High performance in tough industrial service

Hammelmann high pressure application systems

Surface preparation
Tank cleaning
Pipe cleaning
Water jet cutting
Valves, water hydraulics and accessories
Hammelmann
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## More details: Hammelmann.us/catalogue

### Environmentally friendly

Cleaning systems with direct vacuuming of removed waste material and water plus filtering have long been Hammelmann’s hallmark for “green competence”.

### Reliable

Hammelmann cleaning systems are reliable modules for integration into production processes and machinery. Renowned companies benefit from our technology.

### Optimised

The number, arrangement and angle of nozzles for surface blasting and nozzle holder systems are calculated using the latest simulation programmes. This ensures a highly effective use of energy.

### Economical

Hammelmann’s ship cleaning systems for example. These can be used following just a very short set-up time and quickly remove coatings from metal surfaces.

### Innovative

Turning new ideas into practical water blasting tools is what our application engineers do every day, whether on the customer’s site or in our flexible and efficient technology centre.

### Precise

Precision tools are required for cleaning and deburring very small bores and intercepting bores. Automobile manufacturers worldwide use Hammelmann’s high pressure technology.

### Safe

User-friendly water blasting tools increase safety when working and allow the operator to work for longer periods of time and with greater concentration.

### Flexible

Hammelmann application systems can be adapted to individual cleaning requirements. The RD Flex rotor jet for example can be adjusted to work at different rotation speeds without the need for tools.

### Energy-saving

Tools with optimised flow characteristics reduce energy consumption and make full use of flow and pressure. Result: the total energy consumption is reduced.
### SURFACE PREPARATION

**Surface preparation**

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<td>Dockboy</td>
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<td>Dockmate</td>
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</tr>
</tbody>
</table>

**Calculator app for surface preparation**

Free app for iOS, Android, Blackberry and your browser

**Water Jetting Calculator:** [hammelmann.com/app](hammelmann.com/app)
High pressure water blasting guns up to 43,500 psi

**Blasting gun Technology**

**Blasting gun**

**Operating pressure**

**Weight**

<table>
<thead>
<tr>
<th>Blasting gun</th>
<th>Operating pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP 400 M</td>
<td>up to 6,000 psi</td>
<td>71 lbs</td>
</tr>
<tr>
<td>SP 1000 M</td>
<td>up to 14,500 psi</td>
<td>8.0 lbs</td>
</tr>
<tr>
<td>SP 1000 ME</td>
<td>up to 14,500 psi</td>
<td>10.1 lbs</td>
</tr>
<tr>
<td>SP 3000 E</td>
<td>up to 43,500 psi</td>
<td>7.7 lbs</td>
</tr>
<tr>
<td>SP 3000 E H</td>
<td>up to 43,500 psi</td>
<td>11.0 lbs</td>
</tr>
<tr>
<td>SP 3000 MB</td>
<td>up to 43,500 psi</td>
<td>8.2 lbs</td>
</tr>
<tr>
<td>SP 3000 MBE</td>
<td>up to 43,500 psi</td>
<td>9.3 lbs</td>
</tr>
<tr>
<td>SP 3000 MB – 2H</td>
<td>up to 43,500 psi</td>
<td>14.3 lbs</td>
</tr>
<tr>
<td>SP 3000 E – 2H</td>
<td>up to 43,500 psi</td>
<td>10.1 lbs</td>
</tr>
</tbody>
</table>

**Ergonomics**

An ergonomically formed handle and various extensions can be easily combined. Each operator can find the working posture that best suits him, saving him effort and increasing workplace health and safety.

A small lever but with a great effect

A simple lever mechanism makes the trigger of our new blasting guns child’s play to operate. The operator can use the gun without feeling strain and physical stress which enables longer, more concentrated working periods.
SP 3200 E Ergoflex

The high pressure hose is routed to the high pressure tool through the central guide tube of the gun.

Added safety and more increased flexibility distinguish the Ergoflex blasting gun.

In this new blasting gun concept the high pressure hose is ‘encapsulated’ in a central guide tube. There is no danger to the operator from leakages at connections or fittings.

The blasting gun is of modular design providing adjustment flexibility. Thus every operator can find his own optimal stance. The body-matched ergonomics avoid a one-sided body load causing cramping of the muscles. This increases the safety at work.

Technical data SP 3200 E Ergoflex
Max. operating pressure: 46,400 psi
Max. flow rate: 8 gpm
Hose connection: M 14 x 1.5 LH male
Length overall: 57.6 inch
Weight: 9.5 lbs
High pressure hose (4 m): 6.6 lbs
Connection thread: M 14 x 1.5 LH

• The high pressure hose is assembled with bearings allowing it to swivel in the guide tube
• No swivel connection is required between gun and high pressure hose
• Can be used with reaction forces up to 56 lbf
• The handle is made of shock-resistant plastic
• A second hand grip and shoulder stock can be rotated and positioned to suit the operator
• The integral reed switch for 24 VDC control signals can be used in intrinsically-safe circuits Ex(i)
• Safety lock prevents high pressure being switched on unintentionally

The modular design allows the Ergoflex to be adjusted for various operating positions.
Radio remote control – RRC

Swivelling connections

The swivel connector makes work with high pressure blasting guns easier by eliminating high pressure hose constraints. Light, compact design.

Swivelling connection for blasting guns
Swivelling connections are available up to an operating pressure of 3000 bar. They are available for the blasting guns SP 400, 1000 and 3000. Weight approx. 1.3 lbs.

Swivelling connection for high pressure hoses
Swivelling connection DN 14 is available for operating pressures of up to 23,000 psi. M36 x 2 DKO threads serve as connections on both sides.

RRC Basic
• Transmitter ON/OFF
• High pressure OFF switch
• High pressure ON/OFF
• 4-pole bypass socket with 60 inch connecting cable
• Status LEDs
• Receiver with connecting cable
• Battery charger
• Belt

RRC Plus
Same as basic plus:
• Emergency stop switch
• Rocker switch, high pressure pump ON/OFF
• Rocker switch, set value +/-

More RRC versions are available

Safe and ergonomic work with high pressure water

JETMATE

The reaction forces are absorbed by the holding device.

The Jetmate enables reaction force free working during the cleaning process, easy to handle and provides increased safety.

Simple handling and increased safety at work, these are the demands in the modern working environment. To meet these requirements it is our policy to continuously develop our high pressure systems.

• Blasting tool can be easily moved and swivelled in all directions
• Weight relief by pneumatic cylinder compensation
• Suitable for standard gun barrels
• Pneumatic deployment module to advance and retract during blasting
• Deployment module is available without holding device

JETBOY

Working with the Jetboy is virtually effortless, enabling the operator to get much more done in less time.

Mechanical assistance for manual gun work with single or rotor jets and Aquablast surface cleaner on:
• Ceilings, supports (bridges, multi-storey car parks)
• Floor surfaces (removal of expansion joints and markings)
• Blasting of edges and corners with accuracy and ease
Aquablast® surface cleaners

**Description**

Easy handling and high power performance make the Aquablast surface cleaners more than just cleaners. They can be used for a wide range of applications.

(Optional: wear protection for spray bar.)

**Typical applications**

- Paint booth grid cleaning
- Floor and paving cleaning
- Stripping and removal of paint and rust etc.
- Cleaning fuel, oil and grease deposits / stains
- Removal of coatings, mastics, laitance, adhesion inhibitors, mortar rendering etc.
- Roughening concrete and asphalt

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<table>
<thead>
<tr>
<th>Surface cleaner</th>
<th>Working width</th>
<th>Op. pressure</th>
<th>Flow rate</th>
<th>Rotation speed</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR 1000</td>
<td>20 inch</td>
<td>up to 14,500 psi</td>
<td>42 gpm</td>
<td>1500 r.p.m.</td>
<td>~ 260 lbs</td>
</tr>
<tr>
<td>FR 1500</td>
<td>16 inch</td>
<td>up to 21,800 psi</td>
<td>39 gpm</td>
<td>1000 r.p.m.</td>
<td>~ 200 lbs</td>
</tr>
<tr>
<td>FR 3000</td>
<td>9 inch</td>
<td>up to 43,500 psi</td>
<td>11 gpm</td>
<td>3000 r.p.m.</td>
<td>~ 170 lbs</td>
</tr>
<tr>
<td>FR 3000 HD</td>
<td>11 inch</td>
<td>up to 43,500 psi</td>
<td>11 gpm</td>
<td>3000 r.p.m.</td>
<td>~ 210 lbs</td>
</tr>
</tbody>
</table>

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Aquablast FR 1500

- Spray bar driven by reaction force of the water jets.
- Wear-resistant rotary joint with labyrinth seal
- Pressure on/off control options: Mechanical bypass valve or electric in 4-pole system to pump. Special controls available upon request.
- On/Off control by twin trigger action
- Four-wheel carriage
- Optional: wear protection for spray bar

Aquablast FR 3000 HD

- Spray bar driven by reaction force of the water jets.
- Height-adjustable spray bar
- Pressure on/off control options: Mechanical bypass valve or electric in 4-pole system to pump. Special controls available upon request.
- On/Off control by twin trigger action
- The Aquablast’s all-steel chassis means it can be cleaned using high pressure water.

Aquablast FR 3000

- Spray bar driven by reaction force of the water jets.
- Wear-resistant rotary joint with labyrinth seal
- Pressure on/off control options: Mechanical bypass valve or electric in 4-pole system to pump. Special controls available upon request.
- On/Off control by twin trigger action
- Four-wheel carriage
- Optional: wear protection for spray bar

Aquablast FR 3000 HD

- Spray bar driven by reaction force of the water jets.
- Height-adjustable spray bar
- Pressure on/off control options: Mechanical bypass valve or electric in 4-pole system to pump. Special controls available upon request.
- On/Off control by twin trigger action
- The Aquablast’s all-steel chassis means it can be cleaned using high pressure water.

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More details: hammelmann.us/catalogue
Aquablast® PLUS surface cleaner

**Description**
The removed waste and waste water can be directly vacuumed away to a combined vacuum/filter unit where they are separated for further disposal.

**Typical applications**
- Removal of coatings, paint and rust from metal surfaces, e.g. ship hulls, storage tanks
- Cleaning storage spaces, flooring, machine shops, façades
- Roughening concrete and asphalt
- Removal of markings on roads, parking and storage spaces in production halls

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**Aquablast FRV 3000**
- **Working width:** 9 inch
- **Operating pressure:** up to 43,500 psi
- **Flow rate:** up to 11 gpm
- **Rotation speed:** up to 2500 r.p.m.

Direct vacuuming allows the use of high pressure water blasting in factories and machine shops without halting production or on roads, upper storeys of buildings etc. without the need for closure.

**Vacuum system**
For use with the Aquablast PLUS units. The waste water and solids are separated within the system for further disposal.

- **Capacity:** 2 x 61 gal
- **Power required:** 7.4 hp
- **Vacuum:** 2.9 psi
- **Suction power:** 7,062 ft³/h

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**Aquablast FR WV 3000**
- **Working width:** 6 inch
- **Operating pressure:** up to 43,500 psi
- **Flow rate:** up to 5 gpm
- **Rotation speed:** up to 2500 r.p.m.

Ergonomic handheld cleaning and stripping unit for vertical surfaces.

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**Aquablast (example: Twin)**
- **Working width:** 22 inch
- **Operating pressure:** up to 43,500 psi
- **Flow rate:** up to 15 gpm
- **Rotation speed:** up to 3000 r.p.m.
**Aquablast® Drive**

- Direct vacuuming of waste material and waste water
- Spray bar driven by reaction force of the water jets
- Optimised with 2 x 4 nozzle arms i.e. a total of up to 8 nozzles
- Modular Aquablast system

**Working width:** up to 40 inch  
**Op. pressure:** up to 14,500 psi  
**Flow rate:** up to 63.4 gpm  
**Average working speed:** 164 ft/min  
**Total weight:** 2,000 lbs

**Applications**
Cleaning large surfaces such as runways and industrial sites

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**Aquablast® Remote**

Self-sufficient carrier vehicle that can take various jetting tools for surface treatment, i.e. the cleaning and de-coating of ship decks

- Flexible use in combination with cleaning vehicles and with independent high pressure units
- Easy to use in combination with cleaning vehicles, without the hassle of performing hydraulic installation on the vehicle
- Modular system for different working widths
- Simple and safe handling, radio remote controlled. Operator can control it from outside danger zones
- One-man operation

**Vacuum system**

Vacuum system for suctioning off and pre-filtering waste water.

- Prefractionator: 166 gal  
- Fine separator: 430 gal  
- Weight: 3,300 lbs  
- Engine: 3-cylinder diesel engine

**Technical data**

- **Working width:** max. 34 inch  
- **Travelling speeds:** 16 – 220 ft/min  
- **Operating pressure:** max. 43,500 psi  
- **Flow rate:** 21 gpm

**Typical applications**

- Removal of road markings on lanes, parking and storage spaces
- Cleaning and de-coating of ship decks, industrial floors etc.
- Can be used at airports to clean runways and terminal areas
- Removal of concrete laitance

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- Double chamber system
- Prefractionator: 166 gal  
- Fine separator: 430 gal  
- Weight: 3,300 lbs  
- Engine: 3-cylinder diesel engine

**Conversion option for ceiling/underfloor cleaning**

**Overhead work**
Rotor jets

Rotors jets utilise the high efficiency of round jets to blast more surface in less time. Thanks to varying nozzle heads and controlled rotation speed adjustment, there are a great number of possibilities when it comes to blasting surfaces. The light and compact design enables the operator to reach areas with limited access.

Typical applications

Surface preparation:
- Cleaning
- Roughening
- Removing coatings
- Concrete demolishing

RD Masterjet

The new rotor jet generation with HPS sealing technology.

High level of ergonomics
due to the light weight and compact nozzle design

Outstanding performance
with operating pressures up to 46,400 psi

High energy efficiency
The optimum internal flow allows the pump’s total performance to be used without loss of energy

Variable speed
Long life expectancy based on the Hammelmann HPS seal system and new robust components

Versatile
Universal nozzle hub for working with 2 or 4 nozzle inserts

Easy maintenance
Service friendly design with few components

Operating pressures
Standard version: max. 26,100 psi
HPS version: max. 46,400 psi

Speed adjustable by hand controlled by variable magnetic brake, in rev. settings (no oil or filling tool required)

Universal nozzle hub

Variable speed

Universal nozzle hub for working with 2 or 4 nozzle inserts

RD 400 / 1000 / 1600

For use with blasting guns series SP 400, 1000, 3000 and high pressure lances.

RD 3000 PR (pneumatic)

Pneumatically powered rotor jet for use with blasting guns series SP 3000, high pressure lances and the Ergoblast.

Nozzle holders

Rotor jets

Op. pressure
Flow rate
Rotation speed
Connection thread
Weight

RD Flex 3000
up to 43,500 psi
2.2 – 8 gpm
1000 – 4000 r.p.m.
M 14 x 1.5 LH * Adapter 9/16”-18 UNF
4.0 lbs

RD Masterjet
up to 46,400 psi
up to 16 gpm
1000 – 3500 r.p.m.
M 14 x 1.5 LH * Adapter 9/16”-18 UNF
2.6 lbs

RD 400
up to 5,800 psi
up to 21 gpm
1000 – 2000 r.p.m.
G 3/8 *
2.6 lbs

RD 1000
up to 14,500 psi
up to 16 gpm
1000 – 2000 r.p.m.
G 3/8 *
2.6 lbs

RD 1600
up to 23,200 psi
up to 13 gpm
800 – 2000 r.p.m.
MH 14 x 1.5 LH Adapter 9/16”-18 UNF
3.5 lbs

RD 3000 PR
up to 43,500 psi
up to 8 gpm
100 – 3000 r.p.m.
MH 14 x 1.5 LH Adapter 9/16”-18 UNF
5.7 lbs

MORE DETAILS: HAMMELEMM.US/CATALOGUE

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Rotor jets

Mechanically deployed rotor jets handle high pump power inputs and are generally built into cleaning machines or systems. The rotation is effected by the reaction force of the water jets. Can be configured with axial or radial jetting heads.

### Rotor jets

<table>
<thead>
<tr>
<th>Model</th>
<th>Operating pressure</th>
<th>Flow rate</th>
<th>Rotation speed</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDM 200</td>
<td>up to 14,500 psi</td>
<td>up to 42 gpm</td>
<td>100 – 1500 r.p.m.</td>
<td>17.6 lbs</td>
</tr>
<tr>
<td>RDM 250</td>
<td>up to 21,800 psi</td>
<td>up to 32 gpm</td>
<td>100 – 1500 r.p.m.</td>
<td>17.6 lbs</td>
</tr>
<tr>
<td>RDM 300</td>
<td>up to 14,500 psi</td>
<td>up to 48 gpm</td>
<td>50 – 250 r.p.m.</td>
<td>18.1 lbs</td>
</tr>
<tr>
<td>RDM 400</td>
<td>up to 20,300 psi</td>
<td>up to 53 gpm</td>
<td>50 – 250 r.p.m.</td>
<td>62 lbs</td>
</tr>
<tr>
<td>RDM 400 R</td>
<td>up to 36,300 psi</td>
<td>up to 26 gpm</td>
<td>50 – 500 r.p.m.</td>
<td>93 lbs</td>
</tr>
<tr>
<td>RDM 750</td>
<td>up to 23,200 psi</td>
<td>up to 106 gpm</td>
<td>100 – 1000 r.p.m.</td>
<td>160 lbs</td>
</tr>
</tbody>
</table>

### Powered rotary joints

Powered rotor jets are a combination of a rotary drive and water blasting tool. The motors are electric, pneumatic or hydraulic and are available in various power ratings. Here are a few examples:

#### Hydraulically powered rotary joints

- **Op. pressure:** up to 43,500 psi
- **Rotation speed:** up to 3000 r.p.m.
- **Flow rate:** up to 66 gpm

#### Pneumatically powered rotary joints

- **Op. pressure:** up to 43,500 psi
- **Rotation speed:** up to 3000 r.p.m.
- **Flow rate:** up to 11 gpm

#### Electrically powered rotary joints

- **Op. pressure:** up to 43,500 psi
- **Rotation speed:** up to 2850 r.p.m.
- **Flow rate:** up to 26 gpm

### Possible combinations of powered rotary joints and nozzles holders

- **Rotor jet with spray bar and wear protection, hydraulically powered (Working width: 15.7 inch)**
- **Centrally powered nozzle bar system, 3 rotary joints (working width: 59.7 inch)**

Modular combinations of powered rotary joints and nozzle holders are possible. There are further nozzle holder versions available.

More details: Hammelmann.us/catalogue

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The number of nozzles and their arrangement on surface cleaning systems are optimised using the latest simulation programs.
Process integrated application systems

Typical applications

- Deburring and washing engine and gearbox components
- Removal of coatings, paint etc.
- Robot-assisted high pressure applications such as car body skid cleaning and decoring
- Roughening of metallic surfaces
- Internal blasting and decoring of castings
- Internal blasting and decoring of castings
- Internal blasting and decoring of castings
- Paint and coating removal
- Cleaning and decoring of engine components
- Washing and cleaning of complex parts
- Robotic application systems
- High pressure cleaning systems
- Internal blasting systems
- Electrically powered rotors
- Electrically powered nozzle lances
- Multiple rotor jets, electrically powered
- Electrically driven angled rotary joints
- Electrically driven multiple rotary joints (oscillating)
- Electrically powered multiple rotary joints for external drive
- Nozzle arms, hydraulically powered

MORE DETAILS: HAMMELMANN.US/CATALOGUE
Spiderjet® V – Vacuum

The Spiderjet V is held on the work surface by a vacuum, which at the same time suctions off the removed waste material and waste water.

Technical data:

- Working width: 14.7 inch
- Operation pressure: up to 43,500 psi
- Flow rate: up to 13.2 gpm
- Weight: 232 lbs
- Max. operation speed: 0 – 16.7 ft/min

Vacuum:
- depending on the nature of the surface
- approx. 7.3 psi
- Suction connection: DN 100

Vacuum system for Spiderjet V and M consisting of:

- Vacuum collector (photo on right)
- Suction power: 8,365 gpm @ 7.3 psi vacuum
- Max. vacuum: 7.3 psi
- Vacuum generator: Roots - rotary piston blower
- Electric motor: 60 hp
- Length: 92 inch
- Width: 58 inch
- Height: 94 inch

Cyclone pre-separator

- Length: 64 inch
- Width: 58 inch
- Height: 133 inch

Suction hopper

- Capacity: 106 ft³
- Length: 93 inch
- Width: 93 inch
- Height: 165 inch

Spiderjet M – Magnetic

The Spiderjet M is attached to the work surface with permanent magnets. An optional vacuum system retrieves all waste water and removed solids.

- Maximum manoeuvrability via two individually, electrically driven magnetic wheels
- Radio remote control
- Secured by a double fall arrest system
- Special nozzle layout ensures a uniform distribution of the high pressure water across the working width
- Nozzle holder self-propelled due to the reaction force of the high pressure water jets
- Rotation speed can be varied with the spraybar angle
- Rotary joint with dynamic high pressure seals, leakage-free, long service intervals

Working width: 14.7 inch
Max. operating pressure: 43,500 psi
Max. flow rate: 13.2 gpm
Weight: 132 lbs
Operation speed: 0 – 19.6 ft/min

Working width:

- 14.7 inch

Max. operating pressure:

- 43,500 psi

Max. flow rate:

- 13.2 gpm

Weight:

- 132 lbs

Operation speed:

- 0 – 19.6 ft/min

High pressure unit

Vacuum unit (optional)

Cyclone pre-separator

Suction hopper

Radio remote control

Ship bottom preparation

More details: Hammelmann.us/catalogue
Dockboy

The Dockboy is a semi automatic vehicle primarily for working on ship hull bottoms or similar surfaces.

In combination with direct vacuuming, it ensures eco-friendly rust removal and old coating removal with waste and waste water collection. An Aquablast surface cleaner is attached to the end of the jib. The rotor is hydraulically powered.

The jib is designed to allow multifunctional work to be carried out on flat or rounded surfaces as well as on ground and overhead surfaces.

- Working width: 14.6 inch (optional 19.9 inch)
- Op. pressure: 43,500 psi
- Working height: 0 – 19 ft
- Vehicle height: 4 ft
- Arc width: 13 ft

Dockmate

The Dockmate is a completely dust-free, eco-friendly alternative to dry open abrasive blasting capable of preparing hull surfaces to the most exacting standards applicable today.

Using pressures varying between 36,300 psi and 43,500 psi, up to 2690 ft² per hour of surface can be prepared to NACE/SSPC standards WJ1/SC-2.

- The ultra high pressure unit is attached separately
- Telescopic jib: heights of 72 ft, 88 ft and 105 ft (optional)

High pressure units

Filter / recovery module

The waste water and the removed solids are separated in the filter recovery module and the solids are collected in a “big bag”.

Working width
- 14.8 inch (optional)
- 23.6 inch (optional)
- 33.9 inch (optional)

Aquajet 17
- 7.4 gpm – 43,500 psi
- 2 x Aquajet 17
- 14.8 gpm – 43,500 psi
- 3 x Aquajet 17
- 22.2 gpm – 43,500 psi

Aquajet 25
- 12.2 gpm – 43,500 psi
- 2 x Aquajet 25
- 24.3 gpm – 43,500 psi
Tank cleaning

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Aquamat Select for large vessels 32
Nozzle holder arms for tank cleaning heads 33
Aquarex tank cleaning devices 34 – 37

TANK CLEANING

Calculator app for tank cleaning
Free app for iOS, Android, Blackberry and your browser
Water Jetting Calculator: hammelmann.com/app
Aquamat® tank cleaning units

**Description**

Hammelmann automatic tank cleaners remove deposits including hardened materials from tank internal walls at pressures of up to 26,100 psi. The units operate solely with the power of high pressure water. The wide range of Hammelmann nozzle holder arms achieve the cleaning standard required at the specified performance parameters. Units can be fitted with one or two arms.

**Typical applications**

- Internal cleaning of autoclaves, vessels, Euro containers, reactors, agitator vessels, holding tanks, drying towers etc.
- Decontamination
- Disinfection (with chemical additives)
- Cleaning the interior of large diameter pipework with deployment sledge

**Design features**

- Minimum pressure losses result in high efficiency.
- Coherent water jets for max. cutting performance and distance.
- Wear-resistant, stepless adjustable braking system. The adjusting mechanism is dirt-protected.
- Compact and corrosion-resistant housing
- Freely suspended operation possible

**Simulation of tank cleaning**

Homogenous and thorough cleaning is ensured by an optimal interaction of rotational movements combined with an adjustable speed.

**Before**  
**After**

The cleaning action covers a wide area thanks to the rotating motion of the axes 

<table>
<thead>
<tr>
<th>Tank cleaning units</th>
<th>Operating pressure</th>
<th>Flow rate*</th>
<th>Min. tank access</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>L 1400-2</td>
<td>up to 20,300 psi</td>
<td>up to 50 gpm*</td>
<td>5.5 inch</td>
<td>17.2 lbs</td>
</tr>
<tr>
<td>L 1500 PLUS</td>
<td>up to 21,700 psi</td>
<td>up to 80 gpm*</td>
<td>5.5 inch</td>
<td>17.9 lbs</td>
</tr>
<tr>
<td>L 1800-2</td>
<td>up to 26,100 psi</td>
<td>up to 40 gpm*</td>
<td>7.5 inch</td>
<td>22.7 lbs</td>
</tr>
<tr>
<td>XL-500-2</td>
<td>up to 7,300 psi</td>
<td>up to 105 gpm*</td>
<td>6.7 inch</td>
<td>32.6 lbs</td>
</tr>
<tr>
<td>XL 1600-2</td>
<td>up to 23,200 psi</td>
<td>up to 70 gpm*</td>
<td>7.5 inch</td>
<td>32.6 lbs</td>
</tr>
<tr>
<td>XL 1600 PLUS</td>
<td>up to 23,200 psi</td>
<td>up to 118 gpm*</td>
<td>7.5 inch</td>
<td>32.6 lbs</td>
</tr>
<tr>
<td>XL 1600-2 Pumping chemicals</td>
<td>up to 23,200 psi</td>
<td>up to 70 gpm*</td>
<td>7.5 inch</td>
<td>32.6 lbs</td>
</tr>
<tr>
<td>XL 1600-2 Pumping chemicals gas tight</td>
<td>up to 23,200 psi</td>
<td>up to 70 gpm*</td>
<td>8.1 inch</td>
<td>85 lbs</td>
</tr>
<tr>
<td>XXL 1600-2</td>
<td>up to 23,200 psi</td>
<td>up to 220 gpm*</td>
<td>11.8 inch</td>
<td>205 lbs</td>
</tr>
</tbody>
</table>

* Energy-efficient flow rates with low pressure loss. Higher flow rates however are possible.

**Technical specifications**

- **Pumping chemicals**
  - Hot water (85 °C)
  - Pressure-resistant
  - It is possible to pump chemical media, e.g. alkalis
  - Version for pumping chemicals
  - Additionally with gas tight encapsulation
Aquamat® Select cleaning system for very large vessels

The cleaning time is reduced by an oscillating movement of the nozzle arm. The oscillation angle of the surface of the length (A) can be limited to 35° or 83°. The rotation around the vertical axis of the apparatus for the surface length (B) is preselected at 36° or 81°. When used in large containers (Fig. 1) the tank cleaning head is positioned at the vessel wall and cleans section by section.

1a Long blasting arm, oscillating motion
1b Short blasting arm, oscillating motion
2 Drive arm, powered by the jet reaction force

Fig. 1 - Very large diameter vessel
Fig. 2 - Large cylindrical vessel

Variants to enable different cleaning positions (vessel top, bottom) are possible. The drive of the Aquamat Select is provided by a second, reaction force powered nozzle arm. For the rotation mode, a wide range of nozzle inserts are used. This allows optimized cleaning time and efficiency.

Nozzle holder arms for tank cleaning heads

Hammelmann can supply nozzle holder arms in various designs, lever actions and arm lengths to achieve the cleaning standard required at the specified performance parameters.

- Nozzle holder Type "L" arm for TCH "XL"
- Nozzle holder Type "V" arm for TCH "L"
- Nozzle holder Type "V" arm for TCH "XL"
- Nozzle holder Type "S" arm for TCH "L"
- Nozzle holder Type "S" arm for TCH "XL"
- Special version for smokestack cleaning

Particularly compact designs make cleaning through small openings possible.

Deployment pipes
To stabilise the tank cleaning unit. Recommended for use when the unit is freely suspended by the hose with the unit brake adjusted to maximum.

Protective covers
Impact resistant plastic covers for tank cleaning units and nozzle holder arms.

Protective cage
Manufactured from rust and acid resistant stainless steel with rubber-coated frame sections. Offers all-round protection when fitted with type "Z" or "S" nozzle holder arms in conjunction with an impact resistant cover for the arm.

Sledge type guides
Guides to enable tank cleaning units to be used for pipe cleaning. The unit is mounted in the centre and a swivelling pulling eye is provided. Optional “kick plate” available so that the assembly self-propels through the pipe.

Accessories for tank cleaning heads

Extension arm from 4.33 inch to 43.3 inch

MORE DETAILS: HAMMELMANN.US/CATALOGUE
Aquarex® tank cleaning devices

Hammelmann custom-built special devices for cleaning the insides of various different tank and vessel designs.

Here are a few examples:

**Lance hose system**
The lance can be rotated, swivelled and extended and is attached onto a manhole. The tank cleaning device is lifted and lowered using a crank handle.

**Lance hose system**
The lance is positioned over the manhole by the mobile chassis. The lance can be manually rotated, swivelled, retracted and extended.

**Gastight lance system**
Four-stage telescopic lance driven by high pressure water. The cleaning device is controlled and monitored by a freely programmable PLC.

**Hose reel system with weatherproof cabinet**
The cleaning positions are freely programmable and controlled by the process plant controller.

**Twin lance system**
The entire cleaning device is powered by high pressure water and oil-free compressed air. (With chain drive as an alternative for a stroke of 14.7 ft or more.)

**More details:** Hammelmann.US/CATALOGUE

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**Lance system**
With integrated ball valve for permanent installation. The automatic tank cleaning unit remains in the vessel during production.

**Lance system**
Manually extendable, tilting lances. The nozzle standoff distance is adjusted by a crank drive and chain.

**Telescopic lance system**
The lance is attached onto a manhole. It can be manually rotated, swivelled, retracted and extended. It is pulled out by its own weight.

**Gastight lance system**
The entire cleaning device is powered by high pressure water and oil-free compressed air. (With chain drive as an alternative for a stroke of 14.7 ft or more.)

**Hose reel system in standing or suspended design**
The cleaning positions are freely programmable and controlled by the process plant controller.
Aquarex® tank cleaning devices

Hose reel system with jib
Electrically driven hose reels. The jib is manually positioned above the opening and lowered onto the cleaning port by handheld control. The cleaning positions are freely programmable and controlled by the process plant controller.

Hose reel system with cantilever
Electrically driven hose reel. Can be manually rotated and swivelled at the flange. Available with various cantilever designs.

Gastight hose reel system
The control of the operation of the system is by PLC with a frequency converter for the reel electric motor.

Swivellable telescopic cylinder
The four-stage telescopic cylinder can be turned up to 180 degrees, swivelled 90° max. and can be extended up to 13.1 ft.

Cleaning system for very large vessels
The system is designed for cleaning vessels up to 65.6 ft in diameter. It is lowered into the vessel and fixed in position by three extendable support arms. The workarms with hydraulically driven rotor nozzles turn in a horizontal plane by means of a turntable, extend or retract hydraulically and swivel vertically powered by hydraulic cylinders.

Lance system - moved hydraulically/pneumatically actuated
Lance system - moved and actuated pneumatically

MORE DETAILS: HAMMELMANN.US/CATALOGUE
### Pipe Cleaning

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**PIECE CLEANING**

**App for nozzle calculation**
Free app for iOS, Android, Blackberry and your browser

**Water Jetting Calculator**: hammelmann.com/app
Turbojets

Turbojets have a high speed rotating nozzle body which prevents “striping” inside the pipe. The rotation of up to 20,000 r.p.m. is effected by the reaction force of the water jets.

Radial jet

Radial jets have 90° bores to clean and polish pipes. Allrounders have, in addition to the efficiency of the Radial jet, front facing bores.

Typical applications

To remove scale from partially blocked pipes and heat exchanger tubes

Turbojet Ø Connection thread Tube diameter (inch) Nozzles (mm*) Max. flow rate gpm at up to 14,500 psi (incl. leakage)

<table>
<thead>
<tr>
<th>Turbojet Ø</th>
<th>Connection thread</th>
<th>Tube diameter (inch)</th>
<th>Nozzles (mm*)</th>
<th>Max. flow rate gpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.47 inch</td>
<td>M 7</td>
<td>0.59</td>
<td>2 x Ø 0.9* radial</td>
<td>approx. 8 gpm</td>
</tr>
<tr>
<td>0.55 inch</td>
<td>G 1/8”</td>
<td>0.67</td>
<td>2 x Ø 1.0* radial</td>
<td>approx. 10 gpm</td>
</tr>
<tr>
<td>0.71 inch</td>
<td>G 1/4”</td>
<td>0.79</td>
<td>2 x Ø 1.1* radial</td>
<td>approx. 12 gpm</td>
</tr>
<tr>
<td>0.87 inch</td>
<td>G 1/4”</td>
<td>0.98</td>
<td>2 x Ø 1.0* radial</td>
<td>approx. 13 gpm</td>
</tr>
<tr>
<td>1.10 inch</td>
<td>G 1/4”</td>
<td>1.30</td>
<td>2 x Ø 1.1* radial</td>
<td>approx. 16 gpm</td>
</tr>
</tbody>
</table>

Driver

The driver is installed as an adapter between the high pressure lance or hose and the Radial jet/Allrounder. The driver has 3 angled rear facing bores and moves the nozzle into the pipe using the reaction force of the water jets.

Up to 1500 bar – free spinning

<table>
<thead>
<tr>
<th>Turbojet Ø</th>
<th>Connection thread</th>
<th>Tube diameter (inch)</th>
<th>Nozzles (mm*)</th>
<th>Max. flow rate gpm at up to 1500 bar (incl. leakage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.71 inch</td>
<td>G 1/4”</td>
<td>0.79</td>
<td>2 x Ø 0.6* radial</td>
<td>approx. 11 gpm</td>
</tr>
<tr>
<td>0.87 inch</td>
<td>G 1/4”</td>
<td>0.98</td>
<td>2 x Ø 0.6* radial</td>
<td>approx. 11 gpm</td>
</tr>
</tbody>
</table>

Up to 2500 bar – free spinning

<table>
<thead>
<tr>
<th>Turbojet Ø</th>
<th>Connection thread</th>
<th>Tube diameter (inch)</th>
<th>Nozzles (mm*)</th>
<th>Max. flow rate gpm at up to 2500 bar (incl. leakage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.59 inch</td>
<td>G 3/8&quot; - 24 UNF LH</td>
<td>0.71</td>
<td>2 x Ø 0.6* radial</td>
<td>approx. 7 gpm</td>
</tr>
<tr>
<td>0.63 inch</td>
<td>G 3/8&quot; - 24 UNF LH</td>
<td>0.75</td>
<td>2 x Ø 0.6* radial</td>
<td>approx. 7 gpm</td>
</tr>
<tr>
<td>0.71 inch</td>
<td>G 3/8&quot; - 24 UNF LH</td>
<td>0.79</td>
<td>2 x Ø 0.7* radial</td>
<td>approx. 9 gpm</td>
</tr>
<tr>
<td>0.79 inch</td>
<td>M 14 x 1.5 LH</td>
<td>0.91</td>
<td>2 x Ø 0.7* radial</td>
<td>approx. 9 gpm</td>
</tr>
</tbody>
</table>

* 1" = 25.4 mm
0.04" = 1mm

Driver

Max. diameter of drive nozzle: up to 14,500 psi

<table>
<thead>
<tr>
<th>Max. diameter of drive nozzle</th>
<th>Qmax gpm up to 14,500 psi</th>
<th>Connection thread (internal / external)</th>
<th>Hose nominal i/d mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.51 inch</td>
<td>approx. 16 / 3.4 / 6 / 9.2</td>
<td>G 1/8”</td>
<td>DN 4</td>
</tr>
<tr>
<td>0.51 inch</td>
<td>approx. 24 / 3.4 / 6 / 9.2</td>
<td>G 1/8”</td>
<td>DN 6</td>
</tr>
<tr>
<td>0.71 inch</td>
<td>approx. 16 / 6 / 9.2 / 13.5</td>
<td>G 1/4”</td>
<td>DN 4</td>
</tr>
<tr>
<td>0.71 inch</td>
<td>approx. 34.4 / 19.2 / 11.4 / 13.5</td>
<td>G 1/4”</td>
<td>DN 6</td>
</tr>
<tr>
<td>up to 43,500 psi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.75 inch</td>
<td>16 – 13.5</td>
<td>M14 x 1.5 LH</td>
<td>DN 9</td>
</tr>
</tbody>
</table>
Flexible and rigid lances / Push and pull nozzles

Lances
High and ultra high pressure lances as gun barrel extensions or for cleaning heat exchanger tubes.

Flexible lances
For use with a blasting gun or foot valve
Operating pressure: 14,500; 20,300 psi
Length: 19.7; 32.8; 49.2; 65.6 ft
Nominal i/d: 0.16; 0.24 inch

Rigid lances
For use with a hose or foot valve
Operating pressure: up to 43,500 psi
Length: 19.7; 32.8; 49.2; 65.6 ft
Nominal i/d: 0.10; 0.20; 0.31; 0.39; 0.51; 0.63 inch
OD: 0.25; 0.39; 0.55; 0.73 inch

Push and pull nozzles

1. Cleaning completely blocked tube in axial direction.
2. Push jets remove material from in front of the nozzle. When using flexible lances only employ in conjunction with pull jets.
3. 90° radial jets for maximum cleaning and cutting efficiency.
4. Pull jets remove any material behind the nozzle while pulling the lance and nozzle into the pipe.

### Flexible Lances
- Minimum pipe inner diameter
- Operating pressure
- Internal thread

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Operating Pressure</th>
<th>Internal Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.47 inch Ø</td>
<td>up to 17,400 psi</td>
<td>M8</td>
</tr>
<tr>
<td>0.67 inch Ø</td>
<td>up to 14,500 psi</td>
<td>M10 x 1</td>
</tr>
<tr>
<td>0.79 inch Ø</td>
<td>up to 23,700 psi</td>
<td>M14 x 1.5 LH</td>
</tr>
<tr>
<td>1.02 inch Ø</td>
<td>up to 43,500 psi</td>
<td>M14 x 1.5 LH</td>
</tr>
<tr>
<td>1.30 inch Ø</td>
<td>up to 7,300 psi</td>
<td>M22 x 1.5 DKO-S</td>
</tr>
<tr>
<td>1.57 inch Ø</td>
<td>up to 26,100 psi</td>
<td>M22 x 1.5 DKO-S</td>
</tr>
<tr>
<td>2.17 inch Ø</td>
<td>up to 20,300 psi</td>
<td>M36 x 2 DKO-S</td>
</tr>
</tbody>
</table>

### Rigid Lances
- Operating pressure
- External thread

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Operating Pressure</th>
<th>External Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.47 inch Ø</td>
<td>up to 36,300 psi</td>
<td>M6 x 0.75</td>
</tr>
<tr>
<td>0.67 inch Ø</td>
<td>up to 43,500 psi</td>
<td>M10 LH</td>
</tr>
<tr>
<td>0.79 inch Ø</td>
<td>up to 36,300 psi</td>
<td>M14 x 1.5 LH</td>
</tr>
<tr>
<td>1.02 inch Ø</td>
<td>up to 43,500 psi</td>
<td>M14 x 1.5 LH</td>
</tr>
<tr>
<td>1.30 inch Ø</td>
<td>up to 43,500 psi</td>
<td>M22 x 1.5 DKO-S</td>
</tr>
<tr>
<td>1.57 inch Ø</td>
<td>up to 43,500 psi</td>
<td>M36 x 2 DKO-S</td>
</tr>
</tbody>
</table>
## Rotor jets for pipe cleaning

- For use with mechanically deployed cleaning devices
- Stainless steel housing
- Built-in eddy current brake and cooling jacket in dustproof enclosure

### Rotor jet specifications

<table>
<thead>
<tr>
<th>Rotor jet diameter</th>
<th>Length</th>
<th>Max. op. pressure</th>
<th>Flow rate</th>
<th>Nozzles</th>
<th>Connection thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.09 inch</td>
<td>7.32 inch</td>
<td>14,500 psi</td>
<td>8 gpm</td>
<td>4 x radial</td>
<td>G 3/8 internal</td>
</tr>
<tr>
<td>2.28 inch</td>
<td>9.37 inch</td>
<td>23,200 psi</td>
<td>26 gpm</td>
<td>2 x radial</td>
<td>M36 x 2 DKO external</td>
</tr>
<tr>
<td>3.07 inch</td>
<td>6.69 inch</td>
<td>23,200 psi</td>
<td>7 gpm</td>
<td>2 x radial</td>
<td>M14 x 1.5 LH internal</td>
</tr>
<tr>
<td>3.54 inch</td>
<td>12.87 inch</td>
<td>14,500 psi</td>
<td>24 gpm</td>
<td>4 x radial</td>
<td>M36 x 2</td>
</tr>
<tr>
<td>5.04 inch</td>
<td>11.93 inch</td>
<td>21,800 psi</td>
<td>16 gpm</td>
<td>2 x radial</td>
<td>M24 x 1.5 DKO external</td>
</tr>
<tr>
<td>5.12 inch</td>
<td>16.46 inch</td>
<td>21,800 psi</td>
<td>26 gpm</td>
<td>4 x radial</td>
<td>M36 x 2</td>
</tr>
<tr>
<td>6.54 inch</td>
<td>25.0 inch</td>
<td>23,200 psi</td>
<td>52 gpm</td>
<td>2 x push</td>
<td>M36 x 2</td>
</tr>
</tbody>
</table>

### Typical applications

- Coating and rust removal
- Pipe and smokestack cleaning
- Cleaning of partially blocked pipes, boilers and smokestacks

**Rotor jets for pipe cleaning**

- Stainless steel housing
- Built-in eddy current brake and a cooling jacket in a dustproof enclosure

**Typical applications**

- Coating and rust removal
- Pipe and smokestack cleaning
- Cleaning of partially blocked pipes, boilers and smokestacks

**More details:** Hammelmann.us/catalogue
Centralizer for rotor jets

The centralizer enables rotor jets to be deployed centrally in a pipe.

The steplessly adjustable scissor arms of the spreading mechanism allow cleaning of all pipe diameters from 17.7 inch to 55.1 inch. A conversion kit for 9.8 inch to 15.7 inch is available as an option.

The centralizer comprises the following main components:

- Central guide pipe with mounting for rotor jet and hose
- Spring loaded adjustable assembly with three scissors, joints and rollers.

The centralizer carriage is made primarily of stainless steel and the rear rollers of hard, shock resistant plastic. Rotor jets are selected separately.

Guide skids for rotor jets

The skids can be adjusted to fit various diameters of pipe.

A swivelling pulling eye is fitted to the rotor jet.

For pipe Ø: 5 – 110 inch

MORE DETAILS: HAMMELMANN.US/CATALOGUE
Nozzle holder for pipe cleaning

For use in conjunction with a hose rotating system to remove soft and hard deposits from pipes.

Typical applications
- Partially and fully blocked pipes
- Deposits on the inner wall
- Hard materials

3D pipe cleaners

3D pipe cleaners are basically tank cleaning units mounted in sledge type guides for pipe cleaning. They are used for removing particularly hard scale deposits. Operating on two axes with a “kick plate” they automatically move through the pipe as the scale is blasted loose. Alternatively where access is available they can be pulled through the pipe.
**Revolving hose reel**

The unit cleans tubes with a diameter ≥ 70 mm. It is the ideal high pressure hose drive and rotating system for use where limited access prevents the use of a rigid lance system.

The mobile unit comprises a hose reel with powered deployment and retraction as well as a rotational drive.

The flexible hose is rotated and pushed into the tube by the powered hose reel.

All movements are electrically powered. The unit is controlled from a portable remote control panel.

**Op. pressure:** 23,200 psi (optional 43,500 psi)

**Hose nominal i/d:** 0.2, 0.47, 0.78 inch

**Hose length:** 328 ft

**Rotation speed:** 0 – 20 r.p.m. adjustable

**Drive speed:** 0 – 25 r.p.m. adjustable

**Pipemaster hose rotating system**

The Pipemaster is a manually operated, high pressure hose rotating system. It is used to remove both soft and very hard deposits from the insides of pipes and pipelines including those with bends and vertical sections.

As an alternative to self-rotating nozzles, the rotary action is achieved by rotating the high pressure hose.

The low rotation speeds of the high pressure hose is ideal to remove hard deposits. The device is easy to operate.

Hose internal diameter 0.31 and 0.47 inch

**Op. pressure:** up to 43,500 psi

Hose internal diameter 0.79 inch

**Op. pressure:** up to 23,200 psi

**Hose rotating unit**

A high pressure supply hose line is fixed between the pump and the rotary joint on the hose rotating unit.

A second hose connected to the rotary joint runs via the deployment unit into a protective hose leading to the positioning device at the workpiece. The rotation of the second high pressure hose around its longitudinal axis is effected by a chain drive from a pneumatic motor to the rotary joint. The rotation speed can be smoothly adjusted by throttle check valves.

The rotating unit is driven by 4,237 scf/h of compressed air at 68 psi and comprises a pneumatic motor with a gearbox, a pneumatic maintenance unit, the high pressure rotary joint and a pneumatic control system.

**Hose deployment unit**

Actuating the control lever of the unit causes the hose to start rotating which produces the forward and backward movement.

The deployment speed is a maximum of 5.2 ft/min. and it is smoothly adjustable by means of the control lever.

**Moving direction**

Changing the angle of the three wheels that press onto the hose will cause the hose to move forward (deploy) or backward (retract). The hose deployment unit is mounted on a sturdy base plate and comprises the height adjustable control lever to deploy or retract the hose as well as the remote control to operate the hose rotating unit.

**Positioning device**

A non-rotating protective hose is fitted between the hose deployment unit and the positioning device. This enables operation in pipes that are difficult to access.

The positioning device enables easy and secure insertion of the hose into the pipe.

The blasting guard prevents a pressurised nozzle from being accidentally pulled out of the pipe.

The positioning device shown here is for use with pipes up to 1.57 inch i/d.
Safety device for heat exchanger cleaning

Foot switch and foot valve (as per PL "e" in accordance with safety standard EN 13849)

Varianten

- Foot valve, mechanical check valve
- Electrical foot switch for switching the high pressure* on and off
- Foot valve combined with electrical foot switch*

*Connection: 4-pole plug with dust cap
Protection class: IP 67 in accordance with DIN 40050

- Switch mechanism with safety latch
- Corrosion-resistant materials
- Robust housing to ensure a non-slip operating position, and increase stability

Height: 10.5 inch
Width: 10.1 inch
Length: 17.6 inch
Weight: 24.3 lbs

Foot switch

Electrical foot switch to control the high pressure.
Housing and protective hood in Gd-Al alloy

- Connection: 4-pole plug with dust cap
- Protection class: IP 67 in accordance with DIN 40050
- Extra-stable base for increased stability
- Rubber feet

Height: 5.7 inch
Width: 6.3 inch
Length: 9.4 inch
Weight: 6.2 lbs

Clamp
The device is used to position the lance nozzle in the heat exchanger bundle tube and to prevent accidental retraction.
The device is clamped to the tube bundle flange. Swivel joints and a telescopic arm enable the lance within the protective sleeve to be positioned at each individual tube of the bundle.

Telescopic arm with protective sleeve
When the operator retracts the lance a suitable sized stop within the protective sleeve prevents jetting to atmosphere.
For bundle diameters: up to 6.6 ft
For lance i/d's: DN 4, 6 und 8
Flange thickness: up 5.51 inch
BG test certificate

X-Y deployment unit on heat exchanger for rotating and swivelling hose reel
Description
- For attaching to the heat exchanger flange, complete with guide frame, manually operated.
- The controls and hydraulic supply are provided by the hydraulic power pack and the hose reel’s portable control panel.

Catching device for pipe cleaning
Mainly for horizontal pipes.
For pipe Ø of 3.94 – 11.81 inch

MORE DETAILS: HAMMELMANN.USA/CATALOGUE
Cutting devices and nozzles

Materials that are difficult to cut require the use of a water jetting nozzle with an abrasive entrainment chamber.

A high pressure water nozzle inside the assembly creates a water jet. This pressurised water jet travels through the entrainment chamber at high speed to a focusing nozzle dragging the air in the chamber with it and creating a vacuum. Abrasive material is fed into the side of the chamber under air pressure. The abrasive particles are sucked into the air around the water jet and accelerated into the water stream to emit from the focusing nozzle.

Carrier trolley

The carrier trolley speed is manually controlled by a pneumatic system. Cutting speed and positioning speed are individually controlled.

Guide rail

To make straight cuts the guide chain is attached to a 6.5 ft long guide rail.

Nozzle carrier mounted on a rail

The abrasive entrainment nozzle assembly is mounted on a pneumatically driven carrier trolley which runs on a tensioned guide chain allowing a constant traverse speed to be achieved.
Nozzle inserts and accessories

Typ B 1500
Op. pressure: 21,800 psi
Flow rate: 6.6 – 10.5 gpm
Designed to be mounted on a nozzle carrier.
Applications: Concrete cutting & steelwork cutting

Typ B 3000
Op. pressure: 43,500 psi
Flow rate: 2.6 – 6.6 gpm
For attachment to carriage.
Applications: Concrete cutting & steelwork cutting

Type S 4000 (with collimation tube)
Op. pressure: 58,000 psi
Flow rate: up to 2.6 gpm
Applications: Especially for use with a cutting table, i.e. cutting shapes in metals, glass, plastics, ceramics etc.

Focusing nozzles, guide piece, nozzle insert

Abrasive material: garnet sand and garnet in a grain size of 0.004 – 0.008 inch

Abrasive hopper with pneumatic controller for the nozzle carrier

Valves, water hydraulics and accessories

Valves, water hydraulics and accessories

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Valves 60 – 62
Protective gear equipment 65
**Systems for pressure and impulse testing**

Ultramodern HP pump based systems with fine-tuned valve and control technology enable pressure and impulse testing to be carried out for a wide range of applications.

Hammelmann provides special solutions to meet individual requirements. These testing systems are rounded off by recordings of measurements and their documentation.

Pressure tests up to 8,700 psi for large boilers and piping systems in power plants.

Pressure tests up to 8,700 psi for large boilers and piping systems in power plants.

Precise and robust valves enable system providers to fit out their machines with advanced equipment in terms of metal forming. Hammelmann provides directional valves, overflow valves, pressure limitation valves and safety valves as well as a variety of combinations allowing for forming pressures of up to 43,500 psi.

**Metal forming**

Precise and robust valves enable system providers to fit out their machines with advanced equipment in terms of metal forming. Hammelmann provides directional valves, overflow valves, pressure limitation valves and safety valves as well as a variety of combinations allowing for forming pressures of up to 43,500 psi.

Control block for high flow rates

Pressure regulating valve with servo control

Layout for metal forming systems

Pressure and impulse testing of vessels, valves and controls in the petrochemical industry

Impulse testing for common rail components
Valves

Hammelmann provides a wide range of high pressure valves, which stand out for their precision, reliability and modern technology. Use of the latest materials ensures a high level of safety and durability.

Pressure regulating valves 26,100 psi

Pressure regulating valves 58,000 psi

Safety valves 43,500 psi

Safety valves 26,100 psi

3/2 way valve 43,500 psi

3/2 way valve 21,800 psi

2/2 way solenoid actuated valves 11,600 psi

High pressure filter 17,400 psi

2/2 way valve 58,000 psi

Bypass valve 58,000 psi

Non-return valves up to 58,000 psi

High pressure ball valve 26,100 psi

Pressure maintaining valves 26,100 psi

Pressure maintaining valves 58,000 psi

Adjustable dissipator nozzle 26,100 psi

Adjustable dissipator nozzle 43,500 psi
Valves
Hammelmann combines high pressure valves for various system requirements. This leads to a high efficiency of the high pressure pumps used together with high pressure systems. Key emphasis is placed on safety, functionality and high utilisation.

Control block with six 2/2 way solenoid actuated valves

Control block for four high pressure consumers

Pressure controlled switching valve

Changeover valve for two blasting guns

High pressure hoses
Nominal i/d: 0.2 – 1.0 inch
Operating pressure: 2,200 – 46,400 psi
Hose length: 2 – 131 ft

To enable us to offer the high standard of Hammelmann quality, we assemble ultra high pressure hoses in our certified workshop.

Wide selection of high pressure hoses
Hose wheel
Snap couplings

Accessories for hoses
- Hose arresters
- Hose protectors
- Hose wheels
- Snap connectors
- Swivel connectors
- Hose fittings
- Suction hose couplings
- Hose bridges

Every hose length required is cut and assembled to measure. By producing our hoses in-house, we can offer very flexible delivery times.

The final pressure test is carried out in accordance with DIN EN 10204-23. The maximum test pressure is currently 69,600 psi.
Nozzle inserts

**TYPE: A ROUND JET**
- Op. pressure: up to 29,000 psi
- Material: Steel
- Nozzle: 0.4 – 4.9 mm *

**TYPE: B FAN JET**
- Op. pressure: up to 29,000 psi
- Efficiency factor: 0.67
- Material: Steel
- Nozzles: 0.8 – 3.0 mm *

**TYPE: C ROUND JET**
- Op. pressure: up to 5,800 psi
- Efficiency factor: 0.92
- Material: Steel
- Nozzles: 0.4 – 4.6 mm *

**TYPE: D FAN JET**
- Op. pressure: up to 5,800 psi
- Efficiency factor: 0.67
- Material: Steel
- Nozzles: 0.4 – 4.6 mm *

**TYPE: E ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.92
- Material: Steel
- Nozzles: 0.25 – 1.2 mm *

**TYPE: G ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.92
- Material: Steel
- Nozzles: 0.25 – 1.2 mm *

**TYPE: H ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.92
- Material: Steel
- Nozzles: 0.25 – 1.0 mm *

**TYPE: I ROUND JET**
- Op. pressure: up to 43,500 psi
- Efficiency factor: 0.75
- Material: Steel/sapphire
- Nozzles: 0.25 – 1.1 mm *

**TYPE: K ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.75
- Material: Steel/sapphire
- Nozzles: 0.3 – 1.0 mm *

**TYPE: L ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.75
- Material: Steel/sapphire
- Nozzles: 1.0 – 3.9 mm *

**TYPE: M ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.95
- Material: Steel/ceramic
- Nozzles: 1.0 – 3.9 mm *

**TYPE: O ROUND JET**
- Op. pressure: up to 36,300 psi
- Efficiency factor: 0.95
- Material: Steel/sapphire
- Nozzles: 1.5 – 1.5 mm *

**TYPE: P ROUND JET**
- Op. pressure: up to 43,500 psi
- Efficiency factor: 0.71
- Material: Steel/sapphire
- Nozzles: 1.0 – 1.2 mm *

**TYPE: R FAN JET**
- Op. pressure: up to 43,500 psi
- Efficiency factor: 0.67
- Material: Steel
- Nozzles: 0.3 – 1.2 mm *

**TYPE: S ROUND JET**
- Op. pressure: up to 43,500 psi
- Efficiency factor: 0.95
- Material: Steel/sapphire
- Nozzles: 1.0 – 1.8 mm *

**TYPE: T ROUND JET**
- Op. pressure: up to 50,700 psi
- Efficiency factor: 0.72 - 0.92
- Material: Steel/diamond
- Nozzle: 0.15 – 1.00 mm *

**TYPE: U ROUND JET**
- Op. pressure: up to 58,000 psi
- Efficiency factor: 0.7
- Material: Steel/sapphire
- Nozzles: 0.4 – 4.9 mm *

**TYPE: W ROUND JET**
- Op. pressure: up to 43,500 psi
- Efficiency factor: 0.95
- Material: Steel
- Nozzles: 0.25 – 0.5 mm *

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Personal protective equipment

**Protective clothing for water jets up to 43,500 psi operating pressure**

1. **Jacket with hand protection**
2. **Trousers**
3. **Apron**
4. **Gaiters**
5. **Hand and forearm protection**

**Protective suit made of robust polyester with polyurethane coating in accordance with standard EN 343**

- **Safety helmet**
- **Safety boots**

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**Protective suit made of robust polyester with polyurethane coating in accordance with standard EN 343**

- **1” = 25.4 mm**
- **0.04” = 1mm**

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MORE DETAILS: HAMMELMANN.US/CATALOGUE
Water jetting technology for rent

3-D Tank cleaner

Aquablast surface cleaner

Waterblasting guns

Pipemaster hose rotating system

Dual static hose reel

Abrasive cutting

3-D Pipecleaner

Rental units

HDP 144
Power rating: up to 200 hp
Op. pressure: up to 55,000 psi
Flow rate: up to 90 gpm
Applications:
• Surface preparation
• Coating removal
• Abrasive cutting
• Tube cleaning

HDP 196
Power rating: up to 250 hp
Op. pressure: up to 3,000 psi
Flow rate: up to 160 gpm
Applications:
• Pipe testing
• Coating removal
• Abrasive cutting
• Tube cleaning

HDP 200
Power rating: up to 300 hp
Op. pressure: up to 55,000 psi
Flow rate: up to 130 gpm
Applications:
• Surface preparation
• Coating removal
• Abrasive cutting
• Tube cleaning

HDP 300
Power rating: up to 400 hp
Op. pressure: up to 46,400 psi
Flow rate: up to 282 gpm
Applications:
• Surface preparation
• Coating removal
• Abrasive cutting
• Tube cleaning

HDP 500
Power rating: up to 670 hp
Op. pressure: up to 43,500 psi
Flow rate: up to 338 gpm
Applications:
• Surface preparation
• Coating removal
• Abrasive cutting
• Tube cleaning

HDP 800
Power rating: up to 1072 hp
Op. pressure: up to 43,500 psi
Flow rate: up to 563 gpm
Applications:
• Surface preparation
• Coating removal
• Abrasive cutting
• Tube cleaning

MORE DETAILS: HAMMELMANN.US/CATALOGUE