

ENGLISH



AUTOMATED
EQUIPMENT

STONEAGE®



INNOVATIVE, ROBUST WATERBLAST TOOLING AND EQUIPMENT

DELIVERED TO YOU WHEN YOU NEED IT

StoneAge products have been the industry leader for over 40 years. Our knowledgeable and experienced team will help you select and configure the right tool for the job, provide specialized technical support, deliver world-class training and, most importantly, help you get your job done safely and successfully.

YOU CAN RELY ON US.

At the bottom of many pages, you'll find QR codes that will take you directly to the appropriate product page on our website. Once on the website, you will find a variety of resources related to each product: videos, blog posts, manuals, specifications, related accessories, and training resources. Reach out to your StoneAge Representative for additional support.



**SCAN
HERE**

for the digital catalog.
Bookmark it on your
device for quick
in-field access.

Under Pressure? **GET THE JOB DONE**

...on time, on budget, and as easy as possible!

Your job is difficult in the best of times -

not to mention when you're facing additional challenges due to workforce shortages and increased safety requirements.

You deserve fast access to the equipment you need to get your waterblasting jobs done on time and as easily as possible. That's why we've expanded our ***automated equipment rental fleet*** and created simple payment options for every budget.



REMEMBER:

StoneAge stocks everything you need to get the job done. Tools, hoses, parts and accessories, and we'll work with you to minimize your downtime.

AUTOMATED EQUIPMENT

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Pictured: AutoBox 3L with Sentinel Technology



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.

Hylle Poll, Industrial cleaning operator at Reym

Sentinel Technology enables StoneAge AutoBox systems to find and clean tubes faster than an operator.

... and the easy-to-use operating system allows you to train new employees quickly, empowering them to clean as well as your most experienced operator.

Experience the future of industrial cleaning with Sentinel, the ultimate automation technology platform that seamlessly integrates with StoneAge's AutoBox 3L and 1L tube cleaning systems. Sentinel empowers your workforce with an active sensor system and software that automatically positions cleaning nozzles and efficiently cleans exchanger tubes, even in challenging low visibility conditions.

- ✓ Learns tube pitch to adapt to obstacles
- ✓ Rugged controller delivers uninterrupted operation through harsh conditions
- ✓ Delivers operational performance insights through a highly-secure platform



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 flow rate



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SENTINEL OPERATING SYSTEM 2

UPGRADE FOR A CLEANER, SMARTER AND MORE EFFICIENT CLEANING

Our latest release, Sentinel Operating System 2, takes your cleaning operations to new heights with streamlined job setup, onscreen tubesheet visualization, automatic learning functions, and predictive job data. Unlock unparalleled efficiency, precision, and consistency in your cleaning processes with Sentinel OS 2.

NEW FEATURES IN SENTINEL OS 2:

- ✓ **NEW AUTONOMY MODE:** Sentinel identifies the boundary of the tubesheet during setup, then predictively diagrams and cleans the remaining interior tubes automatically.
- ✓ **TUBESHEET VISUALIZATION:** The controller now displays a real-time visual diagram of the tube sheet, enabling efficient cleaning without requiring a direct line of sight.
- ✓ **JOB CAPTURE:** Save the job-specific tubesheet diagram generated by Sentinel, and re-load it for full automation the next time the bundle is cleaned.
- ✓ **OBSTACLE AVOIDANCE:** Sentinel can automatically steer around plugged tubes and other obstructions during cleaning, preventing equipment damage.
- ✓ **AUTOMATIC LEARNING FUNCTION:** Sentinel can now learn the pitch and pattern of a tubesheet without requiring the operator to make manual measurements. No need for P&ID from the plant to begin the job.
- ✓ **STREAMLINED JOB SETUP:** System setup has been simplified to a few guided steps, enabling operators to get up and running quickly and successfully.
- ✓ **PREDICTIVE JOB DATA:** Estimate "time until completion" based on cleaning rate and tube count.
- ✓ **UNIFIED OPERATING SYSTEM:** Use the same controller and software for both 3L and 1L Sentinel systems.



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SENTINEL AUTOPACKS

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 two Sentinel-enabled, 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

AutoPack 3L with Sentinel shown for reference.

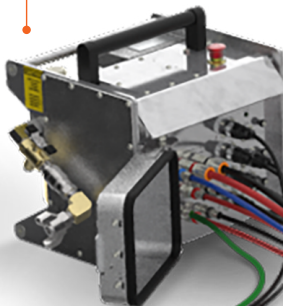
CONTACT STONEAGE TO FIND OUT HOW YOU CAN CONVERT YOUR EXISTING EQUIPMENT INTO AN AUTOPACK.

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.***



WATER PRESSURE SENSOR

Provides the exact water pressure output during cleaning. Operators can monitor pressure loss in real time, so they can replace worn rotary tools when to maintain optimum performance.



BANSHEE & BEETLE 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

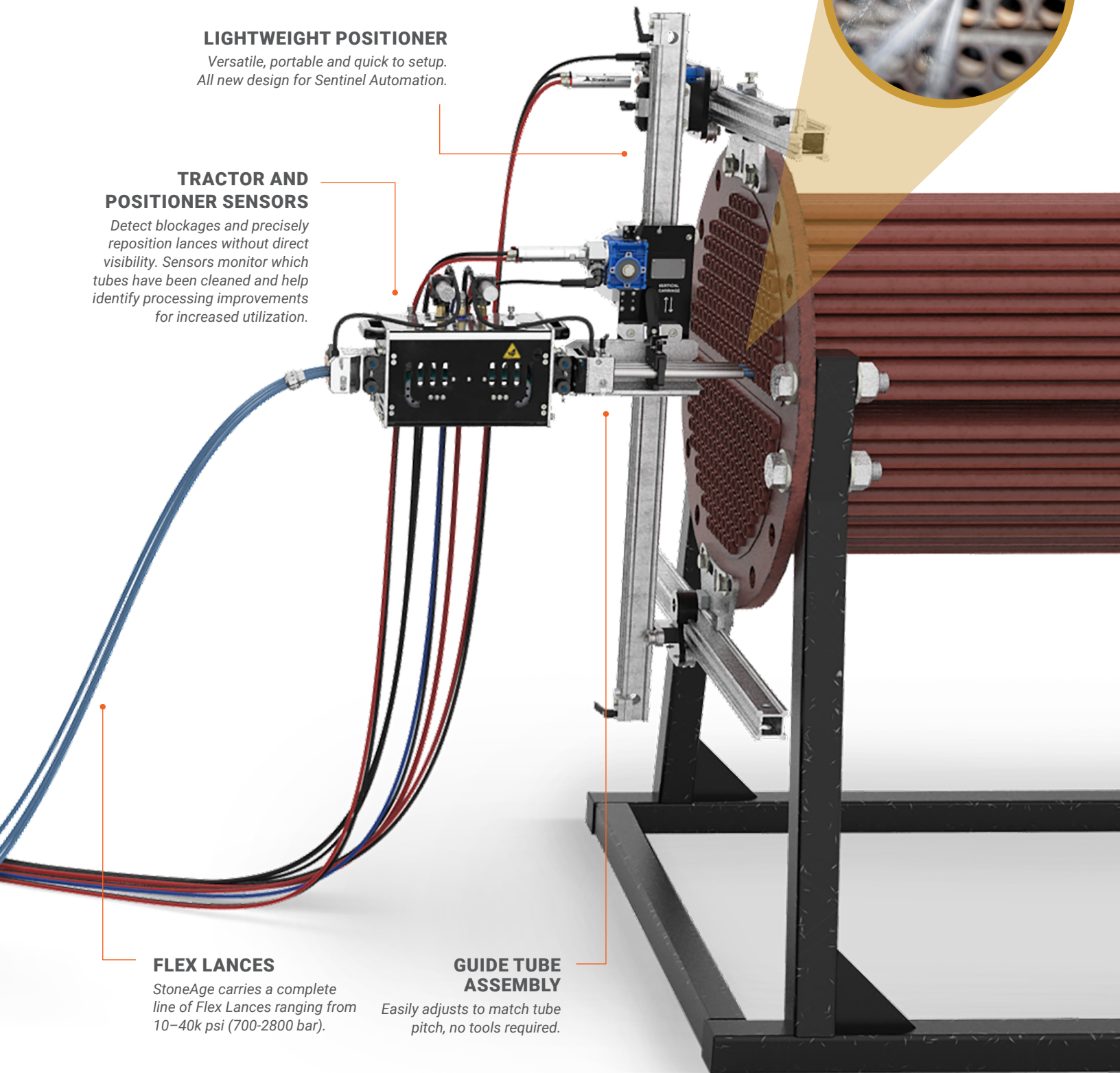
Detect blockages and precisely reposition lances without direct visibility. Sensors monitor which tubes have been cleaned and help identify processing improvements for increased utilization.

FLEX LANCES

StoneAge carries a complete line of Flex Lances ranging from 10–40k psi (700–2800 bar).

GUIDE TUBE ASSEMBLY

Easily adjusts to match tube pitch, no tools required.





AUTOPACK 3L WITH 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.

This is a complete package for the AutoBox 3L with Sentinel Technology that includes all the available sizes of all component parts in a portable job box.

- ✓ Deliver unmatched productivity with 30% faster cleaning
- ✓ Game-inspired controller transforms operators at any skill level shine through the most difficult job conditions
- ✓ Job data helps continuously improve cleaning performance and produce industry-leading, consistent results



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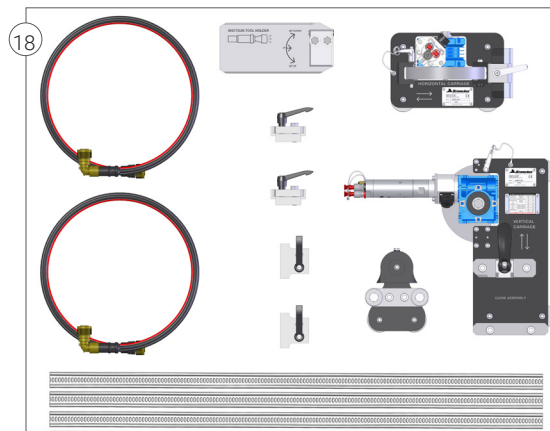
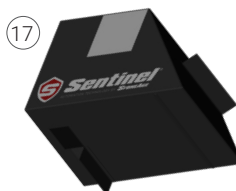
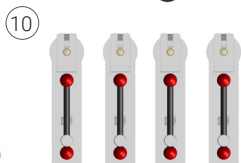
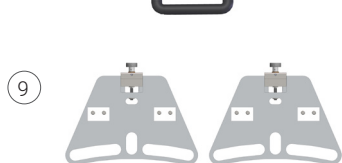
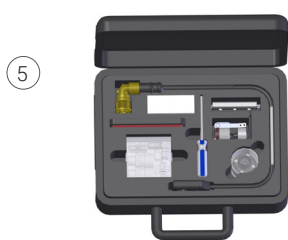
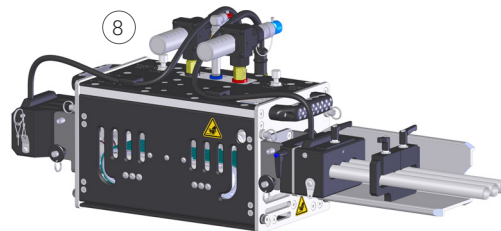
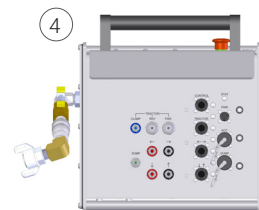
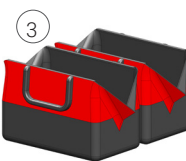
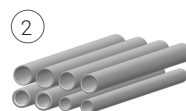
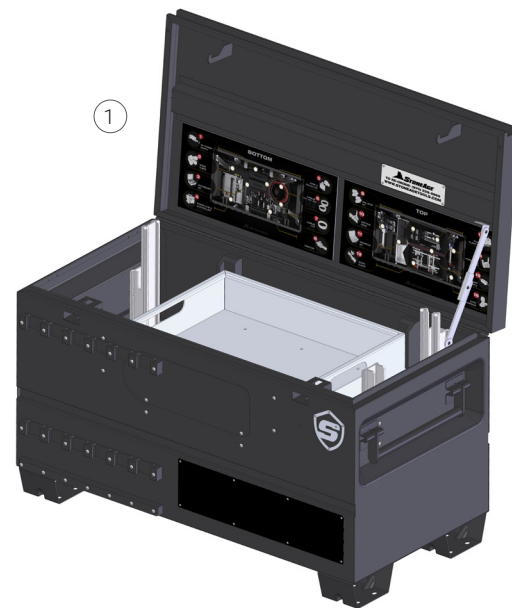


#	PART NUMBER	DESCRIPTION	QTY
1	GPT 071-3LS	CHEST, 3LS AND LWPS	1
2	ABX 631-12	KIT, 12IN GUIDE TUBES (3 EA ABX 115, 116, 117, 119)	1
3	GPT 310	TOOL BAG, 18IN	2
4	PH-A0302A00C20	POWER HUB	1
5	ABXS 628	SPARE PARTS KIT, 3LS AND LWPS W IPOD	1
6	GPT 108-S	KIT, HOSE STOP AND COLLET 3L	1
7	CTRL-101	CONTROLLER	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

SUGGESTED NOZZLES:

○ Badger ✓ Banshee ✓ Barracuda ✓ Beetle ○ BJV

See Rotary Tools Catalog for more information





AUTOPACK 1L WITH COMPASS & SENTINEL

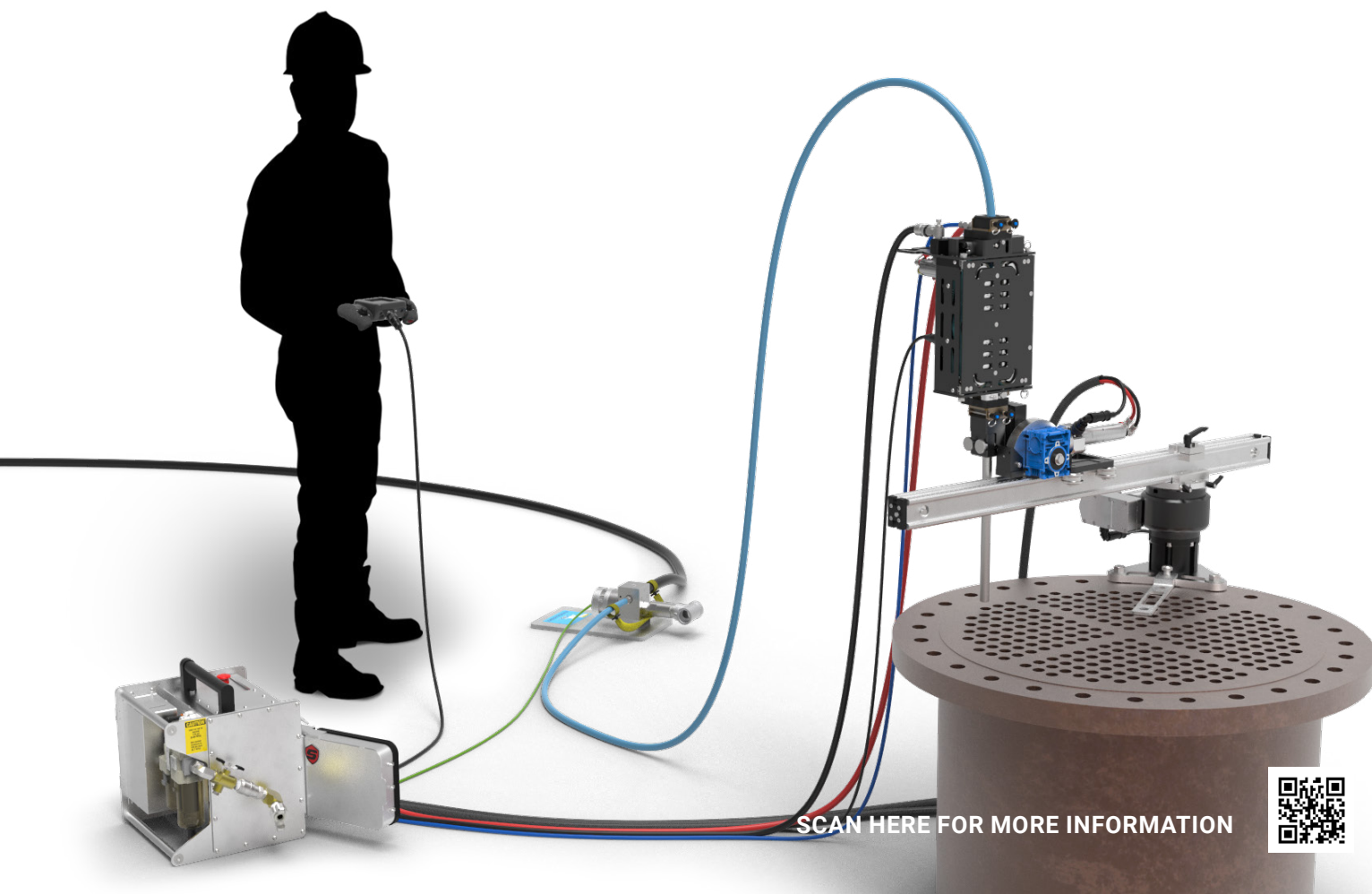
Built around a NEW smart tractor with Sentinel Technology and the Compass radial indexing device, this AutoPack has everything you'll need to clean horizontal, top-down, bottom-up, and enclosed heat exchanger bundles. Delivering 35% faster clean times with accurate tube-to-tube positioning, the Sentinel-enabled AutoBox 1L tractor provides operational data to ensure high efficiency cleaning and quality results.

The system is designed for versatility in a range of confined spaces, particularly those in ethanol, sugar, pulp and paper evaporators or exchangers inside refineries and chemical plants. The AutoBox 1L directs all of the power from a smaller pump into a single lance for maximum cleaning efficiency and can be just as fast as a 3L tractor for vertical applications or very long tubes.

- ✓ NEW AutoBox 1L single-lance tractor produces more power and torque for longer runs and heavier hoses
- ✓ Compass enables radial indexing motion from a single connection point to clean with minimal remounting
- ✓ Lightweight modular design enables operators to set-up in minutes, reducing downtime
- ✓ Can be operated with the same Controller and Power Hub as the Sentinel-enabled AutoBox 3L

Horizontal, vertical, and enclosed heat exchanger bundles can now be cleaned 30% faster than before with repeatable, reliable results and data-driven positioning accuracy.

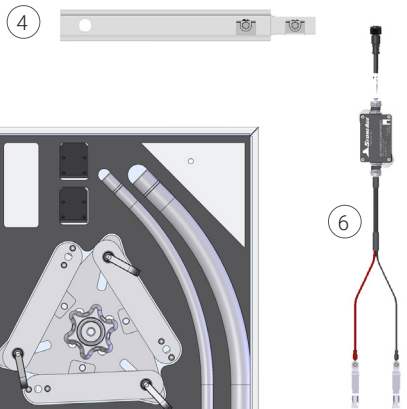
- ✓ Ideal entry point for adding automated indexing with minimal investment.
- ✓ Simple set-up and intuitive operation make the system accessible for inexperienced operators.
- ✓ Job data enables steady cleaning improvements each time, benefitting contractors and their asset customers



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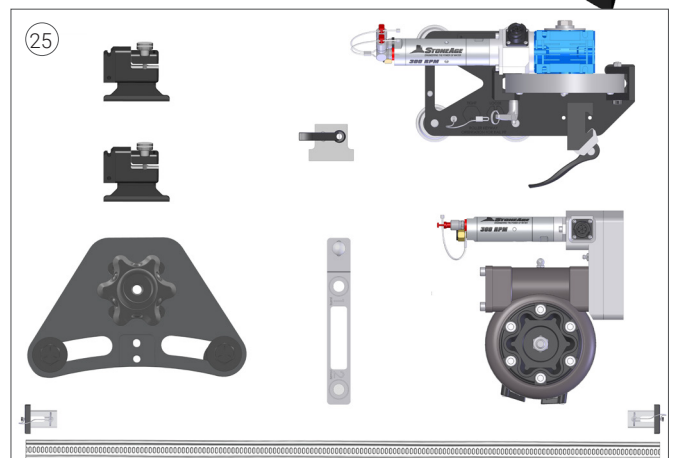
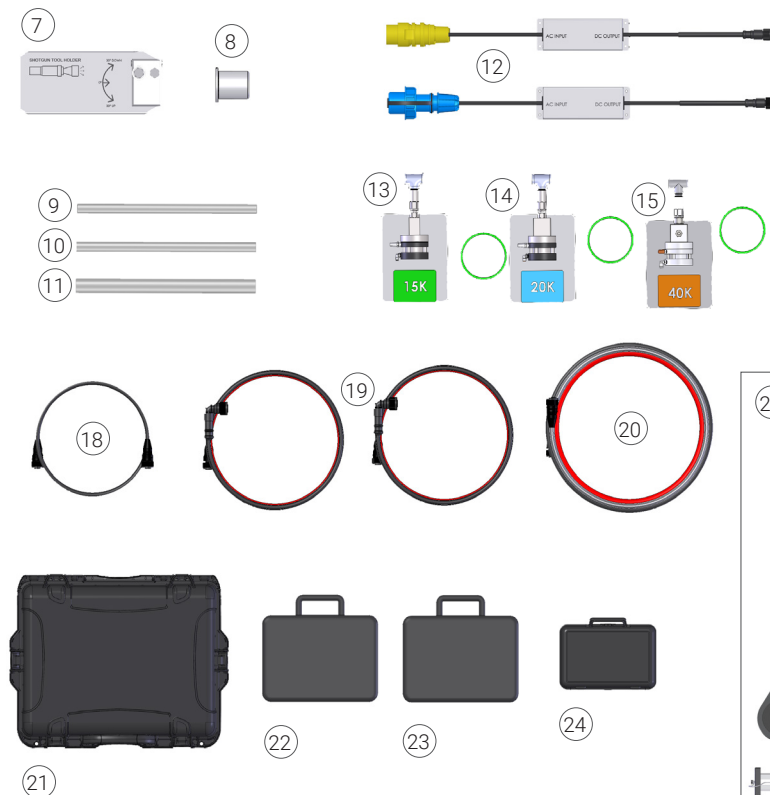
#	PART NUMBER	PART NUMBER AND DESCRIPTION	QTY
1	GPT 072-CPS	SENTINEL COMPASS CHEST ASSEMBLY	1
2	CTRL-101	CONTROLLER	1
3	ABXS-1L-300	AUTOBOX 1LS SENTINEL TRACTOR ASSEMBLY	1
4	PROP 580-1.33-001	2.5 INCH BOX RAIL EXTENSION KIT, SLOTTED, 1.33 FT	1
5	CPS-CSK -PKG	COMPASS CONFINED SPACE KIT	1
6	PROP 520-001	12V, DC-DC POWER CONDITIONER ASSEMBLY	1
7	PROP 480	SHOTGUN MOUNT	1
8	LWP 560	HARDLINE COLLET 9/16 LANCE	1
9	ABX 116-16	GUIDE TUBE .546 ID, 16IN/ 406.4MM L (BN13)	1
10	ABX 119-16	GUIDE TUBE .745 ID, 16IN/ 406.4MM L (BN18)	1
11	ABX 125-16	GUIDE TUBE 1.010 ID, 16IN/ 406.4MM L (BN24)	1
12	CAM 410-XX	AC POWER SUPPLY US (YELLOW) OR EU (BLUE)	1
13	ACDA 61001007-K	15K DUMP VALVE, BASE PLATE, AIR FITTINGS & HOSE	1
14	ACDA 61020019-K	20K DUMP VALVE, BASE PLATE, AIR FITTINGS & HOSE	1
15	ACDA 61040006-K	40K DUMP VALVE, BASE PLATE, AIR FITTINGS & HOSE	1
16	PH-A0302A00C20	POWER HUB	1
17	PHA 112	SENITNEL POLY POWERHUB SHIELD, BLACK	1
18	CBL E020F-1RB6PP	CABLE FOR CONTROLLER	1
19	CBL EA15F-1RB6RP-2PL5	CABLE FOR POSITIONER	1
20	CBL EA15F-1RB6PP-2PL10-1PL5	CABLE FOR ABXS TRACTOR	1
21	CAM-UNI-US OR EU	CAMERA WITH CASE ASSEMBLY	1
22	ABXS 629	1L SPARE PARTS KIT	1
23	PT 641	PRESSURE TRANSDUCER & FITTINGS KIT	1
24	GPT 109	1L COLLET AND HOSE STOP KIT	1
25	CPS-100	SENTINEL 1L COMPASS ASSEMBLY	1



SUGGESTED NOZZLES:

☐ Badger ☒ Banshee ☒ Barracuda ☒ Beetle ☐ BJV

See Rotary Tools Catalog for more information



TRIPLE, DUAL & SINGLE LANCE 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.

AutoPack 3L shown for reference.

- ✓ 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



ALREADY OWN A 3L SYSTEM?

Sentinel Conversion options available

Contact StoneAge to find out how you can convert your existing equipment into an AutoPack.

SUPPLY HOSES

StoneAge carries a full line of supply hoses and fittings.

DUMP VALVE

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

FLEX LANCES

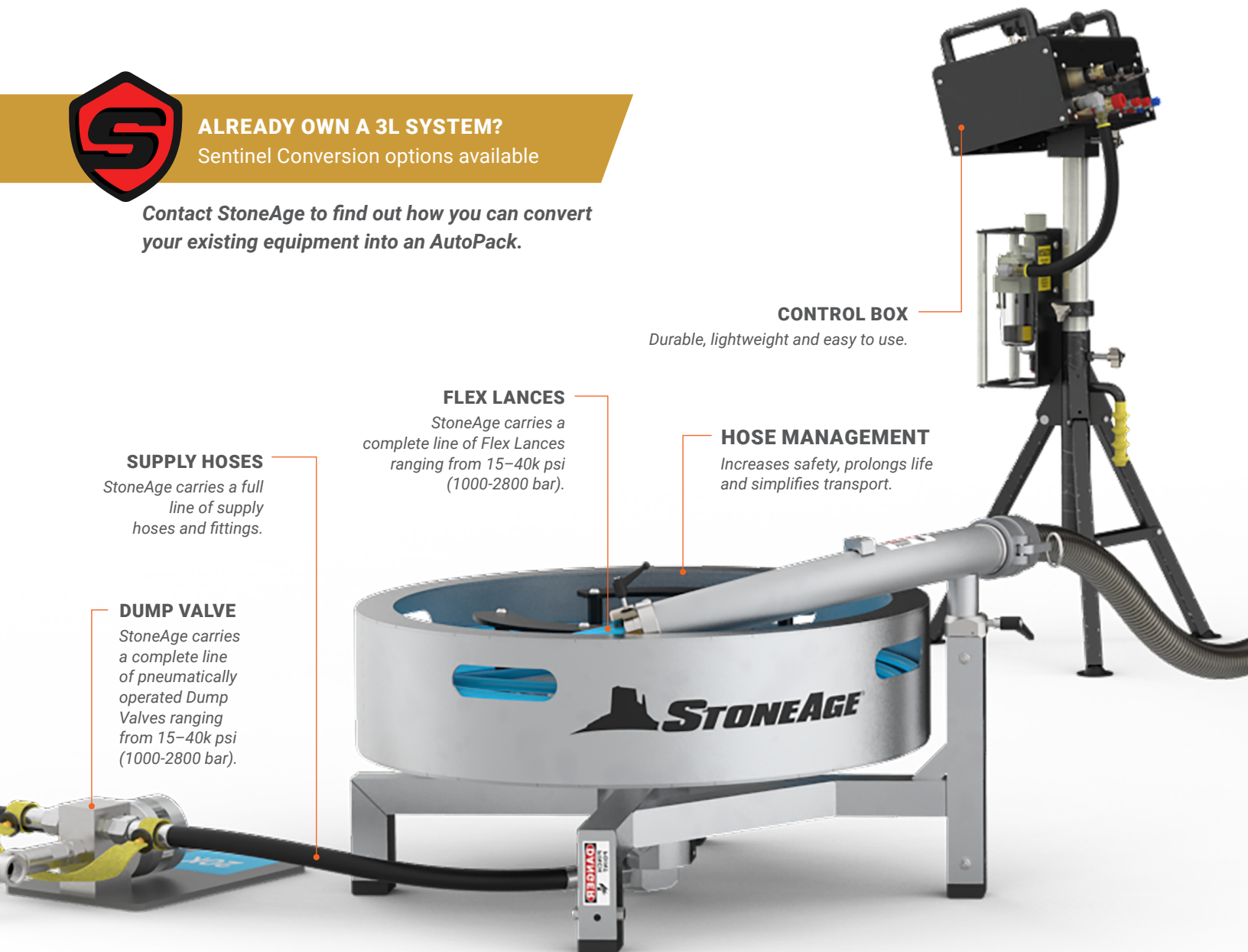
StoneAge carries a complete line of Flex Lances ranging from 15–40k psi (1000–2800 bar).

HOSE MANAGEMENT

Increases safety, prolongs life and simplifies transport.

CONTROL BOX

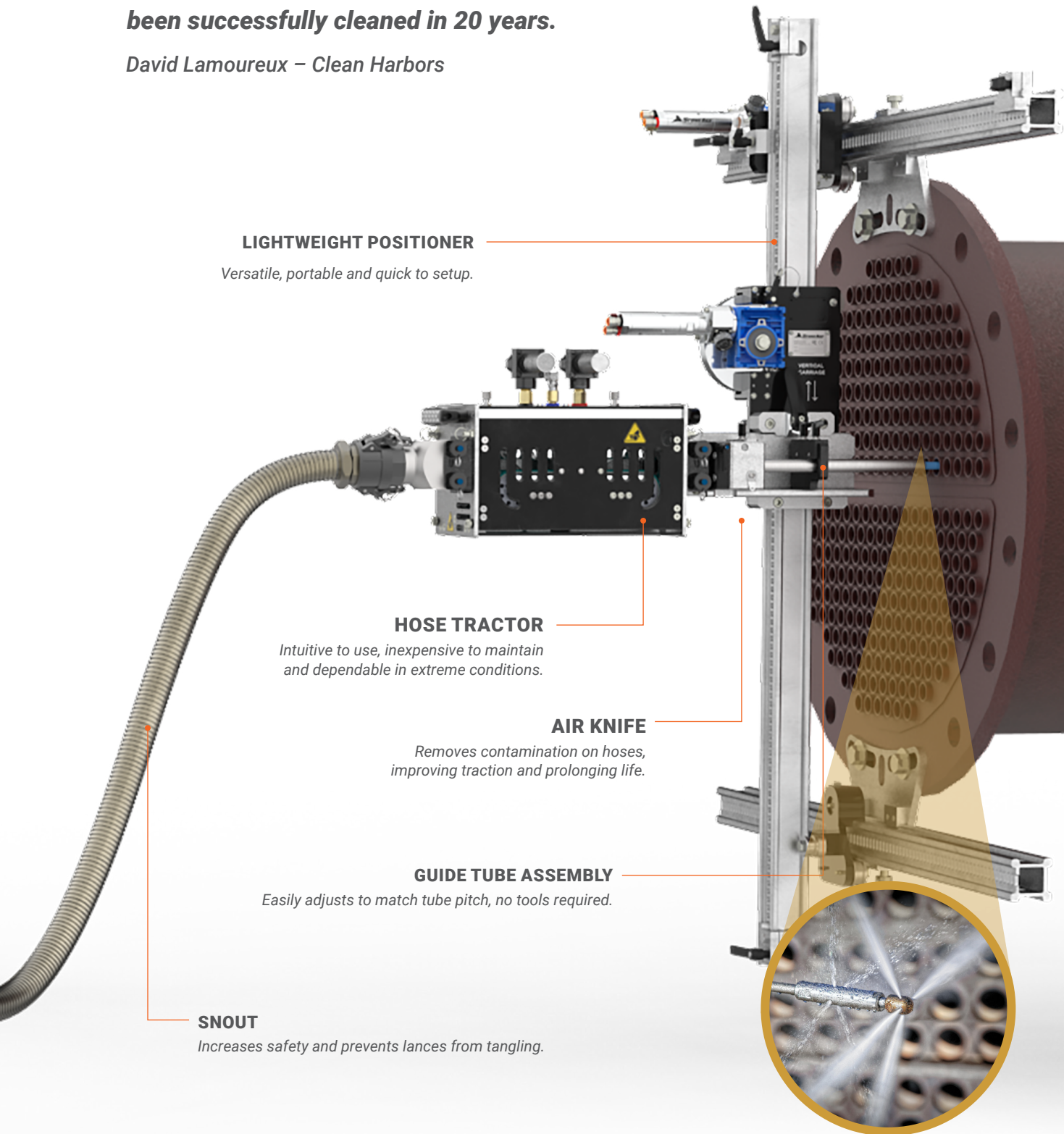
Durable, lightweight and easy to use.





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



LIGHTWEIGHT POSITIONER

Versatile, portable and quick to setup.

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.

BANSHEE & BEETLE ROTARY TOOLS

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

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 or Fin Fan heat exchanger cleaning.



Compatible with
Sentinel Automation Technology Conversion

1

2



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#	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

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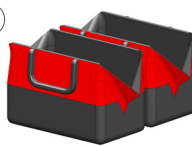
☐ Badger ☒ Banshee ☒ Barracuda ☒ Beetle ☐ BJV

See Rotary Tools Catalog for more information

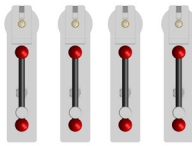
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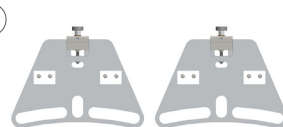
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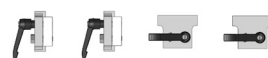
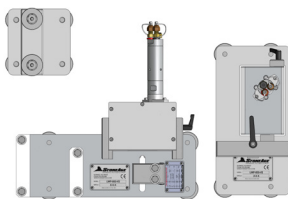
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AUTOPACK 2L

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

The StoneAge AutoBox 2L is a hands-free single and dual lance system for heat exchanger tube cleaning applications. It was designed to reliably control one or two flex lances with an emphasis on portability, ease of setup, and safety.

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



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#	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

SUGGESTED NOZZLES:

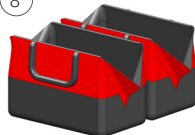
☐ Badger ☒ Banshee ☒ Barracuda ☒ Beetle ☐ BJV

See Rotary Tools Catalog for more information

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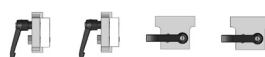
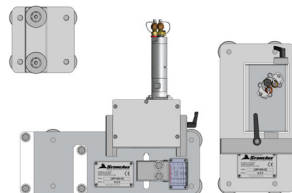
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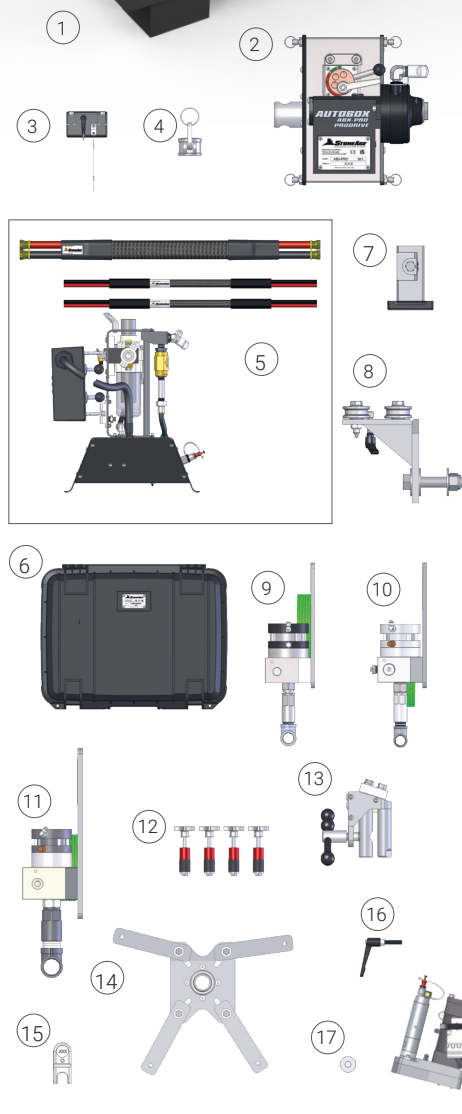
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AUTOPACK PRO WITH COMPASS

The AutoPack Pro with Compass combines the Compass Positioner and the Confined Space Kit with a ProDrive single lance tractor to deliver an affordable and completely self-contained solution for exchanger or confined space tube cleaning applications.

Offered in several customizable packages, the AutoPack Pro with Compass includes equipment formerly known as the ProP-DBP and ProPositioner and the ProDrive (ABX-PRO) in a protective job box.

Ask us how to convert your existing ABX-PRO equipment into a fully equipped AutoPack Pro



#	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

SUGGESTED NOZZLES:

○ Badger ✓ Banshee ○ Barracuda ✓ Beetle ○ BJV

See Rotary Tools Catalog for more information

SCAN HERE FOR MORE INFORMATION



HOSE TRACTORS

TRIPLE, DUAL OR SINGLE LANCE OPERATION

- ✓ Lightweight, modular design allows a single operator to quickly move, set up and run
- ✓ Accomodates 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



	Autobox 3L	Autobox 2L	Autobox 1L	Autobox PRODrive	Rigid Lance Machine
SENTINEL COMPATIBLE	●		●		
RECORDS JOB DATA	●		●		
REQUIRES A LARGE HIGH-FLOW PUMP	●				●
REQUIRES A MEDIUM SIZE PUMP		●	●	●	
TRIPLE LANCE	●				●
DUAL LANCE	●	●			●
SINGLE LANCE	●	●	●	●	●
FLEX LANCING	●	●	●	●	
RIGID LANCING					●
SMALL FOOTPRINT	●	●	●	●	
HORIZONTAL APPLICATIONS	●	●	●	●	●
VERTICAL APPLICATIONS	●	●	●	●	●
HIGH POWER DELIVERY	●	●	●		●

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



SCAN HERE FOR MORE INFORMATION

POSITIONERS

COMPASS

The Compass is a lightweight radial indexing device that pairs with the AutoBox 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

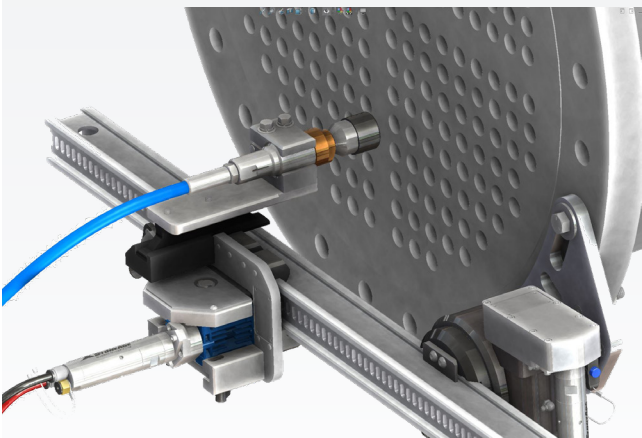


COMPATIBLE TRACTORS:

- ☐ AutoBox 3L ☐ AutoBox 3L Sentinel ☐ AutoBox 2L
- ☒ AutoBox 1L Sentinel ☒ AutoBox Pro

TOOL MODEL	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.

SCAN HERE FOR MORE INFORMATION



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 and sugar 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.

SPIDER PLATE

Easily attaches at a single connection point to clean all tubes in most bundles with minimal re-mounting.

CURVED SNOOT

Curved guide tube cleans around circular bundles and to the edge of a tube sheet face.

SUGGESTED NOZZLES:

- ✓ Badger
- ✓ Banshee
- Barracuda
- ✓ Beetle
- BJV

See Rotary Tools Catalog for more information



EXPANSION PLUGS

Come in several sizes to fit any size tube. Customers can contact StoneAge with their specific needs.



SCAN HERE FOR MORE INFORMATION

POSITIONERS

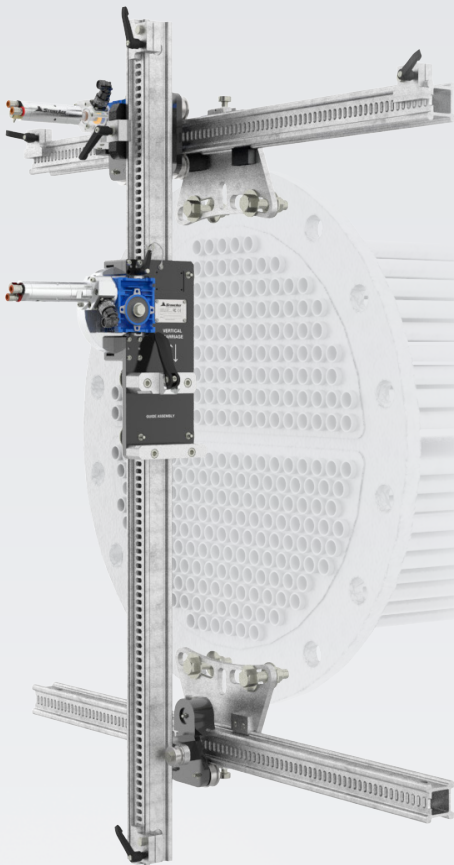
LIGHTWEIGHT POSITIONER

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 and many custom applications 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

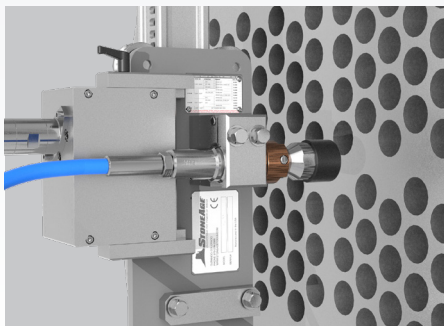


COMPATIBLE TRACTORS:

- ✓ AutoBox 3L
- ✓ AutoBox 3L Sentinel
- ✓ AutoBox 2L
- ✓ AutoBox 1L Sentinel
- ✓ AutoBox Pro

MULTIPLE MOUNTING OPTIONS

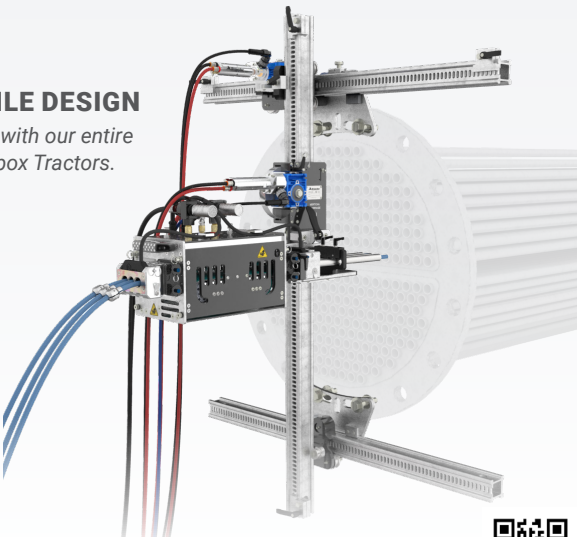
Allows the LWPS to be configured to several different heat exchanger faces.



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

VERSATILE DESIGN

Compatible with our entire line of Autobox Tractors.



OPTIONAL ACCESSORIES

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

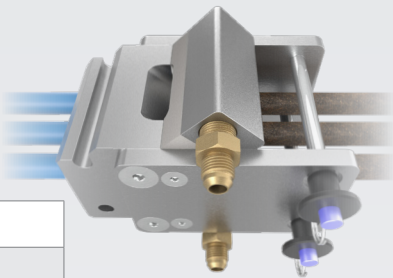
SCAN HERE FOR MORE INFORMATION



LIGHTWEIGHT POSITIONER ACCESSORIES

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.



- ✓ 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

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 m3/h at 0.69 MPa)

HOSE MANAGEMENT SYSTEM

Adaptable solution to contain and protect high-pressure hoses/lances during operation and transport.

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.



UNIVERSAL CAMERA SYSTEM

ALL-INCLUSIVE KIT SPECIFICALLY DESIGNED FOR USE WITH
AUTOMATED EQUIPMENT

When a cleaning job requires monitoring in hard to reach places, like in tanks, or confined space entry, the Universal Camera can be attached to any piece of automated equipment to provide a better line of site to the nozzle while in use.



SCAN HERE FOR MORE INFORMATION





Made to withstand the harshest of conditions, the Universal Camera System displays a clear, up-close view of the working surface on a monitor at the control box.

The ultra-durable camera provides better visibility of an operation to enable faster, safer and more precise completion.

The Universal Camera System comes with everything needed for easy transport, setup and use. It provides real-time visibility during any automated cleaning application, including operations that require remote monitoring from outside a vessel such as confined space entry and tank cleaning applications.

- ✓ Universal mounting options allow one system to be used across an entire fleet of automated equipment
- ✓ Portable in a compact carrying case
- ✓ "Lobster Claw" mount with two swivel joints for adjustability securely positions camera to equipment
- ✓ Monitor with real-time display easily attaches to any control panel
- ✓ Continuous power supply with EU and US connector options

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.

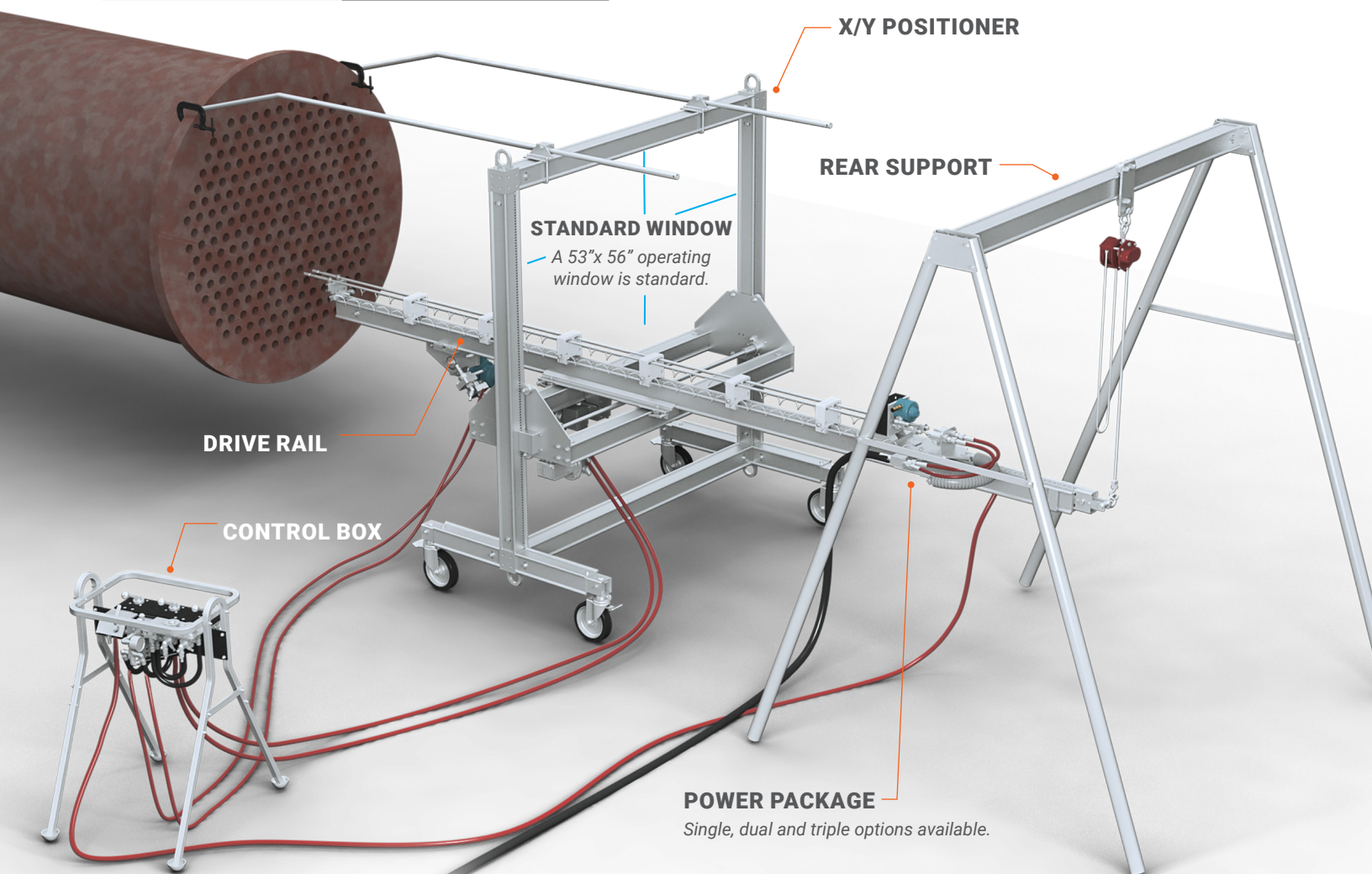
MODEL	BRLM
PRESSURE RANGE	Up to 44k psi 3000 bar
FLOW RANGE	Up to 60 gpm 227 l/min
MAX. RAIL LENGTH	60 ft 18 m
FEED RATE	0.3-1.2 ft/s 0.1-0.37 m/min

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:

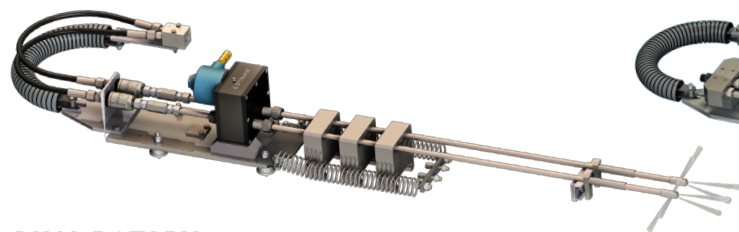
- ✓ Clearing and unplugging vertical and horizontal bundles
- ✓ Cleaning and polishing evaporator tubes
- ✓ Removing thin, hard scale, carbons, coke and polymers



SCAN HERE FOR MORE INFORMATION

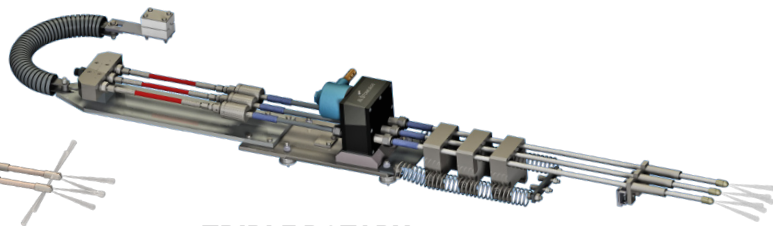


POWER PACKAGE OPTIONS



DUAL ROTARY

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



TRIPLE ROTARY

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

POWER PACKAGE SPECIFICATIONS

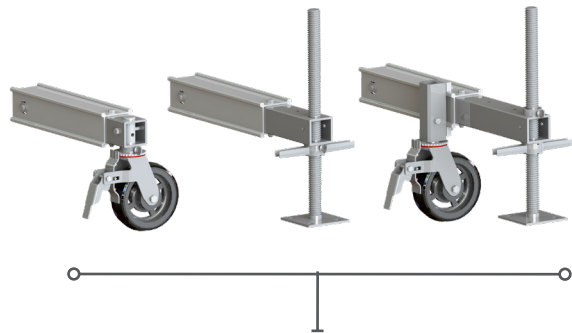
MODEL	PART NUMBER	MAXIMUM PRESSURE	INLET CONNECTION	LANCE CONNECTIONS	ROTATION SPEED
DUAL ROTARY	BRLM 351	15/22k psi 1000/1500 bar	3/4" MP	1/8" or 1/4" NPT, 3/8" or 9/16" MP	105-525 rpm
	BRLM 361	44k psi 3000 bar	9/16" HP	3/8" or 9/16" HP	105-525 rpm
TRIPLE ROTARY	BRLM 353-CS	15-22k psi 1000/1500 bar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

SUGGESTED NOZZLES:

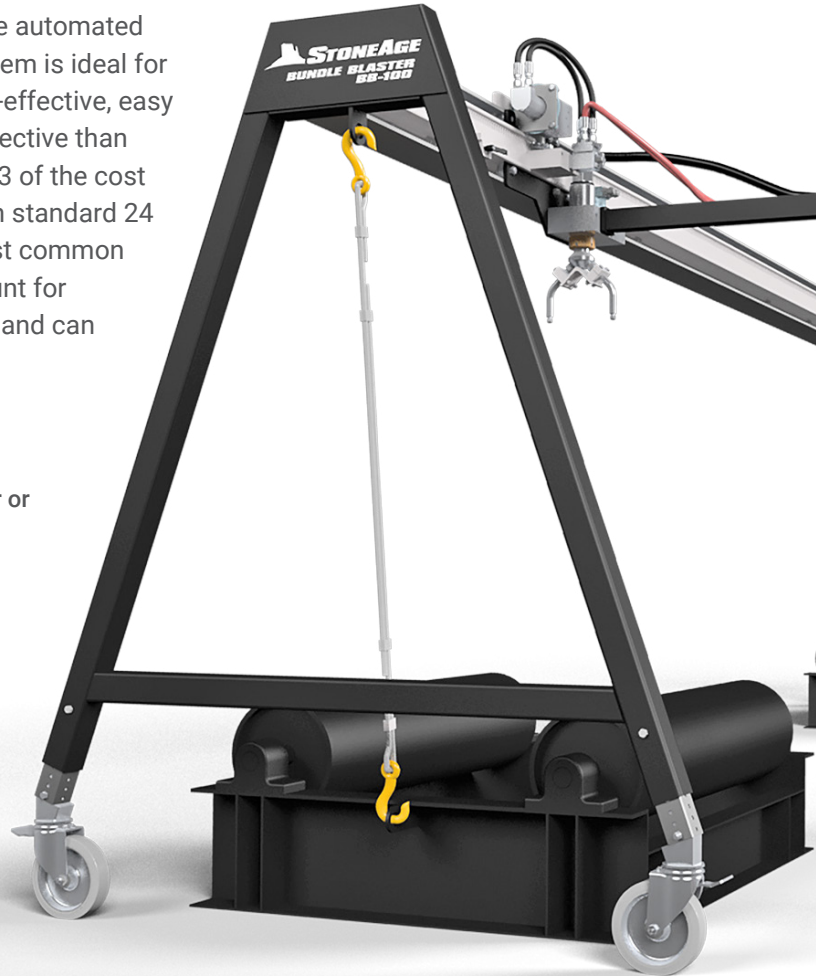
- ☐ Badger ☒ Banshee ☐ Barracuda ☒ Beetle ☐ BJV

See Rotary Tools Catalog for more information

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 trailer 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.

- ✓ 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



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 <small>*available through Customs</small>	24 ft and 36 ft 7.3 m and 11 m

CONTACT STONEAGE

for rental availability or lead times to purchase.

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



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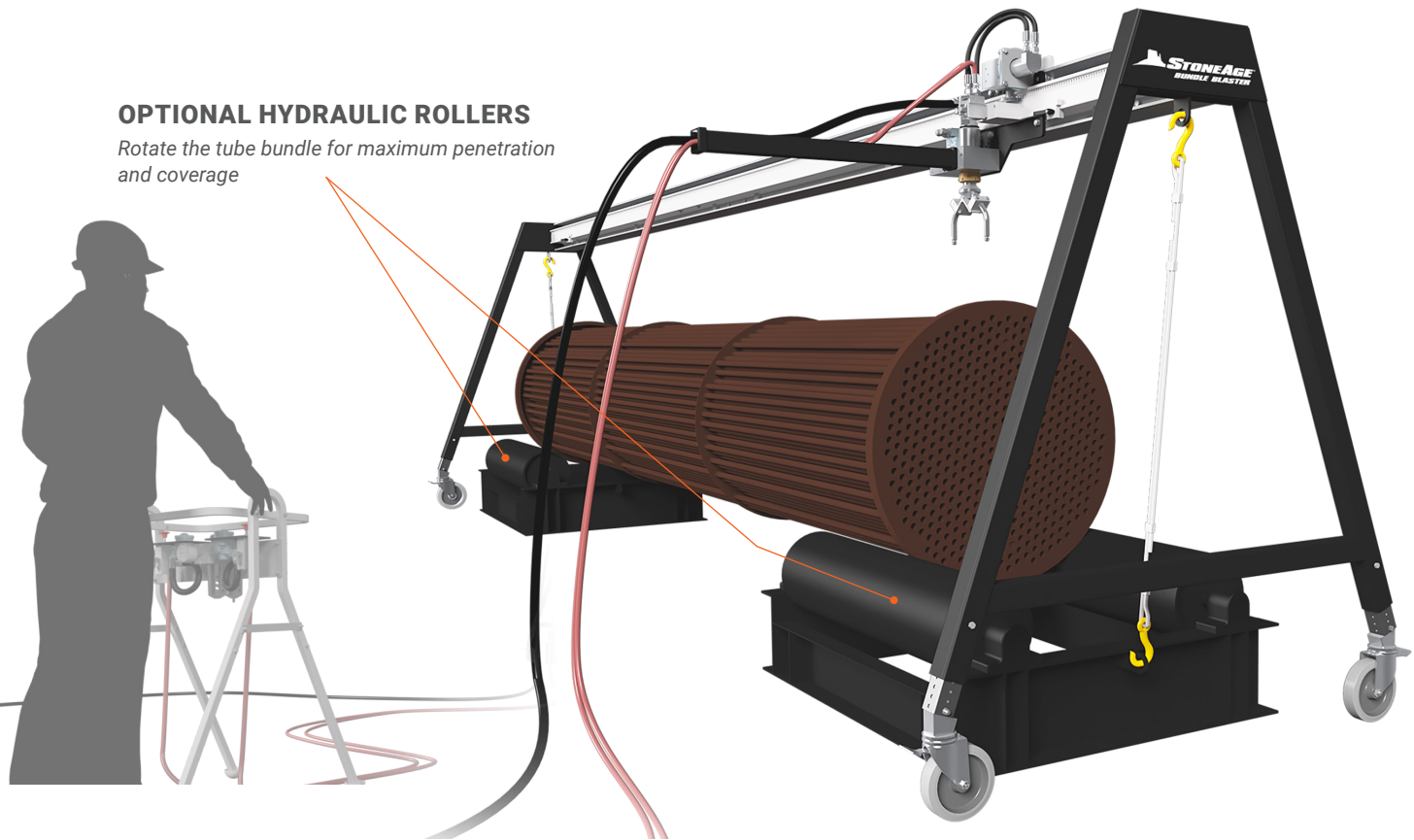


This equipment operates in the most difficult conditions predominantly on petrochemical refineries running consecutive shift patterns on time driven critical projects and performs consistently to a high standard without failure.

Andrew Dobson – Veolia

OPTIONAL HYDRAULIC ROLLERS

Rotate the tube bundle for maximum penetration and coverage



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

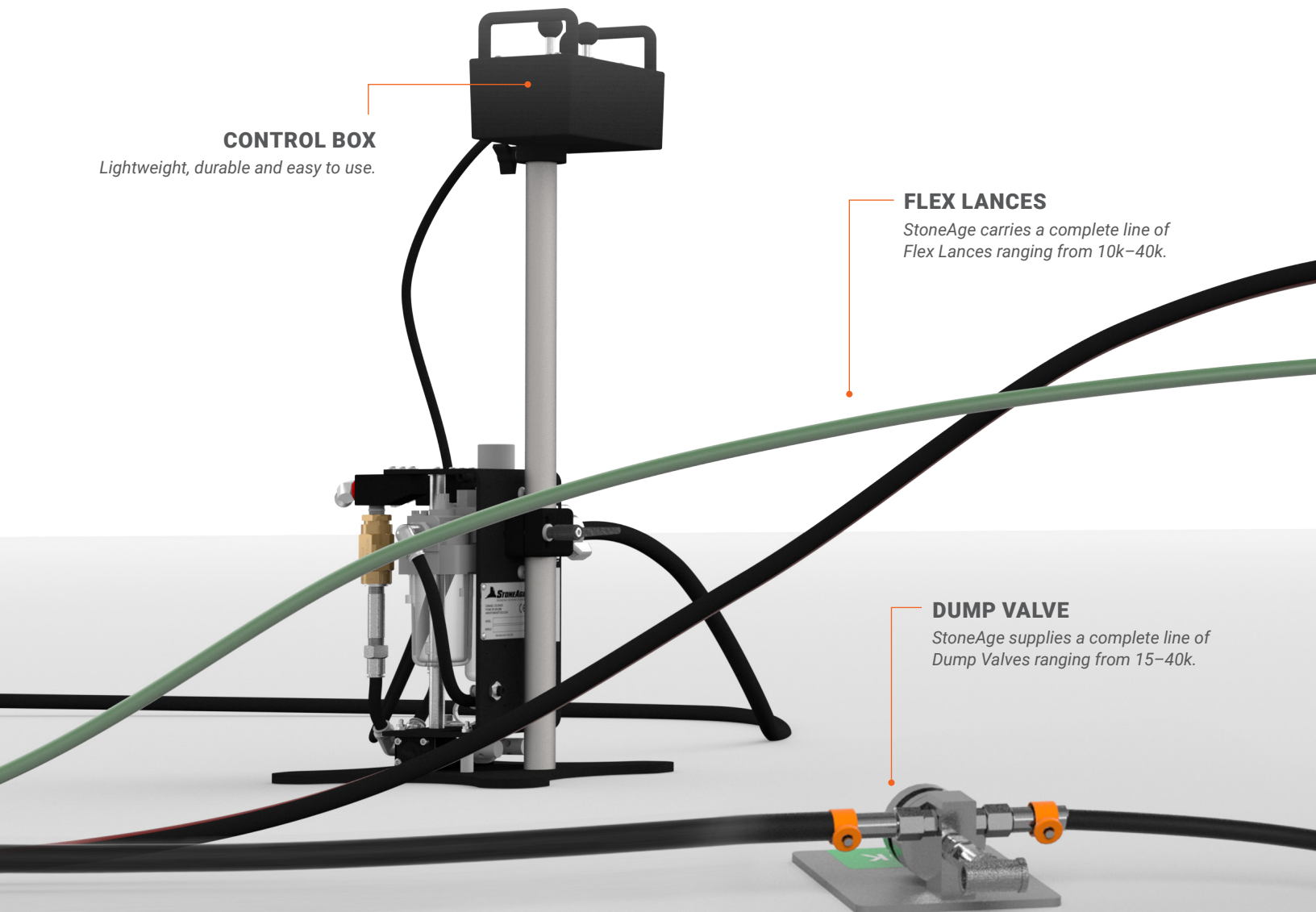
Maximize the Bundle Blaster's cleaning capabilities for different applications

PIPE CLEANING

Pipe cleaning is essential to maintaining the efficiency and productivity in a variety of industrial applications. Waterblasting is the ideal method used to clean process pipes. It removes solids or deposits from pipes, guaranteeing that equipment runs at maximum productivity with limited downtime.

StoneAge offers a range of products for pipe cleaning applications. Our automated equipment maximizes operator safety and efficiency, while our rotary nozzles can clean straight pipes, pipes with bends, and pipes with a wide range of diameters. Accessories such as centralizers that center our nozzles in the pipe provide additional safety and protection for the tool as it passes through the pipe.

AutoPack Pro shown for reference.



CONTROL BOX

Lightweight, durable and easy to use.

FLEX LANCES

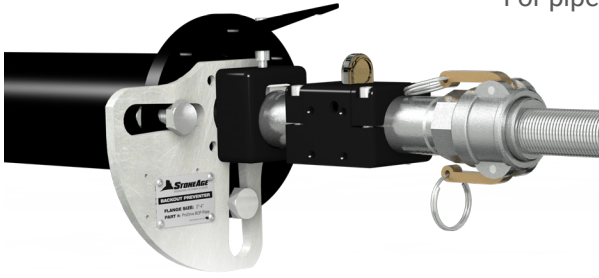
StoneAge carries a complete line of Flex Lances ranging from 10k–40k.

DUMP VALVE

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

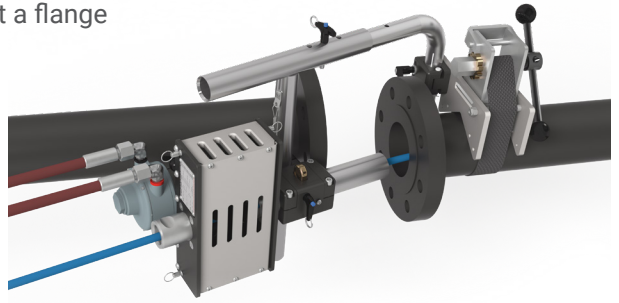
MULTIPLE MOUNTING OPTIONS

For pipes with or without a flange



FLANGE MOUNT

Versatile mount with cam-lock attachment for quick setup.



STRAP MOUNT

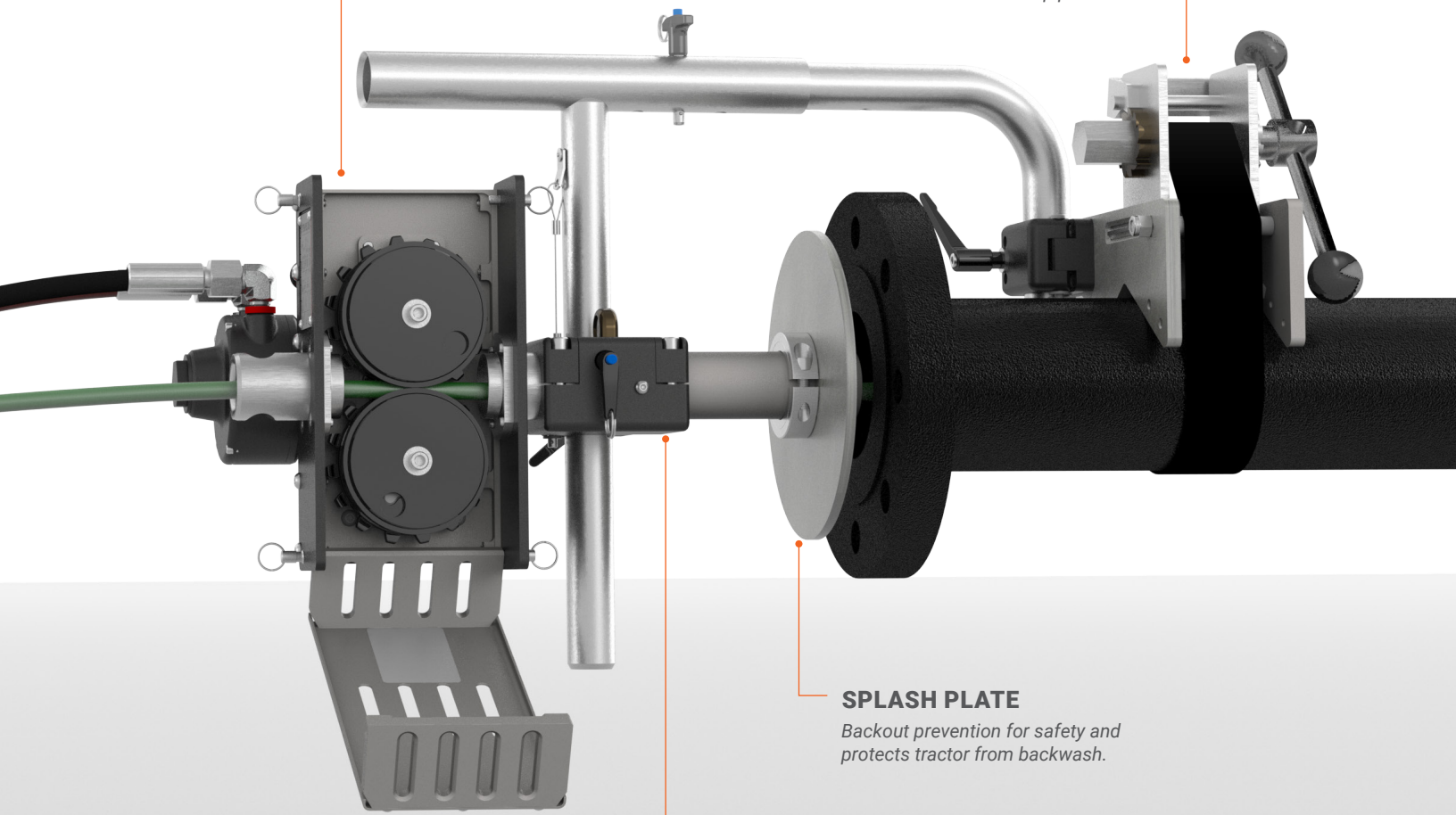
For pipes without a flange or off-axis mounting.

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 and fittings.

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, SNOUT, SS, 1.75 X 6IN	1
18	BOP 082-9-45	SNOUT TUBE, GALVANIZED, 1.5 EMT CONDUIT 45DEG	1
19	BOP 085-K	KIT, SNOUT TUBE AND CAM LOCK	1
20	BOP 086-K	SNOUT 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

SUGGESTED NOZZLES:

✓ Badger ✓ Banshee ○ Barracuda ✓ Beetle ○ BJV

See Rotary Tools Catalog for more information



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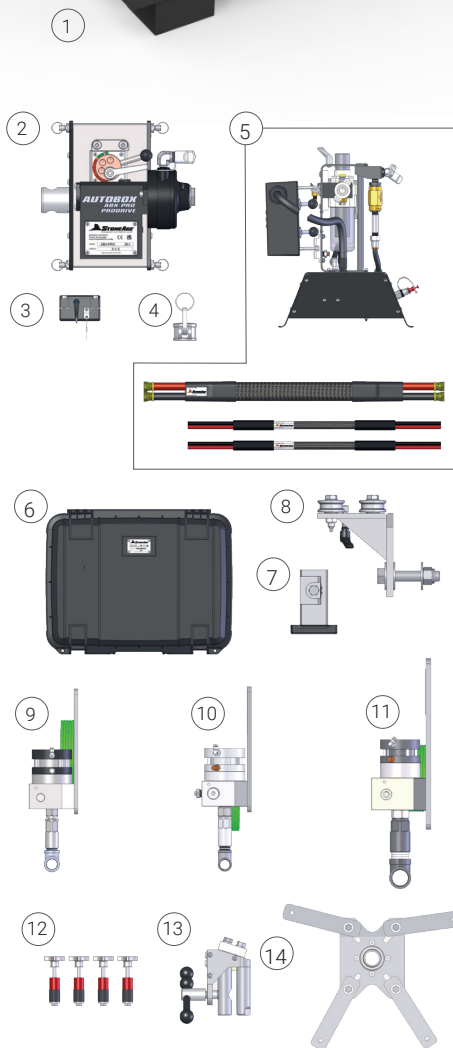


AUTOPACK PRO WITH COMPASS

The AutoPack Pro with Compass combines the Compass Positioner and the Confined Space Kit with a ProDrive single lance tractor to deliver an affordable and completely self-contained solution for exchanger or confined space tube cleaning applications.

Offered in several customizable packages, the AutoPack Pro with Compass includes equipment formerly known as the ProP-DBP and ProPositioner and the ProDrive (ABX-PRO) in a protective job box.

Ask us how to convert your existing ABX-PRO equipment into a fully equipped AutoPack Pro



#	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

SUGGESTED NOZZLES:

✓ Badger ✓ Banshee ○ Barracuda ✓ Beetle ○ BJV

See Rotary Tools Catalog for more information



SCAN HERE FOR MORE INFORMATION

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



SUGGESTED NOZZLES:

- ✔ Badger ✔ Banshee ○ Barracuda ✔ Beetle ✔ BJV
✔ Gopher ✔ Raptor • for the AutoBox 500

See Rotary Tools Catalog for more information



	Autobox Pro	Autobox 500
IDEAL HOSE SIZE	Up to 3/8" OD	Up to 1.75" (14-45 mm) OD
CAN PASS HOSE COUPLINGS	●	●
ROTARY HOSE OPTION	(with additional Navigator)	●
SINGLE LANCE	●	●
FLEX LANCING	●	●
RIGID LANCING	●	●
SMALL FOOTPRINT	●	●
HORIZONTAL APPLICATIONS	●	●
VERTICAL APPLICATIONS	●	●
IDEAL FOR LARGE PIPE & TANK CLEANING	●	(See Pages 33-34 & 43 for more info)
IDEAL FOR PROCESS PIPE & DRAIN CLEANING	(See Page 34 for more info)	●

AUTOBOX 500

The AutoBox ABX-500 is a hands-free hose tractor for pipe and vessel cleaning. This utility hose feeding system can be adapted for a wide range of applications. The ABX-500 controls forward and reverse speed for consistent feed rate and dwell time.

- ✓ Automate 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
- ✓ Accommodates hoses and couplings up to 1.75 in. (44.5 mm) OD
- ✓ Pairs with StoneAge 2D and 3D tools for horizontal or vertical pipe and tank cleaning

HOSE SIZE	0.56–1.75 in. 14–45 mm OD
HOSE FEED RATE	1–30 ft/min 0.3–9.1 m/min
PUSH/PULL FORCE	Up to 200 lbs 90 kg
OPERATING AIR PRESSURE	100 psi 0.69 MPa
DIMENSIONS	19 x 13 x 12 in. 482 x 330 x 305 mm
WEIGHT	90 lbs 22 kg



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FOR MORE
INFORMATION

PRODRIVE

The ProDrive (AutoBox ABX-PRO) is a hose feed tractor engineered with safety, portability, and quick setup in mind. This versatile device is designed with multiple mounting options and accessories to adapt it for a wide variety of pipe, drain and tube cleaning applications.

The ProDrive is the perfect tool for limited access applications and includes a lightweight control box for increased safety and mobility.

- ✓ Automate 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
- ✓ Add Navigator for pipes with multiple bends
- ✓ Ultra-portable

HOSE SIZE	.26–.98 in. .66–2.5 cm OD
HOSE FEED RATE	.4–2.5 ft/sec .12–.76 m/min
PUSH/PULL FORCE	15–150 lb 6.8–68 kg
OPERATING AIR PRESSURE	100 psi 0.69 MPa
DIMENSIONS	7 x 9.25 x 10 in. 17.8 x 23.5 x 25.4 mm
WEIGHT	22 lbs 10 kg

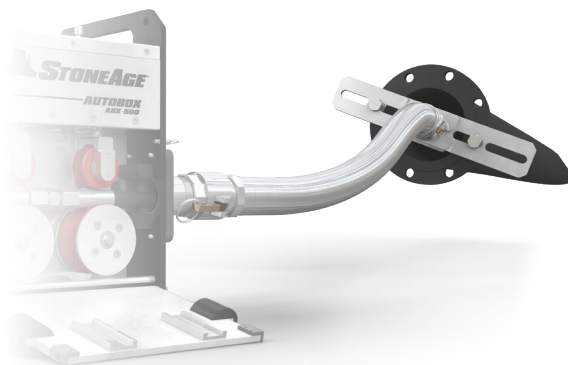


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FOR MORE
INFORMATION

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

AUTOBOX PRO ACCESSORIES

FULL & QUARTER FLANGE PLATE

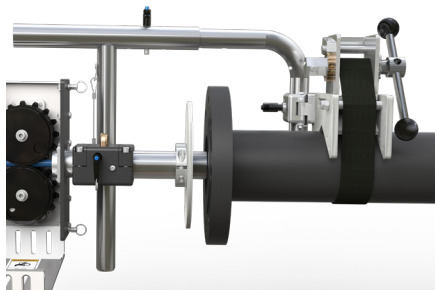
Mounts directly to the pipe flange and guide tube. Helps to prevent the tool from backing out of the pipe during cleaning operations.



- ✓ 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

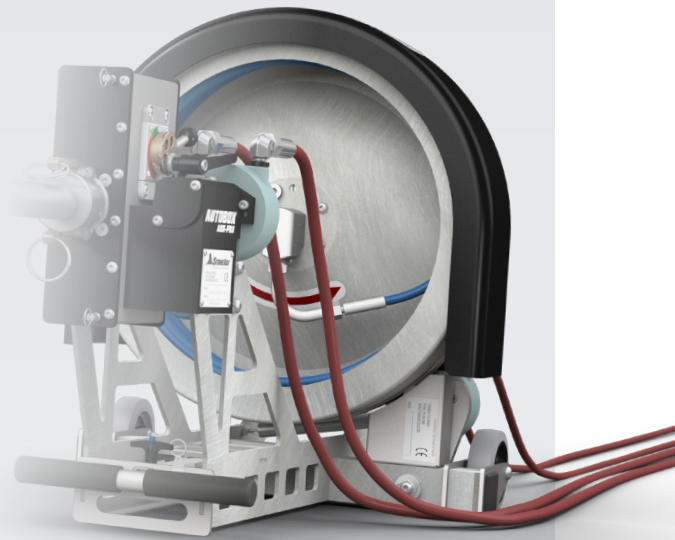
SMALL PROCESS PIPE CLEANING

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

- ✓ 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 75 ft (23 m) of reach



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 75 ft (23 m)
COMPLETE WEIGHT	100lb (45kg)

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.



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.



SUGGESTED NOZZLES:

○ Badger ○ Banshee ○ Barracuda ✓ Beetle ○ BJV

See Rotary Tools Catalog for more information

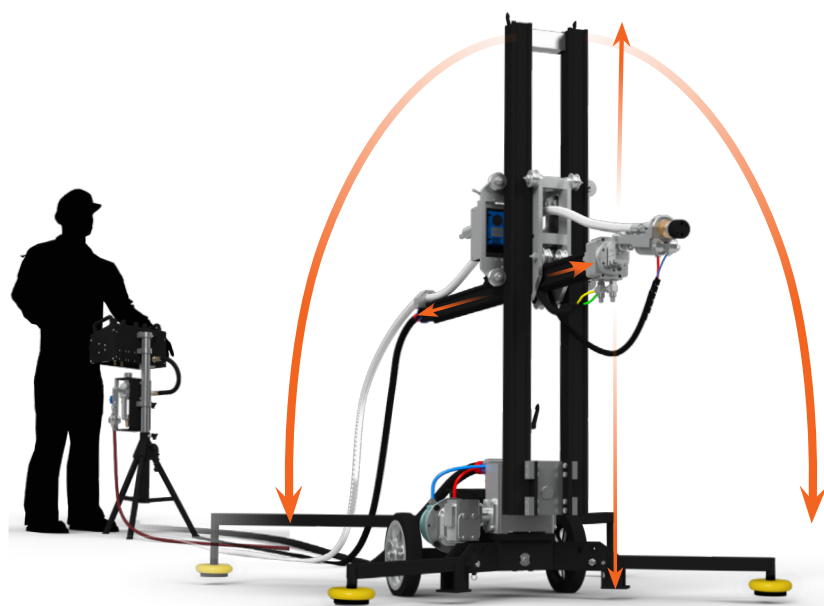


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SURFACE CLEANING

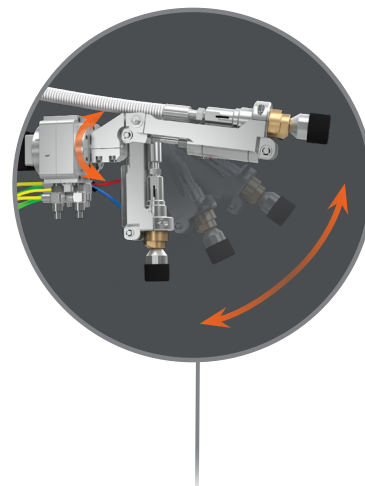
The Striker family of automated surface cleaning systems has been engineered to replace the difficult and dangerous practice of manual shotgunning.

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.



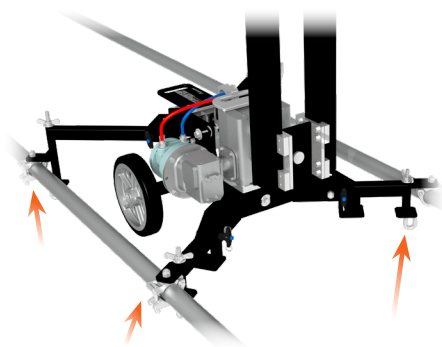
3-D CLEANING CAPABILITY

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.

SUGGESTED NOZZLES:

☐ Badger ☐ Banshee ☒ Barracuda ☐ Beetle ☐ BJV


See Rotary Tools Catalog for more information

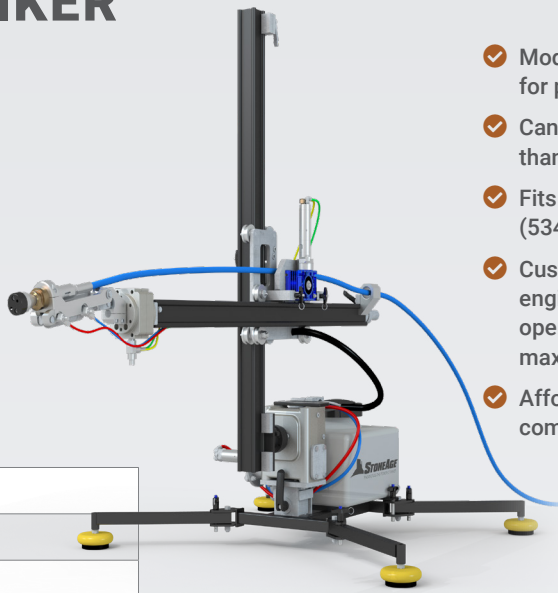
STRIKERS

LIGHTWEIGHT STRIKER SKRL-100

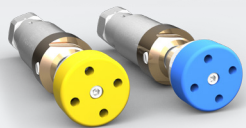
BEST FOR: In SITU cleaning in hard to access locations

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.

MODEL	SKRL-100
PRESSURE RANGE	Up to 20k psi (1380 bar)
JET REACTION RANGE	up to 50 lbs (23 kg)
TOTAL WEIGHT	140 lbs (64 kg)
CONTROL BOX	Tethered
CLEANING WINDOW DIMENSIONS	 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.

MODEL	SKR-STD
PRESSURE RANGE	Up to 40k psi (2800 bar)
JET REACTION RANGE	Up to 70 lbs (32 kg)
TOTAL WEIGHT	260 lbs (118 kg)
CONTROL BOX	Tethered
CLEANING WINDOW DIMENSIONS	 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



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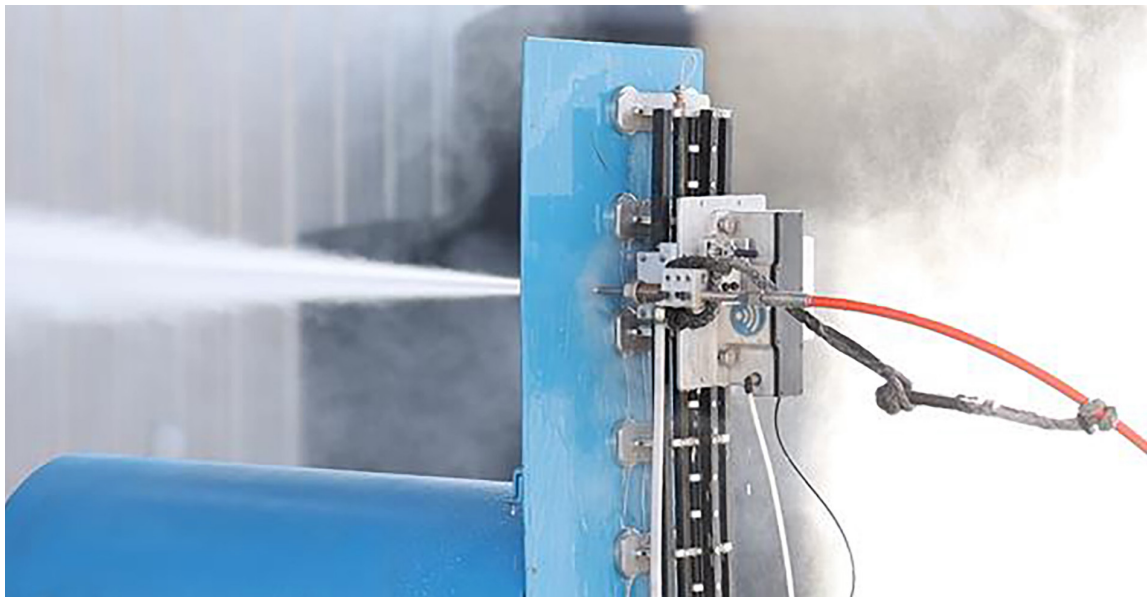
COLD-CUTTING

THE SAFEST METHOD FOR CUTTING STRUCTURES IN HAZARDOUS ENVIRONMENTS

Cold cutting systems utilizing high pressure water infused with an abrasive garnet for cutting through metals, concrete, and more during demolition and access-granting applications without using heat, flame, or sparks.



Pictured: Jack Track Straight Flex Cutter



When you're having to be very precise with each and every cut from start to finish on big jobs, having this piece of equipment really is the most efficient way to get it done.

Matt Weller, Supervisor at Smith Industrial Services

Designed for precision straight, radial, or pipe cutting, the Jack Track is innovative and easy to use.

The lightweight and user-friendly construction allows for a single operator to set up, pierce the cutting surface, and cut in minutes.

Originally developed by Terydon, the Jack Track has long been recognized as an innovative and easy-to-use system for industrial cutting applications. Since joining StoneAge, the original development team continues to support and refine the system for added capability.

- ✓ Semi-rigid, flexible drive track adapts to surface contours while providing a robust base for straight, reliable cuts
- ✓ Magnetic or vacuum pods allow easy positioning and stabilize the system during operation
- ✓ Toothless engagement with drive rail eliminates the “cogging” of typical gear drives, resulting in smoother cuts
- ✓ Easily expandable by splicing multiple tracks together
- ✓ Multiple configurations available to accommodate different types of cuts, precision requirements, and power sources

AUTOPACK JACK TRACK

Recognized as the “Best Cutting System on the Market”, the AutoPack Jack Track is a versatile cold cutting system with everything needed to perform straight, radial, and pipe cuts. Developed for precision cutting but capable of scrap cutting as well, the Jack Track’s lightweight and user-friendly construction allows for a single operator to set up, pierce the cutting surface, and cut in minutes.

Built with a pneumatic or hydraulic power supplies, this AutoPack Jack Track is a complete system including the Straight/Flex Track, Circle/Pipe Cutter, and Mini Radius Cutter.

- ✓ Built-in fall detection capabilities to help operators stay safe on the job
- ✓ Magnetic attachments and suction cups for nonferrous metals
- ✓ Semi-rigid, flexible drive track adapts to surface contours while providing a robust base for straight, reliable cuts
- ✓ Cutting Calculator to help operators successfully plan and perform a wide range of cutting jobs
- ✓ Available with a wireless or cabled controller



JACK TRACK COMPONENTS *(ALSO AVAILABLE SEPERATELY)*

STRAIGHT FLEX CUTTER

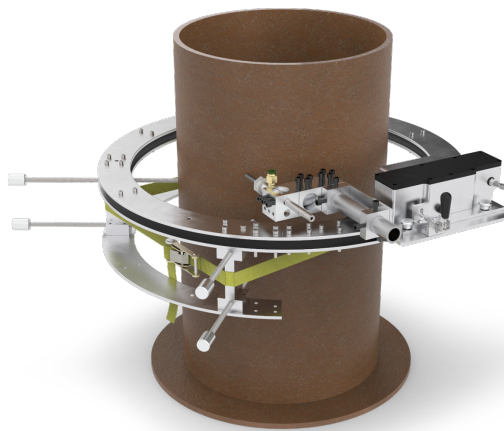
This model includes the Jack Track cutting system and Flex Track attachment. Made of a special semi-rigid, yet flexible composite, this model eliminates the “cogging” of typical gear drives providing smooth feed for smooth cuts. With lateral and longitudinal flexibility, precision cutting can be achieved without special set-up techniques and mounts.



- ✓ Lightweight, modular track system for precision cutting
- ✓ Configurable for straight, beveled, and radial cutting of surfaces
- ✓ Designed with a cutting-edge venturi system for maximum media suction and minimal equipment wear
- ✓ Adjustable feed rate control allows for cutting at 20-50k pressures, 1/8"-12" per minute
- ✓ 12VDC wireless, 12VDC cabled, Hydraulic, and Pneumatic control options available

CIRCLE/PIPE CUTTER

This listing includes the Jack Track cutting system and Circle Track attachment. The Circle Cutter compliments the Flex Track and the Mini-Radius Cutter by either mounting for a Pipe Cut or attaching for a Radius Cut, a flexible option to complete any large diameter cut in the field.



- ✓ Aluminum construction with Polymer Drive Rail
- ✓ Designed to complement Straight/Flex Track by mounting to diameters 4"-24"
- ✓ Adaptable to mount to flat surface for circular cuts up to 48" diameter
- ✓ Designed to share Power Drive Assembly with Straight/Flex Track
- ✓ Toggle Switch allows effortless dis-engagement for precision alignment in neutral drive
- ✓ 12VDC, hydraulic, or pneumatic control options

MINI-RADIUS CUTTER

This Mini Radius Cutter is ideal for cutting door sheet corner and other small radii. Compatible with Jack Track system controllers, this model accepts the UTS/TCH-2 assembly.



- ✓ Specifically designed for cutting corner radii and small holes
- ✓ Cuts radii greater than or equal to 3.25"
- ✓ 12VDC, hydraulic, or pneumatic power options
- ✓ Magnetic/suction mount
- ✓ Adjustable 1/8" to 12" per minute feed rate
- ✓ Center pin for easy location to scribed point



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TANK & VESSEL CLEANING

OPTIMIZE TANK AND VESSEL CLEANING WITH 3D TOOLS

Tank and vessel cleaning is essential to maintaining the efficiency and productivity of industrial facilities. Waterblasting results in lower operating costs and less downtime, which are critical to the bottom line.

Our equipment delivers high flow and controlled rotation for optimal cleaning of medium to large tanks and vessels. This combination is ideal for tackling difficult-to-remove materials such as coke deposits. We also have tools for highly adaptable, hands-free 3D tank cleaning for increased safety. Our tools experience significantly less pressure loss than other competitive tools on the market, which means more power is delivered to the cleaning surface and greater productivity.

AUTOBOX ABX-500 HOSE TRACTOR

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

TORUS 3D TANK CLEANING TOOL

Gear 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.



AUTOBOX 500

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.

- ✓ Remote hose feed tractor increases productivity and reduces operator fatigue
- ✓ Handles hose sizes from 0.56-1.75" (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" (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	19 x 13 x 12 in. 482 x 330 x 305 mm
WEIGHT	90 lbs 22 kg



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MORE INFORMATION

Every vessel has different geometry and different fouling. The AutoBox 500 can be paired with either 2D and 3D cleaning tools to meet those specific needs.

2D TOOLS: BJVE & BJV SERIES

- ✓ Ideal for tanks with central openings and no internal obstructions
- ✓ Best for cleaning side walls
- ✓ Can clean side walls faster than a 3D tool
- ✓ Available in a variety of head configurations
- ✓ Arm extensions and jet plugs available

3D TOOLS: TORUS SERIES

- ✓ Ideal for tanks with internal obstructions
- ✓ Best for full cleaning coverage of all tank surfaces, including top and bottom, without requiring operator entry
- ✓ Adjustable speed controls and multiple jetting configurations enable job customization
- ✓ Extension nipples and centralizers available

SUGGESTED NOZZLES:

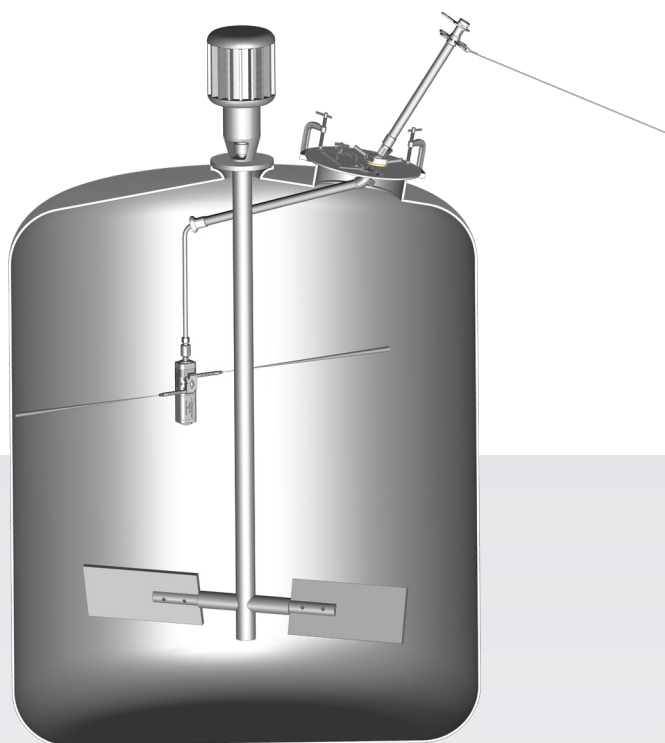
✓ Badger ○ Banshee ○ Beetle ✓ BJV ✓ Torus

See Rotary Tools Catalog for more information

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

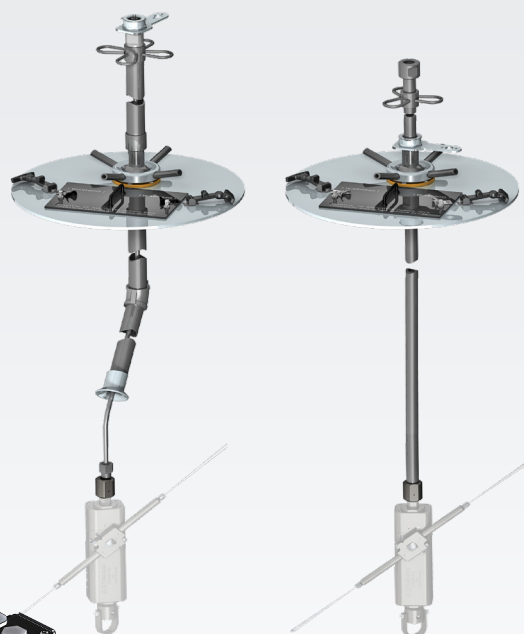
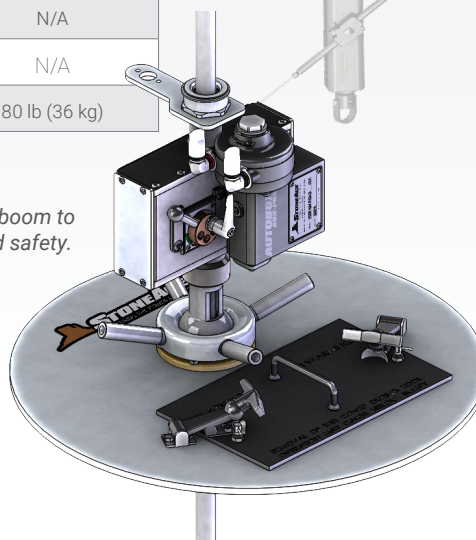
Positioners provide up to 19 ft (5.8 m) of reach for the Torus 3-D tank cleaner in addition to tilt and rotation adjustments. Intended for vertical or near vertical applications.

- ✓ 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

	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)

HANDS-FREE OPTION

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



TORUS sold separately

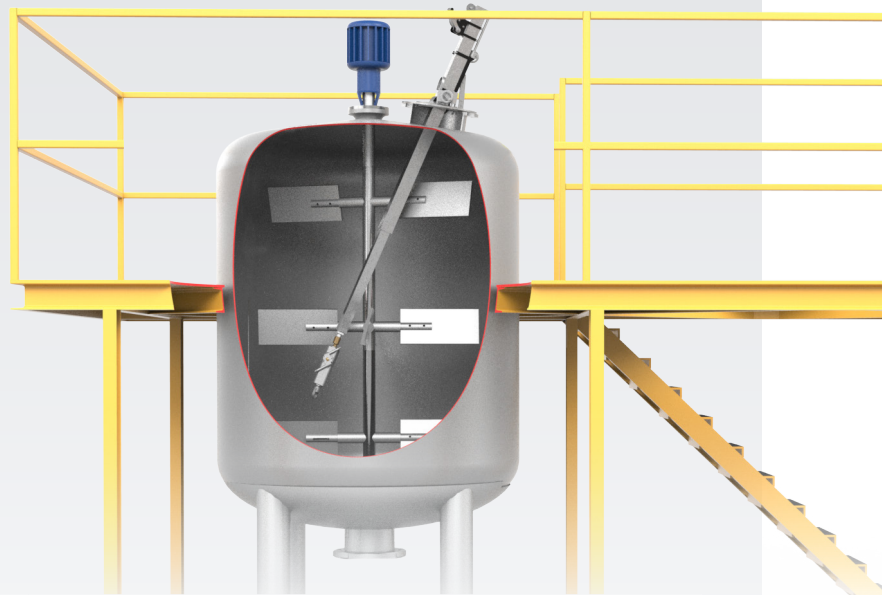
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TELEBOOM

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



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

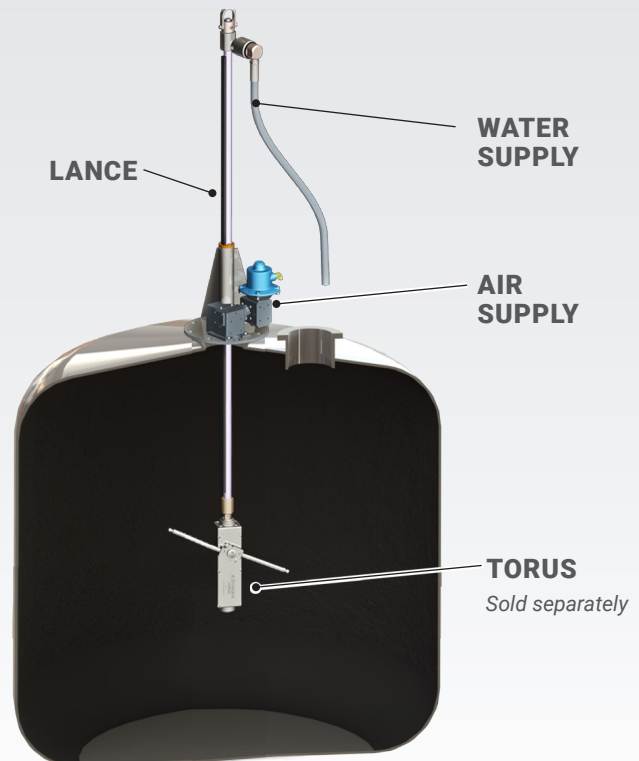
EXTENSION BOOM

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.

	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



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STAY INFORMED WITH EASY ONLINE RESOURCES

VISIT OUR WEBSITE

- Updated product information
- Service literature and user manuals, instructional videos, news and much more
- Contact info for all of our Branch Offices, Authorized Dealers and Repair Centers

www.stoneagetools.com



NEW WEB FEATURES!

- Create a personalized account for individualized content
- Find pricing, availability, order & invoice history, and shipment tracking details
- Find part numbers, product manuals and tool talks easier than ever

JETTING APP

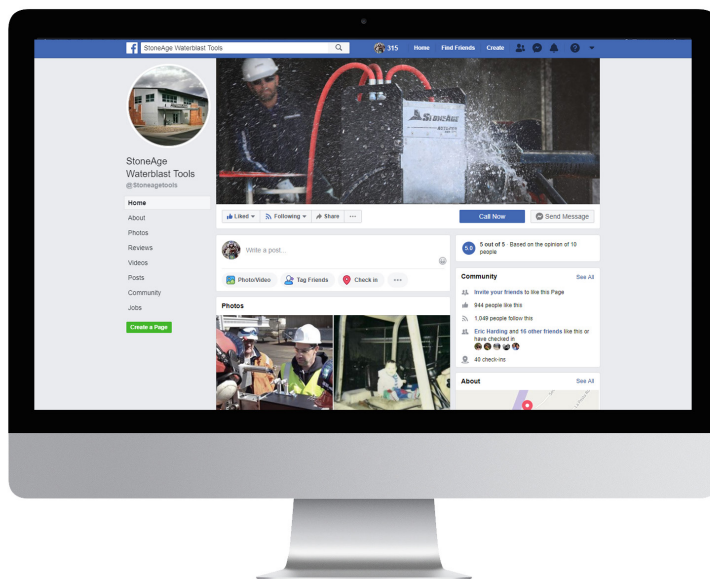
- Optimize your StoneAge Tool for faster cleaning
- Configure jetting, flow and pressure loss
- Dial in the exact working configurations for your nozzle

jetting.stoneagetools.com



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

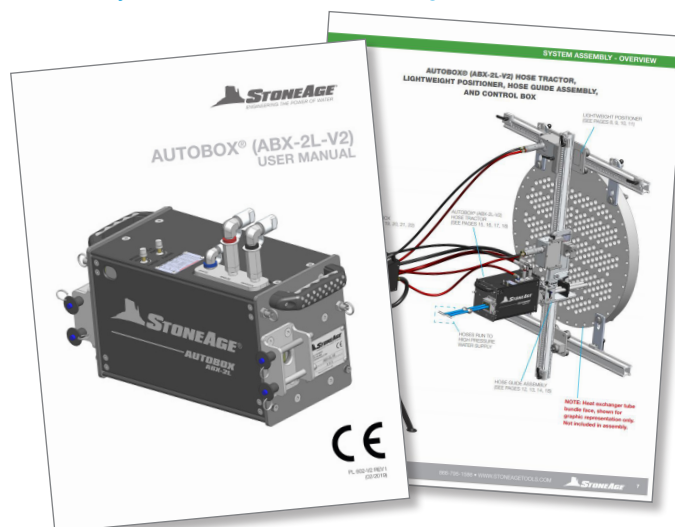


www.youtube.com/user/StoneAgeWaterTools

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 offers several training programs at our 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.

COURSE OVERVIEW

HYDROBLASTING TRAINING & CERTIFICATION

The WJTA's Hydroblaster Training & Certification Program is the first step to becoming compliant in the use of high-pressure water. For new hires and tenured employees alike, certification helps integrate best practices and implement most effective means within all operations, no matter how complex.

Communication is key to safety. Training provides the foundation to communicate. We all recognize that safe success within a project or turnaround depends on all parties being on the same page. Assumptions and inconsistencies are dangerous.

We present a standardized model that brings safe and effective communication into all phases of hydroblasting configuration, planning, and execution.

WATERJETTING SCIENCE & TECHNIQUE

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

ACCREDITED INDUSTRY TRAINING

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



PERMIT ISSUER/PERMIT AUDITOR/HSE PROFESSIONAL SESSIONS

Safe industrial cleaning depends on the shared responsibility between asset owners, cleaning contractors, and equipment manufacturers. All parties must exhibit a sense of ownership in completing the project within specified parameters without incident or injury.

StoneAge Training and the WJTA have had many successful sessions both virtually and in-person with Asset Owners and their Service Providers to establish the standard of What Right Looks Like!

Our sessions equip Operators, Permit Auditors, and HSE Professionals with the knowledge to identify current best practices and compliance.

Visit our website for up-to-date information about our course offerings.



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. 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.



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	$Cv = Q/\Delta P^{1/2}, = 53 \times (D^{2.5}/L^{1/2})$
ΔP = PRESSURE DROP	$\Delta P = (Q/Cv)^2$
F = THRUST IN LB	$F = \pi/2 \times d^2 \times P \times Cd, = .052 \times P^{1/2} \times Q, \approx .0018 \times (Q/D)^2 \times Cd$
ΔT = 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 propriety threads.

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

THREAD SIZE	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.

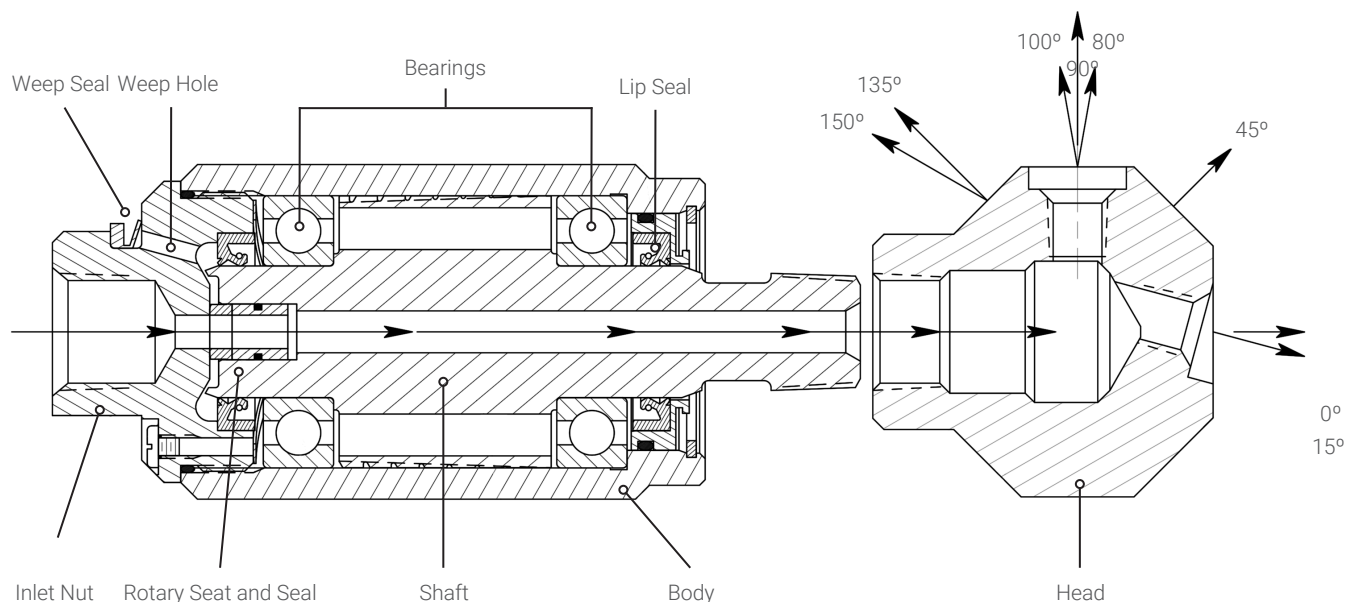
BN33-MP9 is the Part ID for a Banshee swivel. The **MP9** indicates a 9/16" MP inlet that requires a gland and collar and the actual thread size is 13/16"-16 UNF right hand. Check the fittings and adapters section for the correct selection of gland nut and collar or other adapter.

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.

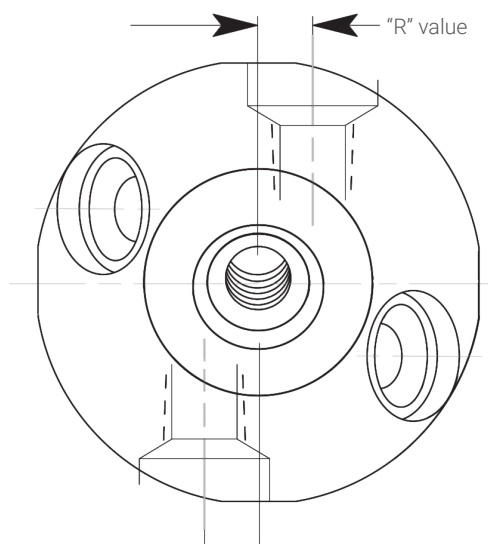
BC-H9-C is the Part ID for a Barracuda tool assembly. The **H9** indicates a 9/16" HP inlet that requires a gland and collar and the actual thread size is 1 1/8"-12 right hand. Check the fittings and adapters section for the correct selection of gland and collar.

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	
BJVE-M24		BJVE 602	BJVE 610	BJVE 612	
BJVE-P16		BJVE 602	BJVE 610	BJVE 612	
BJVE-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-MP9 - 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 - 20K PSI	BAE 600-X	BAE 602	BAE 610-X	BAE 612	
BADGER - BA-P8 & BA-MP9	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-MP9AV9	SL 600-K		SL 610-K	SL 612	GP 048
SG-P8P8 & SG-MP12MP12	SG 600		SG 610	SG 612	GP 048
SG-P12P12-62 & SG-M16M16	SG 600-62		SG 610-62	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
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. 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

CALL US: +1 970-259-2869

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.

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

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:

- if Buyer fails to purchase and use necessary and appropriate safety devices and guards as determined by Buyer and/or as recommended by Seller.
- if Buyer fails to maintain in good working order such safety devices and guards as are purchased from Seller;
- if Buyer adds, omits, repairs, modified, replaces or substitutes any components on the equipment without permission from Seller;
- 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
- 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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