



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

Table of contents

Table of contents	Page
General	
Table of contents	2
General	3
Surface preparation	
High pressure water blasting guns	6 – 7
Ergoflex high pressure water blasting gun	8
Radio remote control, swivelling connections	10
Jetmate	11
Jetboy	11
Aquablast	12 – 13
Aquablast PLUS	14 – 15
Aquablast Drive	16
Aquablast Remote	17
Rotor jets	18 – 20
Rotary joints	21
Process integrated application systems	22 – 23
Spiderjet V – Vacuum	24
Spiderjet M – Magnetic	25
Dockboy	26
Dockmate	27
Tank cleaning	
Aquamat tank cleaning heads	30 – 31
Aquamat Select for large vessels	32
Nozzle holder arms for tank cleaning heads	33
Aquarex tank cleaning devices	34 – 37

Table of contents	Page
Pipe cleaning	
Turbo jets	40 – 41
Flexible and rigid lances	42
Push and pull nozzles	43
Rotor jets for pipe cleaning	44 – 45
Centralizer for rotor jets	46
Guide skids for rotor jets	47
Nozzle holders for pipe cleaning	48 – 49
3D pipe cleaners	49
Revolving hose reel	50
Pipemaster hose rotating system	51
Safety device for heat exchanger cleaning	52
Foot switch and foot valve	53
Water jet cutting	
Cutting systems	55
Cutting nozzles, accessories	56
Valves, water hydraulics and accessories	
Systems for pressure and impulse testing	58
Metal forming	59
Valves	60 – 62
High pressure hoses	63
Nozzle inserts	64
Personal protective equipment	65
Hammelmann	
Technology Centre	66
Service	67
Overview of high pressure pumps and units	68



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. Renown companies benefit from our technology.



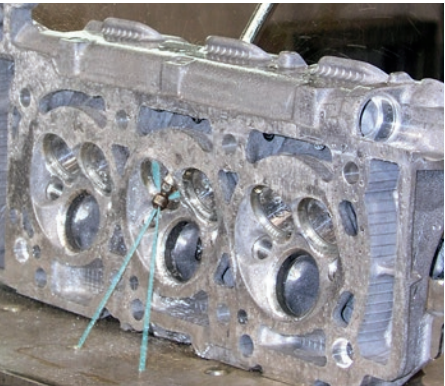
Optimised
The number, arrangement and angle of nozzles for surface blasting and nozzle holder systems are calculated using the latest simulation programmes. This ensures a highly effective use of energy.



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.



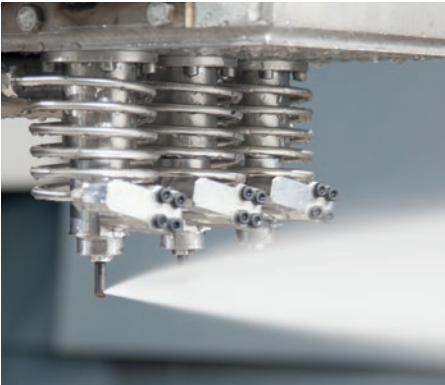
Flexible
Hammelmann application systems can be adapted to individual cleaning requirements. The RD Flex rotor jet for example can be adjusted to work at different rotation speeds without the need for tools.



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



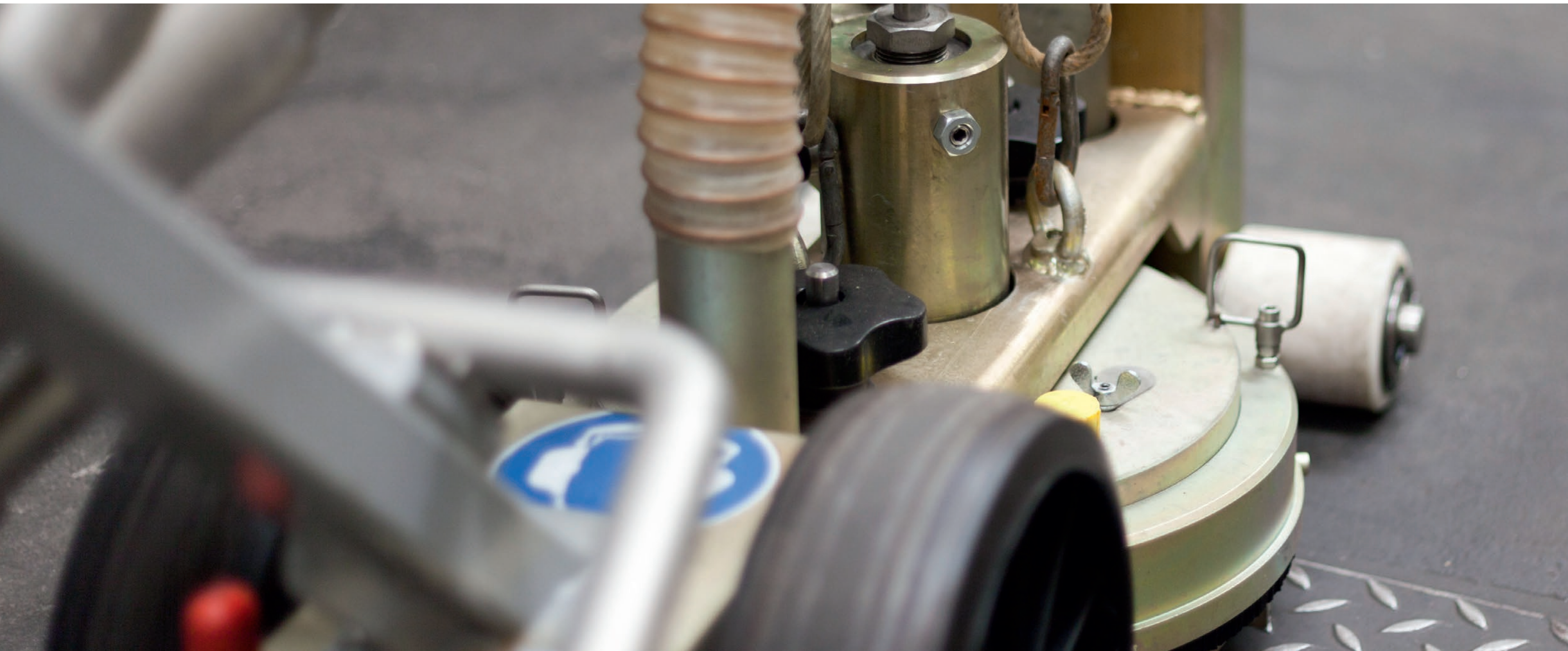
Environmentally friendly
Cleaning systems with direct vacuuming of removed waste material and water plus filtering have long been Hammelmann's hallmark for "green competence".



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



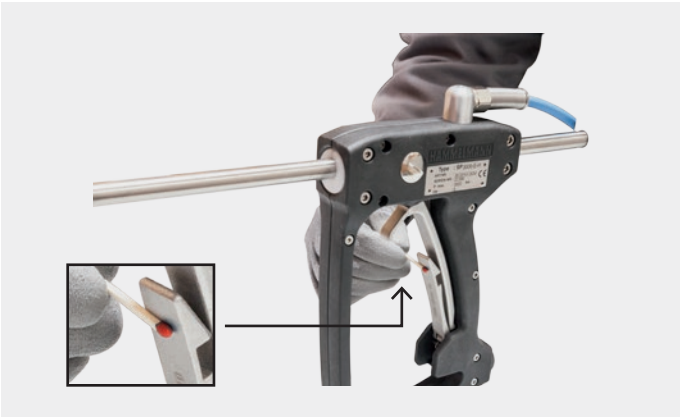
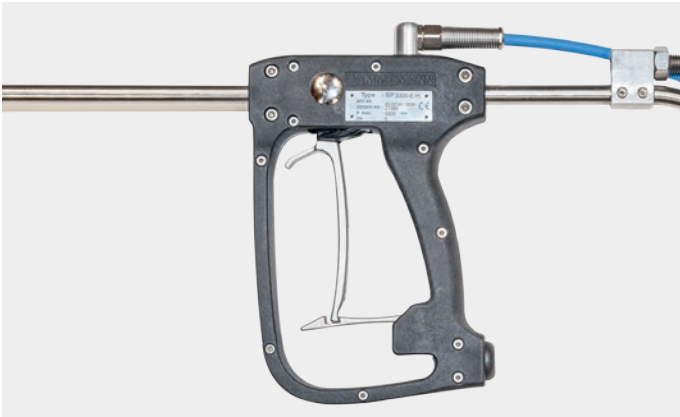
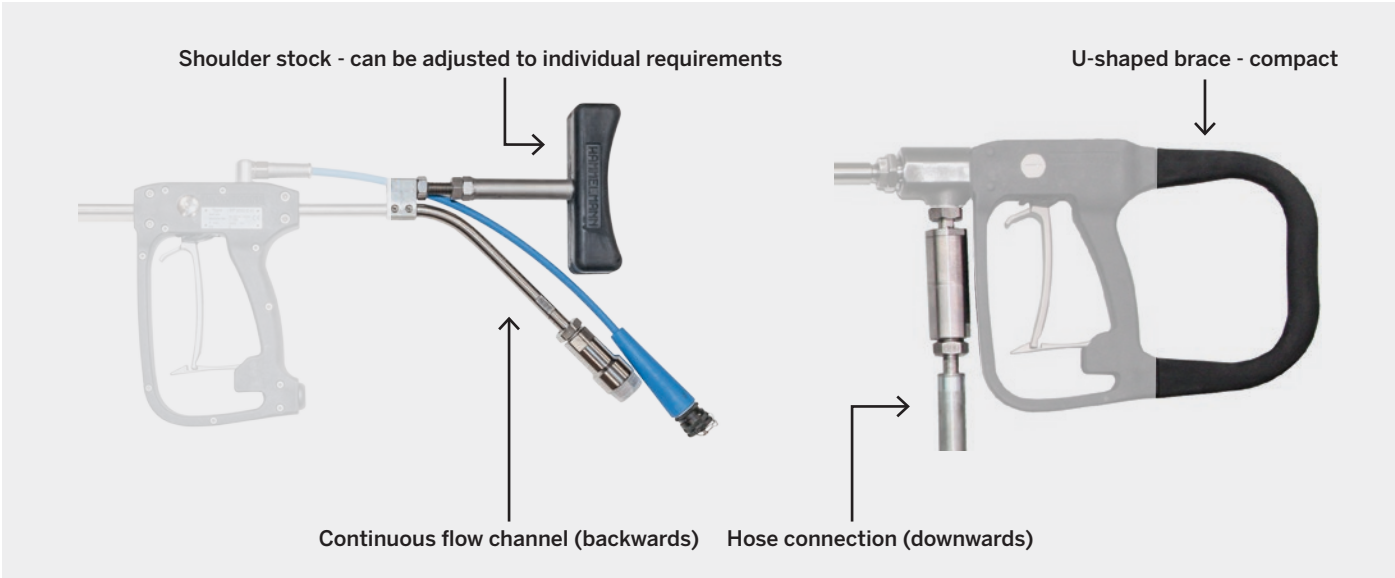
Economical
Take Hammelmann's ship cleaning systems for example. These can be used following just a very short set-up time and quickly remove coatings from metal surfaces.



SURFACE PREPARATION

Surface preparation			
High pressure water blasting guns	6 – 7	Aquablast Remote	17
Ergoflex high pressure water blasting gun	8	Rotor jets	18 – 20
Radio remote control, swivelling connections	10	Rotary joints	21
Jetmate	11	Process integrated application systems	22 – 23
Jetboy	11	Spiderjet V – Vacuum	24
Aquablast	12 – 13	Spiderjet M – Magnetic	25
Aquablast PLUS	14 – 15	Dockboy	26
Aquablast Drive	16	Dockmate	27

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



Bypass



For two-hand operation



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
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
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

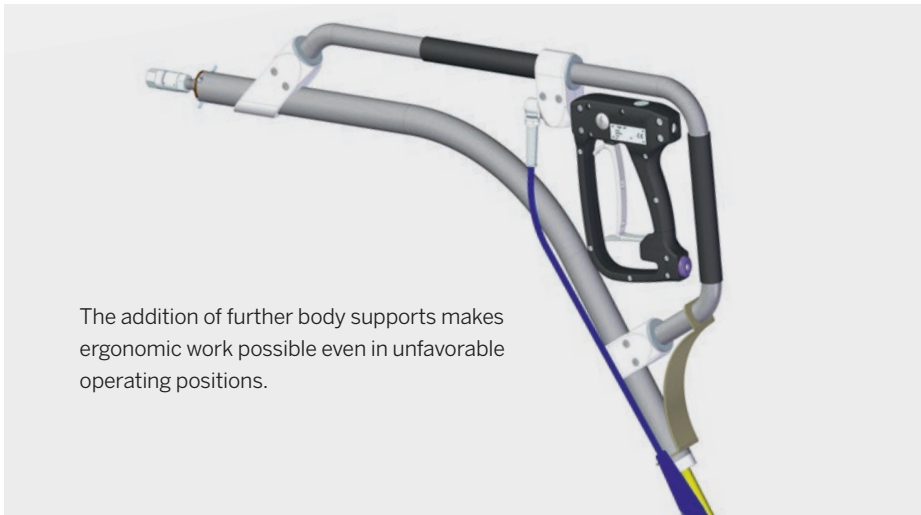
SP 3200 E Ergoflex



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 onesided body load causing cramping of the muscles. This increases the safety at work.



Technical data SP 3200 E Ergoflex

Max. operating pressure: 3200 bar
Max. flow rate: 30 l/min
Hose connection: M 14 x 1.5 LH male
Length overall: 1462 mm
Weight: 4.3 kg
High pressure hose (4 m): 3.0 kg
Connection thread: M14 x 14.5 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 250 N
- 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



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

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



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.

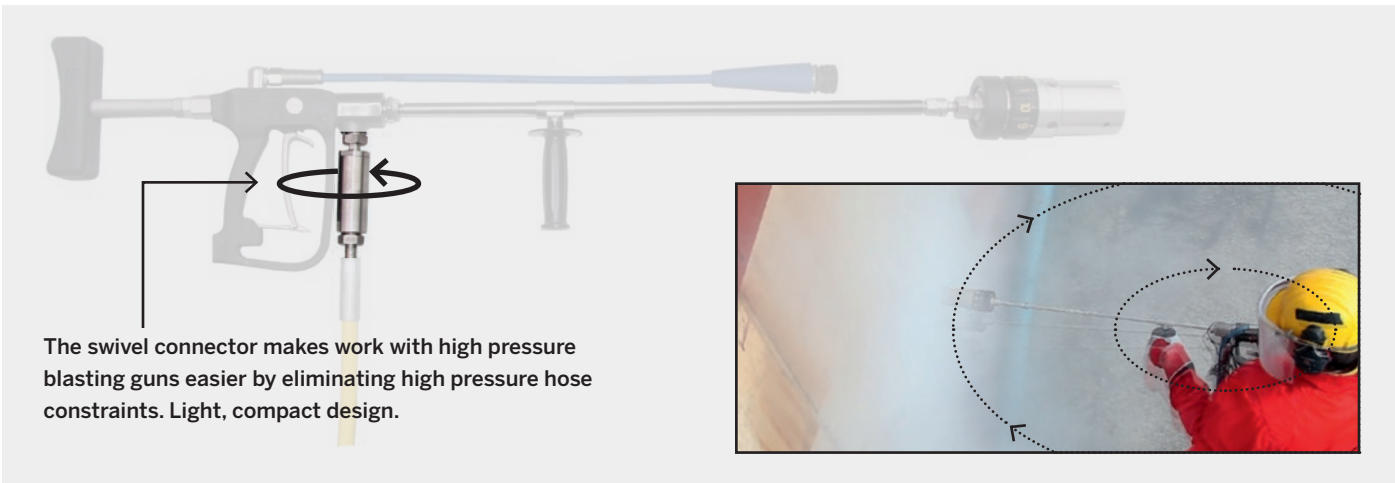
The Jetmate enables reaction force free working during the cleaning process, is easy to handle and provides increased safety.

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

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.



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



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

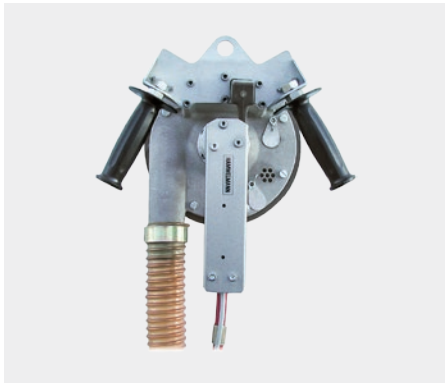
Working width:
215 mm
Operating pressure:
up to 3000 bar
Flow rate:
up to 40 l/min
Rotation speed:
up to 2500 r.p.m.

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.

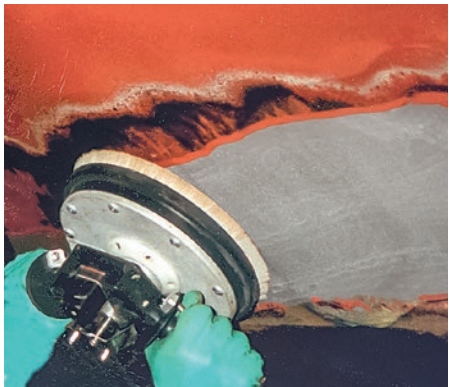
Ergonomic handheld cleaning and stripping unit for vertical surfaces.



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

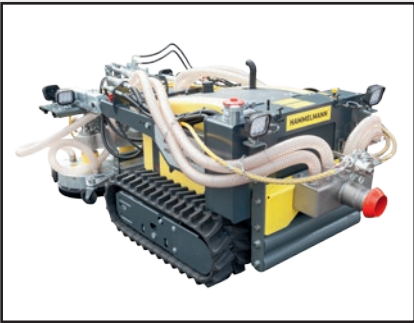
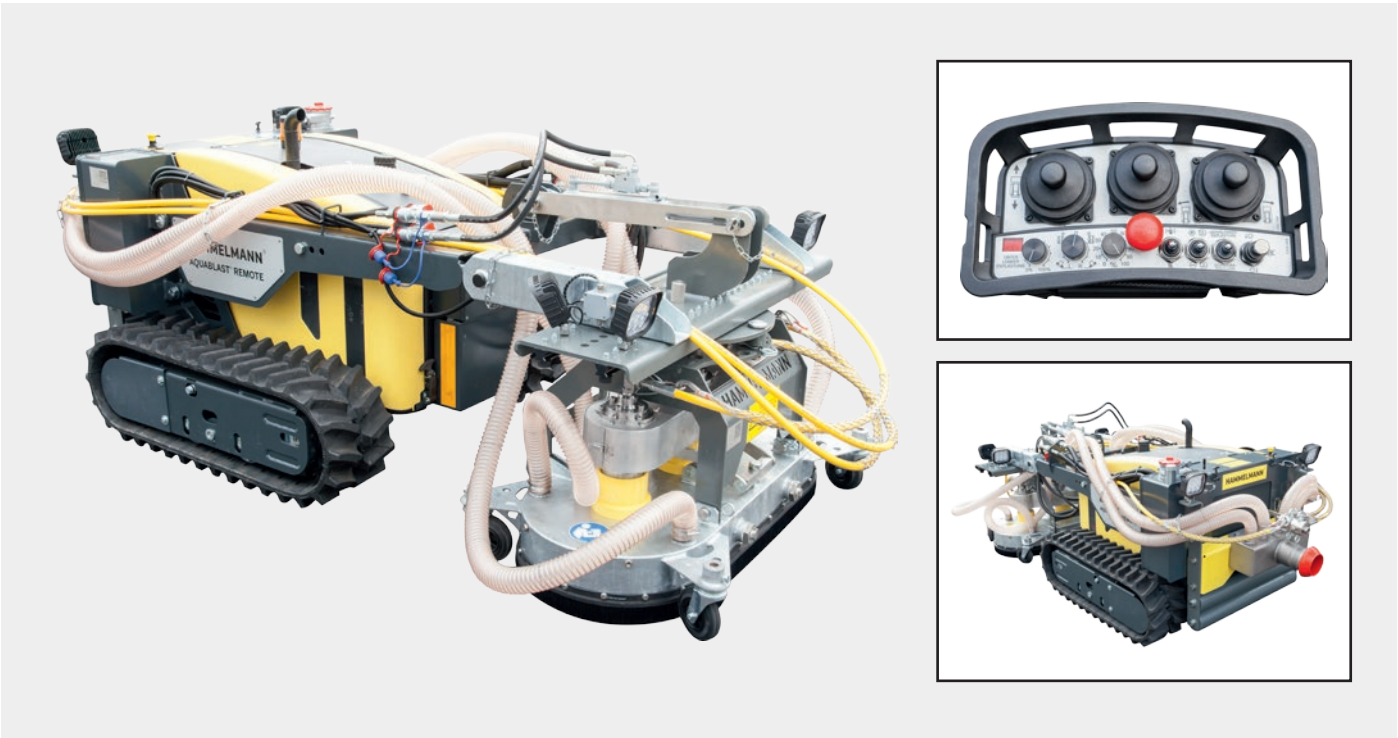


Vacuum system



Vacuum system for suctioning off and pre-filtering waste water.			
Dual chamber system			
Pre-separator:	630 liter	Suction power:	650 m³/h
Fine separator:	430 liter	Vacuum:	240 mbar
Weight:	1.5 t		
Engine:	3-cylinder diesel engine		

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

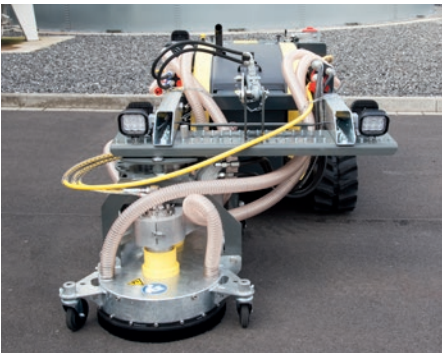
- Flexible use in combination with cleaning vehicles and with independent high pressure units
- Easy to use in combination with cleaning vehicles, without the hassle of performing hydraulic installation on the vehicle
- Modular system for different working widths
- Simple and safe handling, radio remote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

Typical applications

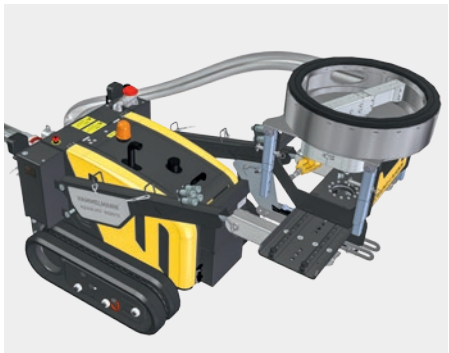
- Removal of road markings on lanes, parking and storage spaces
- Cleaning and de-coating of ship decks, industrial floors etc.
- Can be used at airports to clean runways and terminal areas
- Removal of concrete laitance

Technical data

Working width:	max. 860 mm
Travelling speeds:	5 – 67 m/min
Operating pressure:	max. 3000 bar
Flow rate:	79 l/min



Conversion option for ceiling/underfloor cleaning



Overhead work

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

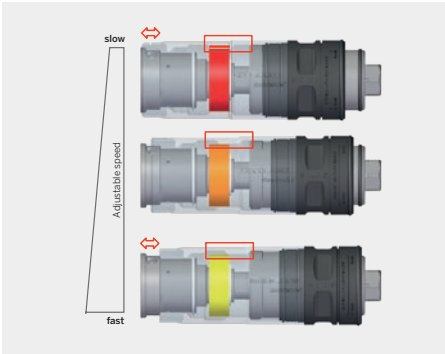
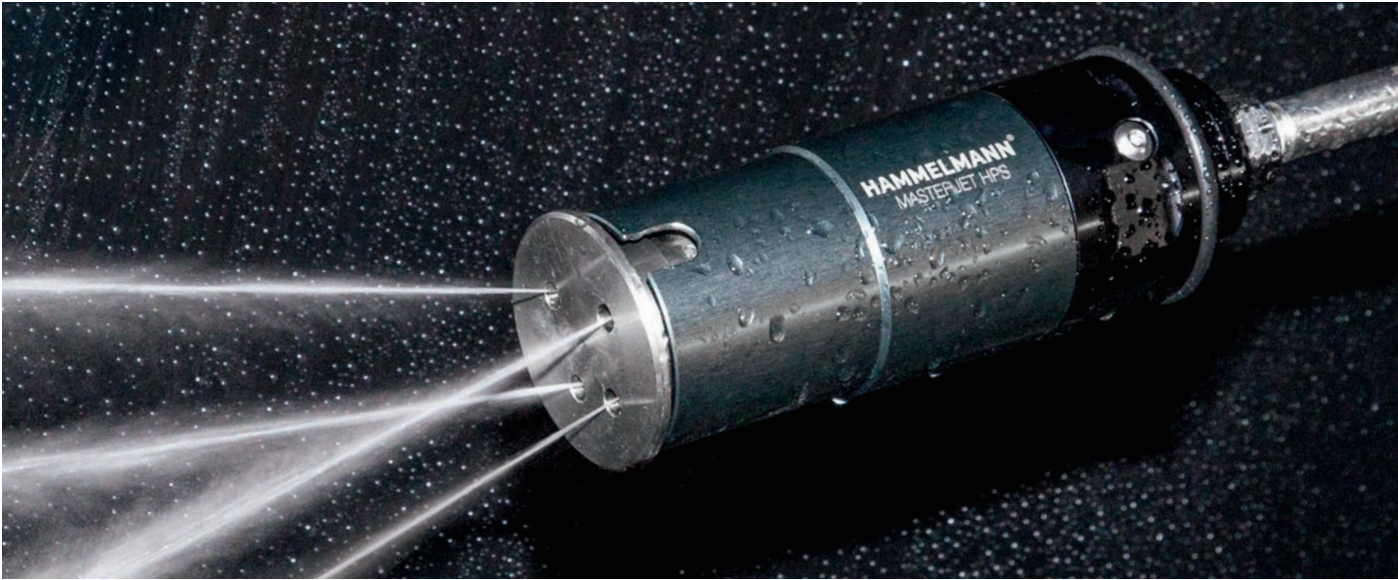
number of possibilities when it comes to blasting surfaces. The light and compact design enables the operator to reach areas with limited access.

Typical applications

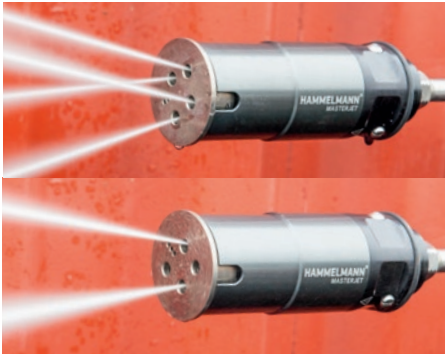
- Surface preparation:
- Cleaning
 - Roughening
 - Removing coatings
 - Concrete demolishing

RD Masterjet

The new rotor jet generation with HPS sealing technology



Variable speed



Working with 2 or 4 nozzle inserts



Universal nozzle hub

High level of ergonomics

due to the light weight and compact nozzle design

Outstanding performance

with operating pressures up to 3200 bar

High energy efficiency

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

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

Variable speed

controlled by infinitely variable magnetic brake

Speed adjustable by hand

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

Easy maintenance

Service friendly design with few components

Operating pressures

Standard version: max. 1800 bar
HPS version: max. 3200 bar



RD Flex 3000

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

1 Standard version with 3 nozzles

2 Spot blasting

3 Profile cleaning

4 Universal head for 2, 4 or 6 nozzles



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 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
RD Masterjet	bis 3200 bar	max. 60 l/min	1000 – 3500 l/min	M 14 x 1,5 LH" Adapter 9/16 "-18 UNF	1,2 kg
RD 400	up to 400 bar	up to 80 l/min	1000 – 2000 r.p.m.	G 3/8 "	1.2 kg
RD 1000	up to 1000 bar	up to 60 l/min	1000 – 2000 r.p.m.	G 3/8 "	1.2 kg
RD 1600	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
RD 3000 PR	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



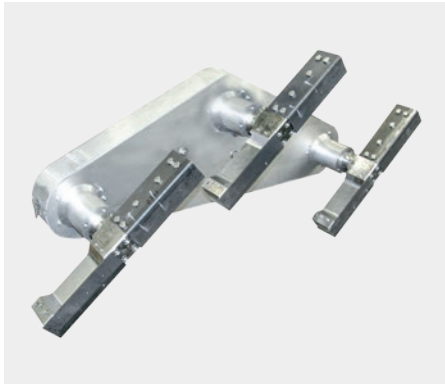
Electrically powered rotary joints
Versions with the following parameters:

Op. pressure: up to 3000 bar
Rotation speed: up to 3000 r.p.m.
Flow rate: up to 50 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)

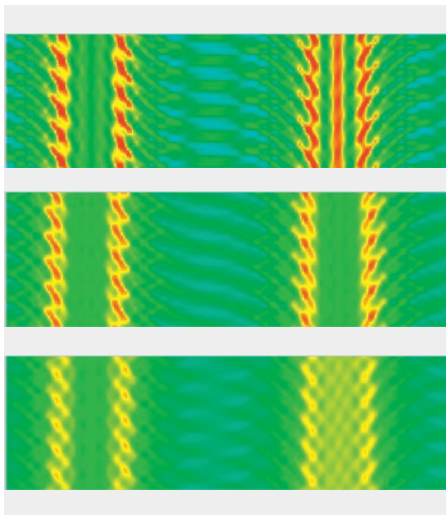
Modular combinations of powered rotary joints and nozzle holders are possible. There are further nozzle holder versions available.



(Working width: 350 mm)



(Working width: 190 mm)



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



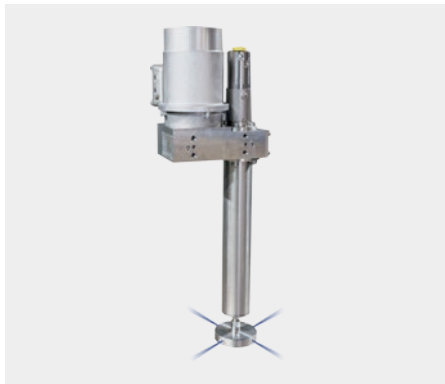
Rotor jet, electrically powered



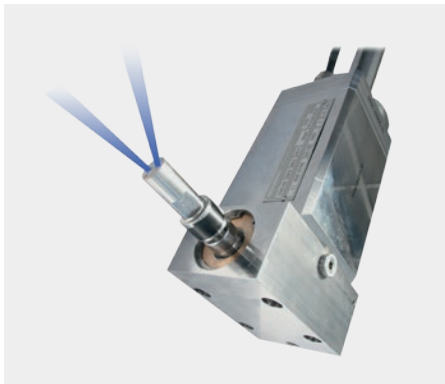
Nozzle lance, electrically powered



Multiple rotor jets, electrically powered



Internal blasting system, electrically powered



Electrically driven angled rotary joints



Electrically driven multiple rotary joints (oscillating)



Spray bars



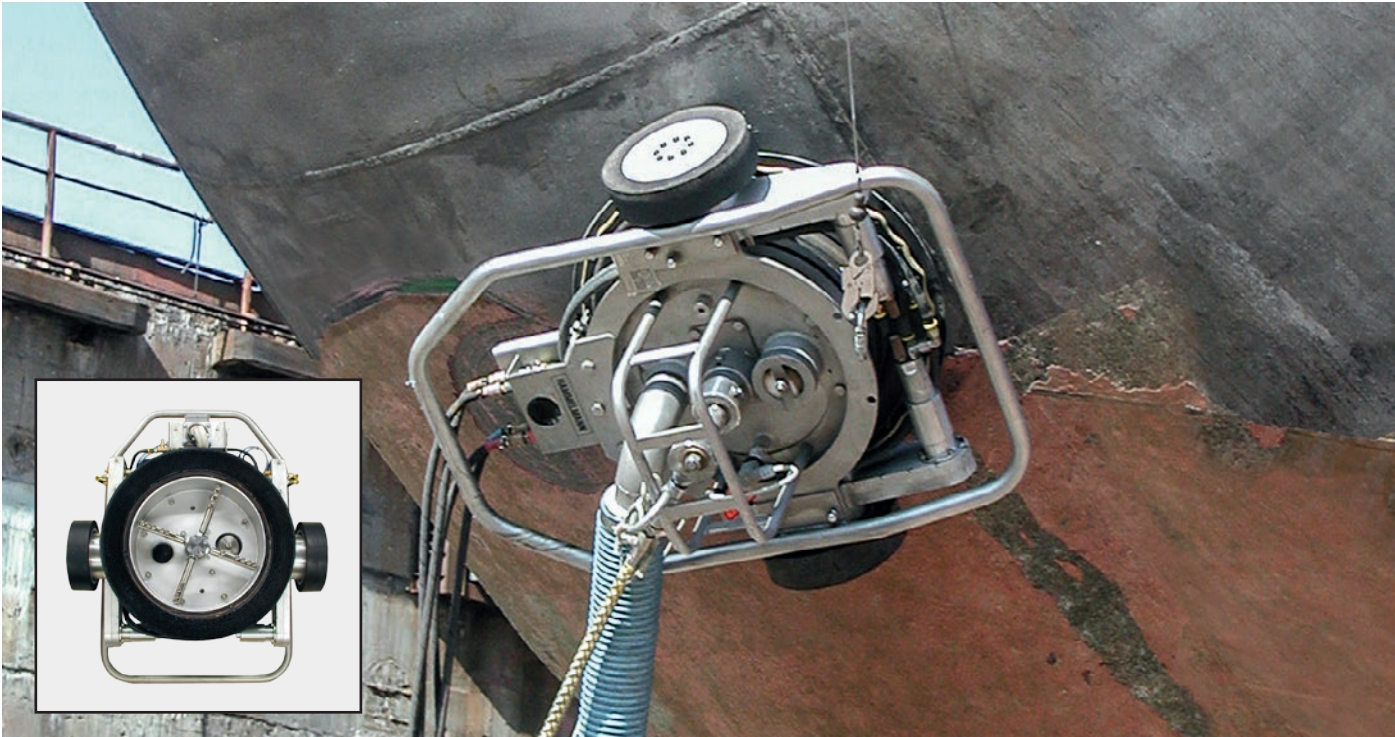
Electrically powered multiple rotary joints for external drive



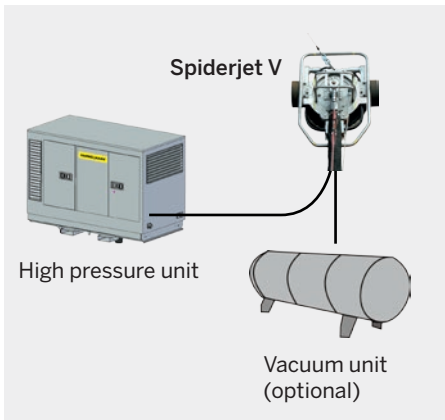
Nozzle arm, hydraulically powered for external drive



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: 374 mm
Operation pressure: up to 3000 bar
Flow rate: up to 50 l/min
Weight: 105 kg
Max. operation speed: 0–6 m/min

Vacuum:
depending on the nature of the surface
approx. 0.5 bar
Suction connection: DN 100

Vacuum system for Spiderjet V and M
consisting of:

Vacuum collector (photo on right)
Suction power: 1900 m³/h @ 500 mbar vacuum
Max. vacuum: 500 mbar
Vacuum generator: Roots - rotary piston blower
Electric motor: 45 kW
Length: 2335 mm
Width: 1500 mm
Height: 2380 mm

Cyclone pre-separator
Length: 1610 mm
Width: 1470 mm
Height: 3380 mm

Suction hopper
Capacity: 3 m³
Length: 2350 mm
Width: 2350 mm
Height: 4200 mm

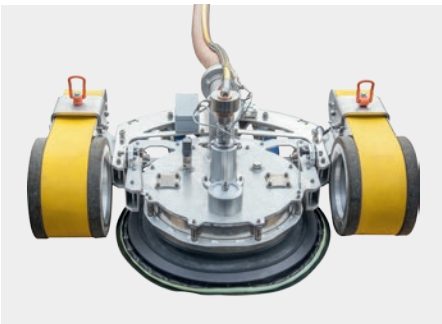
Spiderjet M – Magnetic

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: 375 mm
Max. operating pressure: 3000 bar
Max. flow rate: 50 l/min

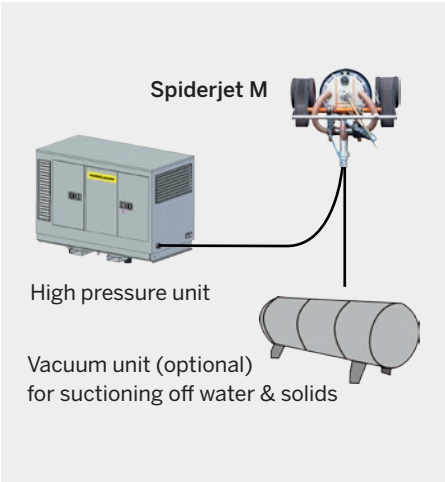
Weight: 60 kg
Operation speed: 0–6 m/min



Spiderjet M - showing drive system with suction housing



Radio remote control



Ship bottom preparation

Dockboy



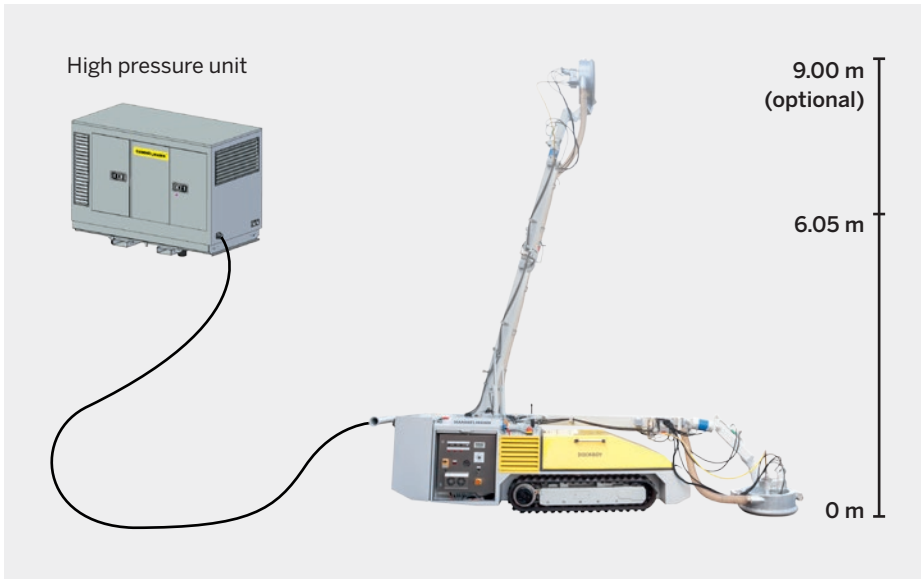
The Dockboy is a semi automatic vehicle primarily for working on ship hull bottoms or similar surfaces.



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 518 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.

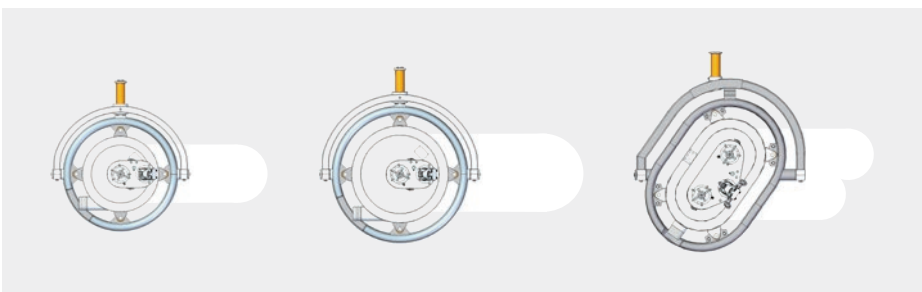
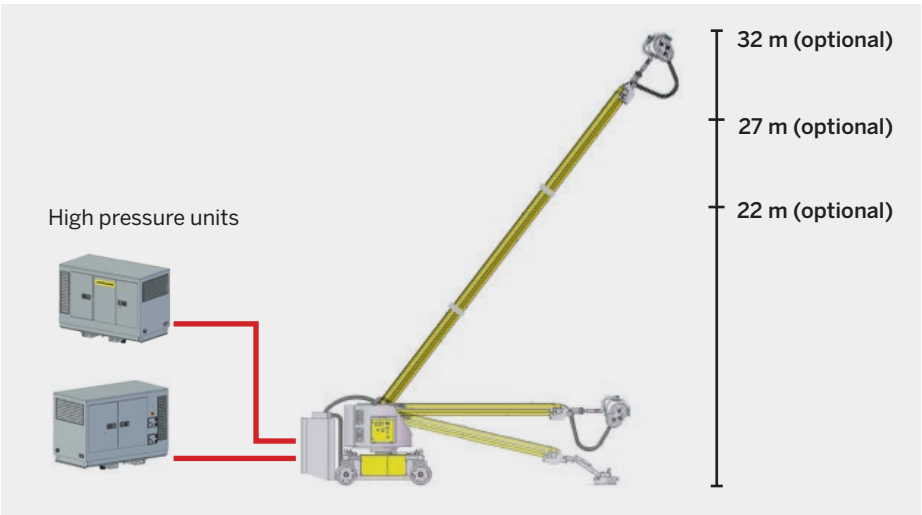
Using pressures varying between 2500 and 3000 bar up to 250 sq. metres per hour of surface can be prepared to NACE/SSPC standards WJ1/SC-2.

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

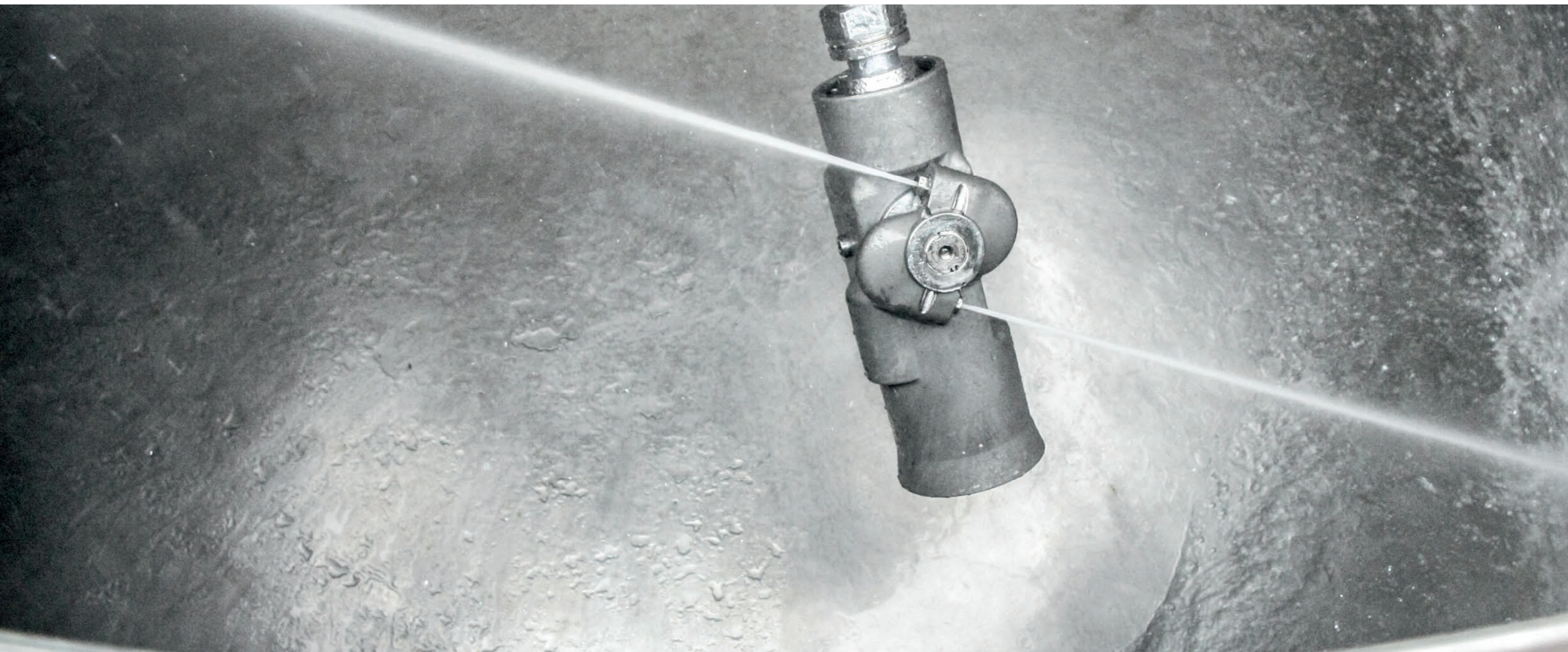


Filter / recovery module

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 375 mm (optional)	Working width 518 mm (optional)	Working width 860 mm (optional)
Aquajet 17 28 l/min – 3000 bar	2 x Aquajet 17 56 l/min – 3000 bar	3 x Aquajet 17 84 l/min – 3000 bar
Aquajet 25 46 l/min – 3000 bar	Aquajet 25 46 l/min – 3000 bar	2 x Aquajet 25 92 l/min – 3000 bar



TANK CLEANING

Tank cleaning

Aquamat tank cleaning heads	30 – 31
Aquamat Select for large vessels	32
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

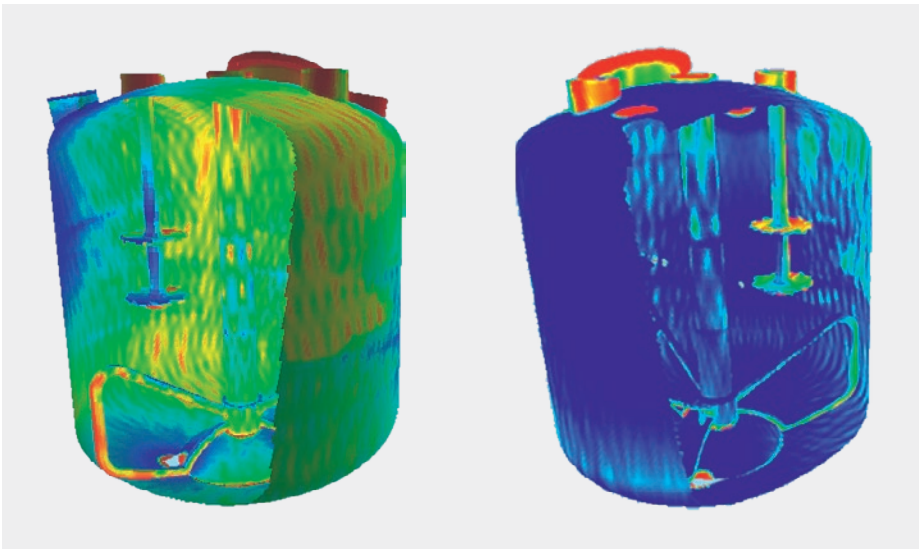
- Internal cleaning of autoclaves, vessels, Euro containers, reactors, agitator vessels, holding tanks, drying towers etc.
- Decontamination
- Disinfection (with chemical additives)
- Cleaning the interior of large diameter pipework with deployment sledge

Design features

- Minimum pressure losses result in high efficiency.
- Coherent water jets for max. cutting performance and distance.
- Wear-resistant, infinitely variable 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.

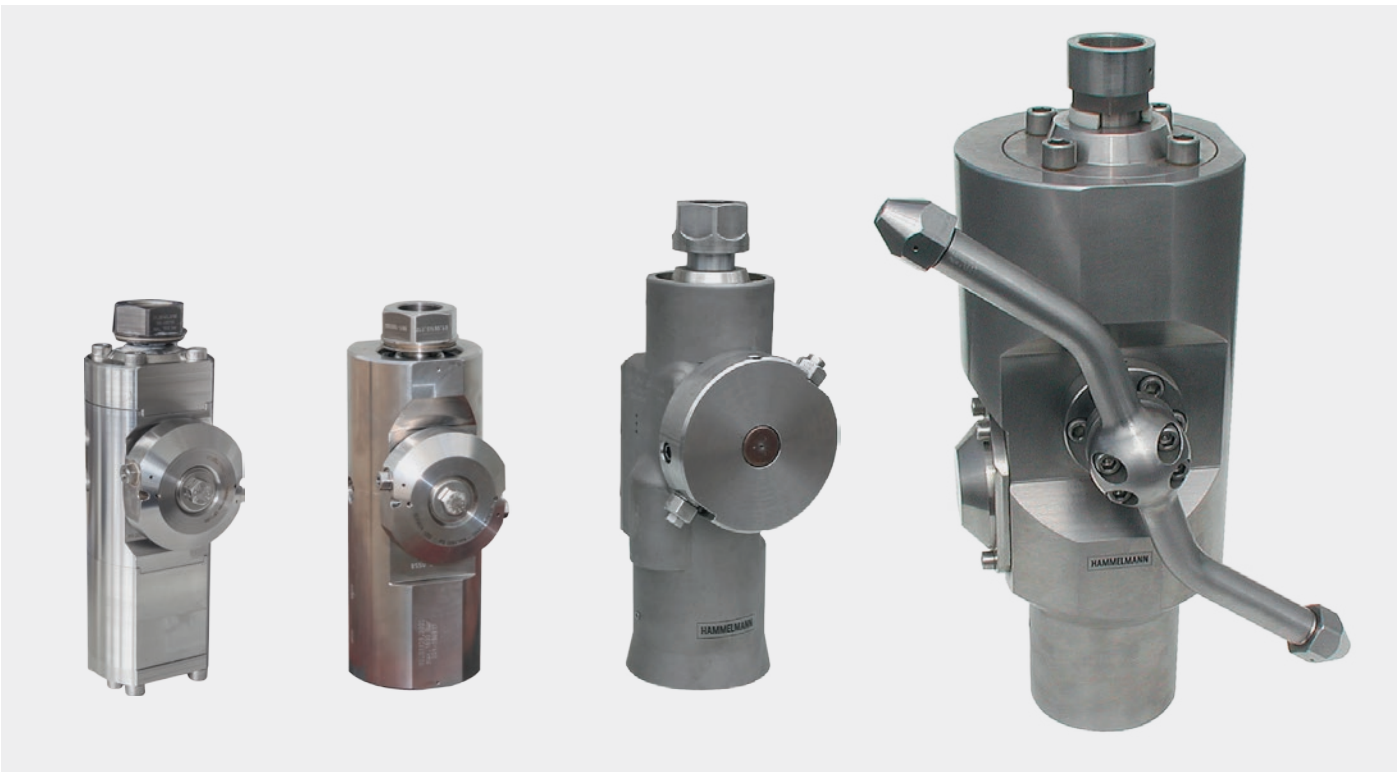


Before

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



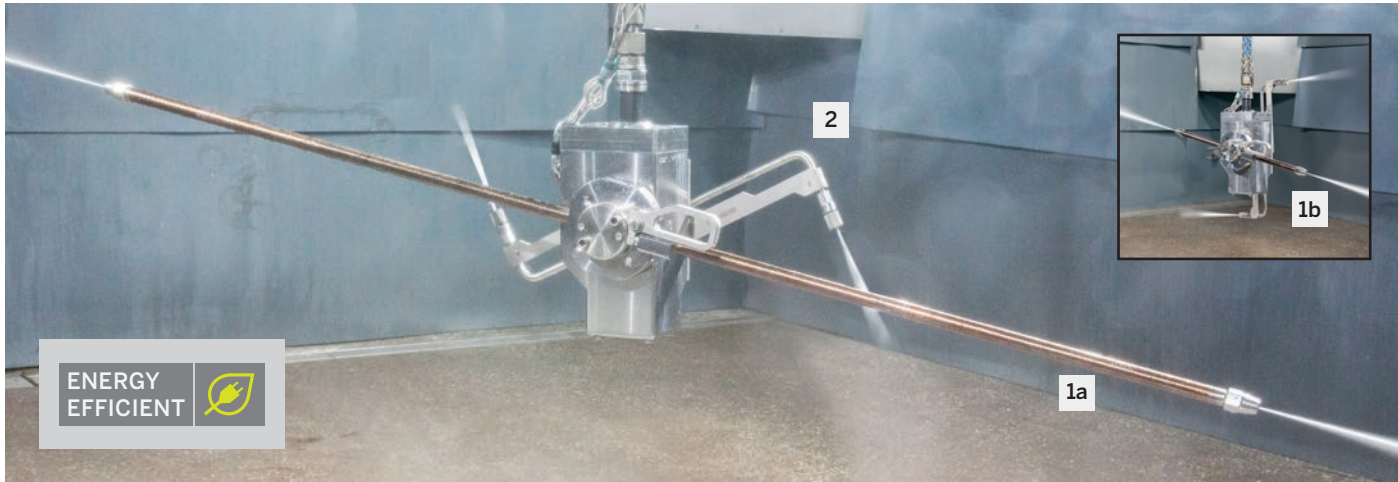
Hot water
(85 °C)



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 1500	up to 1500 bar	300 l/min	min. 140 mm	8.1 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
- 2** Drive arm, powered by the jet reaction force
- 1b** Short blasting arm, oscillating motion

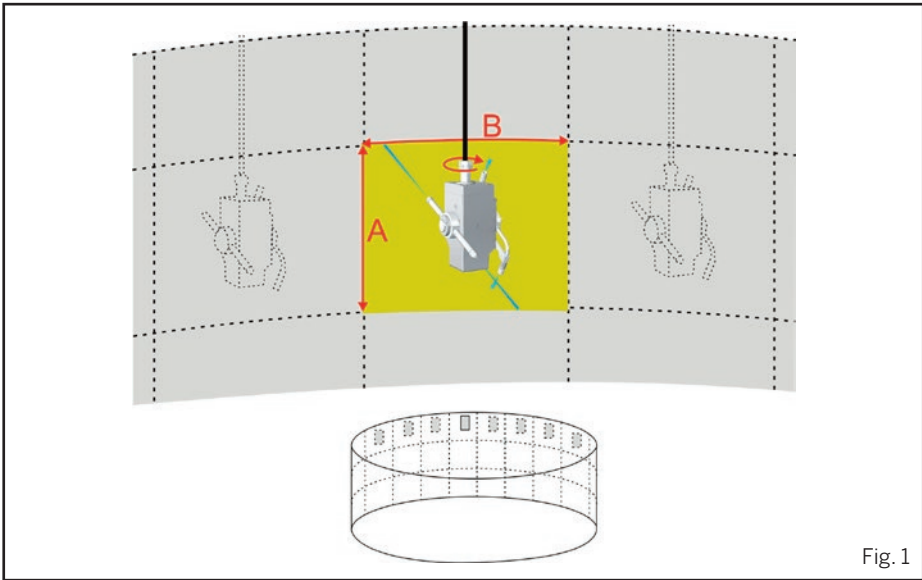


Fig. 1 - Very large diameter vessel

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.

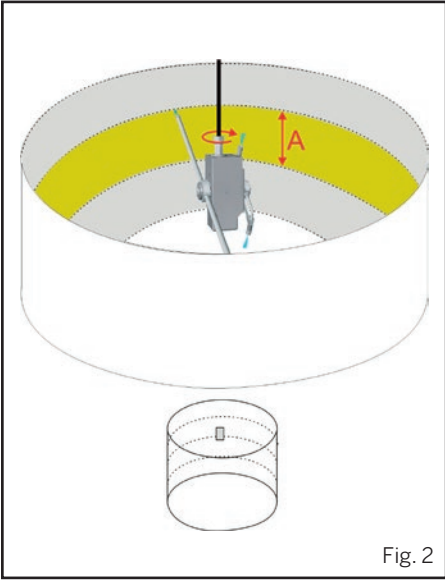


Fig. 2 - Large cylindrical vessel

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.

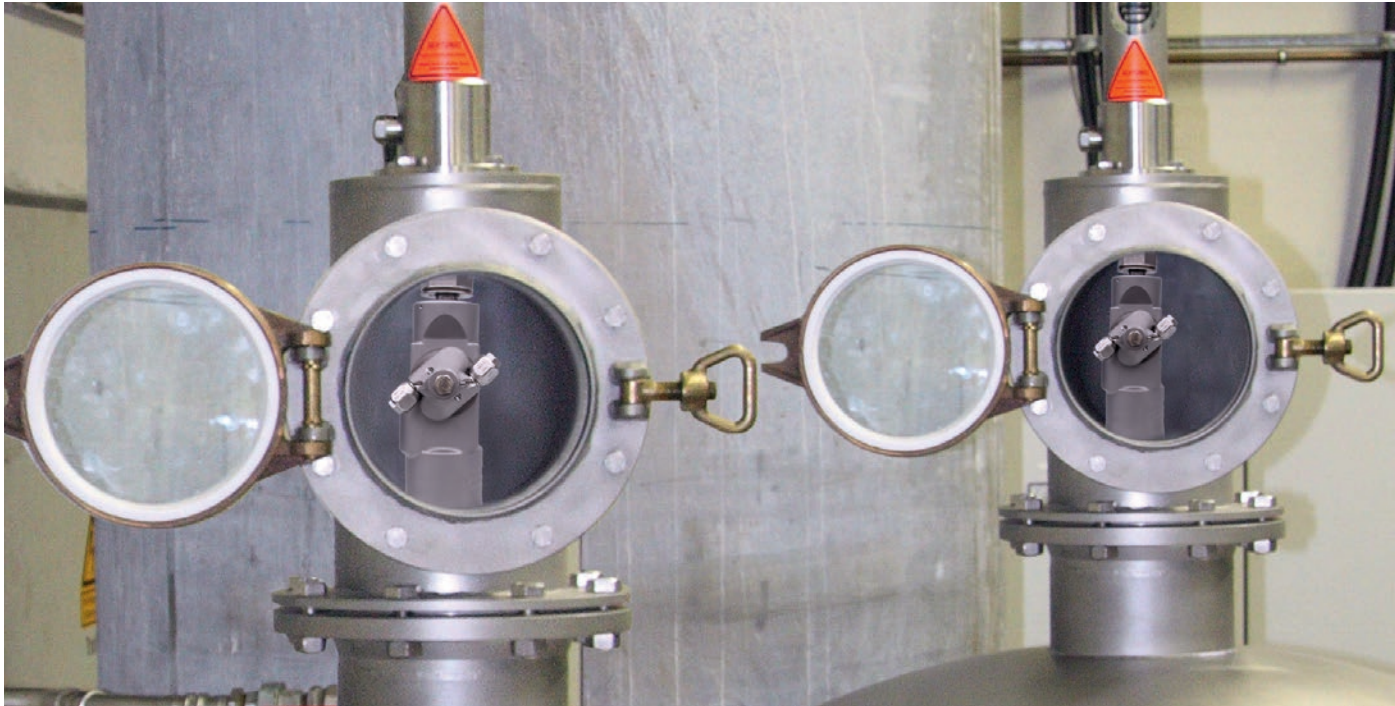


Sledge type guides
Guides to enable tank cleaning units to be used for pipe cleaning. The unit is mounted in the centre and a swivelling pulling eye is provided. Optional "kick plate" available so that the assembly self-propels through the pipe.

Aquarex® tank cleaning devices

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

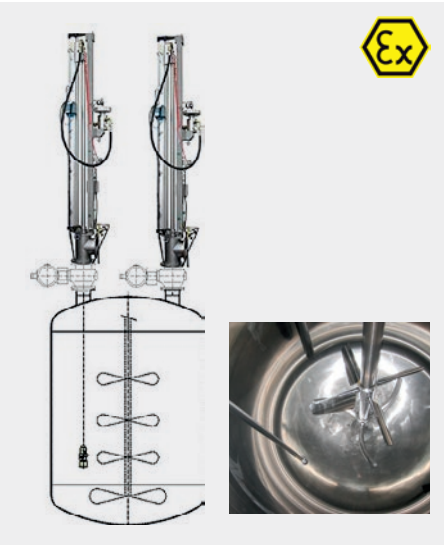
Here are a few examples:



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.



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.)



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.



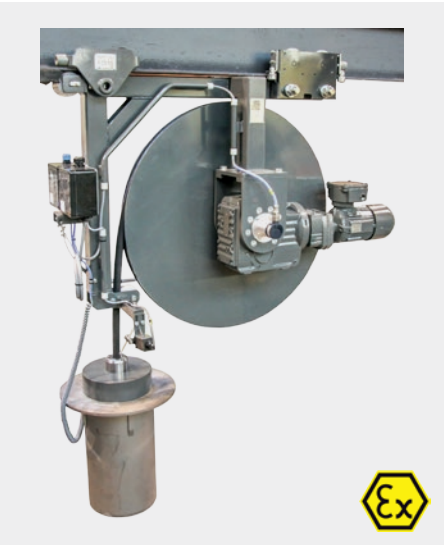
Telescopic lance system
The lance is attached onto a manhole. It can be manually rotated, swivelled, retracted and extended. It is pulled out by its own weight.



Gastight lance system
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.



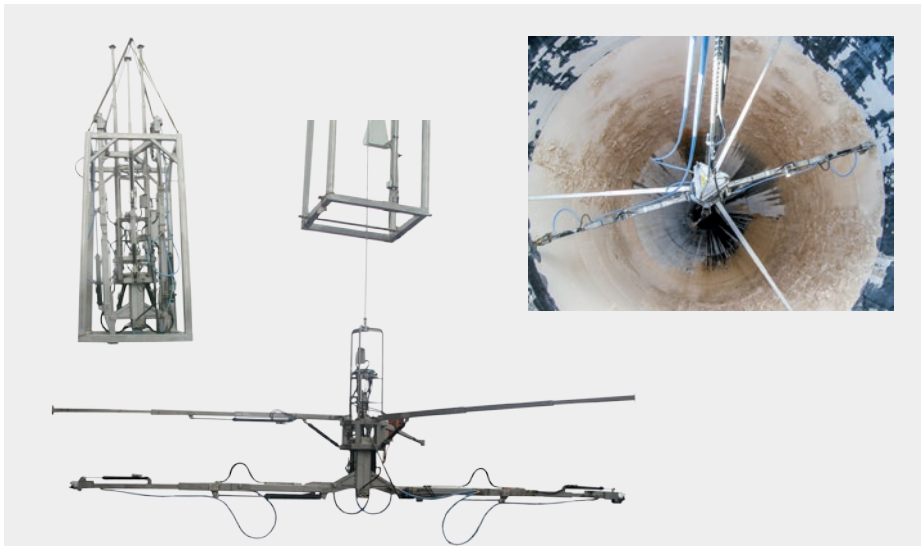
Gastight hose reel system



Hose reel system



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.



Lance system - moved hydraulically/pneumatically actuated



Lance system - moved and actuated pneumatically



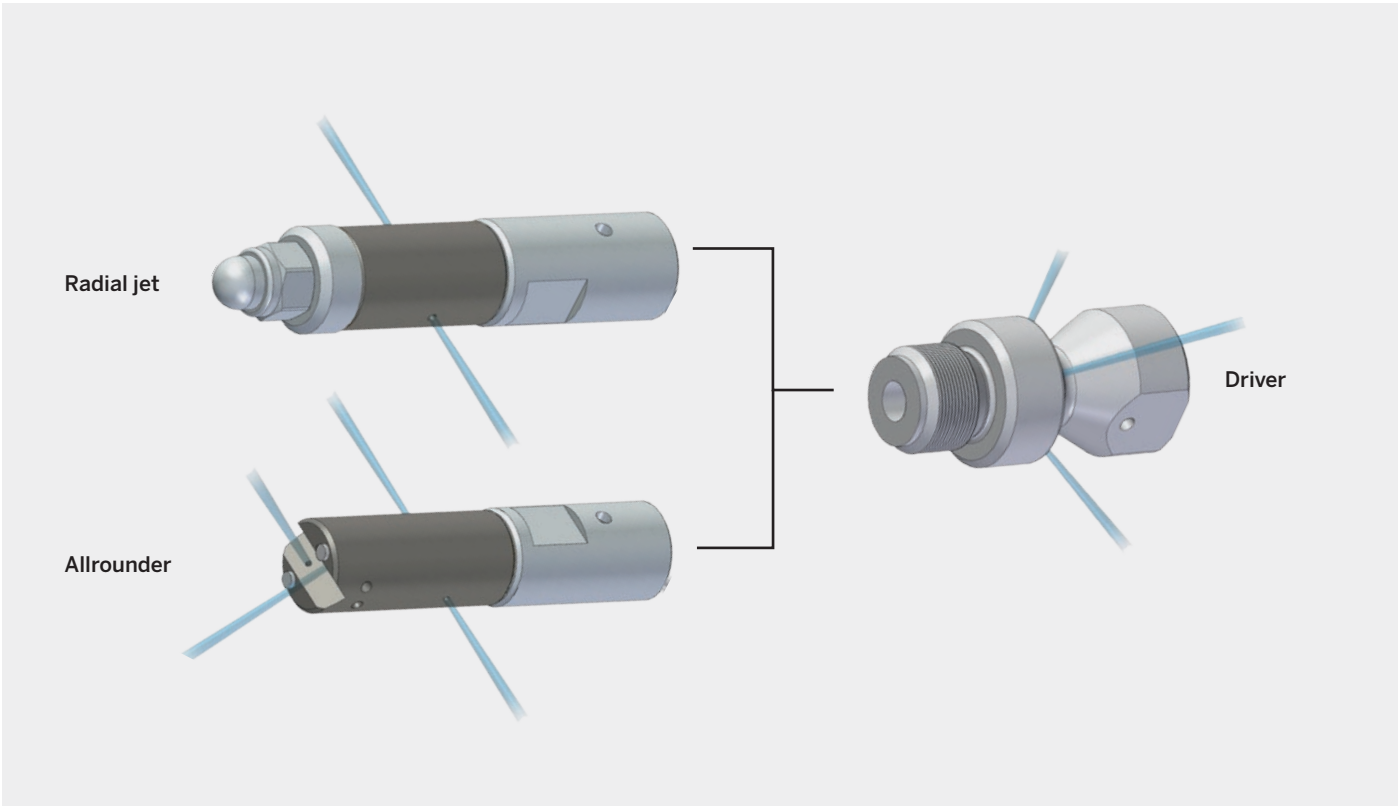
PIPE CLEANING

Pipe cleaning

Turbo jets	40 – 41	Nozzle holders for pipe cleaning	48 – 49
Flexible and rigid lances	42	3D pipe cleaners	49
Push and pull nozzles	43	Revolving hose reel	50
Rotor jets for pipe cleaning	44 – 45	Pipemaster hose rotating system	51
Centralizer for rotor jets	46	Safety device for heat exchanger cleaning	52
Guide skids for rotor jets	47	Foot switch and foot valve	53

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.



Radial jet

Radial jets have 90° bores to clean and polish pipes.

Typical applications

To remove scale from partially blocked pipes and heat exchanger tubes

Allrounder

Allrounders have, in addition to the efficiency of the Radial jet, 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 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

Turbo jet Ø	Connection thread	Tube diameter (mm)		Nozzles (mm)	Max. flow rate l/min at 1500 bar (incl. leakage)
		min.	max.		
	M 7	15	30	2 x Ø 0.9 radial	approx. 30 l/min
	G 1/8"	17	35	2 x Ø 1.0 radial	approx. 38 l/min
	G 1/4"	20	40	2 x Ø 1.1 radial	approx. 45 l/min
	G 1/4"	25	50	2 x Ø 1.0 radial	approx. 50 l/min
	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.		
	G 1/4"	20	40	2 x Ø 0.6 axial	approx. 40 l/min
				2 x Ø 0.6 radial	
	G 1/4"	25	50	2 x Ø 0.6 axial	approx. 40 l/min
				2 x Ø 0.6 radial	

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.		
	G 3/8" - 24 UNF LH	18	35	2 x Ø 0.6 radial	approx. 25 l/min
	G 3/8" - 24 UNF LH	19	35	2 x Ø 0.6 radial	approx. 25 l/min
	G 3/8" - 24 UNF LH	20	40	2 x Ø 0.7 radial	approx. 32 l/min
	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.		
	M 14 x 1.5 LH	20	40	2 x 0.4 radial	approx. 21.5 l/min
	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.		
	M 14 x 1.5 LH	20	40	2 x 0.35 radial 2 x 0.30 axial	approx. 25 l/min
	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



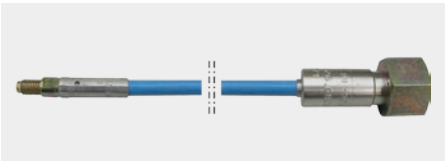
Lances

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

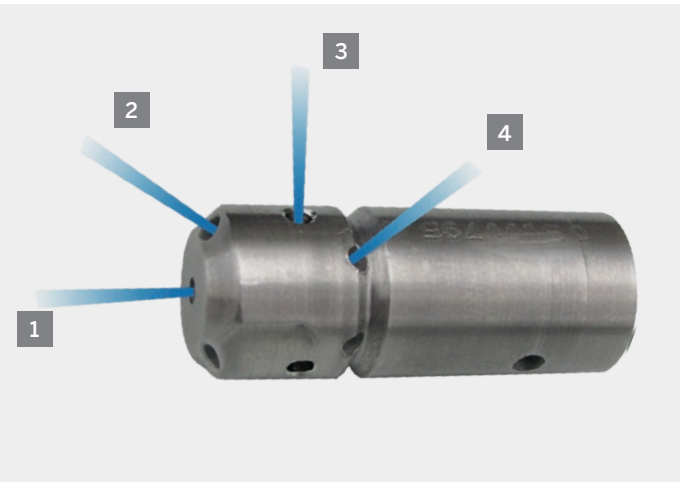
Rigid lances



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



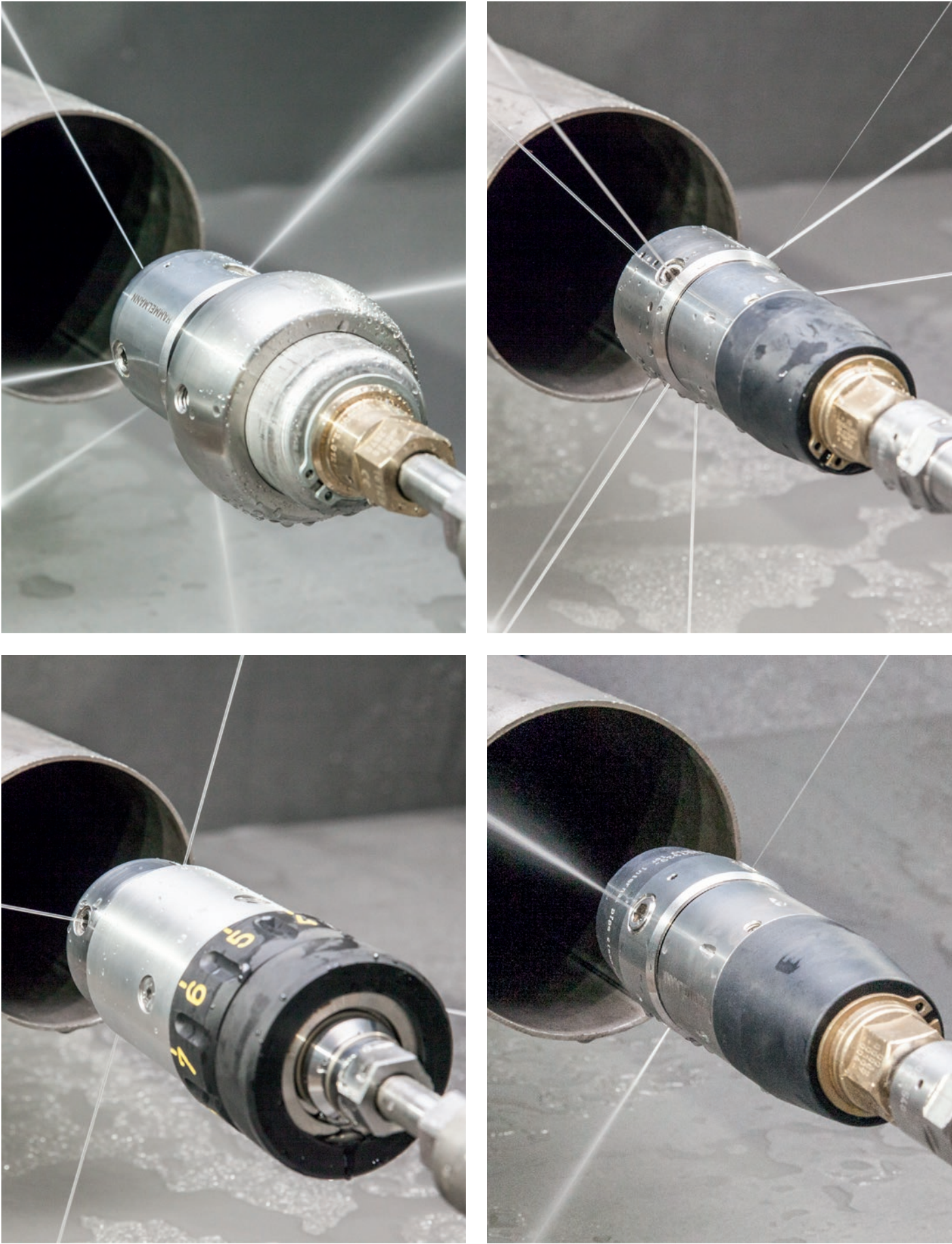
- 1**
Cleaning completely blocked tube in axial direction.

3
90° radial jets for maximum cleaning and cutting efficiency.
- 2**
Push jets remove material from in front of the nozzle. When using flexible lances only employ in conjunction with pull jets.

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






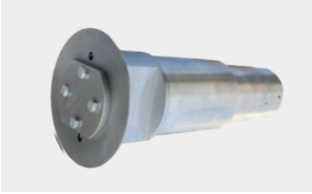
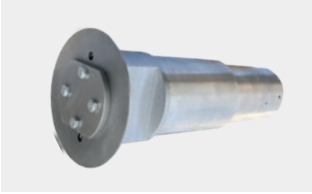


Rotor jets for pipe cleaning

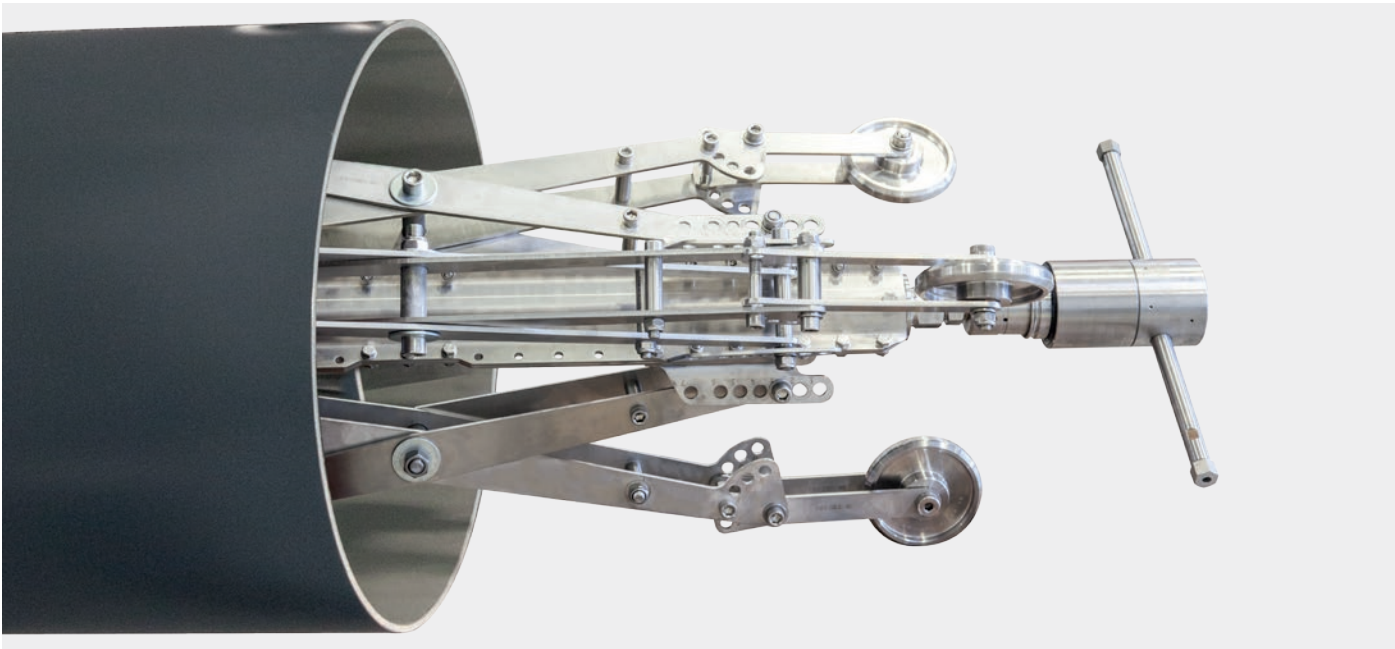
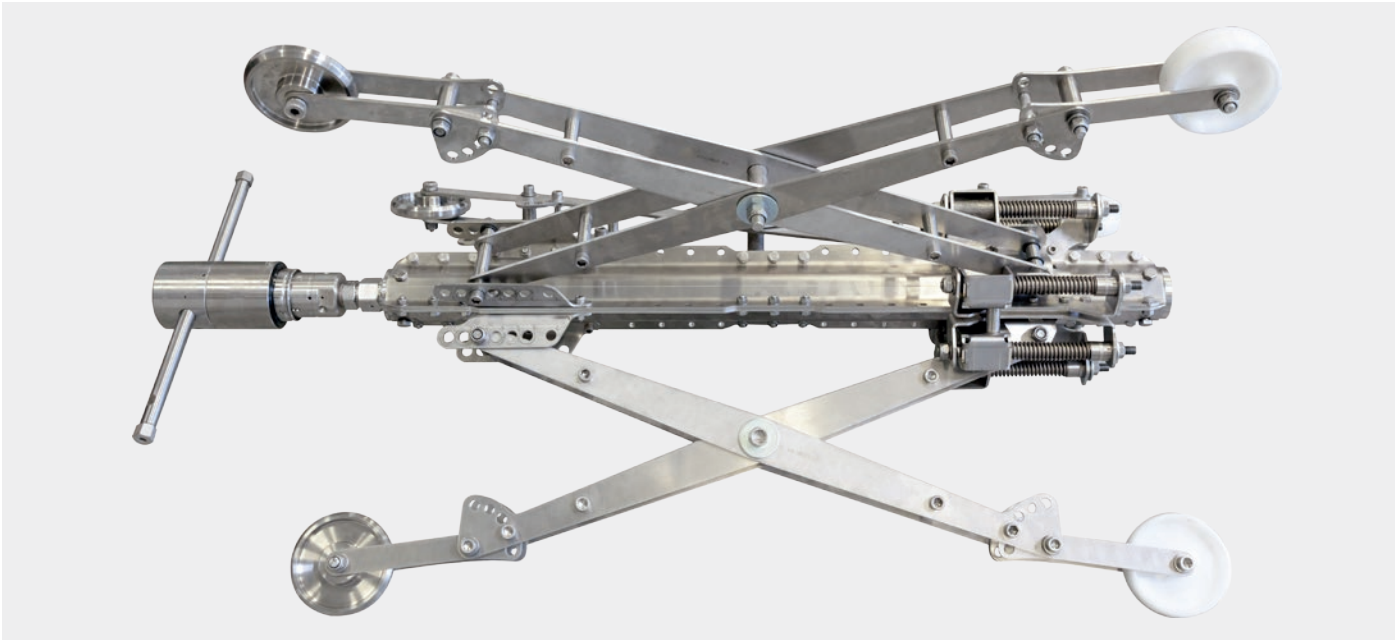
- For use with mechanically deployed cleaning devices
 - Stainless steel housing
 - Built-in eddy current brake and cooling jacket in dustproof enclosure
- Wear-resistant rotary joint with labyrinth seal
 - Axial and radial nozzle arrangement for cleaning tubes
 - With protective cover as an option

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 centrally in a pipe.

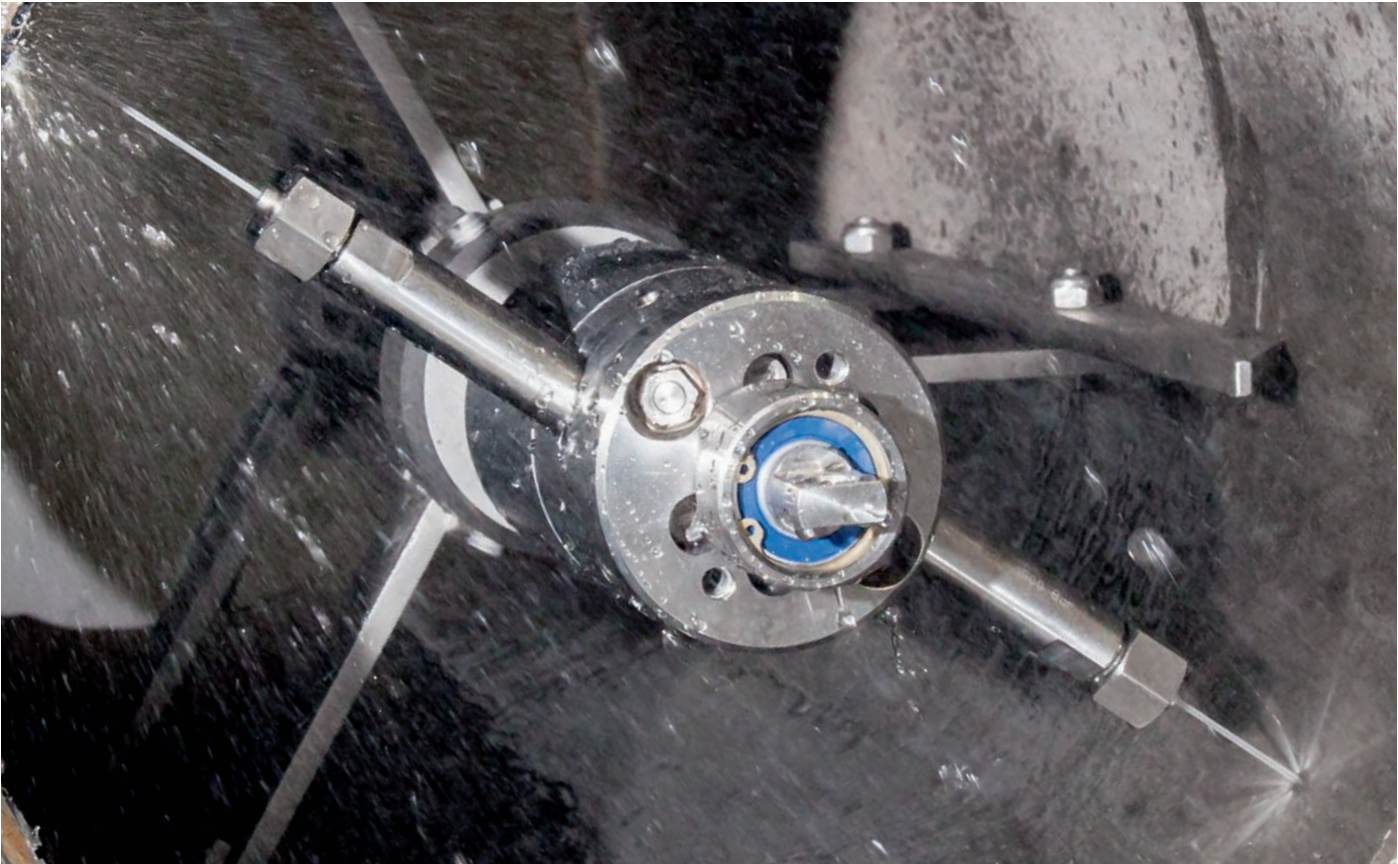
The steplessly adjustable scissor arms of the spreading mechanism allow cleaning of all pipe diameters from 450 mm to 1400 mm. A conversion kit for 250 mm to 400 mm is available as an option.

The centralizer comprises the following main components:

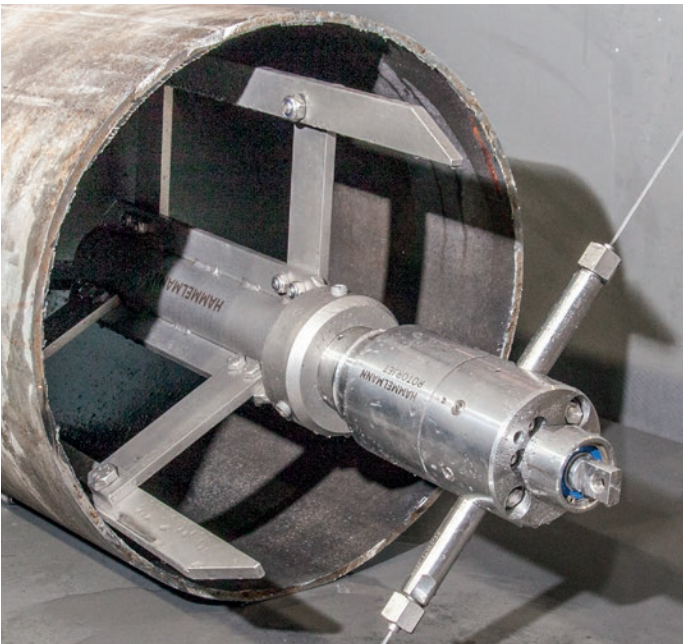
- Central guide pipe with mounting for rotor jet and hose
- Spring loaded adjustable assembly with three scissors, joints and rollers.

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 : 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
	Type L 1200-2	18 mm S arm, 2 nozzles	up to 1400 bar	150 l/min	200 mm
	Type XL 1500-2	35 mm S arm, 2 nozzles	up to 1600 bar	250 l/min	320 mm
	Type XXL 1600-2	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 ≥ 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: 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



Electrically driven unit



Hydraulic version

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 are 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 110 m³/hr of compressed air at 2.8 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

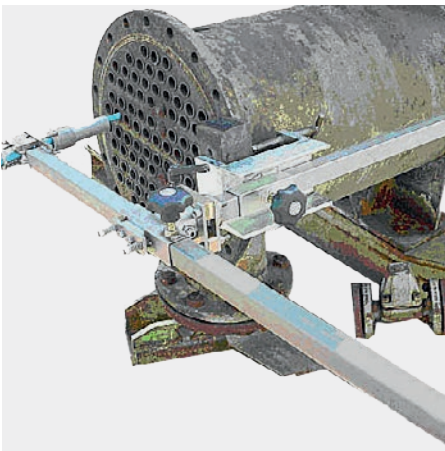
A non-rotating protective hose is fitted between the hose deployment unit and the positioning device. This enables operation in pipes that are difficult to access.

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 suitably sized stop within the protective sleeve prevents jetting to atmosphere.

For bundle diameters: up to 2.0 m
For lance i/d: 4, 6 and 8 mm
Flange thickness: 140 mm max.

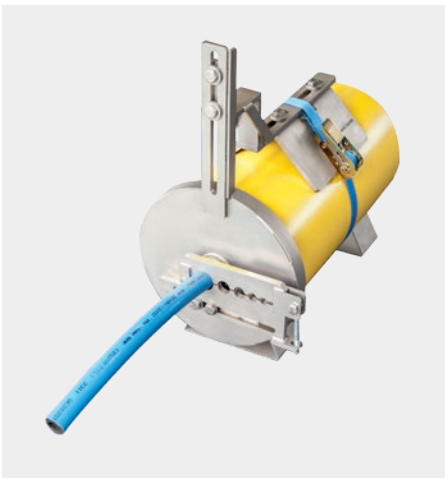
BG test certificate



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)



Options

- 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

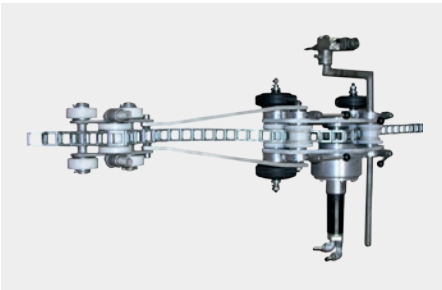
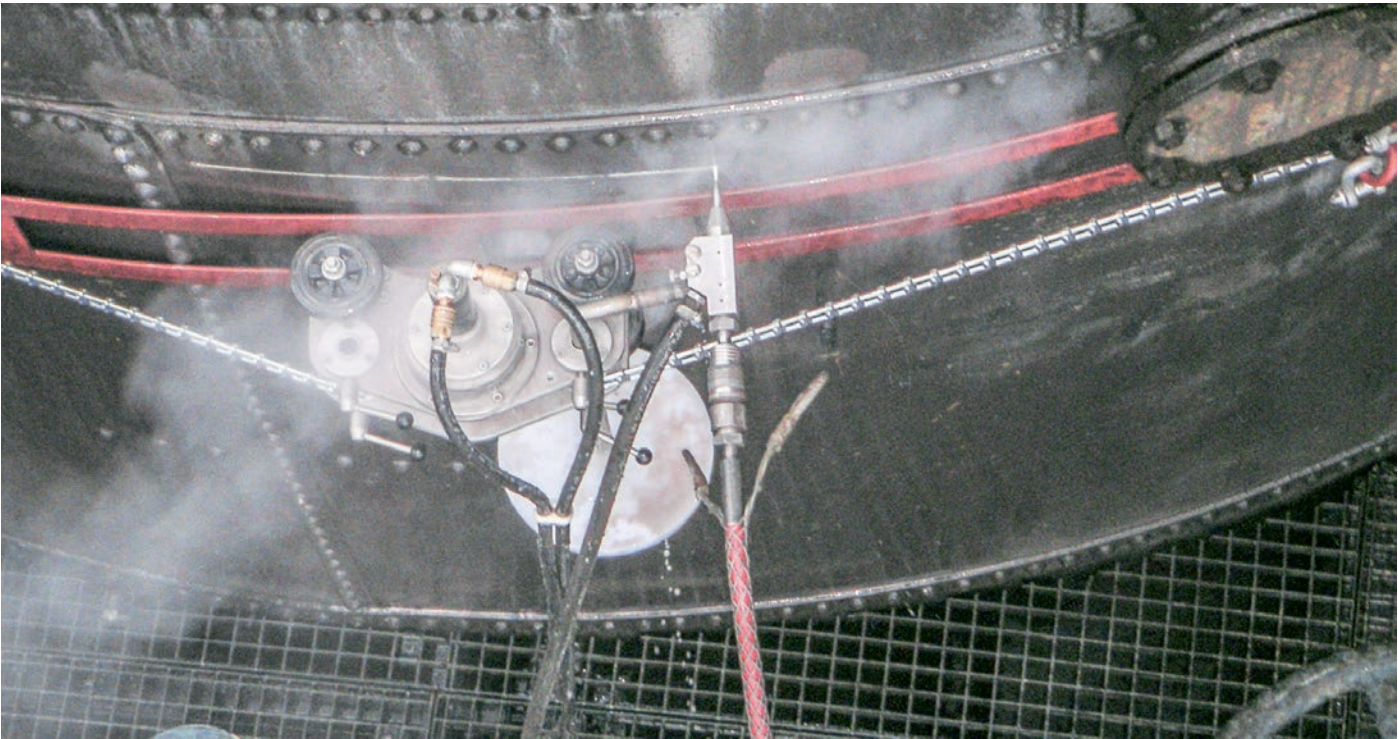
Cutting systems	55
Cutting systems, cutting nozzles, accessories	56

Cutting devices and nozzles

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

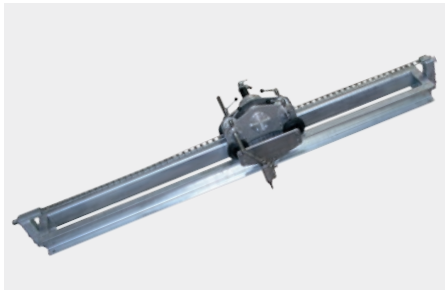
A high pressure water nozzle inside the assembly creates a water jet. This pressurised water jet travels through the entrainment chamber at high speed to a focusing nozzle dragging the air in the chamber

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.



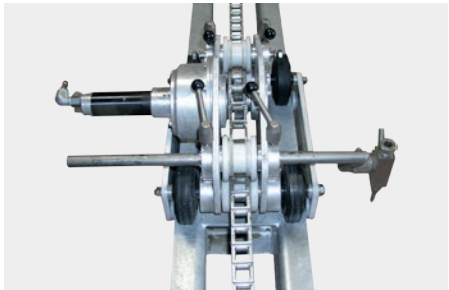
Carrier trolley

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 2 m 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 und accessories



Type 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



Type B 3000

Op. pressure: 3000 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	58	High pressure hoses	63
Metal forming	59	Nozzle inserts	64
Valves	60 – 62	Protective gear equipment	65

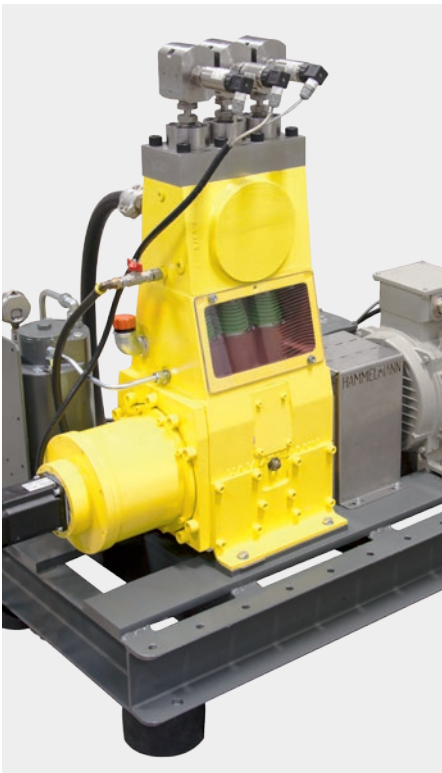
Systems for pressure and impulse testing



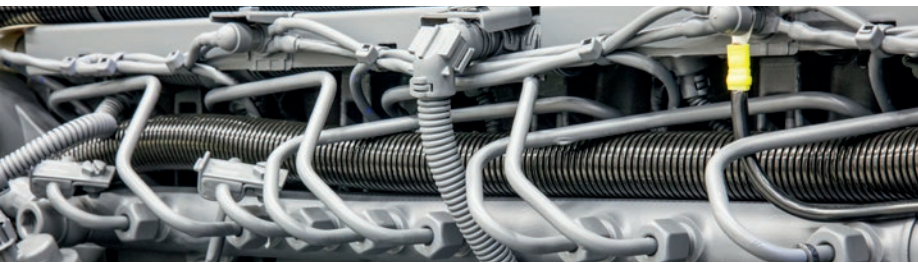
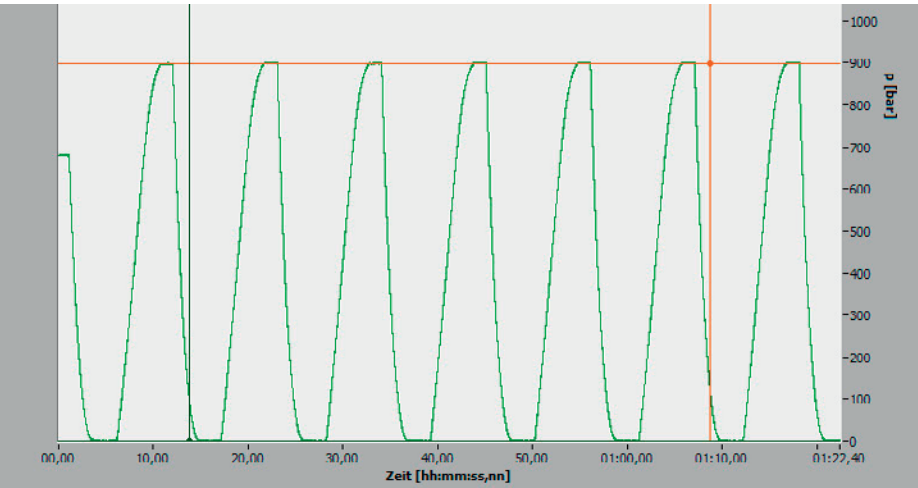
Ultramodern HP pump based systems with fine-tuned valve and control technology enable pressure and impulse testing to be carried out for a wide range of applications.

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 600 bar for large boilers and piping systems in power plants.



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



Impulse testing for common rail components

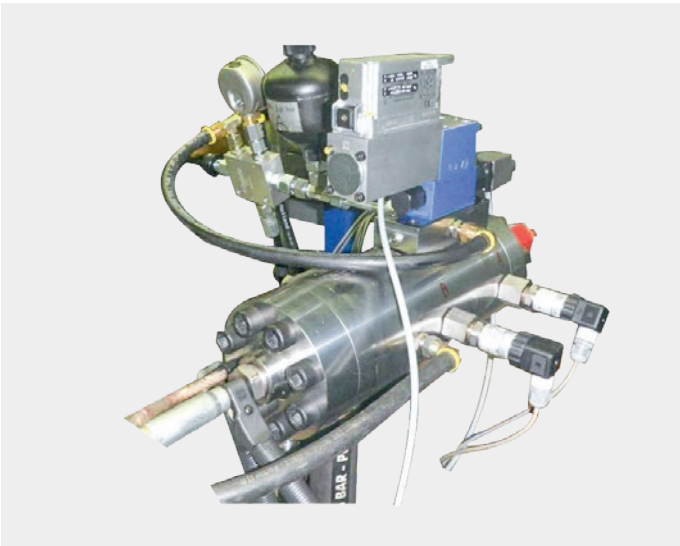
Metal forming



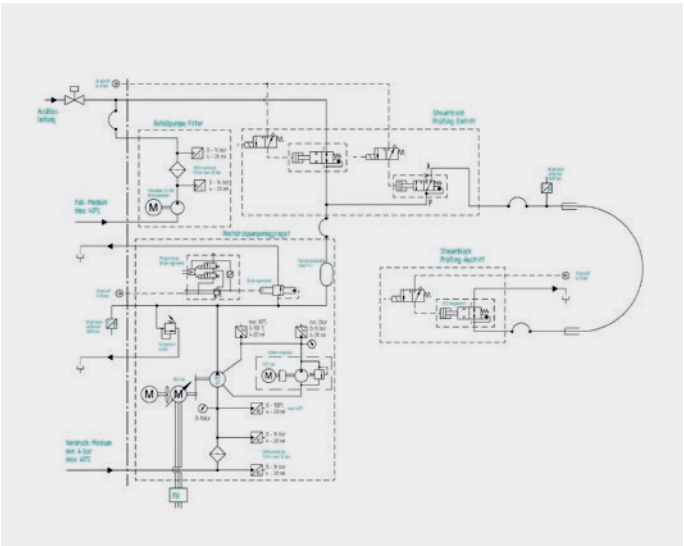
Precise and robust valves enable system providers to fit out their machines with advanced equipment in terms of metal forming. Hammelmann provides directional valves, overflow valves, pressure limitation valves and safety valves as well as a variety of combinations allowing for forming pressures of up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



Control block for high flow rates



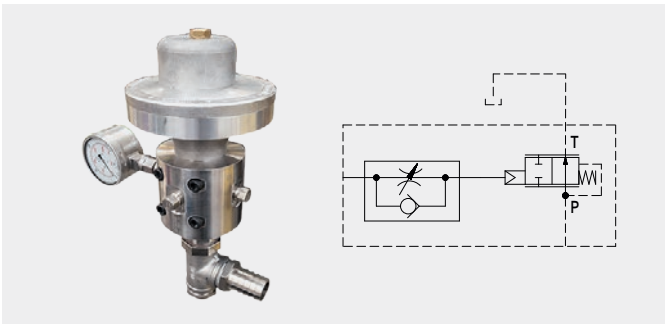
Pressure regulating valve with servo control



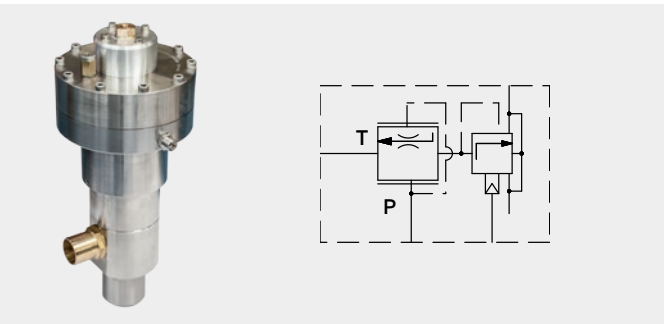
Layout for metal forming systems

Valves

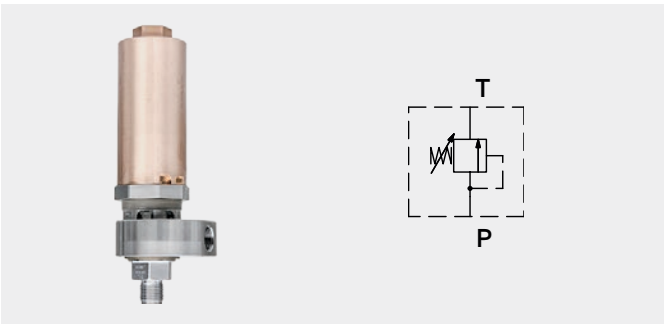
Hammelmann provides a wide range of high pressure valves, which stand out for their precision, reliability and modern technology. Use of the latest materials ensures a high level of safety and durability.



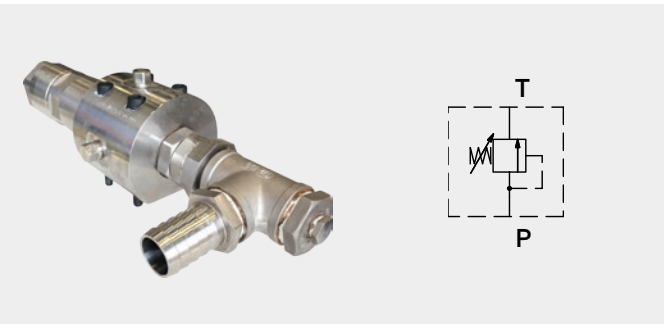
Pressure regulating valves up to 1800 bar



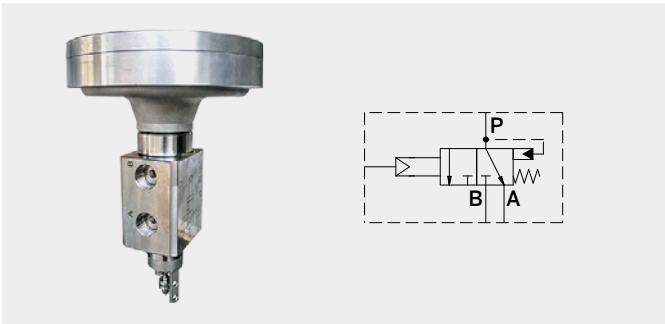
Pressure regulating valves up to 4000 bar



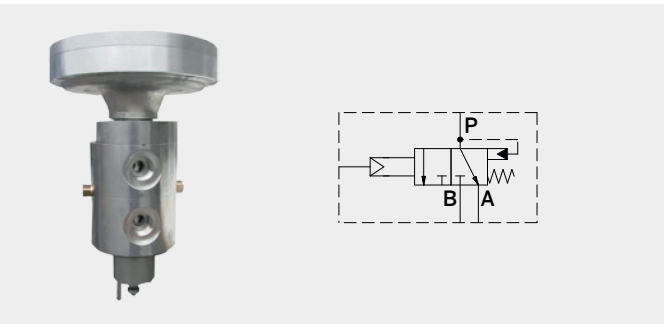
Safety valves up to 3000 bar



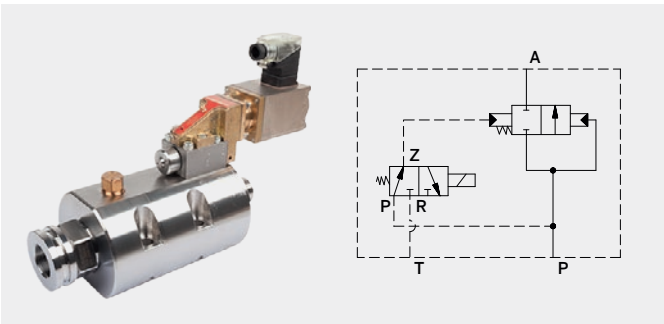
Safety valves up to 1800 bar



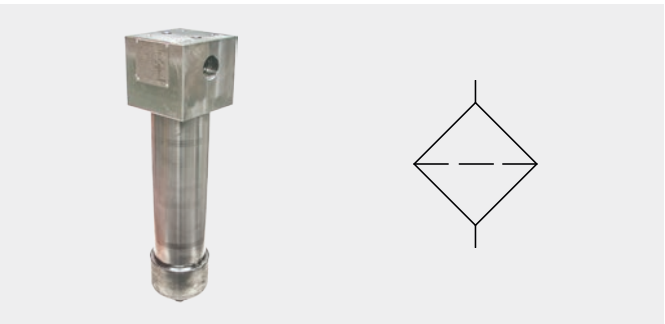
3/2 way valves up to 3000 bar



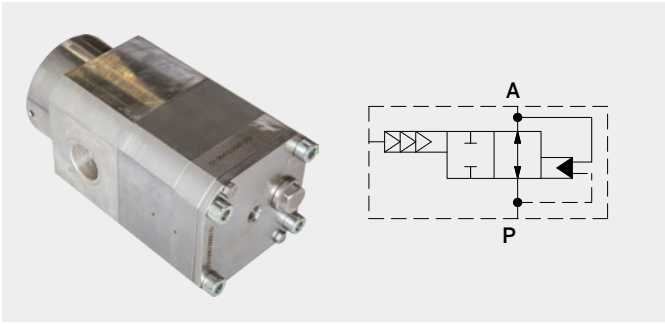
3/2 way valves up to 1500 bar



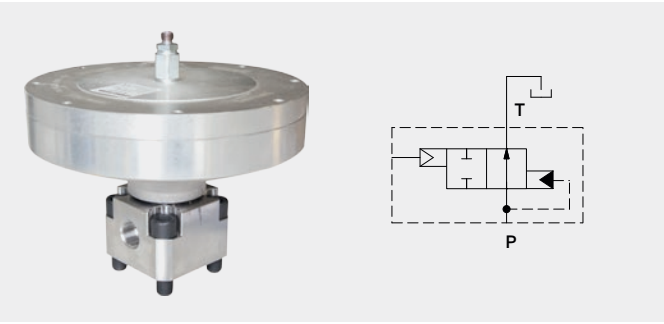
2/2 way solenoid actuated valves up to 800 bar



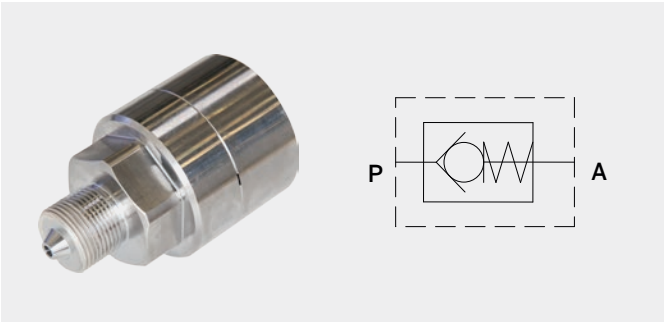
High pressure filter up to 1200 bar



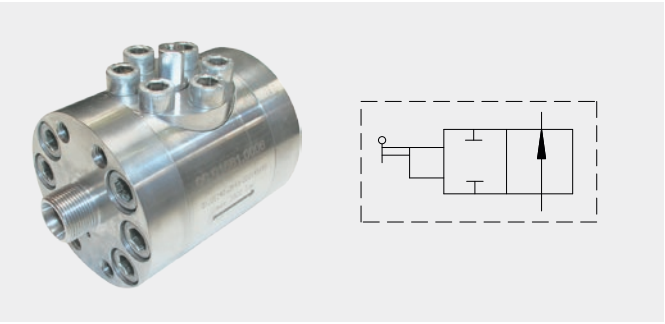
2/2 way valves up to 4000 bar



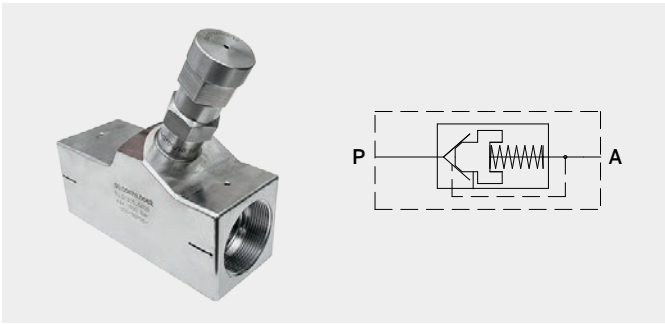
Bypass valves up to 4000 bar



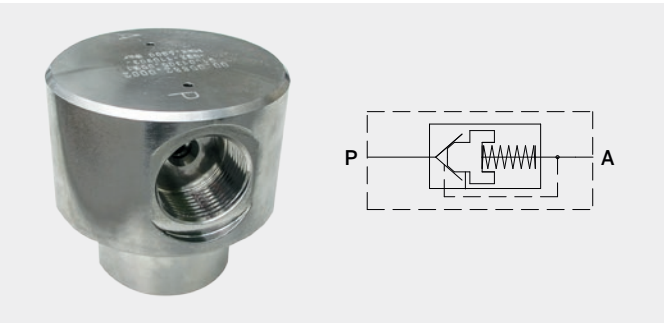
Non-return valves up to 4000 bar



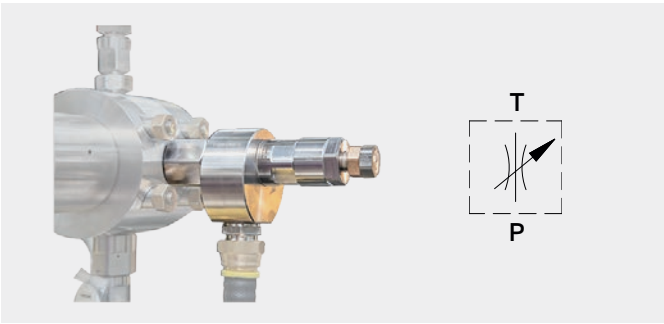
High pressure ball valves up to 1800 bar



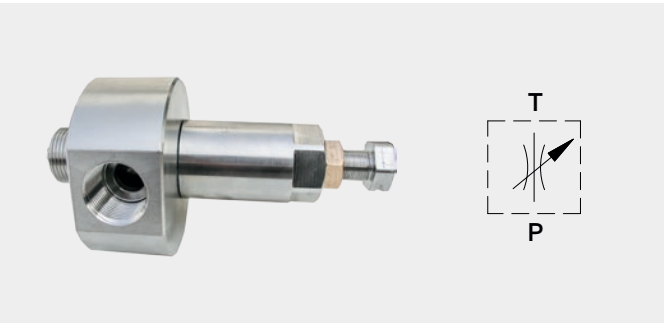
Pressure maintaining valves up to 1800 bar



Pressure maintaining valves up to 4000 bar



Adjustable energy dissipating nozzles up to 1800 bar



Adjustable energy dissipating nozzles up to 3000 bar

Valves

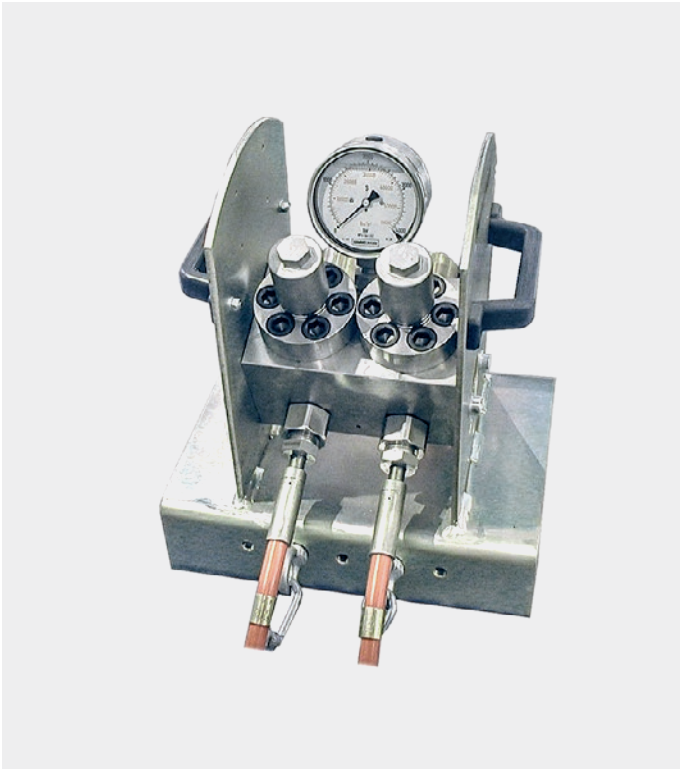
Hammelmann combines high pressure valves for various system requirements. This leads to a high efficiency of the high pressure pumps used together with high pressure systems. Key emphasis is placed on safety, functionality and high utilisation.



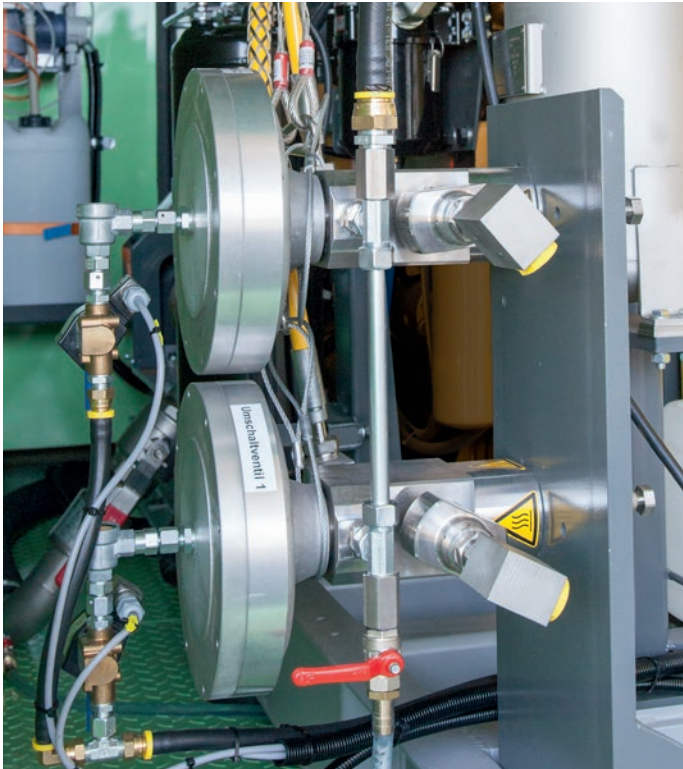
Control block with six 2/2 way solenoid actuated valves



Control block for four high pressure consumers



Pressure controlled switching valve



Changeover valve for two blasting guns

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 caddy
- Snap connectors
- Swivel connectors
- Hose fittings
- Suction hose couplings
- Hose bridges



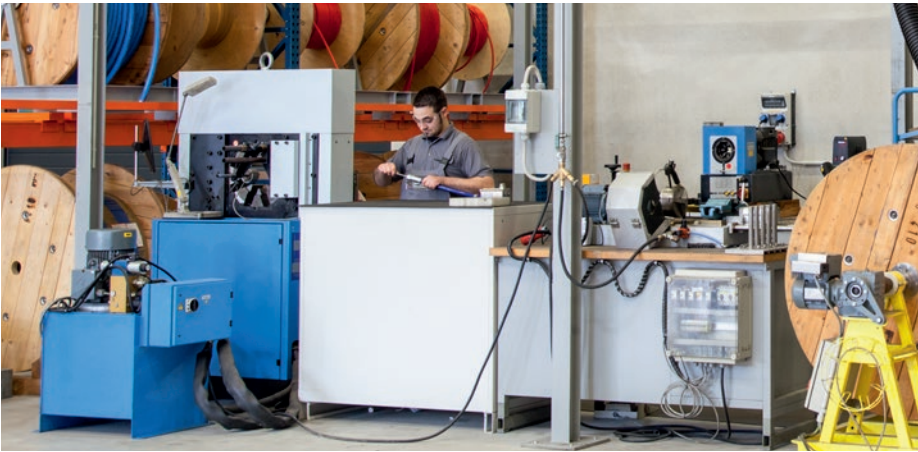
Wide selection of high pressure hoses



Hose caddy



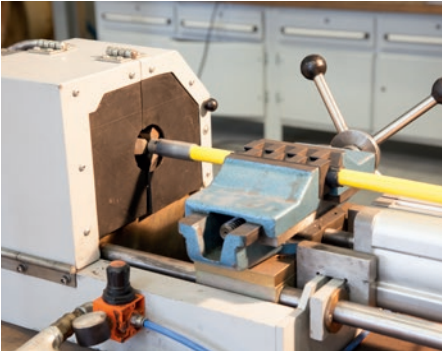
Snap couplings



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



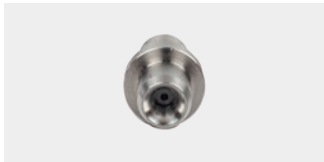
TYPE: I ROUND JET
Op. pressure: up to 3000 bar
Efficiency factor: 0.7
Material: Steel/sapphire
Nozzles: 0.4 – 1.1 mm



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



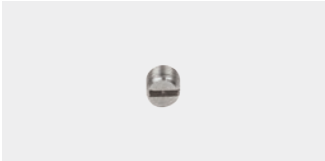
TYPE: L ROUND JET
Op. pressure: up to 1200 bar
Efficiency factor: 0.95
Material: Steel
Nozzles: 1.0 – 3.9 mm



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



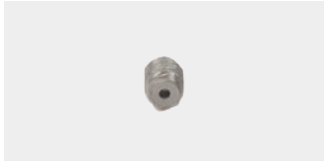
TYPE: S ROUND JET
Op. pressure: up to 3000 bar
Efficiency factor: 0.95
Material: Steel
Nozzles: 1.0 – 1.8 mm



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



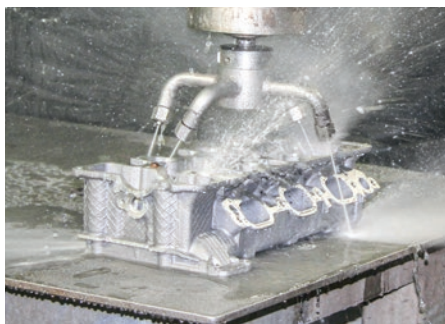
- 1 Protective suit made of robust polyester with polyurethane coating in accordance with standard EN 343
- 2 Safety helmet
- 3 Safety boots
- 4 Hose protection, attached to the connection to the lance/blasting gun

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 benefit 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.

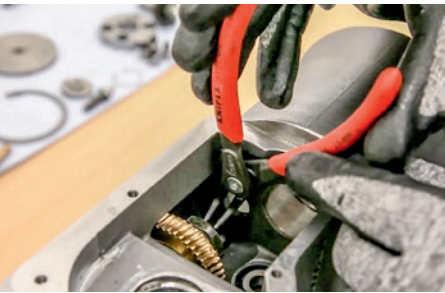
For a fixed day rate, the Technology Centre can be at your disposal. This offer includes

- 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

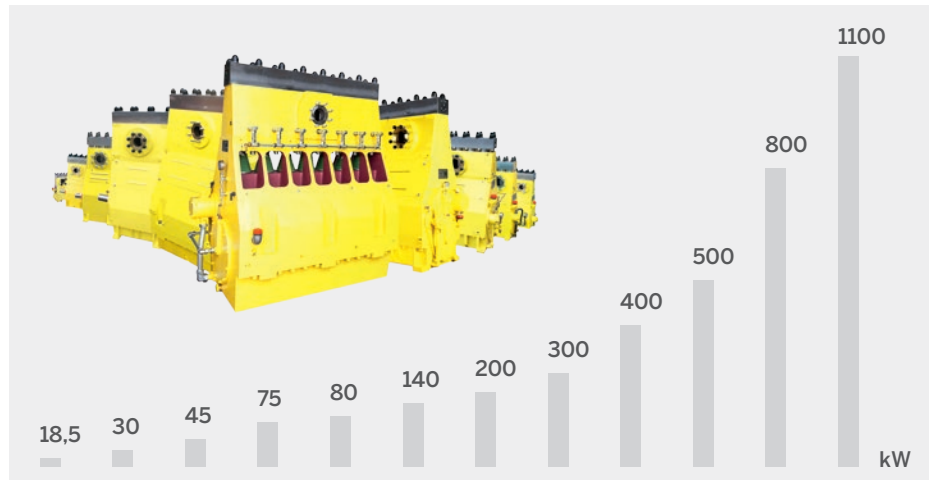
All high pressure water to the cleaning systems is provided by Hammelmann's own high pressure pumps. This means we offer a full high pressure technology package, where knowledge and experience from both areas of application and high pressure pump technology come together and complement each other.

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

Hammelmann GmbH
Carl-Zeiss-Straße 6–8
59302 Oelde • Germany

www.hammelmann.com
mail@hammelmann.de
Phone: +49 (0) 25 22 / 76 - 0



Member of
INTERPUMP GROUP

HAMMELMANN®