



# Industrial high pressure application systems

Over 60 years of innovative technology

Surface preparation

Tank cleaning

Pipe cleaning

Water jet cutting

Valves, water hydraulics and accessories

Hammelmann

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### Hammelmann

Technology Centre

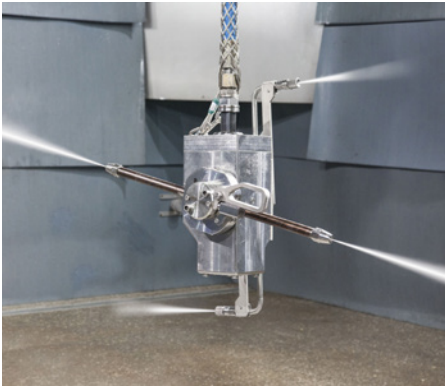
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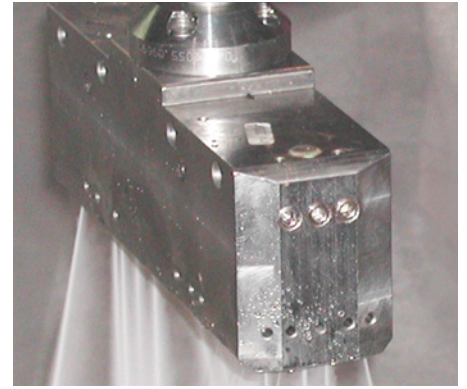
### Energy-saving

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



### Reliable

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



### Optimised

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



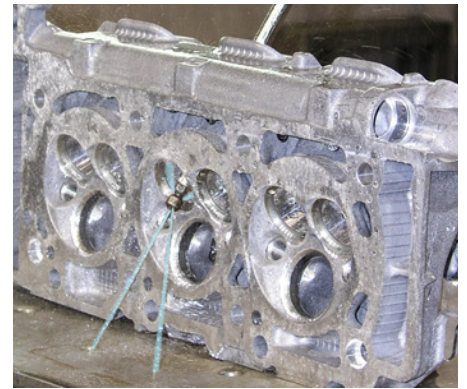
### Safe

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



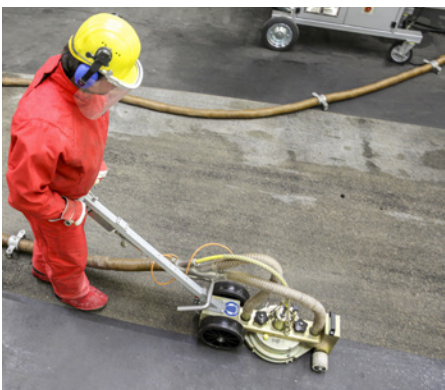
### Flexible

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.



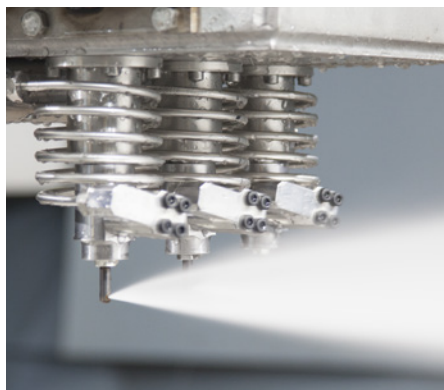
### Precise

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



### Environmentally friendly

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



### Innovative

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



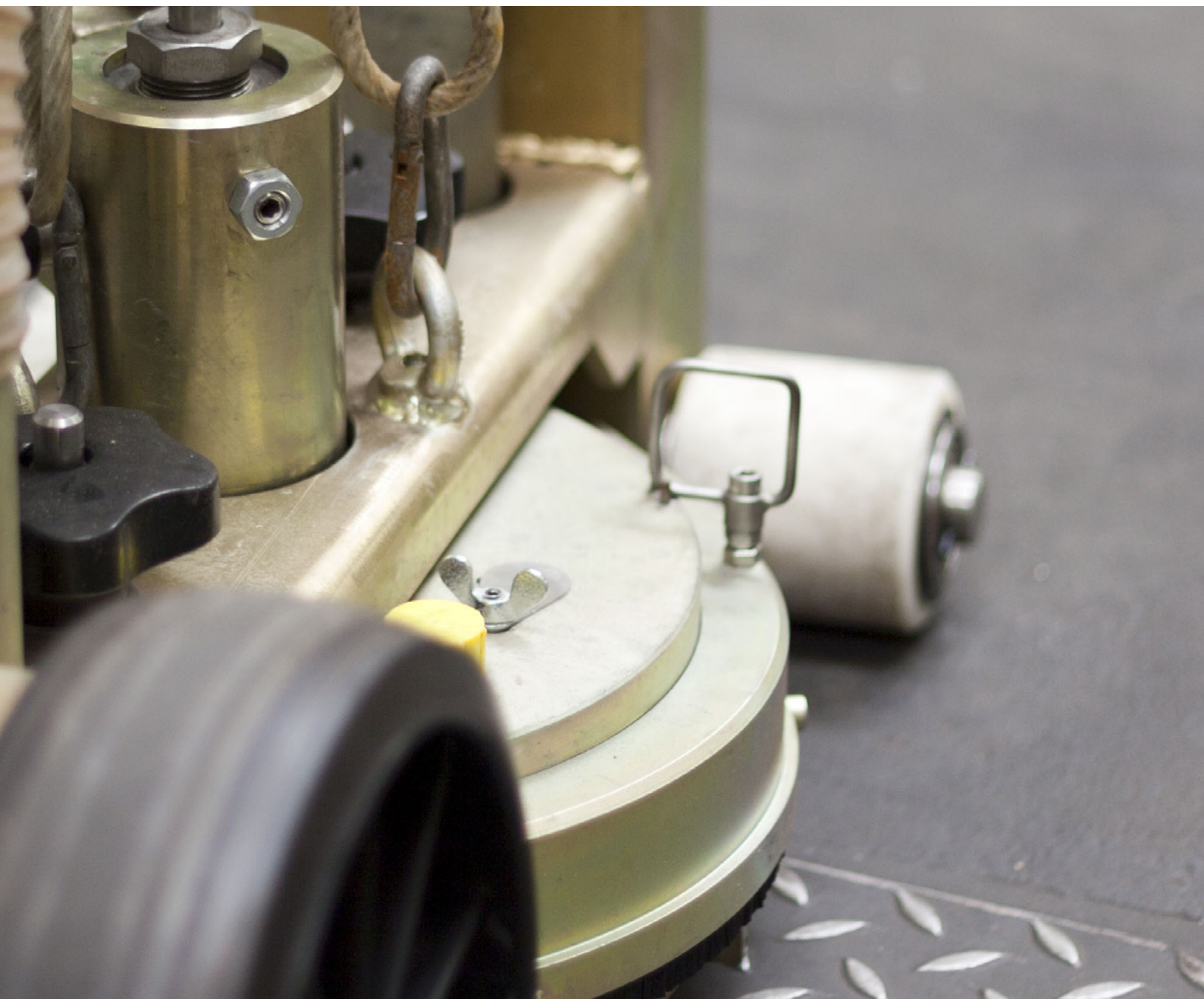
### Economical

Take 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.



# **SURFACE PREPARATION**

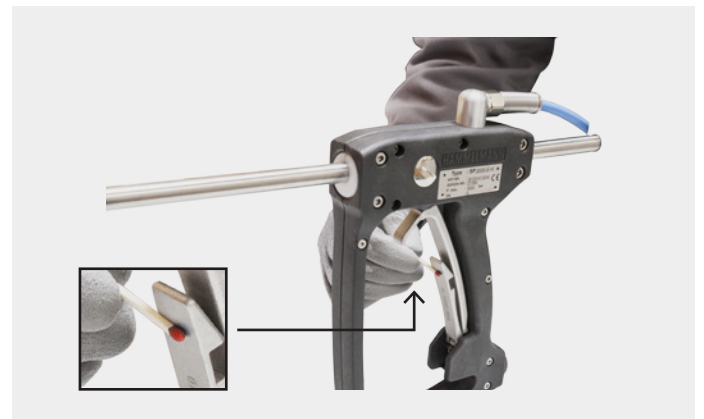
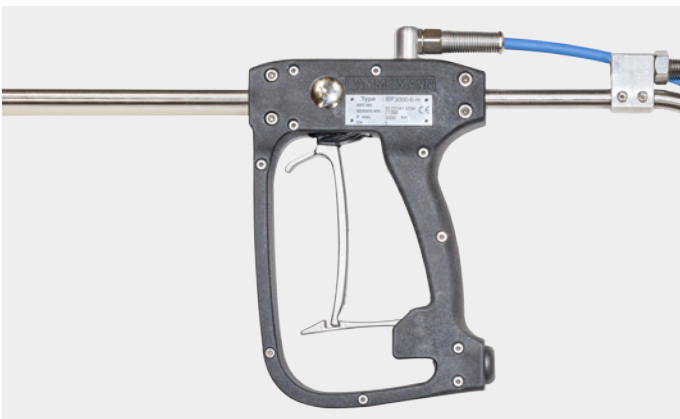
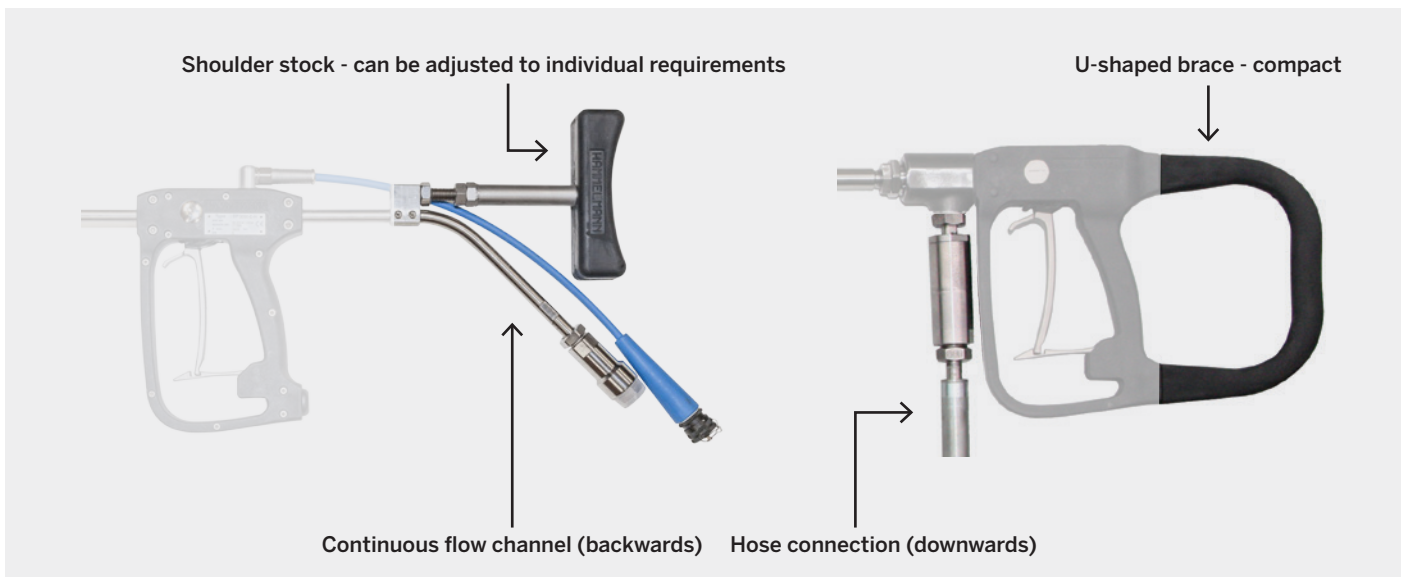




## Surface preparation

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## High pressure water blasting guns up to 3000 bar



### 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.

## Mechanical / Electric



### Blasting gun Technology

### Operating pressure

### Weight

**SP 400 M**  
**SP 1000 M**

Mechanical dry shut off

**up to 400 bar**  
**up to 1000 bar**

3.2 kg  
3.6 kg

**SP 1000 ME**

Mechanical dry shut off /  
Electric

**up to 1000 bar**

4.6 kg

**SP 3000 E**

Electric

**up to 3000 bar**

3.5 kg

**SP 3000 E H**

Electric

**with continuous  
flow channel**

**up to 3000 bar**

5.0 kg

## Bypass



**SP 3000 MB**

Mechanical bypass

**up to 3000 bar**

3.7 kg

**SP 3000 MBE**

Mechanical bypass /  
Electric

**up to 3000 bar**

4.2 kg

## For two-hand operation



**SP 3000 MB – 2H**

Mechanical bypass for  
two-hand operation

**up to 3000 bar**

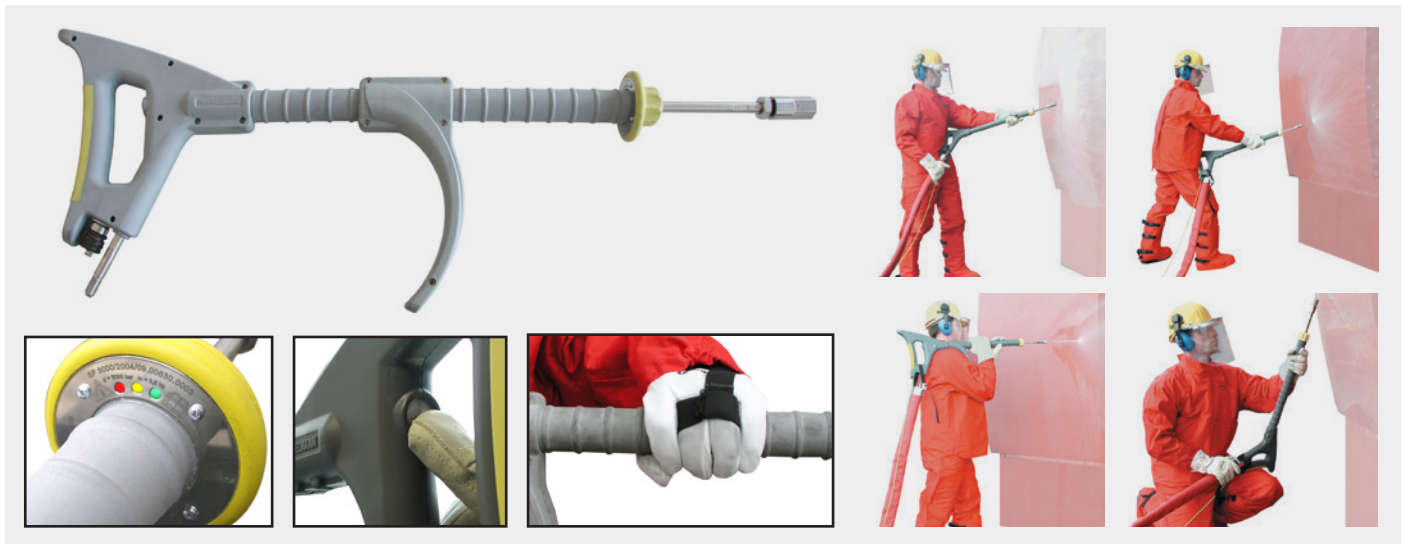
6.5 kg

**SP 3000 E – 2H**

Electric for  
two-hand operation

**up to 3000 bar**

4.6 kg



## SP 3000 Ergoblast

- The gun's lance (from inlet to nozzle) has no sharp bends or restrictions. This design reduces pressure loss and eliminates turbulence.
- The smooth flow results in a more efficient water jet emitting from the nozzle.
- The operator no longer has to 'fight' the trigger pressure.
- Integrated body support for reaction forces of more than 150 N.
- The transponder actuated switching surface extends over the whole length and circumference of the front hand grip.
- Many different working postures are possible.

## Economical operation - high reliability

- The ergonomic design puts much less physical strain on the operator which means less fatigue so there is increased utilisation.
- Robust design and no moving parts means no maintenance costs.
- Versatile modular construction enables many applications.
- Robust, fully encapsulated electronics.
- No moving parts.
- Contactless switching thanks to robust hand-worn encapsulated transponder, eliminating mechanical wear.
- No seals or housing openings.
- Manufactured from wear-resistant, long-life materials.

## Handrail cleaner

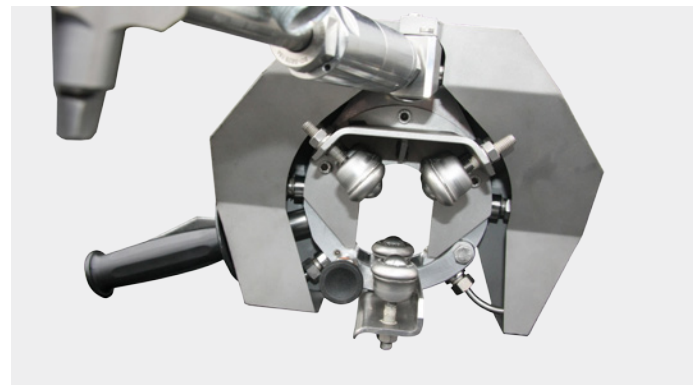
The "Handrail cleaner" has been especially developed for cleaning, rust removal and paint stripping operations on hand rails and pipes up to 50 mm in diameter.

- Manual cleaning unit guided along the pipe.
- Housing made of aluminium and synthetic materials.
- Parts subjected to high pressure are made of high-strength corrosion-resistant stainless steel.
- A series of roller guides provide consistent standoff distance
- 6 fan jets for optimal all-round cleaning.
- Special design for minimal weight.

## Technical data

- Suitable for pipes with outside diameters from 25 to 50 mm.
- 6 nozzle inserts Type "R"
- Fan jets 20°, 30° or 45° can be used

<b>Op. pressure:</b>	up to 3000 bar
<b>Flow rate:</b>	up to 30 l/min
<b>Weight:</b>	6.5 kg
<b>Height:</b>	242 mm
<b>Width:</b>	380 mm incl. handgrip
<b>Length:</b>	560 mm



## Radio remote control - RRC



**RRC Basic**

- Transmitter ON/OFF
- High pressure OFF switch
- High pressure ON/OFF 4 pole bypass socket with 1.5 m connecting cable
- Status LEDs
- Receiver with connecting cable
- Battery charger
- Belt



**RRC Plus**

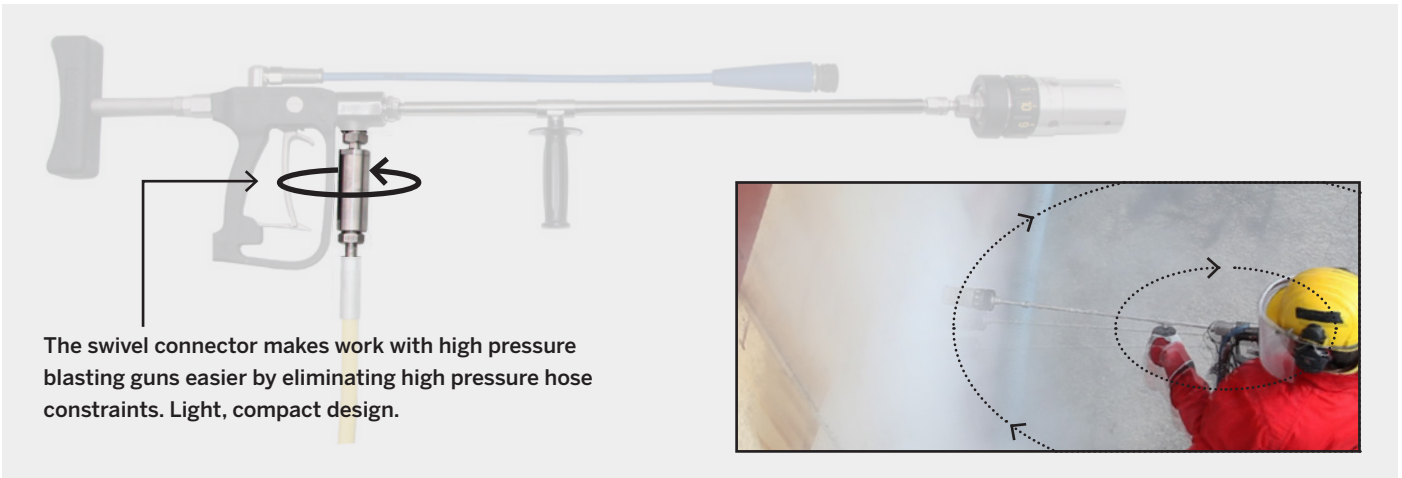
Same as basic plus :

- Emergency stop switch
- Rocker switch, high pressure pump ON/OFF
- Rocker switch, set value +/-

**More RRC versions are available**

Wireless connection between the high pressure pump unit and electrically actuated guns and other blasting accessories

## 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. 600 g.



### Swivelling connection for high pressure hoses

Swivelling connection DN 14 is available for operating pressures of up to 1600 bar. M36 x 2 DKO threads serve as connections on both sides.



## 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, is 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



Manual blasting gun work



Reaction force free working with Jetmate

## 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

### Working on ceilings and undersides



Manual blasting gun work

Reaction force free working with Jetboy device.  
The reaction force is taken by the Jetboy.

### Working on floors



Manual blasting gun work

1 Single/rotor jet

2 Aquablast surface cleaner

## Aquablast® surface cleaners



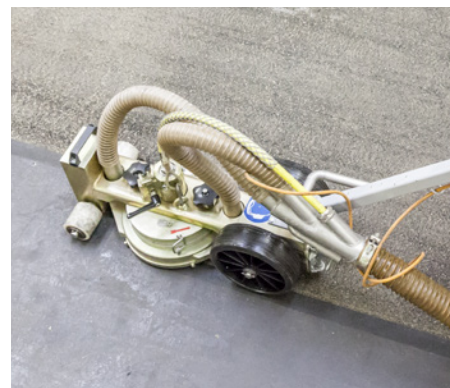
### Description

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





### 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 signal 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 signal 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.
- Height-adjustable spray bar
- Spray bar housing with special seal
- Electrical pressure on/off control in 4-pole system. Special controls available upon request.
- On/Off control by twin trigger action
- Increased stability thanks to four wheel carriage

Surface cleaner	Working width	Op. pressure	Flow rate	Rotation speed	Weight
FR 1000	500 mm	up to 1000 bar	160 l/min	1500 r.p.m.	approx. 120 kg
FR 1500	400 mm	up to 1500 bar	150 l/min	1000 r.p.m.	approx. 90 kg
FR 3000	215 mm	up to 3000 bar	40 l/min	3000 r.p.m.	approx. 76 kg
FR 3000 HD	275 mm	up to 3000 bar	40 l/min	3000 r.p.m.	approx. 95 kg

# 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



Aquablast FRV 3000

### Working width:

215 mm

### Operating pressure:

up to 3000 bar

### Flow rate:

up to 40 l/min

### 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.



Aquablast (example: Twin)

### Working width:

595 mm

### Operating pressure:

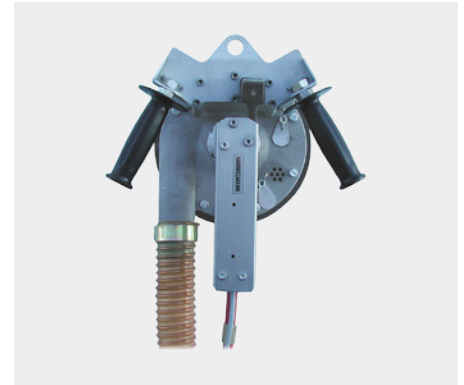
up to 3000 bar

### Flow rate:

up to 56 l/min

### Rotation speed:

up to 3000 r.p.m.



Aquablast FRWV 3000

### Working width:

140 mm

### Operating pressure:

up to 3000 bar

### Flow rate:

up to 19 l/min

### Rotation speed:

up to 2500 r.p.m.

Ergonomic handheld cleaning and stripping unit for vertical surfaces.



## 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 230 l

### Power required:

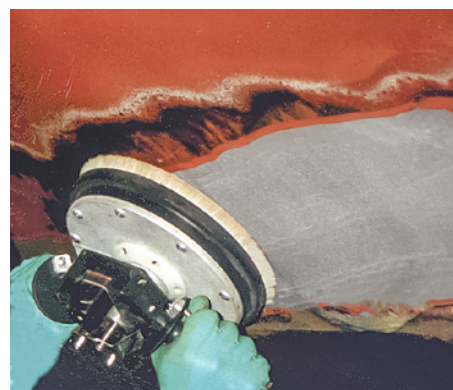
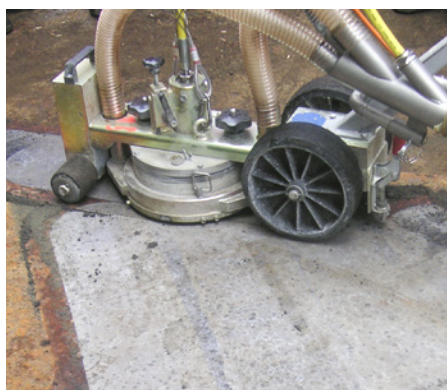
5.5 kW

### Vacuum:

200 mbar

### Suction power:

200 m³/h



## 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 1000 mm  
**Op. pressure :** up to 1000 bar

**Flow rate:** up to 240 l/min  
**Average working speed:** 50 m/min  
**Total weight:** 890 kg



### Applications

Cleaning large surfaces such as runways and industrial sites



## Vacuum system



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

Dual chamber system

**Prefractionator:** 630 Liter

**Fine separator:** 430 Liter

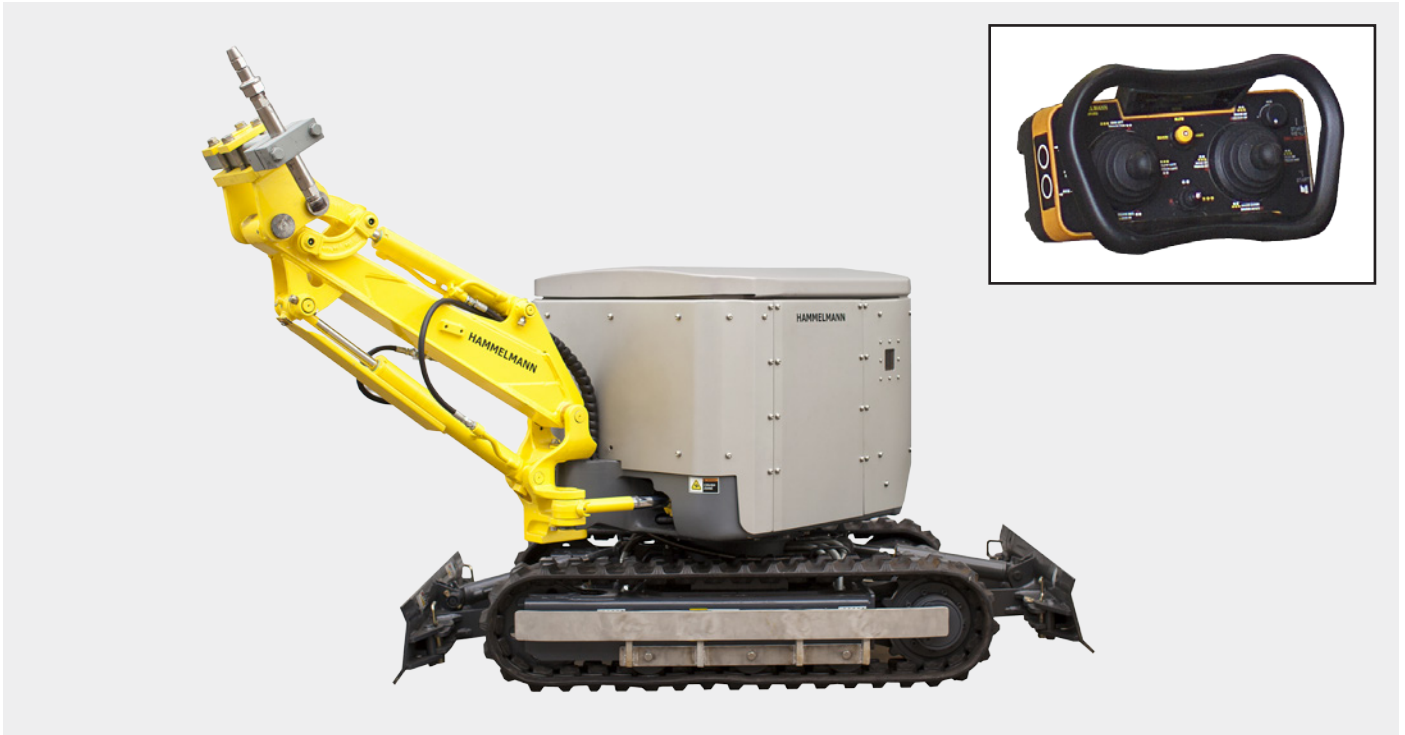
**Weight:** 1.5 t

**Engine:** 3-cylinder diesel engine

**Suction power:** 650 m³/h

**Vacuum:** 240 mbar

## Aquadozer



The Hammelmann Aquadozer is a remote-controlled carrier system for heavy-duty industrial cleaning. The system is suitable for reaction forces resulting from power ratings of the HDP 380 to HDP 800 high pressure pumps.

- Robust chassis
- Tier 4 Final engine
- Radio remote control
- Working arm with universal connection for various water blasting tools
- Hydraulic connection allowing water blasting tool to be quickly connected to the system



Lance system



Hydraulically powered rotor jet



Rotor jet, heavy-duty version,  
driven by reaction force



Rotor jet, medium-duty version,  
driven by reaction force

## Rotor jets



### Rotor jets

Rotor 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 Flex 3000**

Rotor jets with adjustable rotation speed. The rotation speed is adjusted by turning the dial.

**Nozzle heads**

- 1** Standard version with 3 nozzles
- 2** Spot blasting
- 3** Profile cleaning
- 4** Universal head for 2, 4 or 6 nozzles



**RD Flex 3000 MONO**

Single-jet rotor nozzle with adjustable rotation speed. The working nozzle is arranged in such a way as to keep vibrations to a minimum. No tools needed to set the rotation speed.



**RD 400 / 1000 / 1600**

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



**RD 3000 PR (pneumatic)**

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

**Nozzle holders**

Rotor jets	Op. pressure	Flow rate	Rotation speed	Connection thread	Weight
<b>RD Flex 3000</b>	up to 3000 bar	8.5 – 30 l/min	1000 – 4000 r.p.m.	M 14 x 1,5 LH" Adapter 9/16 "-18 UNF	1.8 kg
<b>RD Flex 3000 MONO</b>	up to 3000 bar	8.5 – 30 l/min	1000 – 4000 r.p.m.	M 14 x 1,5 LH" Adapter 9/16 "-18 UNF	2.0 kg
<b>RD 400</b>	up to 400 bar	up to 80 l/min	1000 – 2000 r.p.m.	G 3/8 "	1.2 kg
<b>RD 1000</b>	up to 1000 bar	up to 60 l/min	1000 – 2000 r.p.m.	G 3/8 "	1.2 kg
<b>RD 1600</b>	up to 1600 bar	up to 50 l/min	800 – 2000 r.p.m.	MH 14 x 1,5 LH Adapter 9/16 "-18 UNF	1.6 kg
<b>RD 3000 PR</b>	up to 3000 bar	up to 30 l/min	100 – 3000 r.p.m.	MH 14 x 1,5 LH Adapter 9/16 "-18 UNF	2.6 kg

## 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	Operating pressure	Flow rate	Rotation speed	Weight
RDM 200	up to 1000 bar	up to 160 l/min	100 – 1500 r.p.m.	8.0 kg
RDM 250	up to 1500 bar	up to 120 l/min	100 – 1500 r.p.m.	8.0 kg
RDM 300	up to 1000 bar	up to 180 l/min	50 – 250 r.p.m.	8.2 kg
RDM 400	up to 1400 bar	up to 200 l/min	50 – 250 r.p.m.	28 kg
RDM 400 R	up to 2500 bar	up to 100 l/min	50 – 500 r.p.m.	42 kg
RDM 750	up to 1600 bar	up to 400 l/min	100 – 1000 r.p.m.	72 kg

## 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

Versions with the following parameters:

**Op. pressure:** up to 3000 bar  
**Rotation speed:** up to 3000 r.p.m.  
**Flow rate:** up to 250 l/min



### Pneumatically powered rotary joints

Versions with the following parameters:

**Op. pressure:** up to 3000 bar  
**Rotation speed:** up to 3000 r.p.m.  
**Flow rate:** up to 40 l/min



### Electrically powered rotary joints

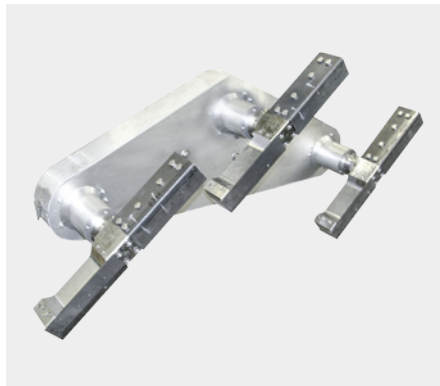
Versions with the following parameters:

**Op. pressure:** up to 3000 bar  
**Rotation speed:** up to 2850 r.p.m.  
**Flow rate:** up to 100 l/min

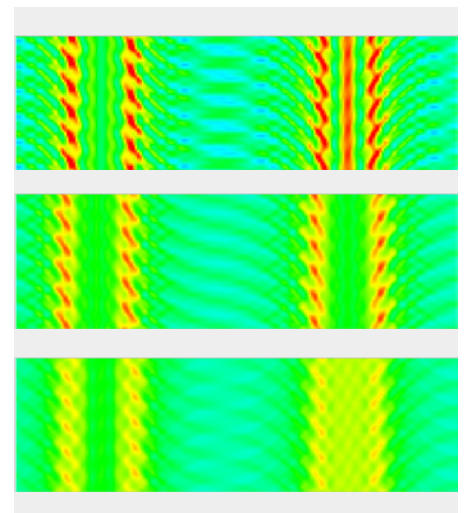
## Possible combinations of powered rotary joints and nozzles holders



Rotor jet with spray bar and wear protection, hydraulically powered  
 (Working width: 400 mm)



Centrally powered nozzle bar system, 3 rotary joints  
 (Working width: 1518 mm)



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

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



(Working width: 350 mm)



(Working width: 190 mm)

## 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 decorating
- Roughening of metallic surfaces
- Internal blasting and decorating of castings



Rotor jet, electrically powered



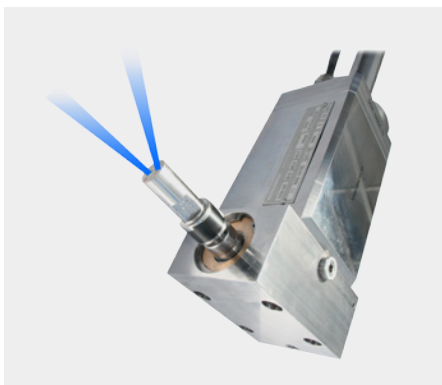
Nozzle lance, electrically powered



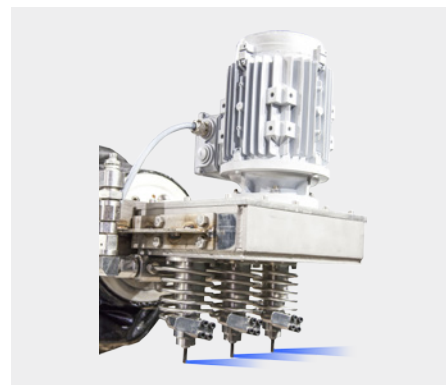
Multiple rotor jets, electrically powered



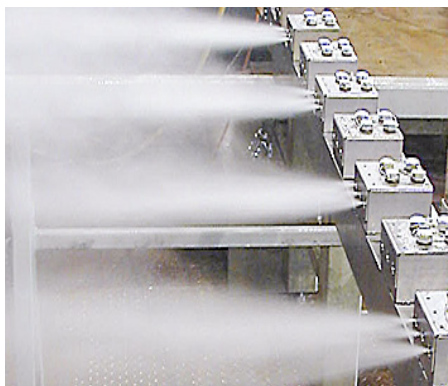
Internal blasting system, electrically powered



Electrically driven angled rotary joints



Electrically driven multiple rotary joints (oscillating)



Spray bars



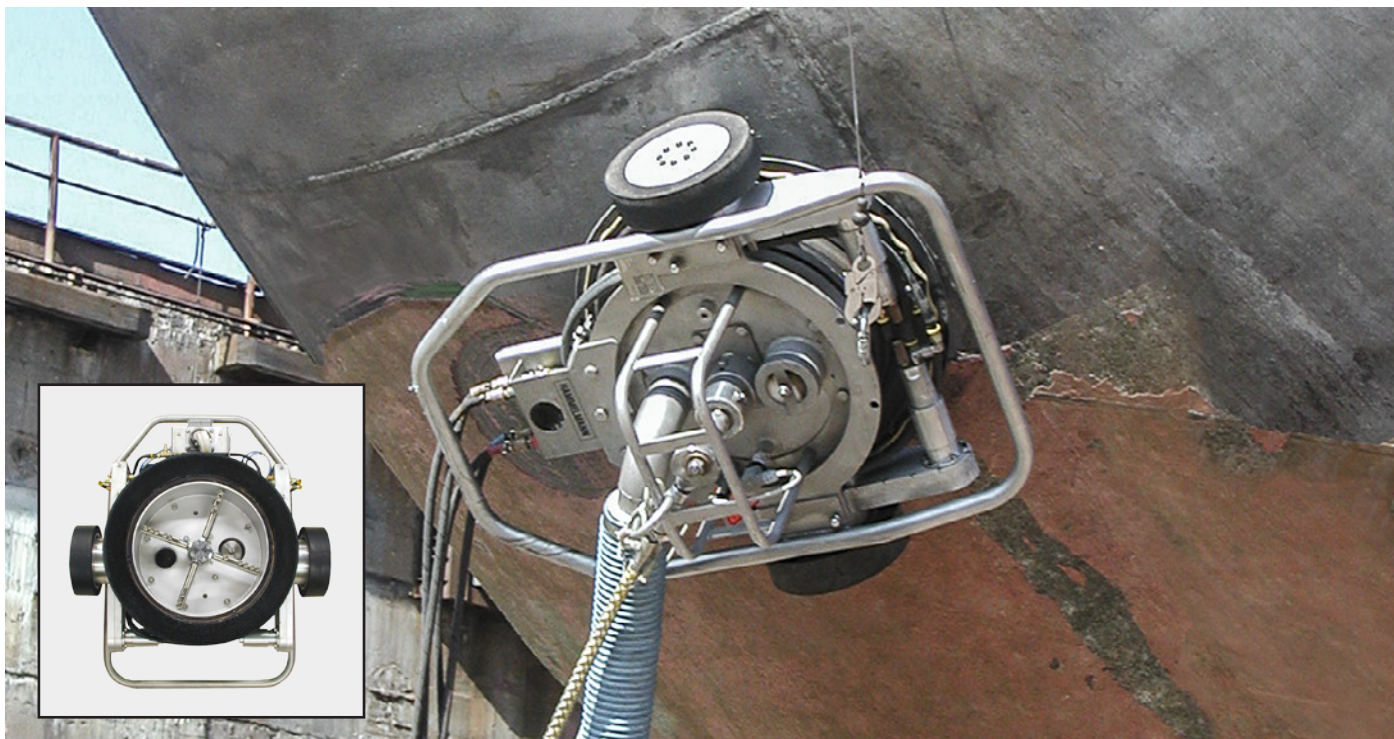
Electrically powered multiple rotary joints for external drive



Nozzle arm, hydraulically powered



## Spiderjet® 3000



The Spiderjet 3000 is held on the work surface by a vacuum, which at the same time suctions off the removed waste material and waste water.



Ship cleaning



External cleaning of large vessels



Concrete preparation

### Typical applications

Cleaning plus coating and paint removal of:

- Storage tanks
- Outer surfaces of ships
- Concrete
- Cargo holds

### Technical data

**Working width:** 374 mm

**Op. pressure:** up to 3000 bar

**Flow rate:** up to 50 l/min

**Vacuum:**

Approx. 0.5 bar depending on the surface

**Suction connection:** DN 100



Pneumatic control cabinet  
(optional: with radio remote control)

## Dockboy



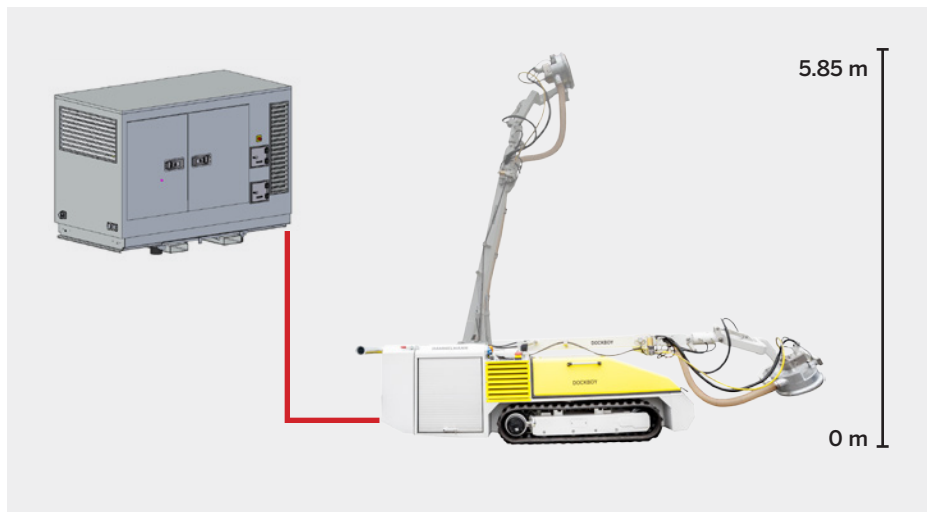
The Dockboy is a semi automatic vehicle primarily for working on ship hull bottoms or similar surfaces.



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:** 370 mm (optional 506 mm)  
**Op. pressure:** 3000 bar  
**Working height:** 0 – 5.85 m  
**Vehicle height:** 1.23 m  
**Arc width:** 4.00 m

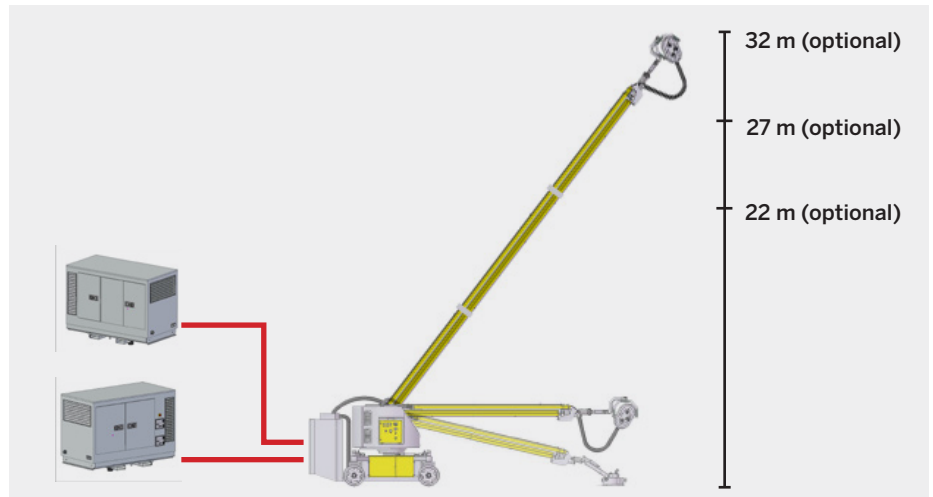


## Dockmate

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.

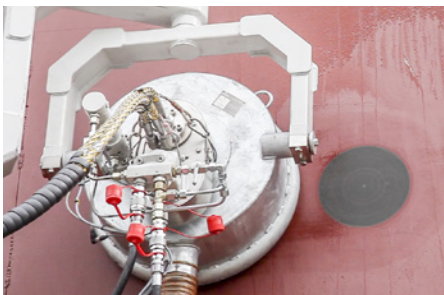
Using pressures varying between 2500 and 3000 bar, up to 250 sq. metres per hour of surface can be prepared to NACE/SSPC standards WJ1/SC-2.

- The **ultra high pressure unit** is attached separately
- Telescopic jib: heights of 22 m, 27 m and 32 m (optional)



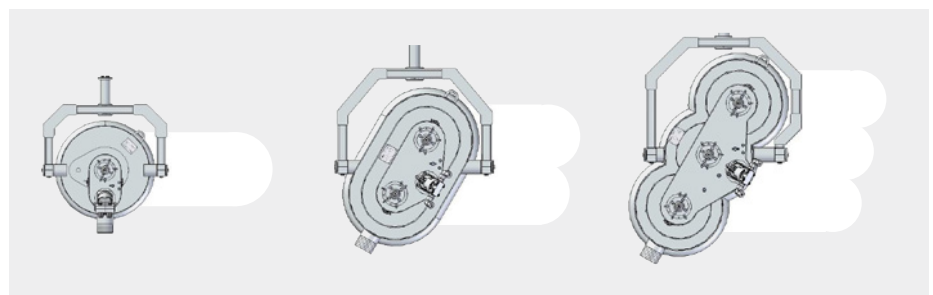
### Different Aquablast versions

- Working widths of 375 mm – 860 mm
- Suitable of flow rates of 28 – 92 l/min at 3000 bar



### Spot blasting

Quick approach of damaged spots without unloading the pump pressure.



**Working width**  
**375 mm (optional)**

**Aquajet 17**  
28 l/min – 3000 bar

**Aquajet 25**  
46 l/min – 3000 bar

**Working width**  
**600 mm (optional)**

**2 x Aquajet 17**  
56 l/min – 3000 bar

**Aquajet 25**  
46 l/min – 3000 bar

**Working width**  
**860 mm (optional)**

**3 x Aquajet 17**  
84 l/min – 3000 bar

**2 x Aquajet 25**  
92 l/min – 3000 bar

### Training software

All work steps and functions can be learned using a simulation software combined with a modified Dockmate remote control.

Errors made when using this remote control are displayed and suggestions given as to their rectification.

No matter where the operator is, he can teach himself the individual functions and procedures using this software.





**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".



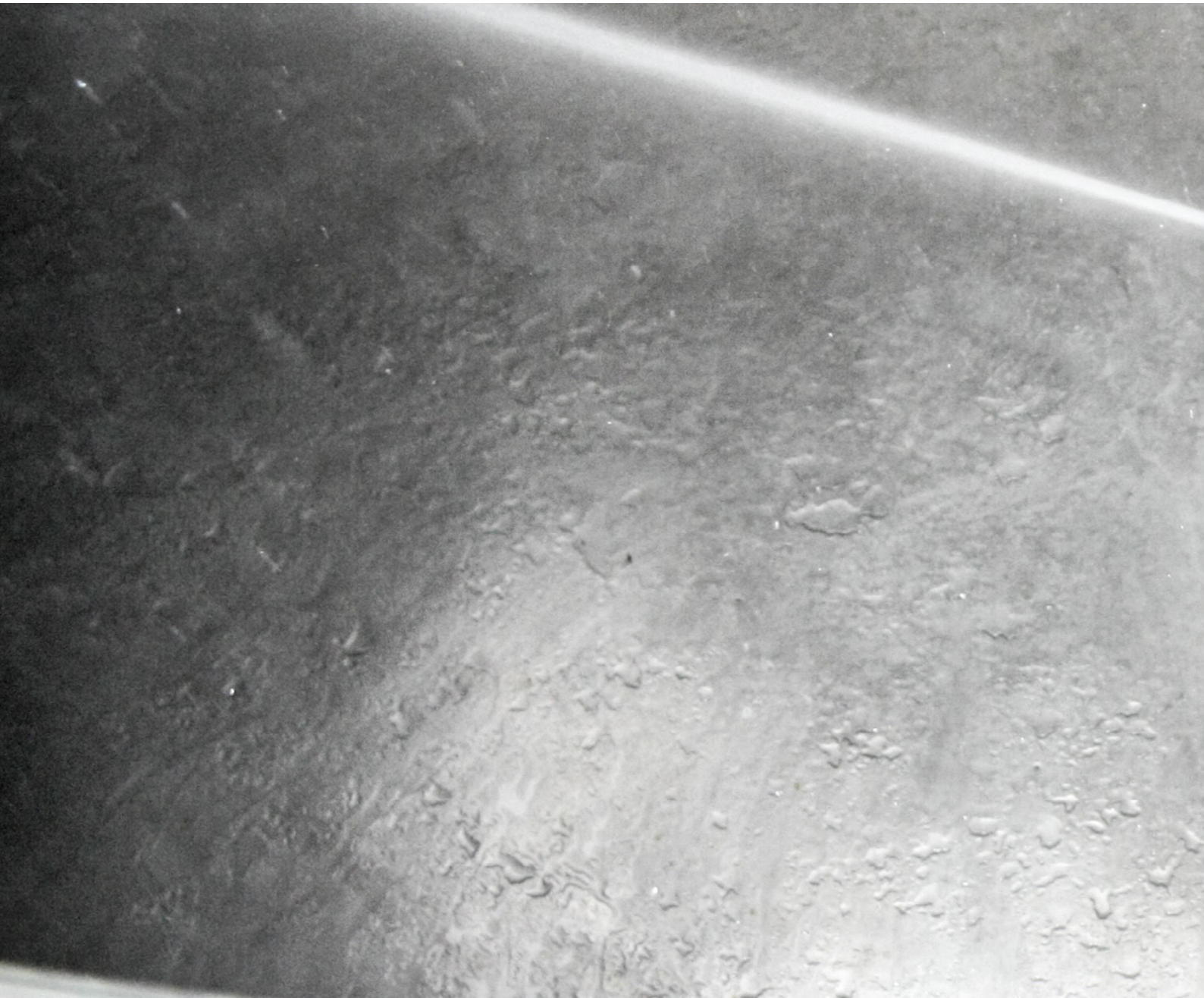
**Portable remote control**

The Dockmate is operated by portable radio remote control.



**Applications**

Blasting of metal surfaces, e.g. outer surfaces of ships and storage tanks. Cleaning of storage spaces, runways, flooring, roughening of concrete and asphalt.



# TANK CLEANING





## **Tank cleaning**

Aquamat tank cleaning heads	30 – 31
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Nozzle holder arms for tank cleaning heads	33
Aquarex tank cleaning devices	34 – 37

## Aquamat® tank cleaning units

### Description

Hammelmann automatic tank cleaners remove deposits including hardened materials from tank internal walls at pressures of up to 1800 bar.

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

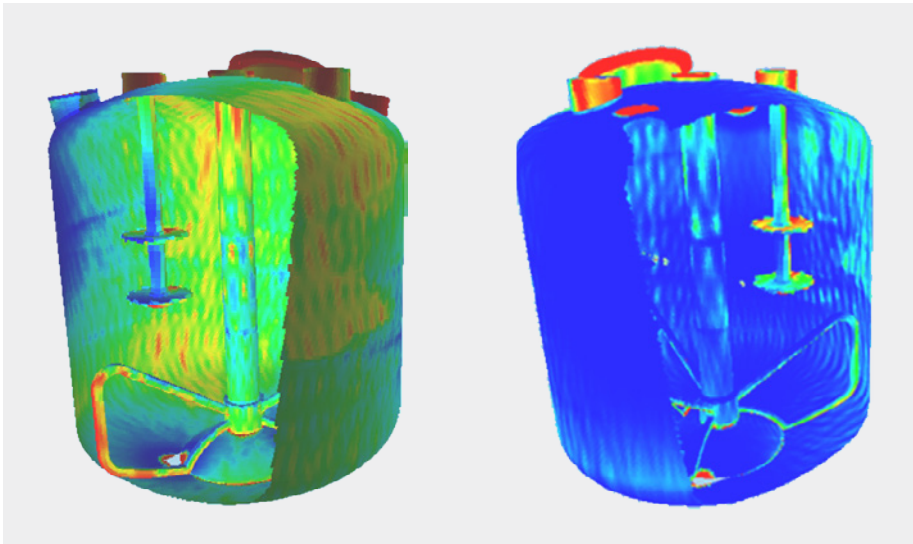
- Internal cleaning of autoclaves, vessels, Euro containers, reactors, agitator vessels, holding tanks, drying towers etc.
- Decontamination
- Disinfection (with chemical additives)
- Cleaning the interior of large diameter pipework with deployment sledge

### 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
- High reliability due to simple and low-maintenance design.
- 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 **1 + 2**.



Chemical industry design



Chemical industry design, gastight



Hot water  
(85 °C)

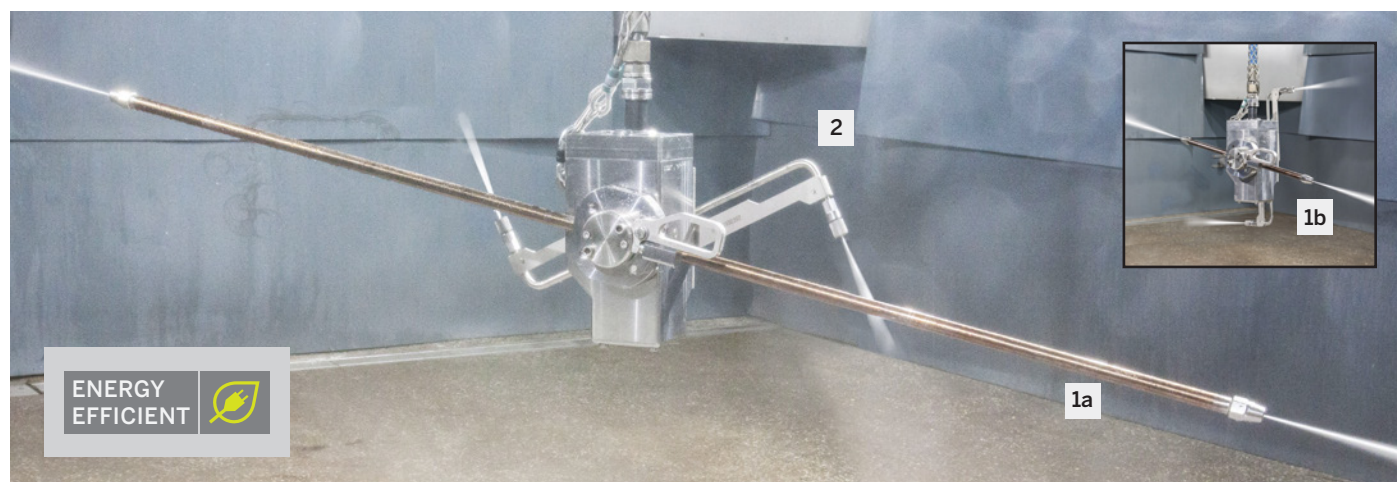


Pressure-resistant



Tank cleaning units	Operating pressure	Flow rate	Min. tank access	Weight
L 1400-2	up to 1400 bar	150 l/min	min. 140 mm	7.8 kg
L 1800-2	up to 1800 bar	150 l/min	min. 190 mm	10.3 kg
XL 500-2	up to 500 bar	400 l/min	min. 170 mm	14.8 kg
XI 1600-2	up to 1600 bar	250 l/min	min. 190 mm	14.8 kg
XL 1600-2 Chemical industry design	up to 1600 bar	250 l/min	min. 190 mm	14.8 kg
XL 1600-2 Chemical industry design gastight	up to 1600 bar	250 l/min	min. 205 mm	38.5 kg
XXL 1600-2	up to 1600 bar	500 l/min	min. 300 mm	93.0 kg

## 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

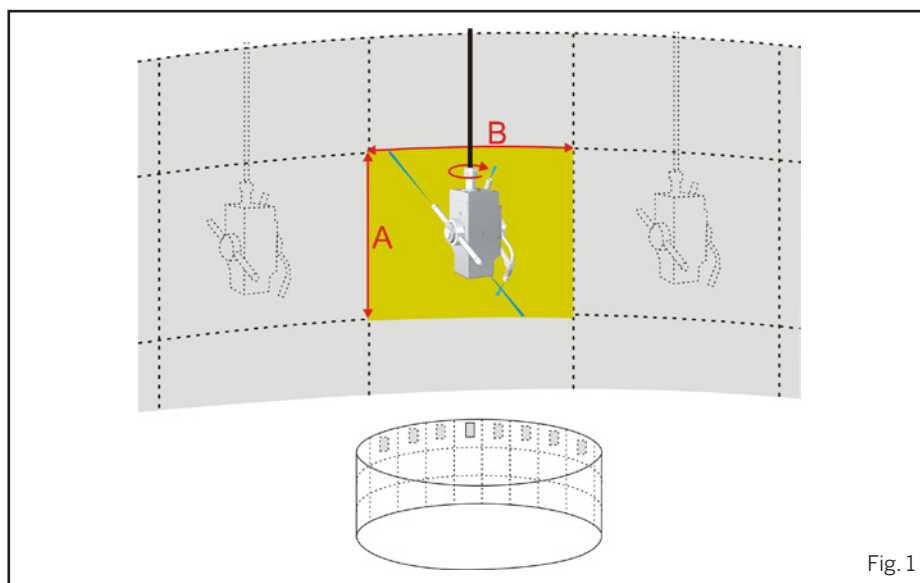


Fig. 1

**Fig. 1 - Very large diameter 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.

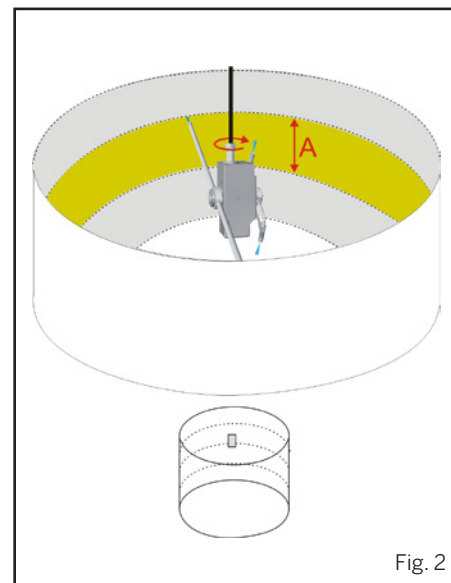


Fig. 2

**Fig. 2 - Large cylindrical vessel**

In smaller diameter large cylindrical vessels (Fig. 2), the tank cleaning head is positioned centrally. The limits on the rotational motion around the vertical axis of the apparatus (B) are removed to enable the full 360°.

## 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.

Particularly compact designs make cleaning through small openings possible.



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



Extension arm from 110 mm to 1100 mm

## Accessories for tank cleaning heads



### 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.



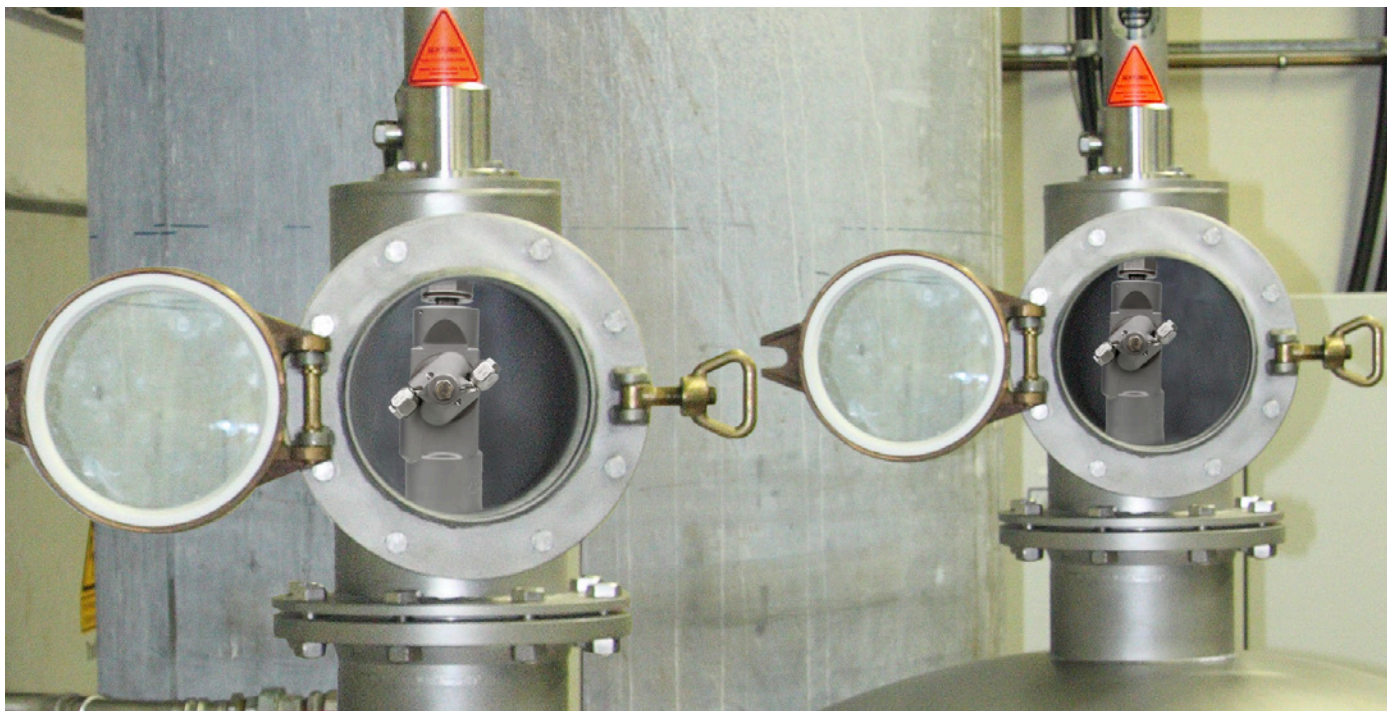
### Sledge type guides

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.

## Aquarex® tank cleaning devices

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

Here are a few examples:



### 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.



#### Lance hose system

The lance is rotatable, swivellable and extendable 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 on the manhole by the mobile chassis. The lance can be manually rotated, swivelled, retracted and extended.



#### 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 4.5 m or more.)



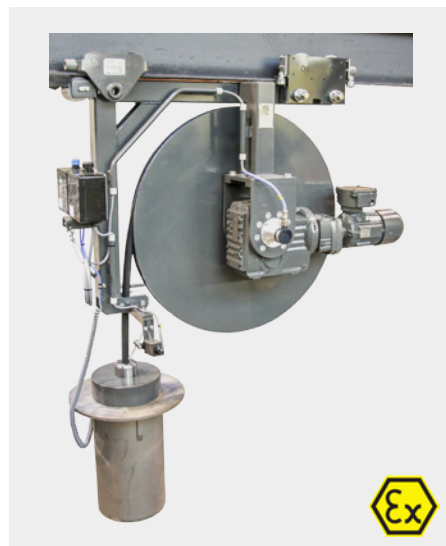
#### Gastight lance system

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.



#### 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 4 metres.



### Cleaning system for very large vessels

The system is designed for cleaning vessels up to 20 m 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.



Gastight hose reel system



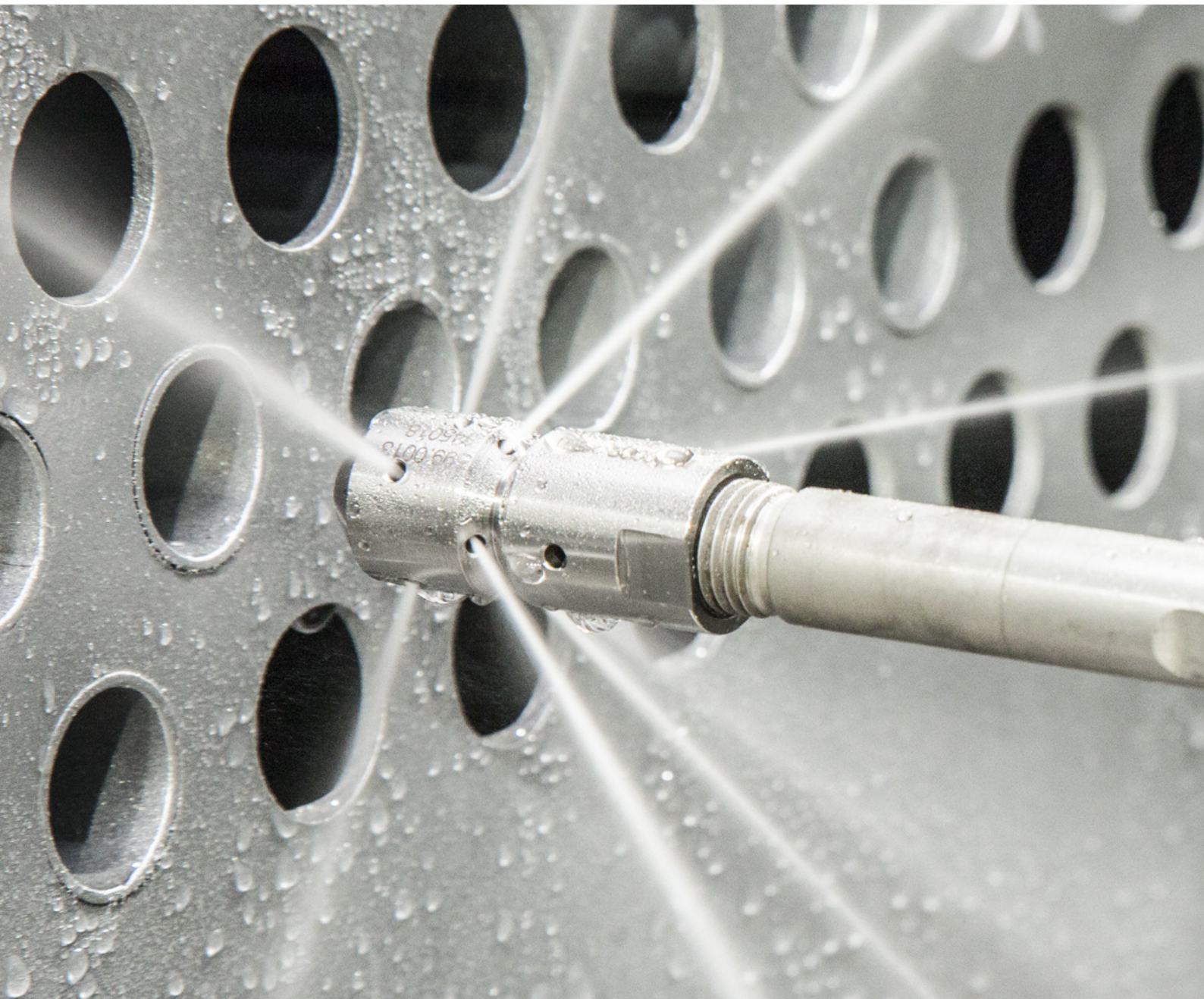
Hose reel system



Lance system - moved hydraulically/pneumatically actuated

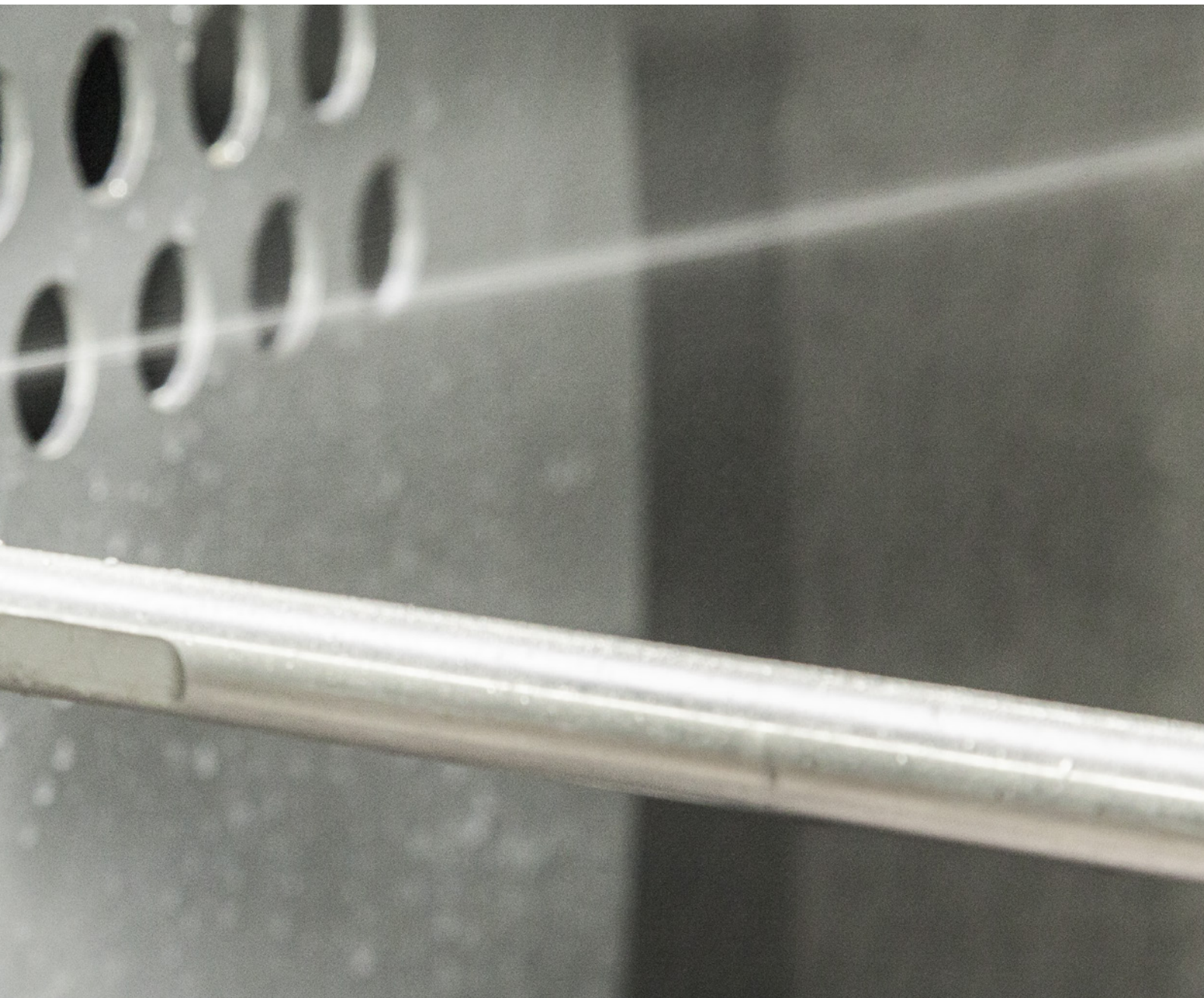


Lance system - moved pneumatically actuated



# PIPE CLEANING



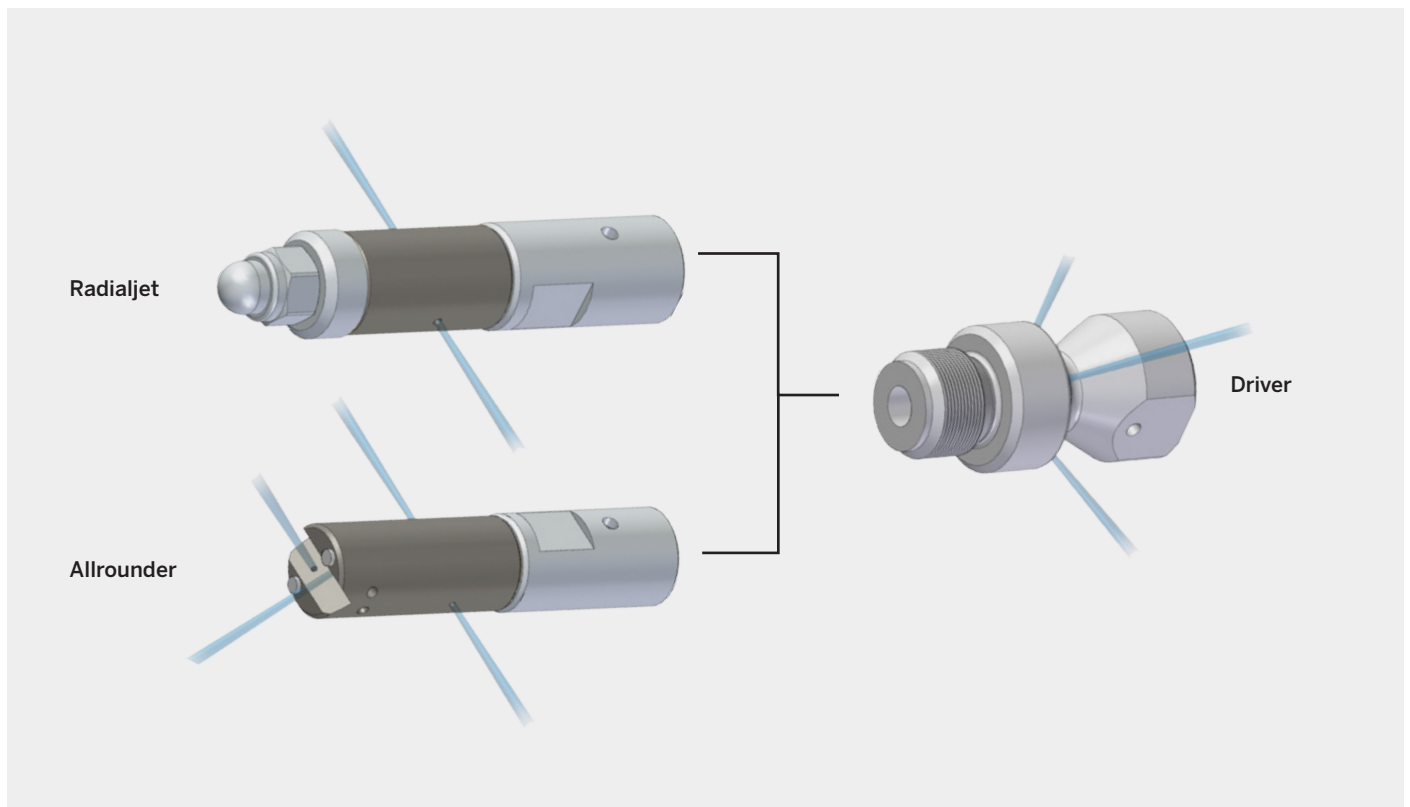
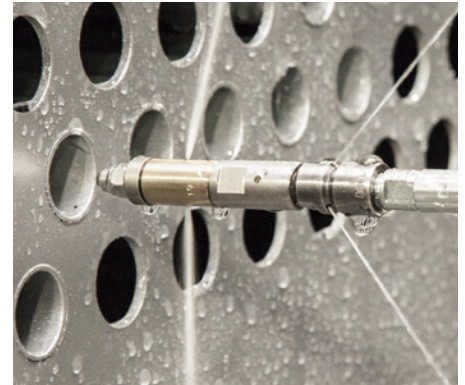
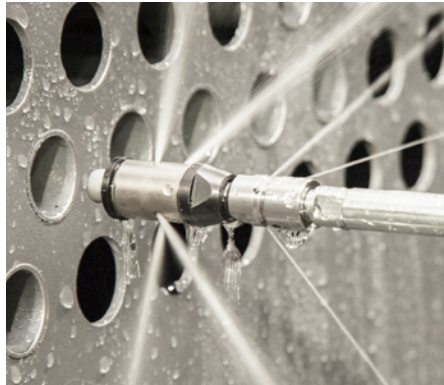
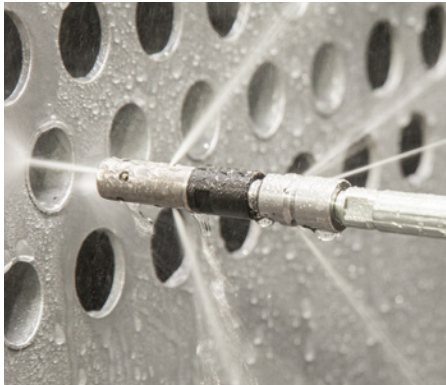


## Pipe cleaning

Turbo jets	40 – 41	Nozzle holders for pipe cleaning	48 – 49
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Push and pull nozzles	43	Revolving hose reel	50
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## Turbo jets

Turbo jets 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.



### Radialjet

Radialjets have 90° bores to clean and polish pipes.

#### Typical applications

To remove scale from partially blocked pipes and heat exchanger tubes

### Allrounder

Allrounder have, in addition to the efficiency of the Radialjet front facing bores.

#### Typical applications

To clean partially and fully blocked tubes and heat exchanger

### Driver

The driver is installed as an adapter between the high pressure lance or hose and the Radialjet/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



Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 1500 bar (incl. leakage)
		min.	max.		
12 mm	M 7	15	30	2 x Ø 0.9 radial	approx. 30 l/min
14 mm	G 1/8"	17	35	2 x Ø 1.0 radial	approx. 38 l/min
18 mm	G 1/4"	20	40	2 x Ø 1.1 radial	approx. 45 l/min
22 mm	G 1/4"	25	50	2 x Ø 1.0 radial	approx. 50 l/min
28 mm	G 1/4"	33	60	2 x Ø 1.1 radial	approx. 62 l/min



Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 1500 bar (incl. leakage)
		min.	max.		
18 mm	G 1/4"	20	40	2 x Ø 0.6 axial 2 x Ø 0.6 radial	approx. 40 l/min
22 mm	G 1/4"	25	50	2 x Ø 0.6 axial 2 x Ø 0.6 radial	approx. 40 l/min

## Up to 2500 bar – free spinning



Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 2500 bar (incl. leakage)
		min.	max.		
15 mm	G 3/8" - 24 UNF LH	18	35	2 x Ø 0.6 radial	approx. 25 l/min
16 mm	G 3/8" - 24 UNF LH	19	35	2 x Ø 0.6 radial	approx. 25 l/min
18 mm	G 3/8" - 24 UNF LH	20	40	2 x Ø 0.7 radial	approx. 32 l/min
20 mm	M 14 x 1.5 LH	23	45	2 x Ø 0.7 radial	approx. 32 l/min

## Up to 2800 bar – magnetic brake



Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 2800 bar (incl. leakage)
		min.	max.		
18 mm	M 14 x 1.5 LH	20	40	2 x 0.4 radial	approx. 21.5 l/min
18 mm	9/16" - 24 UNF LH	20	40	2 x 0.4 radial	approx. 21.5 l/min



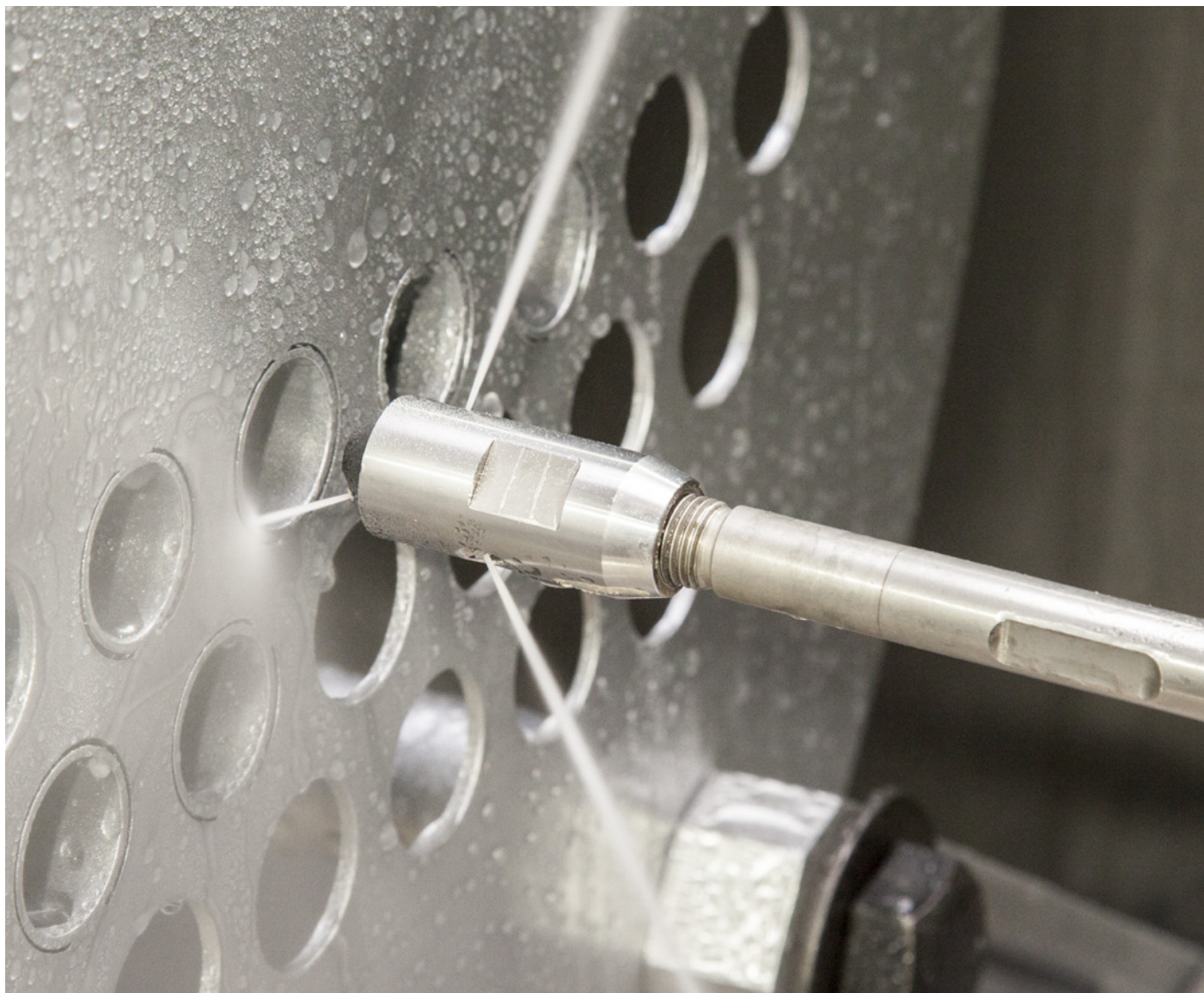
Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 2800 bar (incl. leakage)
		min.	max.		
18 mm	M 14 x 1.5 LH	20	40	2 x 0.35 radial 2 x 0.30 axial	approx. 25 l/min
18 mm	9/16" - 24 UNF LH	20	40	2 x 0.35 radial 2 x 0.30 axial	approx. 25 l/min

## Driver



Max. diameter of drive nozzle	Qmax l/min up to 1000 bar	Connection thread (internal / external)	Hose nominal i/d mm
13 mm	approx. 6 / 13 / 23 / 35	G 1/8"	DN 4
13 mm	approx. 9 / 13 / 23 / 35	G 1/8"	DN 6
18 mm	approx. 6 / 23 / 35 / 51	G 1/4"	DN 4
18 mm	approx. 13/23/35/43/51	G 1/4"	DN 6
up to 3000 bar			
19	6 – 51	M14 x 1.5 LH	DN 5

## 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.

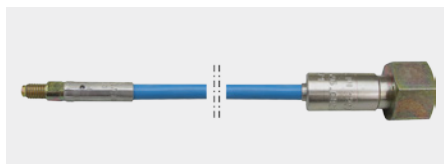
For use with a blasting gun or foot valve

**Operating pressure:** 1000; 1200 bar

**Length:** 6; 10; 15; 20 m

**Nominal i/d:** 4; 6 mm

### Flexible lances



For use with a hose or foot valve

**Operating pressure:** up to 3000 bar

**Length:** 6, 10, 15, 20 m

**Nominal i/d:** 4, 5, 6 mm

### Rigid lances



For use with a blasting gun or foot valve

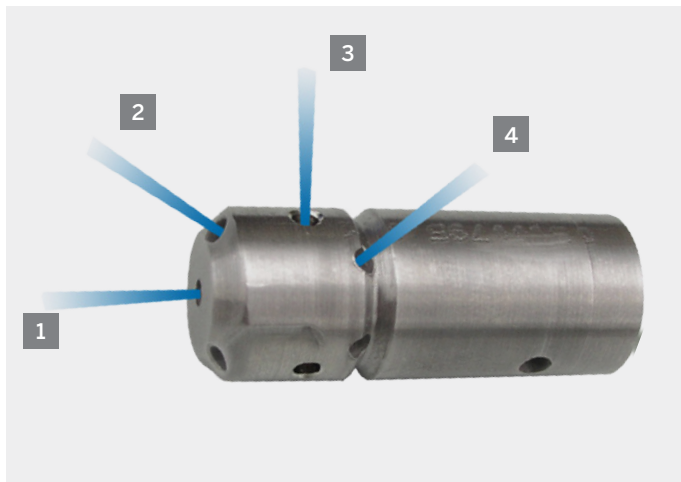
**Operating pressure:** up to 3000 bar

**Length:** 6, 10, 15, 20 m

**Nominal i/d:** 2.5; 5; 8; 10; 13; 16 mm

**OD:** 6.35; 10; 14; 18.5 mm

## 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

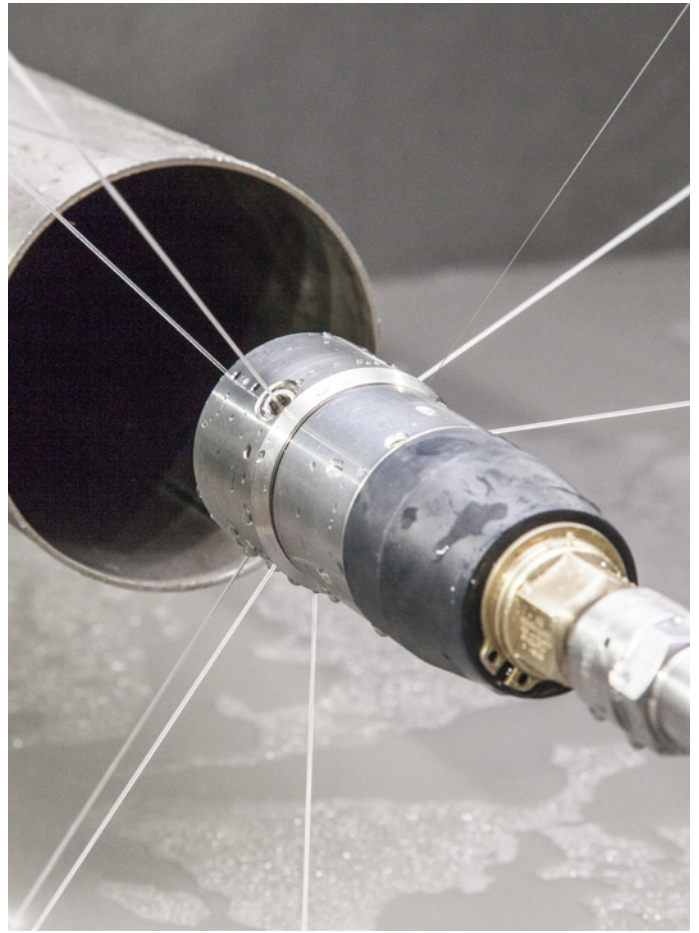
Pull jets remove any material behind the nozzle while pulling the lance and nozzle into the pipe.

### Flexible Lances

### Rigid Lances

	Minimum pipe inner diameter	Operating pressure Internal thread	Operating pressure External thread
	12 mm Ø	up to 1200 bar M8	up to 2500 bar M6 x 0.75
	17 mm Ø	up to 1000 bar M10 x 1	up to 3000 bar M10 LH
	20 mm Ø	up to 1640 bar M14 x 1.5 LH	up to 2500 bar M14 x 1.5 LH
	26 mm Ø	up to 3000 bar M14 x 1.5 LH	up to 3000 bar M14 x 1.5 LH
	33 mm Ø	up to 500 bar M22 x 1.5 DKO-S	–
	40 mm Ø	up to 1800 bar M22 x 1.5 DKO-S	–
	55 mm Ø	up to 1400 bar M36 x 2 DKO-S	–

## Rotor jets for pipe cleaning








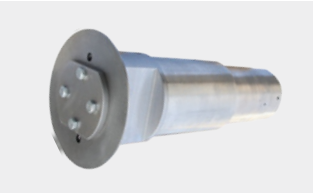
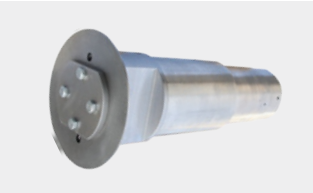
## Rotor jets for pipe cleaning

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

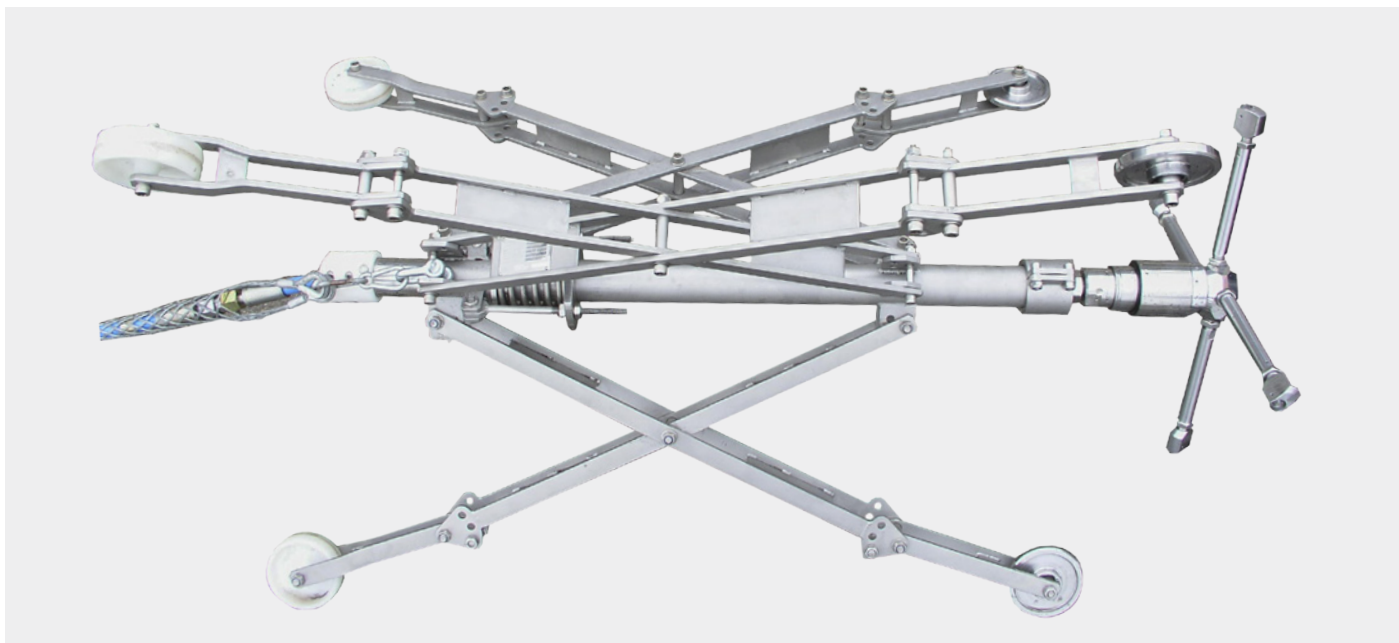
- Wear-resistant rotary joint with labyrinth seal
- Axial and radial nozzle arrangement for cleaning tubes
- With protective cover as an option

## Typical applications

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

	Rotor jet diameter	Length	Max. op. pressure	Flow rate		Nozzles	Connection thread
				min.	max.		
	53 mm	186 mm	1000 bar	30 l/min	– 60 l/min	4 x radial	G 3/8 internal
	58 mm	238 mm	1600 bar	100 l/min	– 200 l/min	2 x radial 2 x push 2 x pull	M36 x 2 DKO external
	78 mm	170 mm	1600 bar	25 l/min	– 50 l/min	2 x radial 2 x push 2 x pull	M14 x 1.5 LH internal
		170 mm	2500 bar	16 l/min	– 32 l/min		
	90 mm	327 mm	1000 bar	90 l/min	– 180 l/min	4 x radial	M36 x 2
	128 mm	303 mm	1500 bar	60 l/min	– 120 l/min	2 x radial 2 x push 2 x pull	M24 x 1.5 DKO external
		247 mm	3000 bar	30 l/min	– 60 l/min		M30 x 2 internal
	130	418 mm	1500 bar	100 l/min	– 200 l/min	4 x radial	M36 x 2
	166	635 mm	1600 bar	200 l/min	– 400 l/min	2 x push	M36 x 2

## Centralizer for rotor jets



### Centralizer for rotor jets

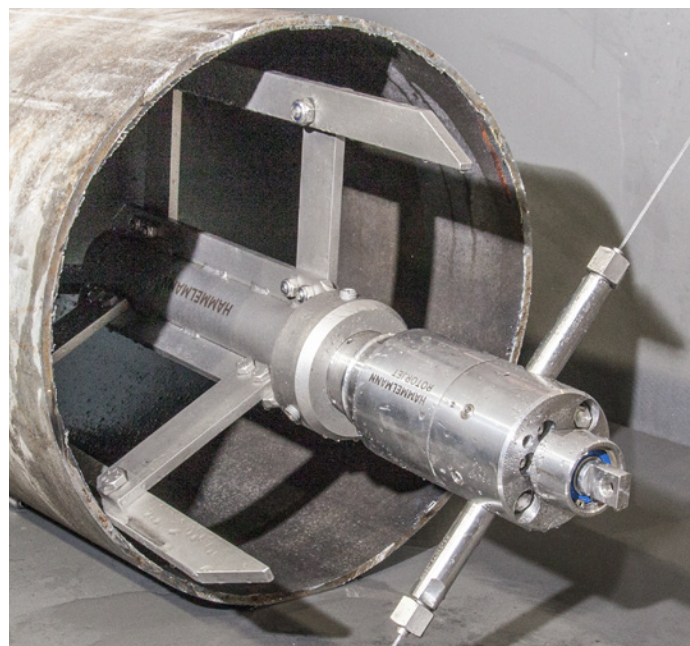
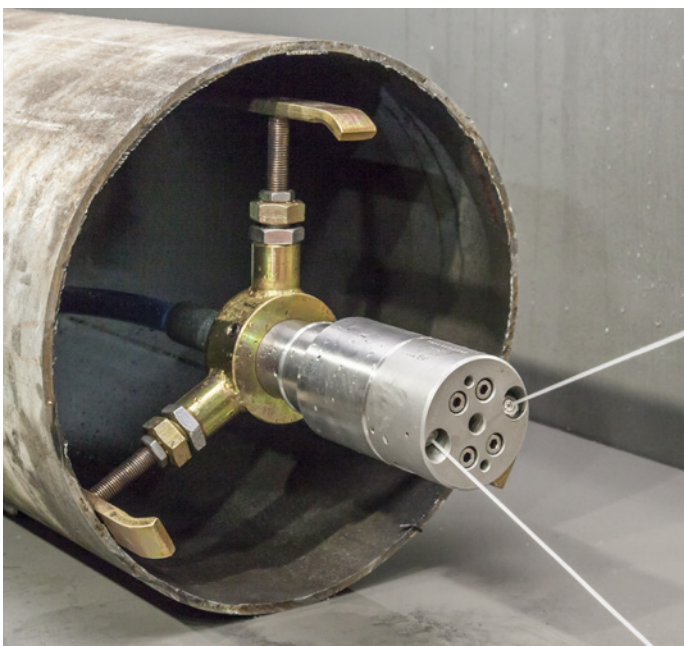
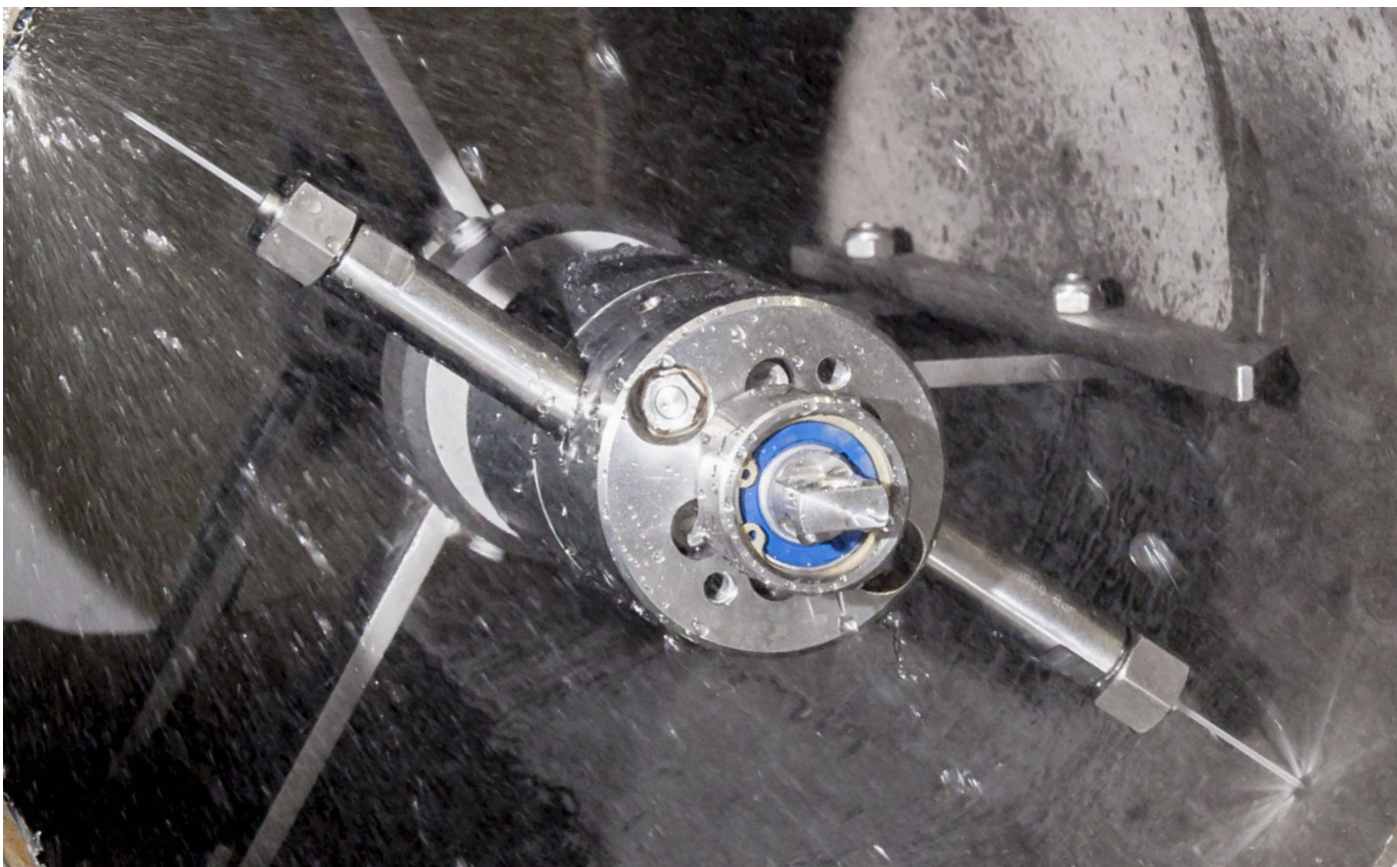
The centralizer enables rotor jets to be deployed absolutely centrally in a pipe. The scissor-like centralizer is suitable for pipes and sewers between 0.40 and 1.40 m in diameter.

It comprises the following main components:

- Guide pipe with mounting for rotor jet and hose
- Adjustment to different pipe diameters
- 3 scissor arms with moving joints and wheels

The complete centralizer is made from rust-resistant materials. Rotary joint, spray pipes and extension blasting arms selected separately.

## Guide skids for rotor jets

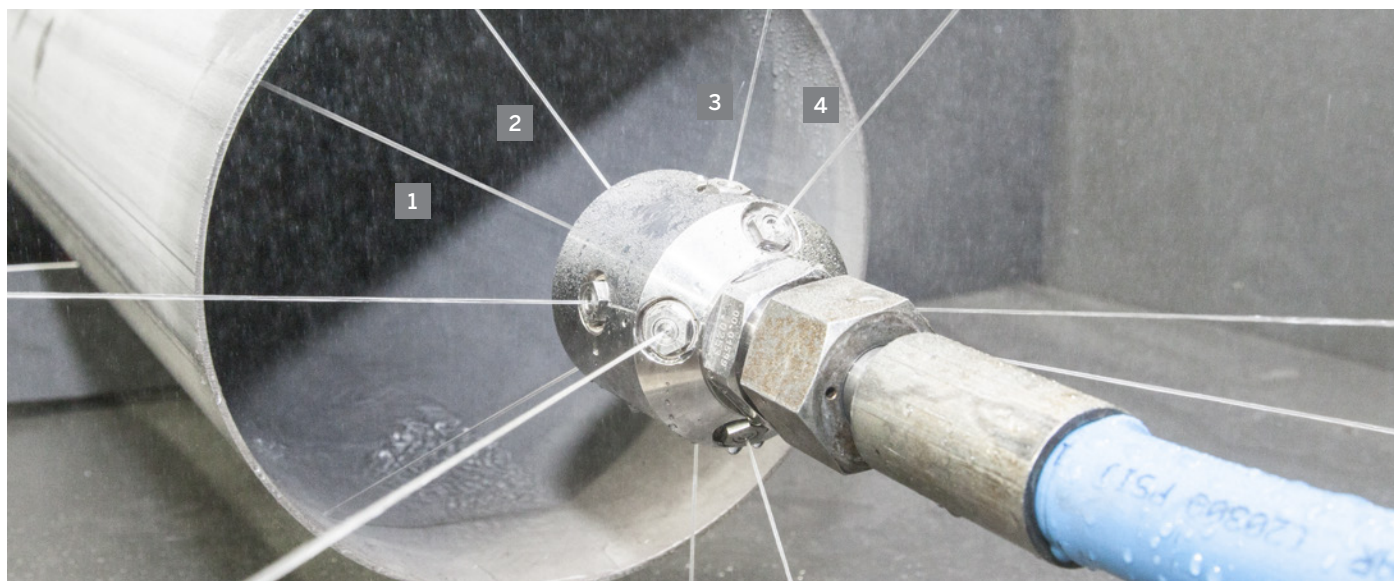


The skids can be adjusted to fit various diameters of pipe.  
A swivelling pulling eye is fitted to the rotor jet.

**For pipe-Ø : 125 – 2800 mm**

## Nozzle holder for pipe cleaning

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

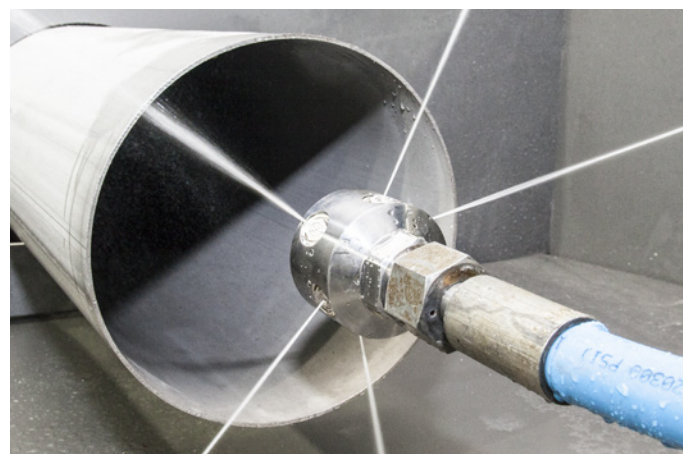


1 Axial nozzle

2 Push nozzles

3 Radial nozzles

4 Pull nozzles







### Nozzle holder

We produce a wide variety of nozzle holders for use with the rotating hose reel or hose rotating system (Pipemaster).

### Typical applications


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

	Nozzle holder diameter	Operating pressure	Nozzles		Connection thread
			Quantity	Adjustment	
	55 mm	up to 1800 bar	7	2 x pull 2 x radial 2 x push 1 x axial	M 24 x 1.5 DKO-S or M 36 x 2 DKO-S
	65 mm	up to 1800 bar	5	2 x pull 2 x radial 1 x axial	M 24 x 1.5 DKO-S or M 36 x 2 DKO-S
			7	2 x pull 2 x push 2 x radial 1 x axial	
	80 mm	up to 1800 bar	7	2 x pull 2 x push 2 x radial 1 x axial	M 24 x 1.5 DKO-S or M 36 x 2 DKO-S
	90 mm	up to 1600 bar	19	6 x pull 6 x push 6 x radial 1 x axial	M 36 x 2 DKO-S

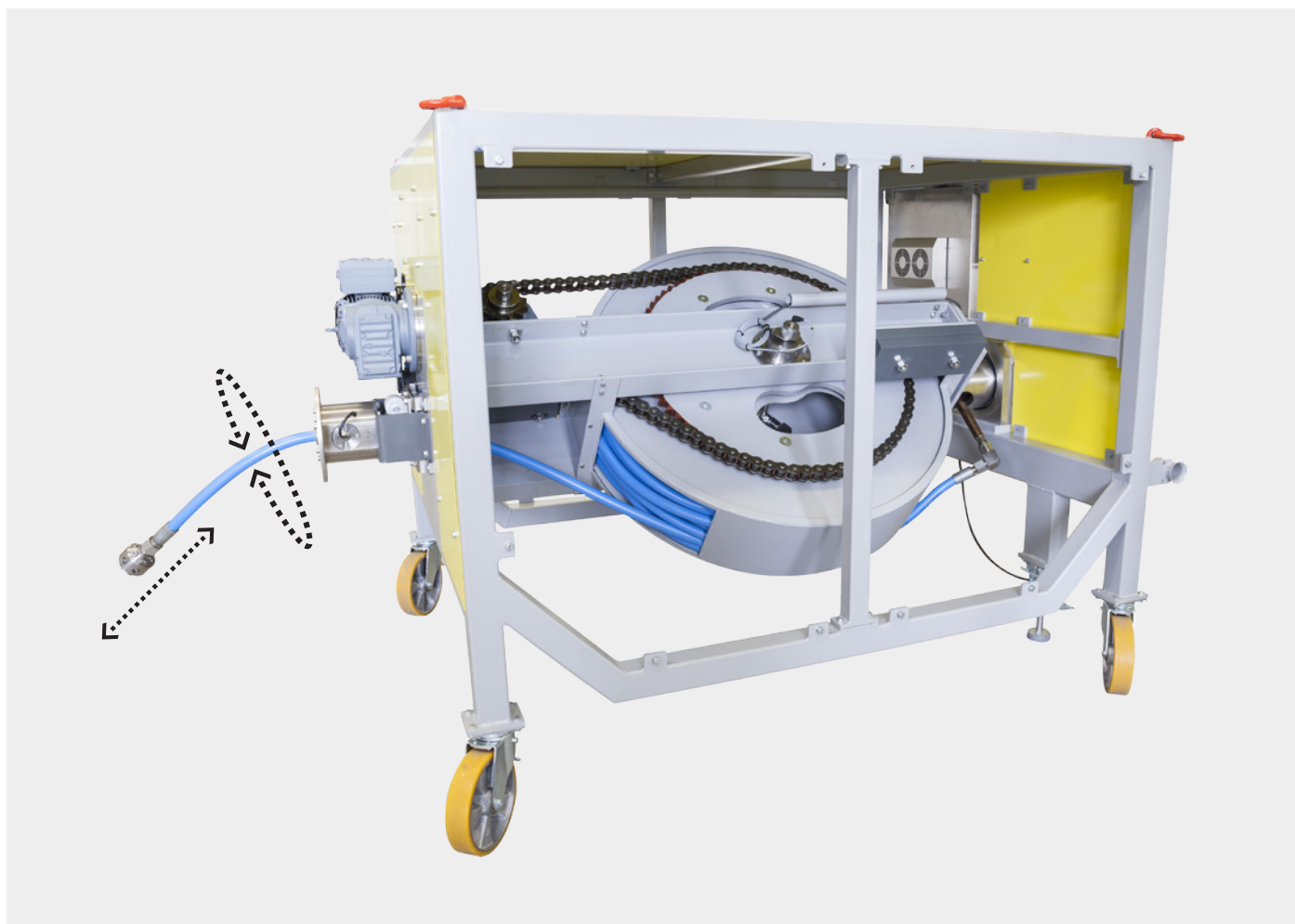
## 3D pipe cleaners

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.



	Type	Nozzle arm	Operating pressure	Flow rate	Minimum pipe i/d:
	<b>Type L 1200-2</b>	18 mm S arm, 2 nozzles	up to 1400 bar	150 l/min	200 mm
	<b>Type XL 1500-2</b>	35 mm S arm, 2 nozzles	up to 1600 bar	250 l/min	320 mm
	<b>Typ XXL 1600-2</b>	13 mm S arm, 2 nozzles	up to 1600 bar	500 l/min	470 mm

## Revolving hose reel



The unit cleans tubes with a diameter  $\geq 70$  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.

A hydraulic version is optional.

**Op. pressure:** 1600 bar  
(optional 3000 bar)

**Hose nominal i/d:** 5, 12, 20 mm

**Hose length:** 100 m

**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 8 and 12 mm**

**Op. pressure:** up to 3000 bar

**Hose internal diameter 20 mm**

**Op. pressure:** up to 1600 bar



### 1 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 120 Nm<sup>3</sup> / hr. of compressed air at 4 bar and comprises a pneumatic motor with a gearbox, a pneumatic maintenance unit, the high pressure rotary joint and a pneumatic control system.

### 2 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 1.6 m/min. and it is smoothly adjustable by means of the control lever.

### 3 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.

### 4 Positioning device

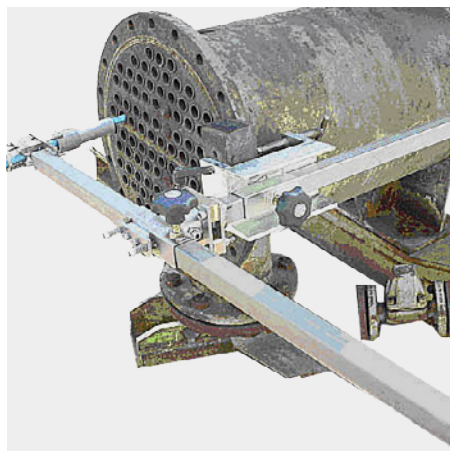
A non-rotating protective hose is fitted between the hose deployment unit and the positioning device. This enables operation in pipes that are difficult to access.

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 40 mm i/d.

## Safety device for heat exchanger cleaning



### 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 2.0 m

For lance i/d's: DN 4, 6 und 8

Flange thickness: 140 mm max.

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.



### Safety device for pipe cleaning

Mainly for horizontal pipes.

For pipe-Ø of 100 – 300 mm

## 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:** 267 mm  
**Width:** 258 mm  
**Length:** 448 mm  
**Weight:** 11 kg

## 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:** 145 mm  
**Width:** 160 mm  
**Length:** 240 mm  
**Weight:** 2.8 kg



# WATER JET CUTTING



## Cold cutting

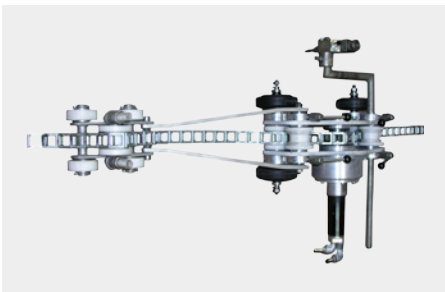
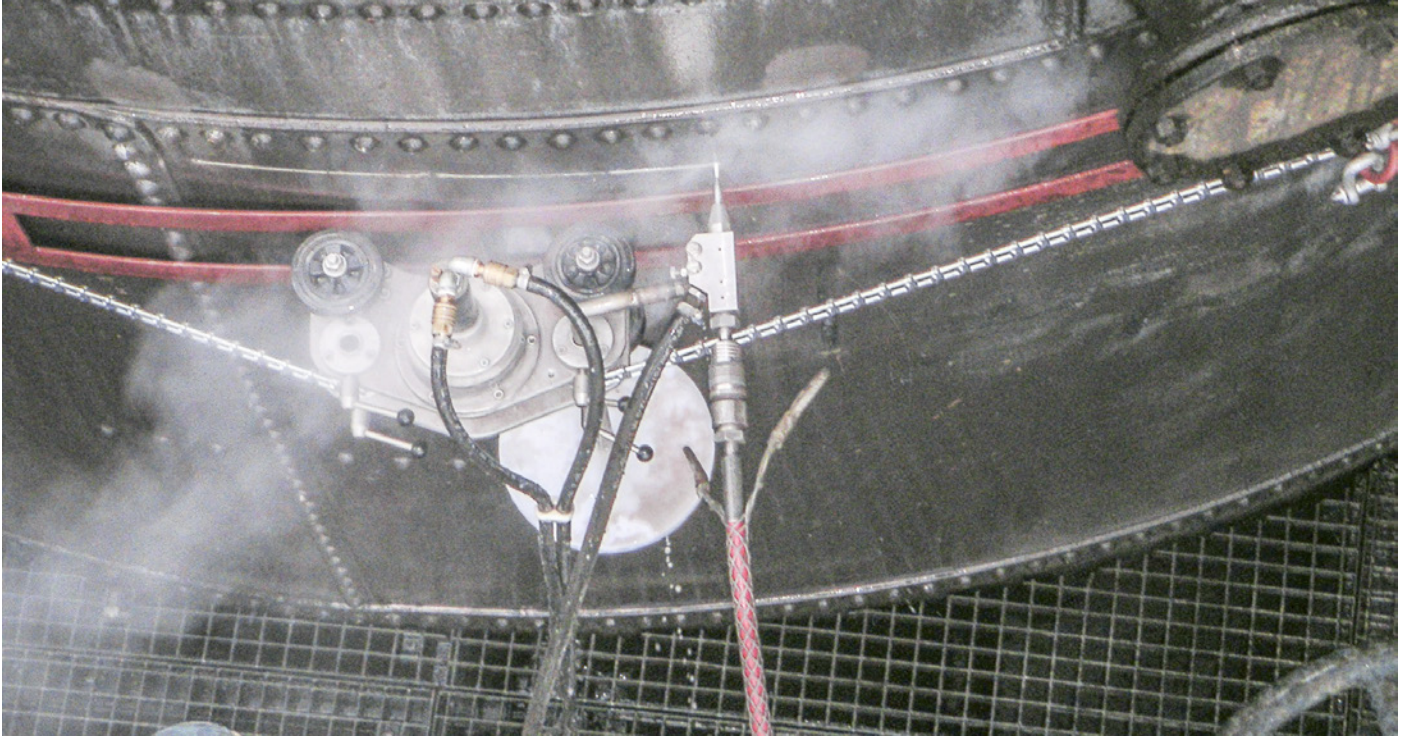
Cutting systems	55
Cutting systems, cutting nozzles, accessories	56

## Cutting devices and nozzles

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

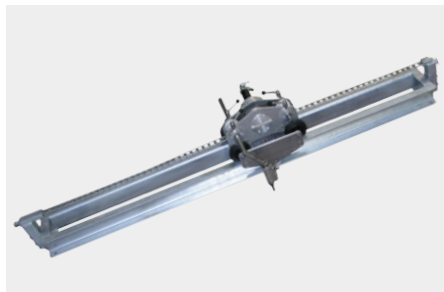
A high pressure water nozzle inside the assembly creates a water jet. This pressurised water jet travels through the entrainment chamber at high speed to a focusing nozzle dragging the air in the chamber

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.



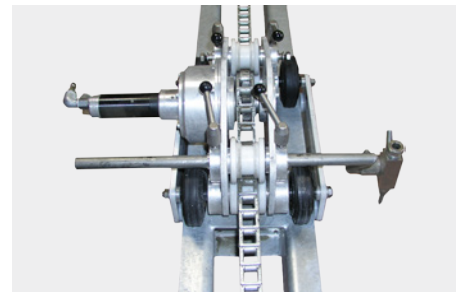
**Carrier trolley**

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



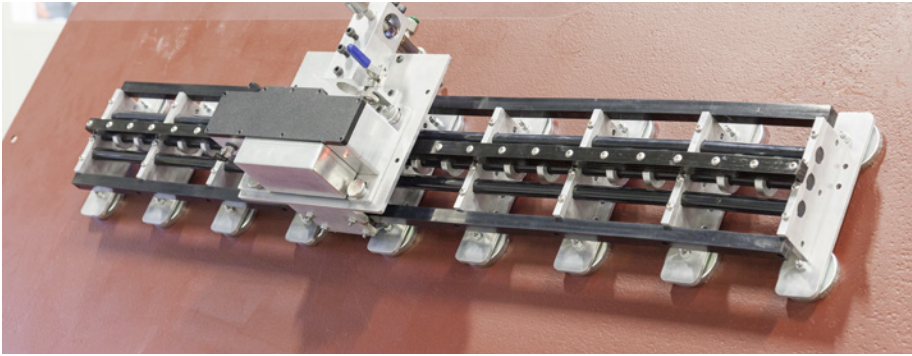
**Guide rail**

To make straight cuts the guide chain is attached to a 2m 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.



**Versatile cutting device with remote control**

- Flexible and modular rail system
- Linear and lateral flexibility
- Attached by magnets (optional: vacuum)
- Carriage electrically driven by 12V DC battery. Optional: pneumatic drive
- Flexible cutting head attachment system
- For use with pipe diameters from approx. 600 mm onwards
- Standard length of rail approx. 1200 mm, modularly extendable



**Remote-controlled via tablet**

- Bluetooth connection to cutting system
- Dead man's control on touch screen
- Acceleration and position sensor on carriage detects problems
- Deployment speed infinitely adjustable, deployment forward/back
- Records cutting parameters and times

## Nozzle inserts und accessories



**Typ B 1500**

**Op. pressure:** 1500 bar  
**Flow rate:** 25 – 40 l/min  
 Designed to be mounted on a nozzle carrier.

**Applications:**  
 Concrete cutting & steelwork cutting



**Typ B 4000**

**Op. pressure:** 4000 bar  
**Flow rate:** 10 – 25 l/min  
 For attachment to carriage.

**Applications:**  
 Concrete cutting & steelwork cutting



**Type S 4000 (with collimation tube)**

**Op. pressure:** 4000 bar  
**Flow rate:** up to 10 l/min

**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 0.1 – 0.2 mm



**Abrasive hopper** with pneumatic controller for the nozzle carrier



# VALVES, WATER HYDRAULICS AND ACCESSORIES

## Valves, water hydraulics and accessories

Systems for pressure and impulse testing  
Metal forming  
Valves

58  
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60 – 62

High pressure hoses  
Nozzle inserts  
Protective gear equipment

63  
64  
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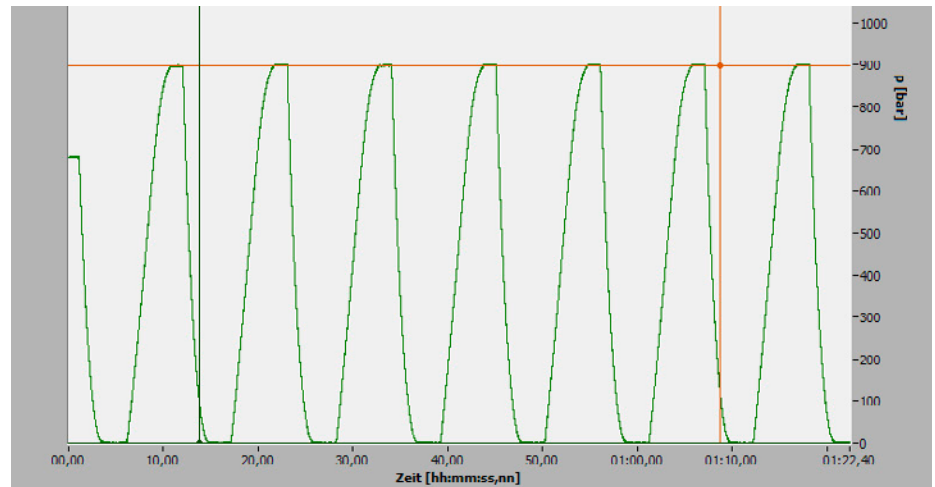
## Systems for pressure and impulse testing



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 600 bar can be performed for large boilers and piping systems in the power plant industry.



Pressure and impulse testing for containers and fittings

Impulse testing for common rail components

## Metal forming



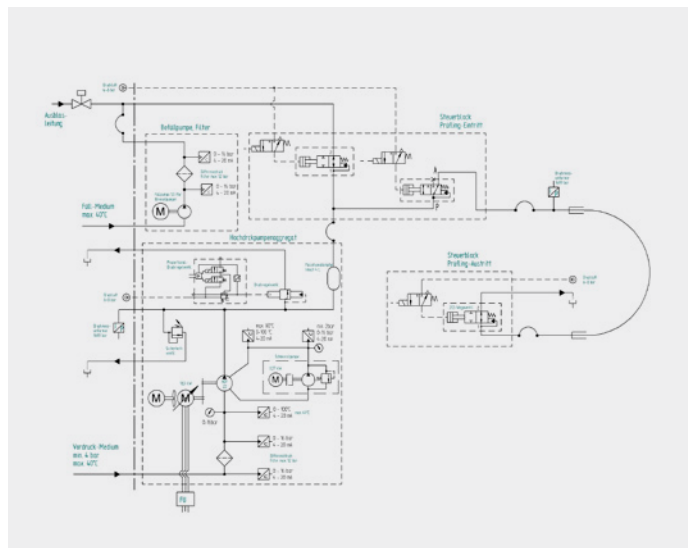
Precise and robust valves enable system providers to fit out their machines with advanced equipment in terms of metal forming. Hammelmann provides directional valves, overflow valves, pressure limitation valves and safety valves as well as a variety of combinations allowing for forming pressures of up to 3000 bar.



Control block for high flow rates



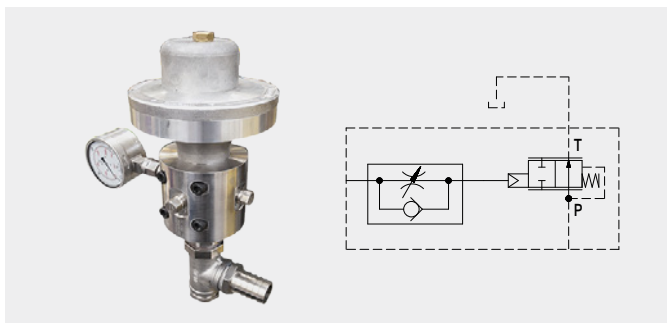
Pressure regulating valve with servo control



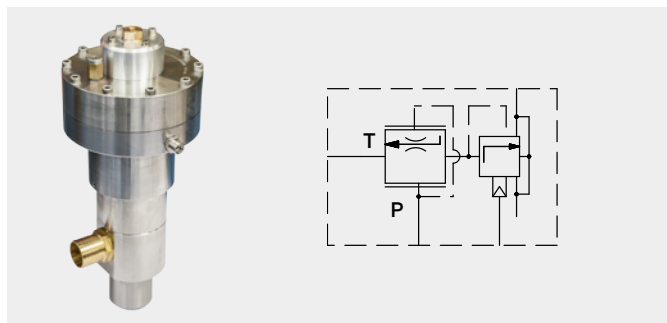
Layout for metal forming systems

## Valves

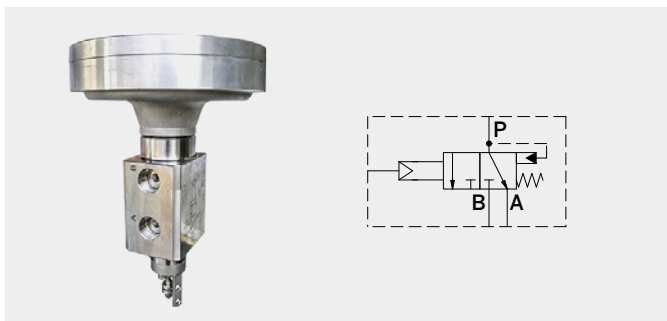
Hammelmann provides a wide range of high pressure valves, which stand out for their precision, reliability and modern technology. Use of the latest materials ensures a high level of safety and durability.



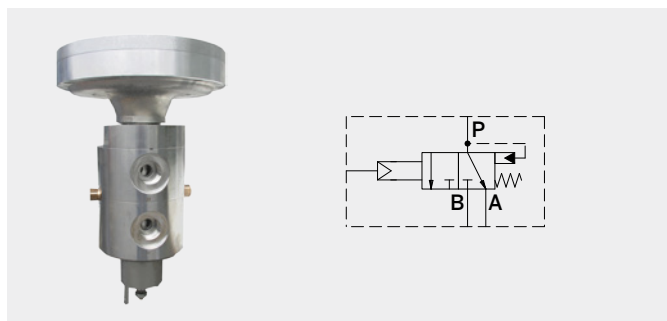
Pressure regulating valves 1800 bar



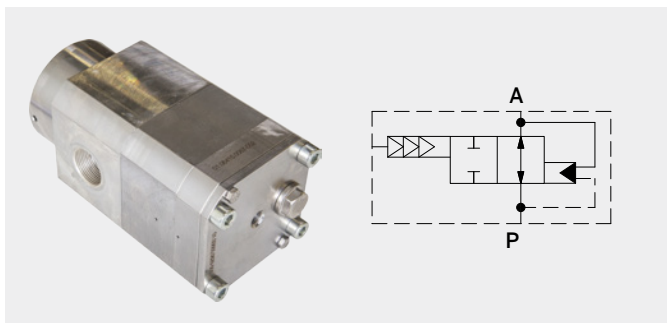
Pressure regulating valves 4000 bar



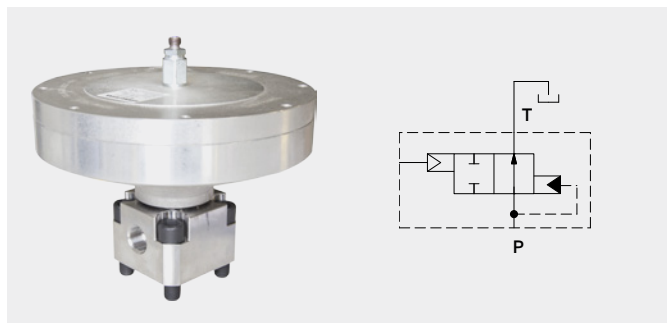
3/2 way valve 3000 bar



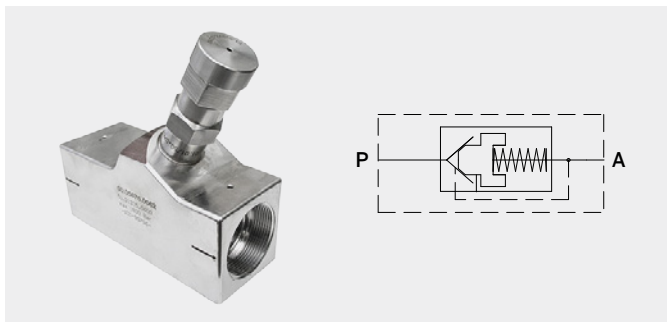
3/2 way valve 1500 bar



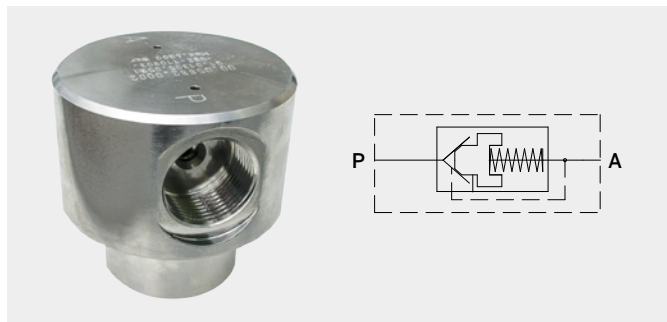
2/2 way valve 4000 bar



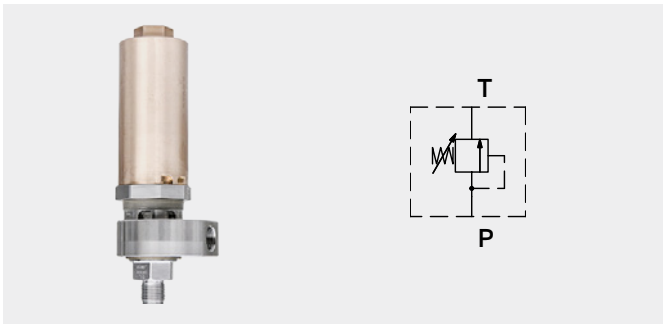
Bypass valve 4000 bar



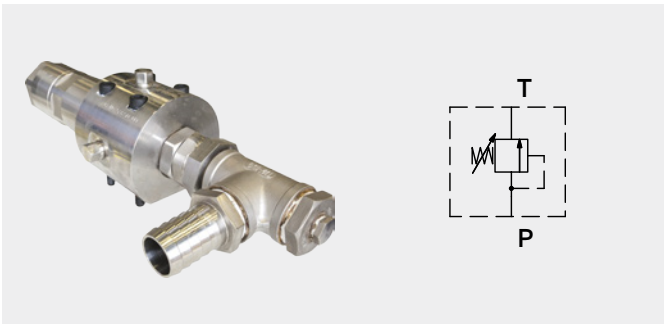
Pressure maintaining valves 1800 bar



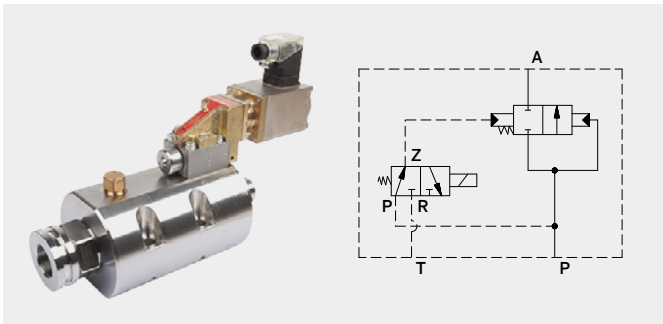
Pressure maintaining valves 4000 bar



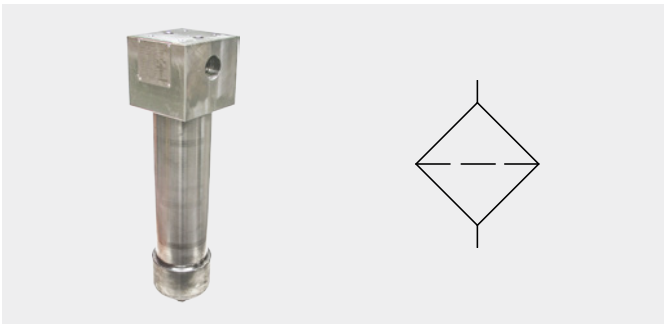
Safety valves 3000 bar



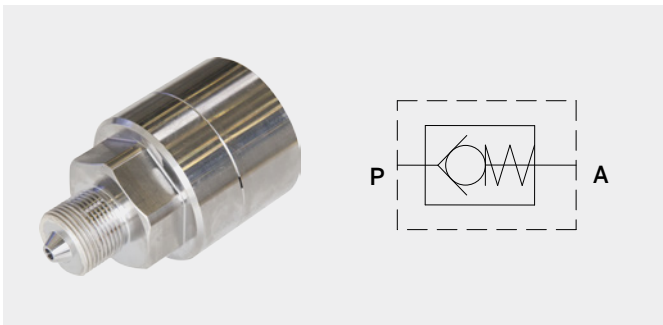
Safety valves 1800 bar



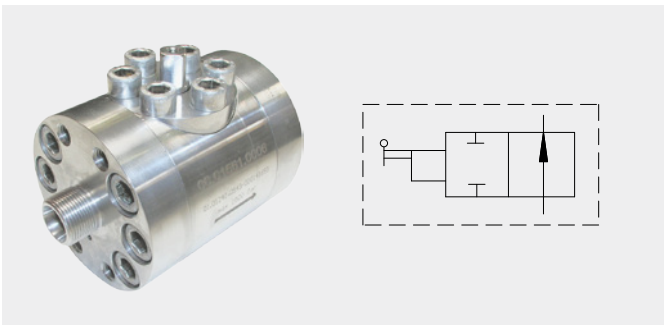
2/2 way solenoid actuated valves 800 bar



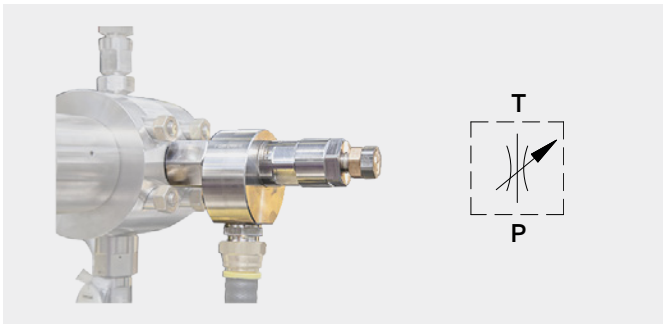
High pressure filter 1200 bar



Non-return valves up to 4000 bar



High pressure ball valve 1800 bar



Adjustable dissipator nozzle 1800 bar



Adjustable dissipator nozzle 3000 bar

## Valves

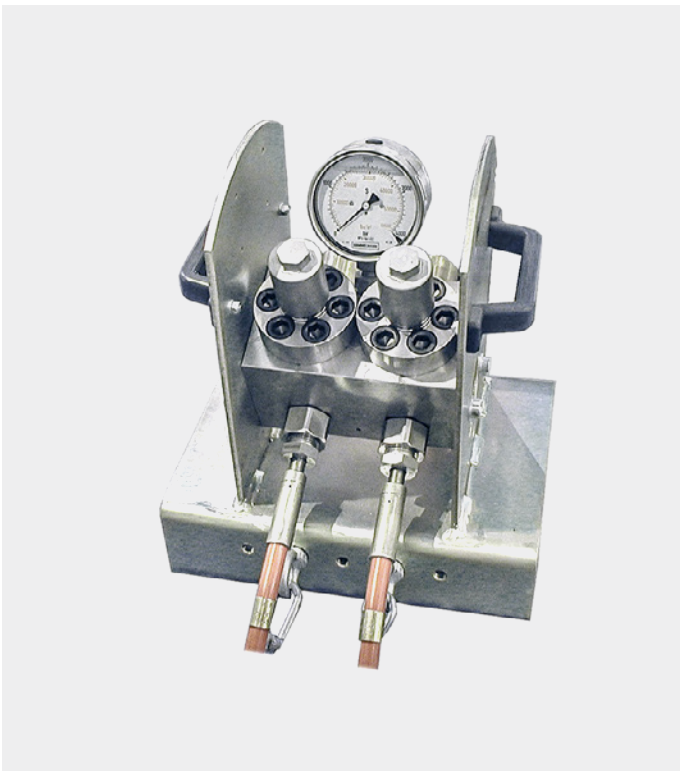
Hammelmann combines high pressure valves for various system requirements. This leads to a high efficiency of the high pressure pumps used together with high pressure systems. Key emphasis is placed on safety, functionality and high utilisation.



Control block with six 2/2 way solenoid actuated valves



Changeover valve for two blasting guns



Pressure-controlled switching valve



Control block for four high pressure consumers

# High pressure hoses

Nominal i/d: DN 5 – 25 mm

Operating pressure: 150 – 3200 bar

Hose length: 0.6 – 40 m

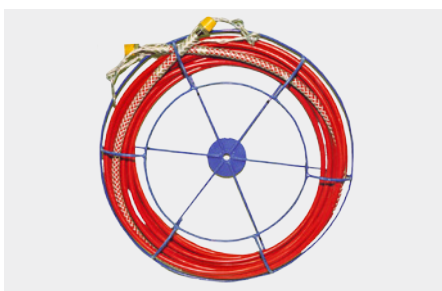
To enable us to offer the high standard of Hammelmann quality, we assemble ultra high pressure hoses in our certified workshop.

## Accessories for hoses

- Hose arresters
- Protective hoses
- Hose wheels
- Snap connectors
- Swivel connectors
- Hose fittings
- Suction hose couplings
- Hose bridges



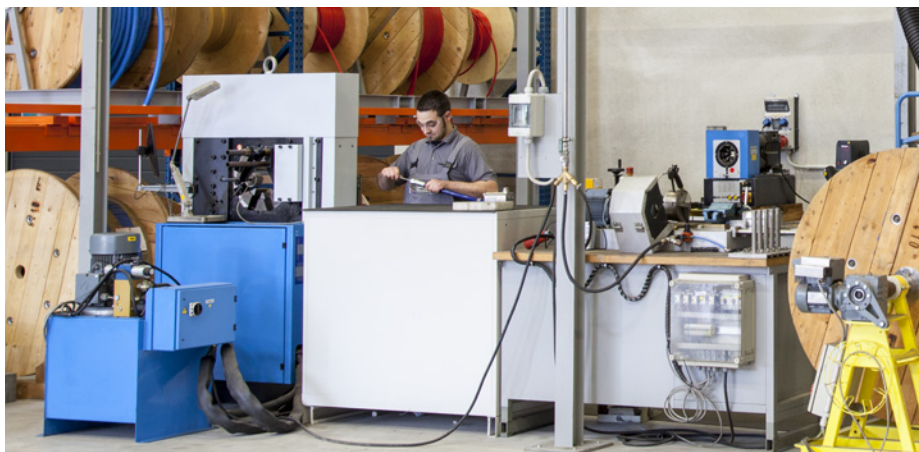
Wide selection of high pressure hoses



Hose wheel



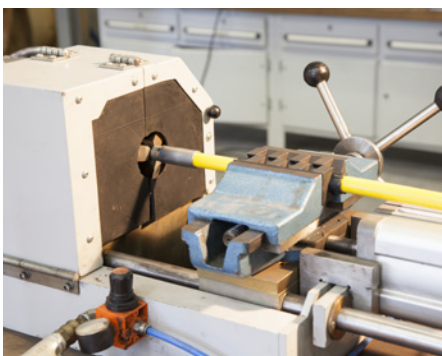
Snap couplings



Precise compaction of hose fitting.



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



Assembly of the hose fitting.



The final pressure test is carried out in accordance with DIN EN 10204-23. The maximum test pressure is currently 4800 bar.

## Nozzle inserts



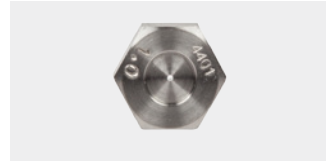
### TYPE: A ROUND JET

Op. pressure: up to 2000 bar  
Efficiency factor: 0.95  
Material: Steel  
Nozzle: 0.4 – 4.9 mm



### TYPE: B FAN JET

Op. pressure: up to 2000 bar  
Efficiency factor: 0.67  
Material: Steel  
Nozzles: 0.8 – 3.0 mm



### TYPE: C ROUND JET

Op. pressure: up to 400 bar  
Efficiency factor: 0.92  
Material: Steel  
Nozzles: 0.4 – 4.6 mm



### TYPE: D FAN JET

Op. pressure: up to 400 bar  
Efficiency factor: 0.67  
Material: Steel  
Nozzles: 0.4 – 4.6 mm



### TYPE: E ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.92  
Material: Steel  
Nozzles: 0.25 – 1.2 mm



### TYPE: G ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.92  
Material: Steel  
Nozzles: 0.25 – 1.2 mm



### TYPE: H ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.75  
Material: Steel/sapphire  
Nozzles: 0.25 – 1.0 mm



### TYPE: I ROUND JET

Op. pressure: up to 3000 bar  
Efficiency factor: 0.7  
Material: Steel/sapphire  
Nozzles: 0.4 – 1.1 mm



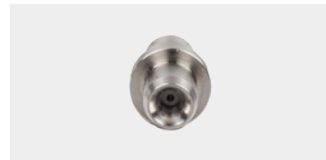
### TYPE: K ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.75  
Material: Steel/sapphire  
Nozzles: 0.3 – 1.0 mm



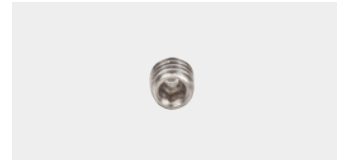
### TYPE: L ROUND JET

Op. pressure: up to 1200 bar  
Efficiency factor: 0.95  
Material: Steel  
Nozzles: 1.0 – 3.9 mm



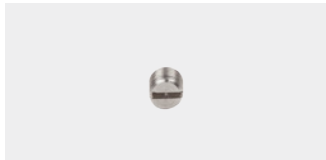
### TYPE: M ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.95  
Material: Steel/ceramic  
Nozzles: 1.0 – 3.9 mm



### TYPE: N ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.63  
Material: Steel/sapphire  
Nozzles: 0.2 – 1.0 mm



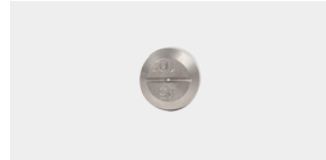
### TYPE: O ROUND JET

Op. pressure: up to 2500 bar  
Efficiency factor: 0.63  
Material: Steel/sapphire  
Nozzles: 0.3 – 1.05 mm



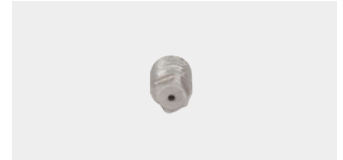
### TYPE: P ROUND JET

Op. pressure: up to 3000 bar  
Efficiency factor: 0.71  
Material: Steel/sapphire  
Nozzles: 0.15 – 1.5 mm



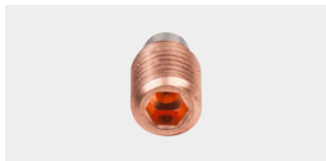
### TYPE: R FAN JET

Op. pressure: up to 3000 bar  
Efficiency factor: 0.67  
Material: Steel  
Nozzles: 0.3 – 1.2 mm



### TYPE: S ROUND JET

Op. pressure: up to 3000 bar  
Efficiency factor: 0.95  
Material: Steel  
Nozzles: 1.0 – 1.8 mm



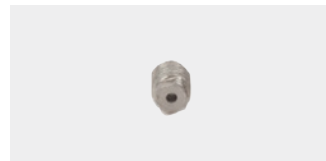
### TYPE: T ROUND JET

Op. pressure: up to 3500 bar  
Efficiency factor: 0.72 - 0.92  
Material: Steel/diamond  
Nozzle : 0.15 – 1.00 mm



### TYPE: U ROUND JET

Op. pressure: up to 4000 bar  
Efficiency factor: 0.7  
Material: Steel/sapphire  
Nozzles: 0.4 – 4.9 mm



### TYPE: W ROUND JET

Op. pressure: up to 3000 bar  
Efficiency factor: 0.95  
Material: Steel  
Nozzles: 0.25 – 0.5 mm

## Personal protective equipment



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

**2** Safety helmet

**3** Safety boots

**4** Hose protection, attached to the connection to the lance/blasting gun

## Protective clothing for water jets up to 3000 bar operating pressure



**1** Jacket with hand protection

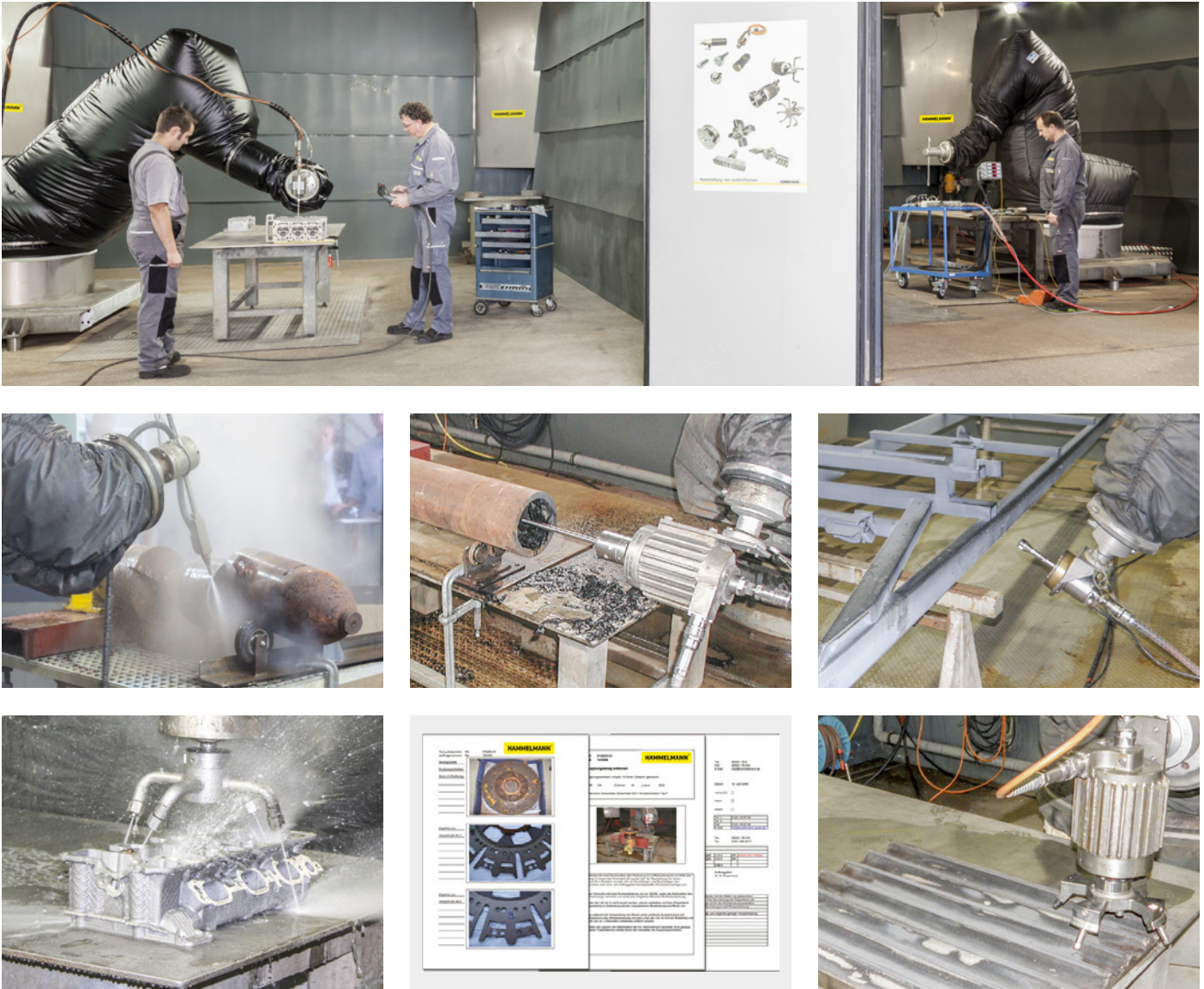
**2** Trousers

**3** Apron

**4** Hand and forearm protection

**5** Gaiters

## Technology Centre



In our state-of-the-art Technology Centre, we test whether you can profit from using water blasting tools and if so, how.

Theoretical support for practical trials is provided by a CFD program. This software enables flow characteristics within nozzles and bores to be calculated.

Analysis equipment is available to examine the test samples. Thanks to the precise results obtained from the various test phases, actual working procedures can be optimised.

For a fixed day rate, the Technology Centre can be at your disposal. This offer includes

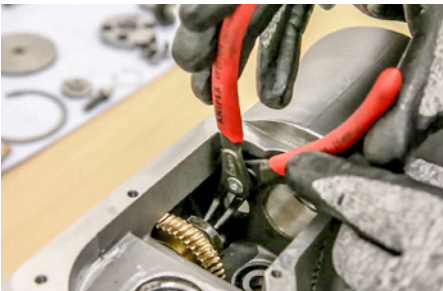
- a high pressure pump
- an array of water blasting tools
- inspection instruments
- a choice of rotary joints and special nozzles
- a robot

You will be assisted by an applications engineer and a technician. A detailed test report will be provided upon completion.

### Typical services

- Planning and carrying out test programmes
- Simulation of production processes
- Report preparation and evaluation of the results
- Defining the necessary design performance parameters and data
- Assessing the viability of new application ideas
- Design and manufacture of water tools

## Service



A product is only as good as the service that supports it. With our logistics centre, we offer a first-class parts service.

With 18,000 storage slots for plastic bins and 900 spaces for euro-pallets, we ensure very speedy delivery. Orders for parts placed with us by 14:00 hours will normally be dispatched the same day.

The completing of individual water jetting tools, i.e. the assembly complete with nozzle inserts, is associated with our logistics centre service.

Retrieval of parts from stores and assembly go hand in hand resulting in a short delivery time.

The flexible and experienced staff of our service department can carry out all maintenance and repair works.

Training courses based on the participants' needs and existing knowledge provide practical and theoretical training for proper operating procedures, maintenance and repair of water tools and high pressure pumps.

## High pressure pumps and units

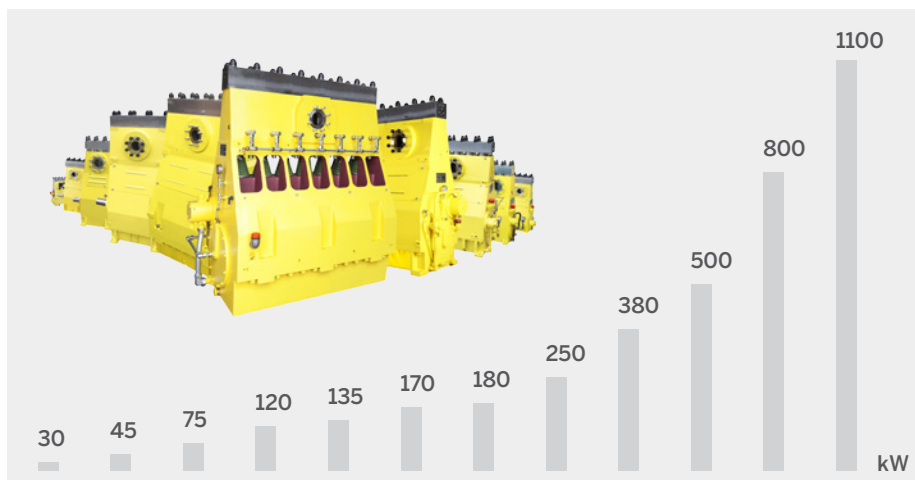
All high pressure water to the cleaning systems is provided by Hammelmann's own high pressure pumps. This means we offer a full high pressure technology package, where knowledge and experience from both areas of application and high pressure pump technology come together and complement each other.

### Power ratings:

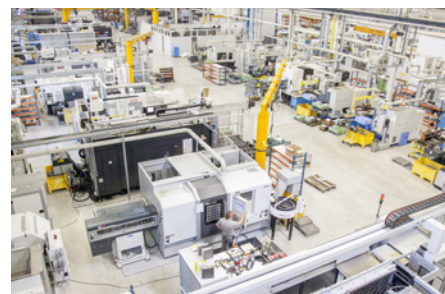
Operating pressures: 25 up to 4000 bar

Flow rates: 2.2 up to 3000 l/min

Drive powers: 5.5 up to 1100 kW



## Hammelmann Germany



**Subsidiaries in Australia, Brazil, China, Spain, USA and 40 agents and distributors worldwide**

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