). When air is sent to the cylinder, the valve closes and allows the system to build pressure. The valve opens when the air is exhausted, reducing system pressure to near atmospheric.

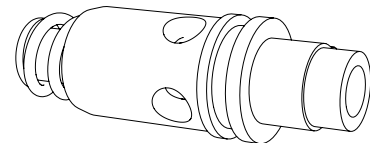


PART NO.	DESCRIPTION
ACDA 61040006-K	Kit, Dump Valve Assembly w/ Air Hose and Fittings, 40k, w/ Base Plate

## HIGH PRESSURE REPLACEMENT CARTRIDGES

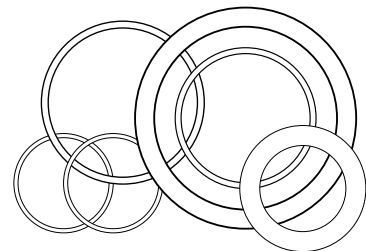
Cartridge Style Design allows dump valve to be rebuilt in under a minute with no special tools.

PART NO.	DESCRIPTION	PRESSURE	
		psi	bar
ACRC 60040001	40k PRV, J/S 53725	40k	2760
ACRC 60040005	40k Hand/Foot, J/S 53475	40k	2760
ACRC 60300001	40k GDWJ Hand/Foot, GDWJ 77700315	40k	2760



## ACCESSORY O-RINGS FOR CARTRIDGES

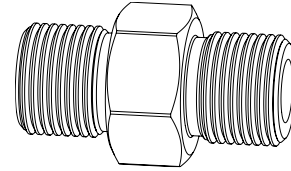
PART NO.	DESCRIPTION
ACOR 30001018	O-Ring 22-17046
ACOR 30001029	O-Ring
ACOR 30001120	O-Ring
ACOR 30001122	O-RING J/S 26776
ACOR 30001218	O-Ring GDWJ 22-74207
ACOR 30003018BU	B/U Ring GDWJ 22-17047
ACOR 30003120BU	Back Up Ring
ACOR 30003122BU	Back Up Ring
ACOR 30003218BU	Back Up Ring



# FITTINGS 40K PSI (2800 BAR)

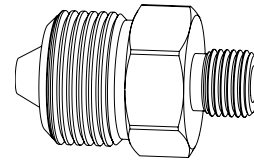
## TYPE M CONNECTORS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 060-060	9/16" Type M Male	9/16" Type M Male	50k	3450
AF 060-062	9/16" Type M Male	7/8" Type M Male	50k	3450
AF 062-062	7/8" Type M Male	7/8" Type M Male	50k	3450
AF 062-063	7/8" Type M Male	1" Type M Male	50k	3450
AF 060-069	1-1/8" Type M Male	9/16" Type M Male	50k	3450
AF 062-069	1-1/8" Type M Male	7/8" Type M Male	50k	3450
AF069-069	1-1/8" Type M Male	1-1/8" Type M Male	50k	3450



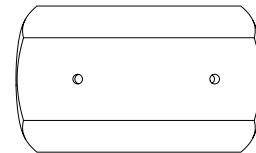
## TYPE M MALE TO HIGH PRESSURE MALE CONNECTORS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 060-H4	9/16" Type M Male	1/4" HP Male	50k	3450
AF 060-H6	9/16" Type M Male	3/8" HP Male	50k	3450
AF 060-H9	9/16" Type M Male	9/16" HP Male	50k	3450
AF 061-H9	3/4" Type M Male	9/16" HP Male	50k	3450
AF 062-H6	7/8" Type M Male	3/8" HP Male	50k	3450
AF 062-H9	7/8" Type M Male	9/16" HP Male	50k	3450
AF 069-H9	1-1/8" Type M Male	9/16" HP Male	50k	3450



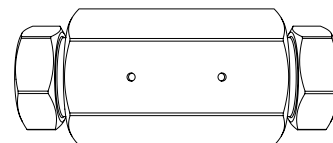
## HIGH PRESSURE STRAIGHT COUPLINGS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 073-H4	1/4" HP Female	1/4" HP Female	50k	3450
AF 073-H4H6	1/4" HP Female	3/8" HP Female	50k	3450
AF 073-H4H9	1/4" HP Female	9/16" HP Female	50k	3450
AF 073-H6	3/8" HP Female	3/8" HP Female	50k	3450
AF 073-H6H9	3/8" HP Female	9/16" HP Female	50k	3450
AF 073-H9	9/16" HP Female	9/16" HP Female	50k	3450



## WITH COLLAR AND GLANDS

PART NO.	CONNECTION TYPE		MAX. OPERATING PRESSURE	
	Connection 1	Connection 2	psi	bar
AF 173-H4	1/4" HP Female	1/4" HP Female	50k	3450
AF 173-H4H6	1/4" HP Female	3/8" HP Female	50k	3450
AF 173-H4H9	1/4" HP Female	9/16" HP Female	50k	3450
AF 173-H6	3/8" HP Female	3/8" HP Female	50k	3450
AF 173-H6H9	3/8" HP Female	9/16" HP Female	50k	3450
AF 173-H9	9/16" HP Female	9/16" HP Female	50k	3450

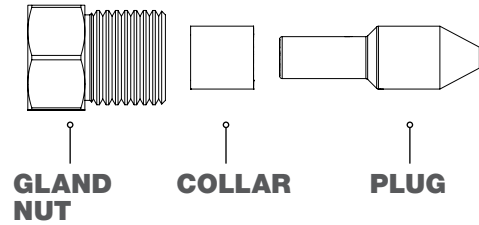


# FITTINGS

## 40K PSI (2800 BAR)

### HIGH PRESSURE GLAND NUTS, COLLARS, AND PLUGS

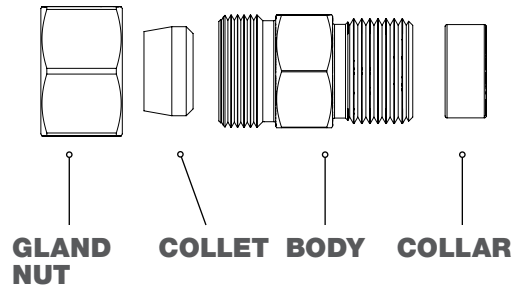
SIZE	GLAND PART NO.	COLLAR PART NO.	PLUG PART NO.
1/4" HP	AF 070-H4	AF 071-H4	AF 076-H4
3/8" HP	AF 070-H6	AF 071-H6	AF 076-H6
9/16" HP	AF 070-H9	AF 071-H9	AF 076-H9



### ANTI-VIBRATION GLAND ASSEMBLIES

Used to reduce stress on tubing threads in conditions where bending or vibration are present. Anti-vibration gland assemblies feature a collet that clamps onto the tubing when tightened to provide extra support and strength.

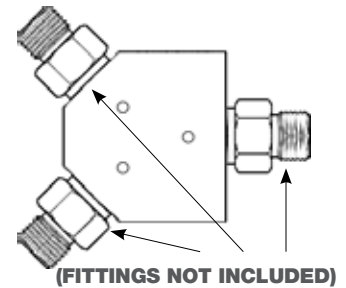
SIZE	ASSEMBLY PART NO.	COLLAR PART NO.
1/4" HP	AF 072-H4	AF 071-H4
3/8" HP	AF 072-H6	AF 071-H6
9/16" HP	AF 072-H9	AF 071-H9



### Y-ADAPTERS

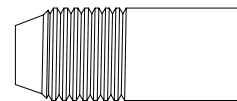
Allows for the connection of two multi-mode valves to one supply source.

PART NO.	CONNECTION 1	CONNECTION 2	MAX. WORKING PRESSURE	
			psi	bar
AF 030-H9	9/16" HP Female		50k	3,450
ABX 369-H9	9/16" HP Female	3/8 HP Female x 3	44k	3,000



### HIGH PRESSURE NIPPLES

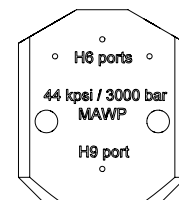
PART NO. <i>Specify length in inches, in place of "XX"</i>	CONNECTION TYPE		MAX. WORKING PRESSURE	
	Connection 1	Connection 2	psi	bar
SA 569-H9LH9L-XX	9/16" HP LH Male	9/16" HP LH Male	60k	4138
SA 569-H9RH9L-XX	9/16" HP RH Male	9/16" HP LH Male	60k	4138
SA 569-H9RH9R-XX	9/16" HP RH Male	9/16" HP RH Male	60k	4138
SA 569-H9LS6-CSTM	9/16" HP LH Male	3/8"-24 Straight Nozzle Female	60k	4138
SA 569-G9S6-10	9/16"-18 Straight O-Ring RH Male	3/8"-24 Straight Nozzle Female	60k	4138



### MANIFOLDS

- Manifolds used in 2L, 3L, BRLM systems

PART NO.	OUTLET CONNECTION	INLET CONNECTION	MAWP PSI/BAR	
			psi	bar
ABX 369-H9	3/8" HP Female	9/16" HP Female	44k	3000

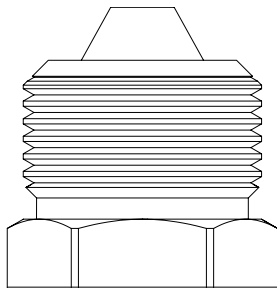


# FITTINGS

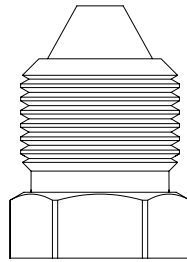
## 40K PSI (2800 BAR)

**HIGH PRESSURE (HP)  
SIZE REFERENCE CHART  
SINGLE PIECE MALE • ACTUAL SIZE**

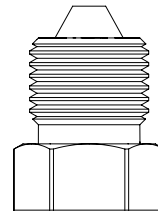
SIZE	RECOMMENDED TORQUE	
	ft-lbs	N-m
1/4" HP	25	34
3/8" HP	50	68
9/16" HP	75	102



**9/16"**



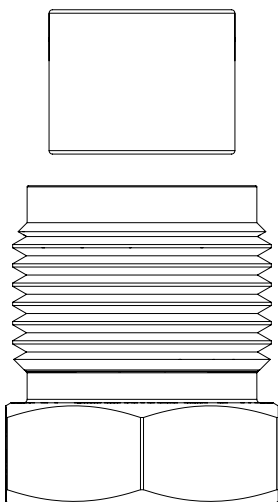
**3/8"**



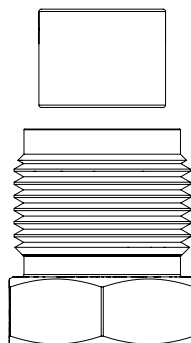
**1/4"**

**HIGH PRESSURE (HP)  
SIZE REFERENCE CHART  
GLANDS AND COLLARS • ACTUAL SIZE**

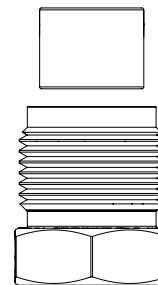
SIZE	RECOMMENDED TORQUE	
	ft-lbs	N-m
1/4" HP	25	34
3/8" HP	50	68
9/16" HP	75	102



**9/16"**



**3/8"**



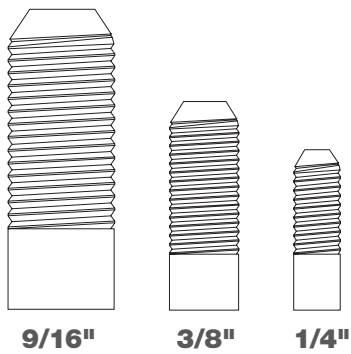
**1/4"**

# FITTINGS

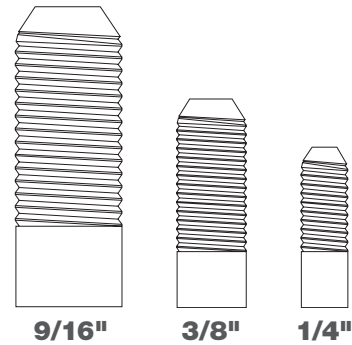
## 40K PSI (2800 BAR)

### HIGH PRESSURE LANCE (HP LANCE) SIZE REFERENCE CHART MALE • ACTUAL SIZE

SIZE	RECOMMENDED TORQUE	
	ft-lbs	N-m
1/4" HP Lance LH	15	20
1/4" HP Lance RH		
3/8" HP Lance LH	20	27
3/8" HP Lance RH		
9/16" HP Lance LH	25	34
9/16" HP Lance RH		



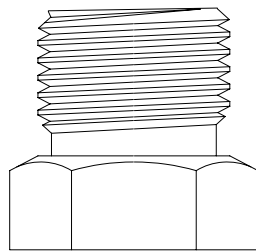
**RIGHT-HAND THREADS**



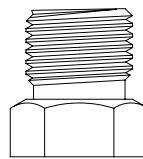
**LEFT-HAND THREADS**

### TYPE M SIZE REFERENCE CHART SINGLE PIECE MALE • ACTUAL SIZE

SIZE	RECOMMENDED TORQUE	
	ft-lbs	N-m
9/16" Type M	30	41
7/8" Type M	60	81



**7/8"**



**9/16"**



# TECHNICAL REFERENCES

## STANDARD THREAD ABBREVIATIONS

NPT = National Pipe Thread	MP = Medium Pressure Cone & Thread Connection	G9 = 9/16 Thread with O-ring Groove Face Seal
NPTM = National Pipe Thread Male	HP = High Pressure Cone & Thread Connection	G12 = 3/4" Thread with O-ring Groove Face Seal
NPTF = National Pipe Thread Female	LH = Left-hand Direct Tube-end Thread Connection	G16 = 1-12 UNF Thread with O-Ring Face Seal
BSPP = British Standard Parallel Pipe	RH = Right-hand Direct Tube-end Thread Connection	K = 1-1/8 Thread with O-ring Groove Face Seal

## STANDARD UNIT ABBREVIATIONS

PRESSURE	FLOW	DISTANCE	WEIGHT	TEMPERATURE
psi = pounds per square inch	gpm = gallons per minute	in. = inches	lb = pounds	°F = degree Fahrenheit
b = bar	l/min = liters per minute	ft = feet	kg = kilograms	°C = degree Celsius
	Cv = flow coefficient	mm = millimeters		
	Cd = discharge coefficient	cm = centimeters		
		m = meters		

## MEASUREMENT CONVERSIONS

FROM	TO	MULTIPLY BY
meters (m)	feet (ft)	3.281
feet (ft)	meters (m)	0.3048
millimeters (mm)	inches (in.)	0.0394
inches (in.)	millimeters (mm)	25.4
l/min	gpm (US)	0.2642
l/min	gpm (Brit)	0.2200
gpm (US)	l/min	3.785
gpm (Brit)	l/min	4.546
gpm (US)	gpm (Brit)	0.8327
gpm (Brit)	gpm (US)	1.201
bar	psi	14.5
psi	bar	0.0689
kilograms (kg)	pounds (mass) (lb)	2.205
pounds (mass) (lb)	kilograms (kg)	0.4536
newtons (N)	pounds (force) (lb)	0.2248
pounds (force) (lb)	newtons (N)	4.448
kilowatts (kW)	horsepower (hp)	1.341
horsepower (hp)	kilowatts (kW)	0.7457

## PRESSURE AND FLOW EQUATIONS

Q = FLOW IN GPM	$Q = 29.92 \times d^2 \times P^{1/2} \times Cd$
V = VELOCITY IN FT/SEC	$V = 12.186 \times P^{1/2} = Cd \times .4085 \times Q/d^2$
P = PRESSURE IN PSI	$P = .00112 \times Q^2/(d^4 \times Cd^2)$
HP = HORSEPOWER	$Hp = .0174 \times d^2 \times P^{3/2} \times Cd, \approx P \times Q/1714$
CV = FLOW COEFFICIENT	$Cv = Q/\Delta P^{1/2}, = 53 \times (D^{2.5}/L^{1/2})$
$\Delta P$ = PRESSURE DROP	$\Delta P = (Q/Cv)^2$
F = THRUST IN LB	$F = \pi/2 \times d^2 \times P \times Cd, = .052 \times P^{1/2} \times Q, \approx .0018 \times (Q/D)^2 \times Cd$
$\Delta T$ = TEMP CHANGE °F	$\Delta T = \Delta P/337.6$

### FOR ALL EQUATIONS:

- L = Tube length in feet
- D = Tube I.D. in inches
- d = Orifice diameter in inches
- Cd = Discharge Coefficient
  - Cd = 0.90 for long cone orifice
  - Cd = 0.70 for drilled steel orifice
  - Cd = 0.65 for sapphire orifice

**OPERATING  
WATERBLASTING  
EQUIPMENT CAN BE  
POTENTIALLY HAZARDOUS.**



See page 9.10 for important  
safety information

# FITTING ASSEMBLY GUIDELINES

Understanding the proper preparation and assembly of high pressure fittings and components is critical to the safe operation and longevity of your tools and equipment.

## TAPERED PIPE THREADS

Tapered pipe threads (NPT) seal by contact of threads. A paste type anti-seize compound such as Parker Thread-Mate™ along with thread sealing tape works most effectively with NPT threads.

- Use anti-seize compound on male thread, then 2–3 wraps of Teflon® tape (if larger than 3/4" NPT, use 3–4 wraps).
- Prepared fittings should engage about 2 turns by hand and at least 5–6 turns before reaching the recommended torque. Failure to reach minimum engagement usually indicates poorly formed or damaged threads.

THREAD SIZE	RECOMMENDED TORQUE	
1/16" NPT	4–5 Nm	3–4 ft-lb
1/8" NPT	20–23 Nm	15–17 ft-lb
1/4" NPT	24–29 Nm	18–21 ft-lb
3/8" NPT	27–34 Nm	20–25 ft-lb
1/2" NPT	54–61 Nm	40–45 ft-lb
3/4" NPT	88–102 Nm	65–75 ft-lb
1" NPT	129–163 Nm	95–120 ft-lb
1-1/4" NPT	176–203 Nm	130–150 ft-lb

## BSPP THREADS

British Standard Parallel Pipe threads (BSPP) seal with the use of a bonded or metal seal that is crushed between the male and female thread at either the face or the shoulder, they do not seal on the threads. A paste type anti-seize compound such as Swagelok Blue Goop® works most effectively with BSPP threads.

- Use anti-seize compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD SIZE	RECOMMENDED TORQUE	
1/8" BSPP	20–22 Nm	15–16 ft-lb
1/4" BSPP	30–35 Nm	22–26 ft-lb
3/8" BSPP	40–50 Nm	30–37 ft-lb
1/2" BSPP	55–65 Nm	41–50 ft-lb
3/4" BSPP	90–100 Nm	66–74 ft-lb
1" BSPP	135–160 Nm	100–118 ft-lb
1-1/4" BSPP	200–230 Nm	150–170 ft-lb

## METRIC THREADS

Metric threads with cone seal (M36, M24, M7) seal with the use of an angled male and female conical surface, they do not seal on the threads. A paste type anti-seize compound such as Swagelok Blue Goop® works most effectively with metric cone seal threads.

- Use anti-seize compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD SIZE	RECOMMENDED TORQUE	
M7	18–20 Nm	13–15 ft-lb
M24	90–105 Nm	66–77 ft-lb
M36	190–220 Nm	140–162 ft-lb

### TYPE M SWIVEL

Type M swivel nut threads (TM12, AF 060-XX, AF 061-XX, AF 062-XX, AF 063-XX) seal with the use of an angled male and female cone, they do not seal on the threads. Designed for fast, simple connections of waterblast hoses and waterblast equipment. A paste type anti-seize compound such as Swagelok Blue Goop® works most effectively with metric cone seal threads.

- Use anti-seize compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD SIZE	RECOMMENDED TORQUE	
9/16"	46–52 Nm	34–38 ft-lb
3/4"	75–81 Nm	55–60 ft-lb
7/8"	102–109 Nm	75–80 ft-lb
1"	122–135 Nm	90–100 ft-lb
1-5/16"	176–203 Nm	130–150 ft-lb

### SAPPHIRE NOZZLES

Sapphire Nozzle threads (OS4, OS6, OS7) seal with the use of an angled male and female seat, they do not seal on the threads. A paste type anti-seize compound such as Swagelok Blue Goop® works most effectively with seat seal threads.

- Use anti-seize compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD SIZE	RECOMMENDED TORQUE	
1/4"-28 OS4	6–7.5 Nm	4.5–5.5 ft-lb
3/8"-24 OS6	19–22 Nm	14–16 ft-lb
7/16"-20 OS7	34–37 Nm	25–27 ft-lb

### SAPPHIRE/M3 NOZZLES

Sapphire and M3 Nozzle threads (OS2, O.D.3M) seal with the use of a thread sealing compound. Loctite® 680 is applied to the male thread. This type of thread needs to have a curing time of 24 hours before water pressure is applied.

- Use thread sealing compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD SIZE	RECOMMENDED TORQUE	
M3 Drilled Nozzle	6–7.5 Nm	4.5–5.5 ft-lb
6-40 UNF Sapphire Nozzle	19–22 Nm	14–16 ft-lb

# FITTING ASSEMBLY GUIDELINES

## STONEAGE PROPRIETARY

StoneAge proprietary threads (G9, G12, G16, K) seal with the use of an O-Ring on the male thread and a flat face at the bottom of the female thread. They do not seal on the threads. A paste type anti-seize compound such as Swagelok Blue Goop® works most effectively with these StoneAge proprietary threads.

- Use anti-seize compound on male thread.
- Prepared fittings should engage fully by hand.

THREAD TYPE	RECOMMENDED TORQUE	
G9	46–52 Nm	34–38 ft-lb
G12	75–81 Nm	55–60 ft-lb
G16	105–115 Nm	80–90 ft-lb
K	122–135 Nm	90–100 ft-lb

## MEDIUM & HIGH PRESSURE FITTINGS

These “cone and thread” fittings use straight threads and seal on a tapered cone. There are two pressure ranges for this type of connection: medium pressure up to 22,000 psi and high pressure up to 40,000 psi. The traditional design consists of pressure containing tubing with a cone on one end and a left-hand thread for a collar and a larger gland nut with right-hand threads. Fitting sizes are indicated by tubing O.D.

Anti-vibe, an additional feature typically included, consists of a split tapered collet that grips the tubing in support to prevent cracking at the left-hand thread.

Variations of these fittings are made where the entire geometry is reproduced in one piece and where the tubing itself is directly threaded into a port with either left or right hand threads.

Female ports have a weep hole that will leak if the fitting is not tightened, if the cone surface is damaged, or if the collar is not threaded on far enough to allow contact of the cone to the seat. If a connection leaks along the tubing through the inside of the gland nut, inspect for a crack in the tubing threads.

### Gland and Collar Assemblies

- Inspect cone surface for damage.
- Use Swagelok Blue Goop® on all male threads.
- Slide gland nut onto tubing, then thread on collar until one thread shows between collar and cone.
- Tighten medium pressure anti-vibe nut last while holding other flats.

### One Piece Connections

- Inspect cone surface for damage.
- Use Swagelok Blue Goop® on male threads.

THREAD SIZE	TORQUE	
1/4"-28 Left Hand	6.5 Nm	5 ft-lb
1/4"-28 Right Hand	6.5 Nm	5 ft-lb
1/4" Gland and Collar 7/16-20	24 Nm	18 ft-lb
3/8"-24 Left Hand	22 Nm	16 ft-lb
3/8"-24 Right Hand	22 Nm	16 ft-lb
3/8" Gland and Collar 9/16"-18	38 Nm	28 ft-lb
9/16"-18 Left Hand	47 Nm	34 ft-lb
9/16"-18 Right Hand	47 Nm	34 ft-lb
9/16" Gland and Collar 13/16-16	68 Nm	50 ft-lb
3/4"-16 Left Hand	70 Nm	50 ft-lb
3/4"-16 Right Hand	70 Nm	50 ft-lb
3/4" Gland and Collar 3/4-14 NPSM	102 Nm	75 ft-lb
1"-12 Left Hand	98 Nm	70 ft-lb
1"-12 Right Hand	98 Nm	70 ft-lb
1" Gland and Collar 1-3/8"-12	135 Nm	100 ft-lb

## STONEAGE THREAD SIZE CODING

We use several codes in StoneAge Part IDs to indicate relevant thread sizes:

NPT THREAD SIZE	STONEAGE CODE
1/16" NPT	P1
1/8" NPT	P2
1/4" NPT	P4
3/8" NPT	P6
1/2" NPT	P8
3/4" NPT	P12
1" NPT	P16
1-1/4" NPT	P20
1-1/2" NPT	P24
BSPP THREAD SIZE	STONEAGE CODE
1/8" BSPP	BSPP2
1/4" BSPP	BSPP4
3/8" BSPP	BSPP6
1/2" BSPP	BSPP8
3/4" BSPP	BSPP12
1" BSPP	BSPP16
1-1/4" BSPP	BSPP20
METRIC THREAD SIZE	STONEAGE CODE
M3 x .5	M3
M7 x 1	M7
M24 x 1.5	M24
M36 x 2	M36
STRAIGHT THREAD SIZE	STONEAGE CODE
M3 x .5 Drilled Nozzle	OD3M
6-40 UNF Sapphire Nozzle	OS2
1/4"-28 UNF Sapphire Nozzle	OS4
3/8"-24 UNF Sapphire Nozzle	OS6
7/16"-20 UNF Sapphire Nozzle	OS7

## FOR EXAMPLE:

**BN9.5-P1** is the Part ID for a Banshee swivel. The **P1** indicates 1/16 NPT inlet thread.

The same applies for nipples/lances:

**SA 356-P8P4-12** is the Part ID for an extension nipple. The **P8P4** indicates 1/2" NPT one end and 1/4" NPT other end. The **-12** indicates overall length in inches.

For metric threads:

**BN9.5-M7** is the Part ID for a Banshee swivel. The **M7** indicates M7 x 1 inlet thread.

The same applies for adapters:

**GP 255-M24OM24C** is the Part ID for a hose adapter. The **M24** indicates M24 x 1.5 thread on one side. The **O** designates an o-ring seal. The second **M24** indicates M24 x 1.5 thread on the other side, with the **C** designating an internal cone to suit a standard M24 Female hose end.

# FITTING ASSEMBLY GUIDELINES

## STONEAGE THREAD SIZE CODING

MP THREAD SIZE	STONEAGE CODE
1/4"-28 Left Hand	MP4L
1/4"-28 Right Hand	MP4R
1/4" Gland and Collar 7/16"-20	MP4
3/8"-24 Left Hand	MP6L
3/8"-24 Right Hand	MP6R
3/8" Gland and Collar 9/16"-18	MP6
9/16"-18 Left Hand	MP9L
9/16"-18 Right Hand	MP9R
9/16" Gland and Collar 13/16"-16	MP9
3/4"-16 Left Hand	MP12L
3/4"-16 Right Hand	MP12R
3/4" Gland and Collar 3/4"-14 NPSM	MP12
M14 x 1.5 Left Hand	MPM14L
1"-12 Left Hand	MP16L
1"-12 Right Hand	MP16R
1" Gland and Collar 1-3/8"-12	MP16

HP THREAD SIZE	STONEAGE CODE
1/4"-28 Left Hand	H4L
1/4"-28 Right Hand	H4R
1/4" Gland and Collar 9/16"-18	H4
3/8"-24 Left Hand	H6L
3/8"-24 Right Hand	H6R
3/8" Gland and Collar 3/4"-16	H6
9/16"-18 Left Hand	H9L
9/16"-18 Right Hand	H9R
9/16" Gland and Collar 1-1/8"-12	H9
M14x1.5 Left Hand	HM14L

STONEAGE THREAD SIZE	STONEAGE CODE
9/16"-18 UNF O-Ring Face	G9
3/4"-16 UNF O-Ring Face	G12
1"-12 UNF O-Ring Face	G16
1-1/8"-12 UNC O-Ring Face	K
3/4" Type M Male	TM12

### FOR EXAMPLE:

**BN18-MP9L** is the Part ID for a Banshee swivel. The **MP9L** indicates 9/16"-18 UNF left hand thread. So this tool would fit directly to a 9/16"-18 LH hose or lance end.

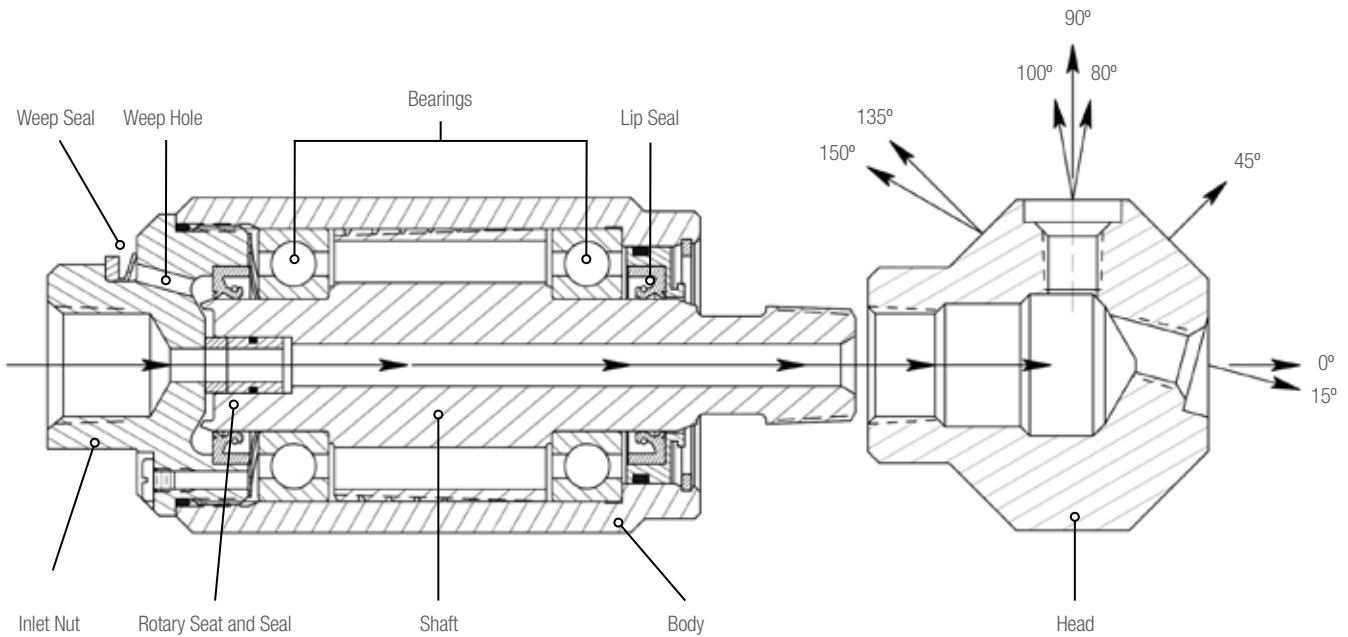
**BN33-MP9** is the Part ID for a Banshee swivel. The **MP9** indicates a 9/16" MP inlet that requires a gland and collar and the actual thread size is 13/16"-16 UNF right hand. Check the fittings and adapters section for the correct selection of gland nut and collar or other adapter.

**BJV-MP12-S** is the Part ID for a BJV swivel. The **MP12** indicates a 3/4" MP inlet that requires a gland and collar and the actual thread size is 3/4"-14 NPSM right hand. Check the fittings and adapters section for the correct selection of gland and collar or other adapter.

**BN13-H4L** is the Part ID for a Banshee swivel. The **H4L** indicates 1/4"-28 UNF left hand thread. The tool would fit directly to a 1/4"-28 LH hose or lance end.

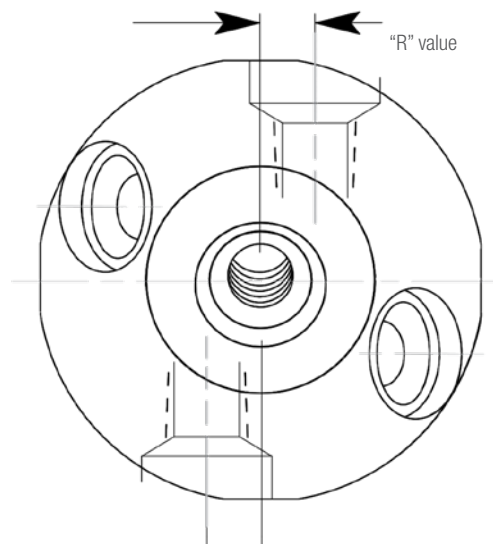
**BC-H9-C** is the Part ID for a Barracuda tool assembly. The **H9** indicates a 9/16" HP inlet that requires a gland and collar and the actual thread size is 1 1/8"-12 right hand. Check the fittings and adapters section for the correct selection of gland and collar.

## STONEAGE SWIVEL BASICS



**StoneAge swivels are designed for optimal delivery of high pressure water for cleaning applications:**

- Water flows in a direct path through the tool from the inlet.
- Weep seals keep contaminants out of the high pressure seat area.
- Weep holes allow water that may leak past the high pressure seat to escape – if a seat leaked and the nut was unable to release pressure, it could “wash out” the viscous fluid or blow the inlet nut off the end of the tool.
- In our rotary seat and seal design, brass or carbide seats seal against inlet nut. The plastic seal under the seat “swells” and rotates with the shaft and against the seat so the seat does not rotate against the nut.
- Lip seals seal in governor fluid (the fluid helps to control rotation speed) and keep contaminants out.
- Jet ports are called by degree, zero being in a straight line with the inlet side of the tool.



- The “R” value on our heads is the offset at 90°, even if the head has no ports there.

# MAINTENANCE KITS

STONEAGE TOOL	SERVICE KIT	SEAL KIT	OVERHAUL KIT	TOOL KIT	LUBRICANT
BARRACUDA - BC-K - 20K PSI	BC 600	BC 602	BC 610	BC 612	GP 042
BARRACUDA - BC-H9-C - 40K PSI	BC 600-H9-C	BC 602-H9-C	BC 610-H9-C	BC 612	GP 042
BJVE-P12		BJVE 602	BJVE 610	BJVE 612	
BJV-M24		BJVE 602	BJVE 610	BJVE 612	
BJV-P16		BJVE 602	BJVE 610	BJVE 612	
BJV-20K		BJVE 602	BJVE 610	BJVE 612	
BJV-H9	BJ 600-H9-X	BJ 602-H9	BJ 610-H9-X	BJ 612-H9	BJ 048-X
GOPHER - GO-M9 - 20K PSI	GO 600	GO 602	GO 610	GO 612	GP 044
GOPHER - GO-H9-C - 40K PSI	GO 600-H9-C	BC 602-H9-C	GO 610-H9-C	GO 612	GP 044
RAPTOR - RPT	RPT 600-X	RPT 602	RPT 610-X	RPT 612	
BADGER - 15K PSI	BAE 600-X	BAE 602	BAE 610-X	BAE 612	
BADGER - BA-P8 & BA-M9	BA 600-P8/M9	BA 602-P8/M9	BA 610-P8/M9	BA 612-P8/M9	BJ 048-F
BADGER - BA-40K	BA 600-H6	BA 602-H6	BA 610-H6	BA 612-H6	BJ 048-F
CST	CST 600		CST 610		GP 048
TORUS TR-130	TR130 600	TR130 602	TR130 610		GP 048
TORUS TR-200	TR200 600	TR200 602	TR200 610		GP 048
SL-P8P4	SL 600-P		SL 610-P	SL 612	GP 048
SL-M9AV9	SL 600-K		SL 610-K	SL 612	GP 048
SG-P8P8 & SG-M12M12	SG 600		SG 610	SG 612	GP 048
SG-P12P12-M & SG-M16M16	SG 600-M		SG 610-M	SG 612	GP 048
SG-CCN	SG 600-CCN		SG 610-CCN	SG 612	GP 048
SH-P8P8	SH 600		SH 610		GP 048
SM-P16	SM 600-P16		SM 610-P16		GP 048
SM-P20	SM 600-P20		SM 610-P20		GP 048
HI	HI 600		HI 610		GP 048
UH-H9H6	UH 600		UH 610	UH 612	GP 048
UHS-H9H9	UHS 600		UHS 610	UHS 612	GP 048

**NOTE:** X Indicates fast or slow rotation speeds available. Please specify when ordering.

**SERVICE KITS** - Kits contain everything needed for routine maintenance, including: high pressure seals, critical o-rings, a seat for the high pressure seal (where applicable), 6 oz. of viscous fluid for rotation control (where applicable) and a fill tube or syringe. Call or visit our website for specific details regarding individual service kits.

**SEAL KITS** - Identical to the Service Kits, but does not include viscous fluid, fill tube and syringe. These kits are for customers who already have these items. Call or visit our website for specific details regarding individual seal kits.

**OVERHAUL KITS** - Kits contain normal wear items, including: a single high pressure seal and seat, shaft seals, bearings and 6 oz. of viscous fluid (where applicable). Call or visit our website for specific details regarding individual overhaul kits.

**TOOL KITS** - These kits differ for every StoneAge tool. They contain special tools for seating shaft seals or performing other tool-specific maintenance. Call or visit our website for specific details regarding individual tool kits.

**LUBRICANTS** - Lubricants are available in each manufacturer's packaging for your convenience.

## ⚠️ WARNING ⚠️

Operations with waterblast equipment can be potentially hazardous. Caution **MUST** be exercised prior to and during machine and water jet tool use.

Please read and follow all of these instructions, in addition to the guidelines in the WJTA Recommended Practices handbook, available online at [www.wjta.org](http://www.wjta.org). Deviating from safety instructions and recommended practices can lead to severe injury and/or death.

- Do not exceed the maximum operating pressure specified for any component in a system.
- The immediate work area **MUST** be marked off to keep out untrained persons.
- Inspect the equipment for visible signs of deterioration, damage, and improper assembly. Do not operate if damaged, until repaired.
- Make sure all threaded connections are tight and free of leaks.
- Always de-energize the system before opening a door to service or replace any parts. Failure to do so can result in severe injury and/or death.

### PRE-RUN SAFETY CHECK

Install mechanical stops, stingers and back out preventers as appropriate when doing any tube, pipe or vessel cleaning. See the WJTA-IMCA's Recommended Practices for the use of high-pressure water jetting equipment and/or the water jetting association's, WJA Code of Practice for additional safety information.

- Complete a job specific risk assessment and act on the resulting actions.
- Adhere to all site specific safety procedures.
- Ensure the waterblasting zone is properly barricaded and that warning signs are posted.
- Ensure the work place is free of unnecessary objects (e.g. loose parts, hoses, tools).
- Ensure all Operators are using the correct Personal Protective Equipment (PPE).
- Check that the air hoses are properly connected and tight.
- Check all hoses and accessories for damage prior to use. Do not use damaged items. Only high quality hoses intended for waterblast applications should be used as high-pressure hoses.
- Check all high-pressure threaded connections for tightness.
- Operate the high-pressure water at full pressure and use the Pneumatic Foot Pedal Dump Control to verify that the dump valve is working properly.
- Ensure that Operators never connect, disconnect, or tighten hoses, adapters, or accessories with the high-pressure water pump unit running.
- Ensure no personnel are in the hydroblasting zone.

### PERSONAL PROTECTIVE EQUIPMENT

Use of Personal Protective Equipment (PPE) is dependent on the working pressure of water and the cleaning application. Managers, Supervisors and Operators **MUST** carry out a job specific risk assessment to define the exact requirements for PPE. See Protective Equipment for Personnel (Section 6) of WJTA-IMCA's Recommended Practices For The Use Of High-pressure Water jetting Equipment for additional information.

- Hygiene—Operators are advised to wash thoroughly after all waterjetting operations to remove any waterblast residue which may contain traces of harmful substances.
- First aid provision—users **MUST** be provided with suitable first aid facilities at the operation site.

#### PPE MAY INCLUDE:

- Eye protection: Full face visor
- Foot protection: Kevlar® brand or steel toe capped, waterproof, non-slip safety boots
- Hand protection: Waterproof gloves
- Ear protection: Ear protection for a minimum of 85 dBA
- Head protection: Hard hat that accepts a full face visor and ear protection
- Body protection: Multi-layer waterproof clothing approved for water jetting
- Hose protection: Hose shroud
- Respiratory protection: May be required; refer to job specific risk assessment

**StoneAge has designed and manufactured this equipment considering all hazards associated with its operation. StoneAge assessed these risks and incorporated safety features in the design. StoneAge DOES NOT accept responsibility for the results of misuse.**

- IT IS THE RESPONSIBILITY OF THE INSTALLER/OPERATOR to conduct a job specific risk assessment prior to use. Job specific risk assessment **MUST** be repeated for each different set up, material and location.
- The risk assessment **MUST** conform to the Health and Safety at Work Act 1974 and other applicable Health and Safety legislation.
- The risk assessment **MUST** consider potential material or substance hazards including: **Aerosols, Biological and microbiological (viral or bacterial) agents, Combustible materials, Dusts, Explosion, Fibers, Flammable substances, Fluids, Fumes, Gases, Mists, Oxidizing Agents.**

# CUSTOMER SERVICE

**1-866-795-1586 (TOLL FREE IN THE U.S.)**

**OUTSIDE THE US: 970-259-2869 • SALES@STONEAGETOOLS.COM**

**HOURS: 8:00 AM - 5:00 PM MONDAY - FRIDAY (USA MOUNTAIN TIME)**

## **TECHNICAL SUPPORT**

For Technical Support in North America, please contact StoneAge. Outside of North America, please visit our website at [www.stoneagetools.com](http://www.stoneagetools.com).

## **MANUALS**

Operator's manuals and repair videos for all equipment are available online. They illustrate tools, identify parts and detail maintenance and overhaul procedures.

## **REPAIRS**

Repair & Maintenance Service is available by the same technicians who build and test our tools. We try to complete repairs and test every tool within three days of receipt. You must call StoneAge for an RMA number prior to sending your tool in for repair.

**Send tool to:** StoneAge Inc. Attention Repairs, 466 S. Skylane Dr., Durango CO 81303, USA

Serial Number Database is maintained on all equipment sold. If a serial number is provided when ordering parts, we can verify that the right parts are specified.

## **LEAD TIME**

Parts and Service Kits are available to ship same day as ordered. Standard tools can usually be shipped the next day. Custom porting of heads usually requires 3-4 days to schedule through the factory. More complicated systems like Lancing Machines are built when ordered, which can take several weeks depending on factory backlog. Check availability and place orders early enough to avoid scheduling conflicts.

## **ORDERING**

Call or email your order to StoneAge or an authorized dealer with purchase order number, shipping and billing addresses and delivery date. Check datasheet to ensure specifications are complete. Advise whether we should hold shipment until all items are available.

## **SHIPPING**

Shipping is pre-paid and invoiced with order but may be charged directly to the customer's account with selected courier by special instruction. Most orders are shipped via UPS or Fed Ex couriers; specify a preference if you wish. Larger equipment will be shipped by truck or air freight. Either party may make the arrangements. Airline counter-to-counter delivery is not reliable from our mountain location.

## **PAYMENT**

Major credit cards or bank transfers are accepted. Pre-payment is required to ship custom equipment.

## **RETURNS**

Any parts returned for credit or warranty must be accompanied by a StoneAge RMA number. Please contact a Customer Service Specialist or Authorized Dealer to obtain an RMA number. A minimum restocking fee of 15% applies to standard items returned unused. Returns will only be accepted on unused items returned 6 months or less from invoice date. All returns and restocking fees are subject to StoneAge final decision. Returns of custom products and obsolete items are not accepted.

# TERMS & CONDITIONS

## REFERENCES

**PRODUCTS SOLD BY SELLER ARE DESIGNED AND INTENDED TO BE USED AT HIGH PRESSURES AND SPEEDS AND MAY BE DANGEROUS IF OPERATED IMPROPERLY OR WITHOUT THE USE OF APPROPRIATE SAFETY DEVICES AND GUARDS. BUYER IS CAUTIONED TO CAREFULLY READ AND UNDERSTAND THESE TERMS AND CONDITIONS, AS THEY HAVE IMPORTANT LEGAL CONSEQUENCES.**

- 1. Purchase Orders.** Buyer shall order products in accordance with these Terms and Conditions. Orders for the purchase of products ("Purchase Order(s)") must be submitted to Seller by an authorized representative of Buyer by email. Each Purchase Order shall specify (i) the quantity of products being ordered, (ii) product prices, (iii) payment terms granted by Seller and (iv) a requested receipt date. Requested receipt dates must be during the term of the Waterblast Tool Reseller Agreement, except, in its sole discretion, Seller may elect to accept a Purchase Order with a requested receipt date after the expiration or termination of Waterblast Tool Reseller Agreement, in which case these Terms and Conditions shall apply to such shipment, but under no circumstances should such shipment be deemed to be or construed as being a renewal, amendment or extension of the Waterblast Tool Reseller Agreement. The Parties agree that these Terms and Conditions shall prevail over any conflicting terms and conditions in any Purchase Order, acknowledgment form, or other instrument. Any additional or different terms or conditions in any Purchase Order, acknowledgment form, or other instrument or response from Buyer shall be deemed rejected by Seller without need of any further or additional notice of rejection and such additional or different term shall be of no effect or in any way binding upon Seller. Seller assumes and shall have no liability for any delay in filling or shipping any Purchase Orders.
- 2. Acceptance of Purchase Order by Seller.** Purchase Orders are subject to written acceptance by an authorized representative of Seller and such acceptance is made expressly conditional on assent by an authorized representative of Buyer to the Terms and Conditions. Seller reserves the unconditional right to reject any Purchase Order, in whole or in part. Purchase Orders submitted by Buyer shall not be binding on Seller until the earlier of written acceptance by Seller or shipment and acceptance by shipment shall only be binding as to the portion of the Purchase Order actually shipped by Seller. Any automatic or computer generated response to a Purchase Order by Seller's internal electronic data exchange system or otherwise shall not be deemed acceptance of a Purchase Order. Notwithstanding the foregoing, Seller reserves the right to refuse, cancel, modify or delay any Purchase Order placed by Buyer and accepted by Seller when Buyer is delinquent in payments or when Buyer has failed to perform any of its obligations under the Waterblast Tool Reseller Agreement.
- 3. Payment/Prices.** Unless other arrangements have been made in writing between Seller and Buyer, payment for product delivered shall be made upon receipt of invoice. The prices shown on the face hereof are those currently in effect. Prices invoiced shall be per pricelist in effect at the time of shipment. Prices are subject to increase for inclusion of any and all taxes which are applicable and which arise from the sale, delivery or use of Seller's products or services and for the collection of which Seller is or may be responsible to any governmental authority unless acceptable exemption certificates are provided by Buyer in accordance with law. Buyer shall pay all charges for transportation and delivery and all excise, order, occupation, use or similar taxes, duties, levies, charges or surcharges applicable to the equipment or services being purchased, whether now in effect or hereafter imposed by any governmental authority, foreign or domestic.
- 4. Warranty.** Subject to the limitations and conditions hereinafter set forth, Seller warrants to the original Buyer that its products are free from defects in workmanship and material for a period of one (1) year from shipment. Seller's obligation under this warranty shall be limited to repairing, replacing or issuing a credit for, at Seller's option, any products or services it finds to be defective in material or workmanship. In no event shall Seller be liable for any incidental, consequential or indirect damages of any kind. **THIS WARRANTY SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY FOR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** No statement or recommendation made by Seller or its representative to Buyer or User shall constitute a warranty by Seller or a waiver or modification to any of the provisions hereof or create any liability for Seller. All warranty claims are subject to the exclusions and limitations set forth below:
  - a. The warranty shall not apply if the product or service (1) has been subject to misuse, negligence or accident; (2) has not been installed or operated in accordance with Seller's recommendations; (3) has been operated under more severe conditions than those specified for the particular product or service; (4) has been operated beyond the rated capacity of the product; or (5) has been repaired or altered outside Seller's facilities or in any way so as, in Seller's judgment, to affect its stability or reliability.
  - b. Products that Seller furnishes, but does not manufacture, carry only the warranty of the manufacturer of such products. Where other manufacturers' or suppliers' products used in Seller's products or services prove defective, Seller's liability shall exist only to the extent that Seller is able to recover from such manufacturers or suppliers for such defects.
  - c. Any warranty granted by Seller to the Buyer shall be deemed void if any goods covered by such warranty are used for any purpose not recommended or permitted. In addition, the Buyer shall indemnify Seller and hold Seller harmless from and against any and all claims, damages, losses, costs, expenses and other liability of whatever nature that Seller suffers or incurs by reason of any such unintended use.
  - d. Notice of defective product or service must be given in writing to Seller by Buyer or User within fifteen (15) business days following receipt of goods. Buyer or User shall keep such products or services in an unaltered condition for examination by Seller's representative. No goods may be returned for credit or adjustment without prior written permission from Seller.
- 5. Product Liability.** Buyer specifically acknowledges that the products being purchased may be operated at high speeds and/or pressures and that as such they may be inherently dangerous if not used correctly. Buyer shall be solely responsible for the safe operation of the products at all times and for determining the safety devices and guards that may be required for the safe operation of the products. Buyer shall undertake to specify and order all safety devices and guards necessary for the safe operation of the equipment covered. All safety devices and guards offered in Seller's quotations are recommended for purchase. Seller may provide necessary safety devices and guards not offered in this quotation at an extra price in accordance with the specifications of Buyer. Buyer shall at all times use and require its employees to use all necessary and appropriate safety devices, guards and proper safe operating procedures. Buyer shall not remove or modify any such devices, guards or warning signs and shall insist on safe operating practices on the part of its personnel. In no event shall Seller be responsible for any injuries to persons or property caused by defects in any equipment, including by way of illustration and not limitation, any pumps, compressors, fittings, connections, components, piping or hoses up to the point that same are connected to the product. Buyer agrees to indemnify and to save Seller harmless from any and all liability or obligation

incurred by or against Seller, including costs and attorneys' fees, to or by any persons injured directly or indirectly in the operation of the equipment furnished under the following conditions:

- a) if Buyer fails to purchase and use necessary and appropriate safety devices and guards as determined by Buyer and/or as recommended by Seller.
  - b) if Buyer fails to maintain in good working order such safety devices and guards as are purchased from Seller;
  - c) if Buyer adds, omits, repairs, modified, replaces or substitutes any components on the equipment without permission from Seller;
  - d) if Buyer exceeds at any time the Max. safe loads, pressures or speeds recommended by Seller for the equipment furnished hereunder without the specific written consent of Seller; or
  - e) if Buyer otherwise fails to operate the product or equipment in accordance with Seller's printed instructions or otherwise negligently operates the equipment.
- 6. Delivery.** Shipment of products shall be F.O.B. the Seller's warehouse. Title and risk of loss will pass F.O.B. Seller's shipping point. Buyer will be responsible for and pay all freight, shipment and insurance charges associated with shipment of the products, even if the order is rejected upon delivery. Seller, in its sole discretion, will determine and arrange the means and manner of transportation of the products.

Seller shall use commercially reasonable effort to ship products to Buyer on or before the requested receipt date designated in a Purchase Order. The Parties agree, however, that shipment of any products ordered from Seller under these Terms and Conditions may be delayed for a period of time sufficient to allow Seller to manufacture and assemble or otherwise acquire the products for Buyer. The Parties further agree that Seller shall not be held liable to Buyer or any other party for any delay in shipment of any Purchase Order.

Order errors must be reported by Buyer within fifteen (15) business days from receipt of shipment to secure adjustment. No merchandise may be returned without securing written approval from Seller.
  - 7. Seller's Right to Delay, Cancel, or Allocate.** Notwithstanding the Seller's obligations under the Waterblast Tool Reseller Agreement, Seller reserves the right to refuse, cancel, modify or delay any shipment to Buyer when Buyer is delinquent in payments, when payment for shipment has not been arranged to Seller's reasonable satisfaction, or when Buyer has failed to perform any of its obligations under the Waterblast Tool Reseller Agreement. Should any Buyer Purchase Order for products exceed Seller's available inventory, Seller shall in its sole discretion determine how to allocate its current and anticipated inventory without liability to Buyer on account of the method of allocation determined or its implementation.
  - 8. Technical Advice.** All technical advice, recommendations and services of Seller are intended for use by persons having adequate skill, at their own risk and Seller assumes no responsibility and Buyer hereby waives all claims against Seller, for results obtained or damages incurred from the use of Seller's advice, recommendations and services.
  - 9. Modification.** These Terms and Conditions are intended by Seller and Buyer to constitute a final, complete and exclusive expression of agreement and cannot be supplemented or amended without Seller's prior written approval. Seller's waiver of any breach or failure to enforce any of the Terms and Conditions at any time, shall not in any way affect, limit or waive Seller's right thereafter to enforce and compel strict compliance with every Term and Condition thereof. If any provisions of these Terms and Conditions are held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.
  - 10. Disputes.** Buyer and Seller shall attempt in good faith promptly to resolve any dispute arising under these Terms and Conditions by negotiations between representatives who have authority to settle the controversy. If unsuccessful, Buyer and Seller shall further attempt in good faith to settle the dispute by nonbinding third-party mediation, with fees and expenses of such mediation apportioned equally to each side. Any dispute not so resolved by negotiation or mediation may then be submitted to a court of competent jurisdiction in accordance with the terms hereof. These procedures are the exclusive procedures for the resolution of all such disputes between the parties.

All sales, agreements for sale, offers to sell, proposals, acknowledgments and contracts of sale, including, but not limited to, Purchase Orders accepted by Seller, shall be considered a contract under the laws of the State of Colorado and the rights and duties of all persons and the construction and effect of all provisions hereof shall be governed by and construed according to the laws of such state. A state or federal court located within the State of Colorado shall have sole and exclusive jurisdiction over any litigation concerning any such matters as well as any alleged defects of any products or equipment covered thereby or damages sustained as a result of such alleged defects.

If any litigation is commenced between Seller and Buyer, or their personal representatives, concerning any provision hereof, the party prevailing in the litigation shall be entitled, in addition to such other relief that is granted, to a reasonable sum as and for their attorneys' fees and costs in such litigation or arbitration.

### STONEAGE TRADEMARK LIST

View the list of StoneAge's trademarks and service marks and learn how the trademarks should be used. Use of StoneAge trademarks may be prohibited, unless expressly authorized.

<http://www.stoneagetools.com/trademark-list>

### STONEAGE PATENT DATA

View the list of StoneAge's current U.S. patent numbers and descriptions.

<http://www.sapatents.com>





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