

HAZARDOUS AREA

# MultiJet CALDER

THE VERY BEST IN HIGH PRESSURE  
WATER JETTING SYSTEMS UP TO 4,000 BAR





# CALDER



## Packaged High Pressure Solutions

Industrial • Process • Oil & Gas • Chemical & Petrochemical



Surface Preparation  
Coating Removal

# MultiJet

High Pressure Solutions for Hazardous Areas



Pipe Cleaning



Heat Exchanger Cleaning



Tank / Vessel Cleaning



Marine Growth Removal



Abrasive Cutting

Since 1981, people have put their trust in Calder MultiJet pump packages. As specialist manufacturers of high pressure pump systems we design and engineer market-leading solutions which set the standards for use in the harshest operating environments around the globe. We are an independent company with one focus – to build the best high pressure systems on the market.



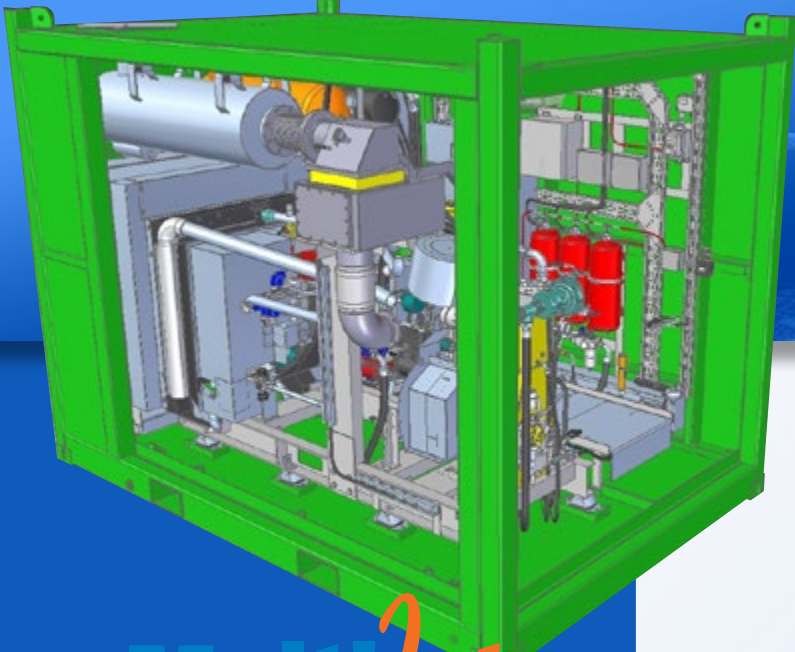
MultiJet is the benchmark in high and ultra high pressure technology and design. Safe, reassuringly reliable, and expertly constructed around the remarkable Hammelmann high pressure pump, MultiJet units meet, and in many cases exceed, the current hazardous area legislation for Zone 1, Zone 2 and Rig Safe environments.

Our investment in new technologies and materials of construction ensures that the MultiJet exceeds the expectations of our customers. We understand that quality, reliability, value for money, weight minimisation and ease of maintenance are of the utmost importance to you. Our commitment to continual improvement is demonstrated in each new generation of MultiJet units.

Whether your business is surface preparation in the marine/offshore market, heat exchanger or tube bundle cleaning, online separator cleaning, tank, vessel, or pipeline cleaning, or abrasive water jetting for abandonment and decommissioning, the MultiJet unit offers the maximum performance whilst returning the lowest cost of ownership in the industry throughout its lifetime.



# ATEX, NORSOK Z-015 & ZONE 2 HAZARDOUS AREA SOLUTIONS



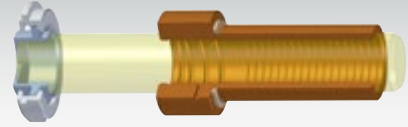
## MultiJet

High Pressure Solutions for Hazardous Areas

- Maximum Performance
- Safe Application
- Reliable Operation
- Simple Maintenance

### Ultra Low Friction Seal System

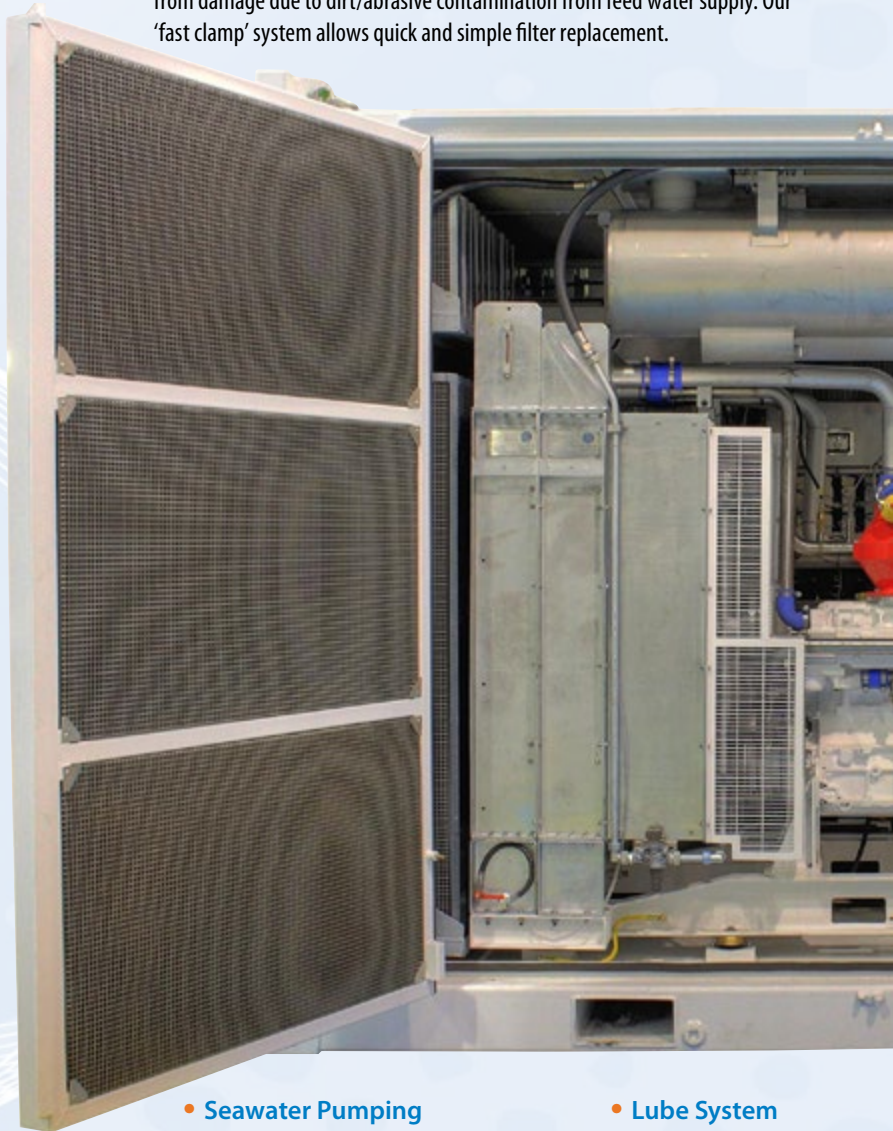
Totally unique, our HP plunger pump labyrinth or hydro dynamic seal system is formed by circumferential labyrinth grooves between the plunger and the seal bushing, creating a low friction liquid seal.



Our seal technology has helped us achieve the single most important advance in pump reliability, giving significant service life and uptime advantages over traditional packing seal technology. To prove it, why not ask us to demonstrate the 'drop test' to you?

### Inlet Water Filter

Bag type inlet water filter with stainless steel housing protects the HP pump from damage due to dirt/abrasive contamination from feed water supply. Our 'fast clamp' system allows quick and simple filter replacement.



### KEY FEATURES

#### • Diesel Engine

Calder select only the most reliable market-leading engines which offer low fuel consumption, and global aftermarket spares and support networks, whilst offering ease of maintenance on the platform/rig. Power from 40 kW to 2,000 kW, to suit pump requirements.

#### • Throttle Control

Engine speed increases only when pressure is demanded, saving fuel and eliminating waste water production.

#### • Direct Drive

Direct drive through the pump's flex coupling. No belts to maintain and no side loads.

#### • Containerised Pump Packages

DNV 2.7-1-certified containers for offshore lifting. CSC-certified containers provided as an option. These afford valuable protection from weather ingress and mechanical damage of the internal pump equipment. Containerised units provide the ideal housing for noise reduction materials to be included in the design, allowing the unit to meet and exceed current noise legislation.

#### • Boost Pump

Fitted as standard, eliminates cavitation and guarantees inlet water feed pressure, extending the life of the pump.

#### • Seawater Pumping

When required, the wetted parts of the HP pump can be supplied in Duplex or Super Duplex stainless steel to allow operation on salt water supply.

#### • Lube System

Pressurised geared lube system, oil cooler and filter.



# CALDER

## Robust Pump Gearend

Our HP pump gearend incorporates critical standard features which are not included by many competitors. The gearend pressure lubrication system includes an oil filter and oil cooler. A built-in lubrication pump ensures that oil is delivered to all bearing surfaces and that the oil is circulated through the on-board 25-micron oil filters to ensure maximum oil cleanliness: this, combined with our gearend oil cooler, which maintains pump lube oil at temperatures below 70°C, protects your high pressure pump power end even when operating on continuous duty, resulting in long term reliability.

## Water Tank

Heavy duty water tank, stainless steel construction, anti-vibration mounted to chassis.

## Additional Safety Systems

Over and above the requirements of ATEX, packages can be fitted with gas detection and fire extinguisher/suppression systems.

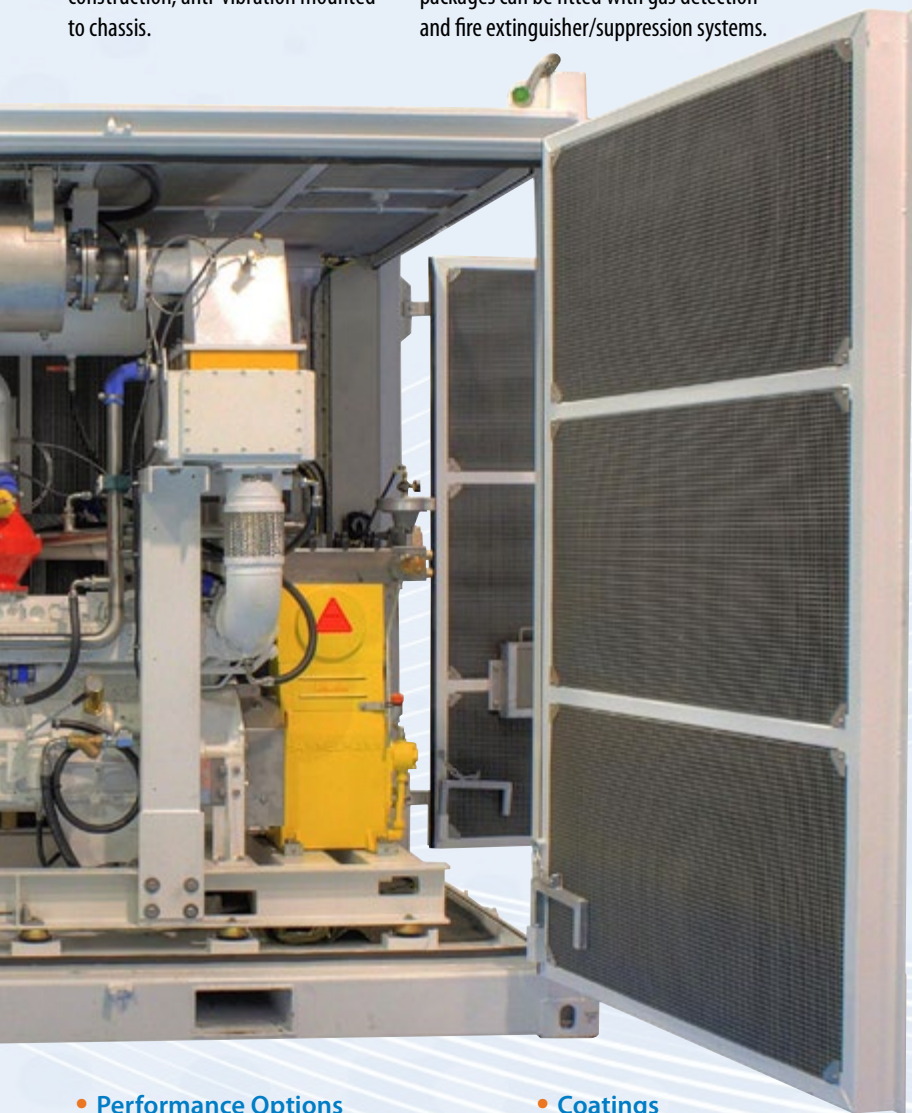
## Direct Drive - Efficient And Maintenance Free

The in-built speed reducer installed in the high pressure pump gearend allows direct drive from the diesel engine, eliminating the need for large ratio V-belt drives and additional guarding: this also eliminates bearing side load damage, and reduces weight and maintenance requirements whilst enabling an extremely compact unit design.

## Reduced Pump Maintenance

Repair when you want to, not when you have to. . . .

With our unique seal system design, emergency repairs to the high pressure pump whilst 'on the job' are eliminated. As wear is gradual, over many thousands of hours, you will experience that scheduled repairs and maintenance are all that is necessary.



## Spark Arrestor

Exhaust spark arrestor fitted as standard.

## Overspeed Valve

Engine overspeed valve installed.

## Exhaust Gases

Water-cooled exhaust manifolds, exhaust gas cooling, and flame traps ensure the MultiJet operates within ATEX requirements.

## Safety Shutdowns

Pump suction pressure, pump oil pressure, pump oil temperature, pump high water temperature, pump low water level, engine high exhaust gas temperature, engine water temperature, yellow alert, engine overspeed, engine oil pressure.

## Crash Frame Pump Packages

Designed to DNV 2.7-3, the crash frame allows a reduced-weight lift and footprint compared with containerised units and provides basic protection of the pumping equipment against mechanical damage during loading and off-loading.

## Bulkhead Service Panel

Low-level hinged door and recessed design prevent damage during loading and transportation. The bulkhead service panel contains all connections required to operate the unit. Having all connections located in one bulkhead allows hoses (inlet and discharge) to exit from one side of the unit, minimising trip hazards.

## Performance Options

Multi performance options up to 4,000 bar (58,000 psi) via a simple conversion kit installation, allows multiple pressure jobs to be undertaken. Flows from 1 lpm to 150m<sup>3</sup>/hr.

## Coatings

Following extensive surface preparation, Calder hazardous area units are coated with our high grade, 2-pack, marine epoxy system, including the underside of the container floor. Client-specified coatings and colours used if requested.



### Operation Made Easy



#### Control Panel Functions (typical)

Sealed stainless steel enclosure.

**Functions:** Start-stop, pressure up/down, engine speed

#### Shutdown Fault Indicators:

- Exhaust temperature
- System air pressure
- Pump - low inlet water pressure
- Pump - high oil temperature
- Pump - low oil pressure
- Pump - high inlet water temperature
- Pump - HP high discharge pressure
- Pump - UHP high discharge pressure
- Engine - fault
- Water tank - low level

#### Control Panel

Externally mounted control panel enabling operation without the need to open main access doors. Can be configured to monitor all required operational parameters and provides system-fault indicators with 'first-up' alarm.



#### Service Manifold

Clearly identified connection points for easy connection of services, including water, air, power.



- **5-leg lifting rope set** allows crane hook to be attached safely from ground level via the 5th leg, rather than from on top of the container.
- **Fork-lift slots** allow movement by fork-lift truck.
- **Corner castings** standard corner castings suitable for twistlock fixing.
- **External fuel fill/level indicator** allows the fuel to be checked and filled without entering the container.

### Optional Equipment

- **NORSOK Z-015 Compliance**  
Including gas & fire detection, and fire suppression systems.
- **Noise Attenuation**  
Various options to reduce noise levels to below 85 dBA.
- **Ambient Temperature Operation**  
Extended radiator for operation in high ambient temperature environments up to 50°C.
- **Lifting Points**  
Located above pump head and flame trap to enable fitting of chain hoist to assist with equipment removal/maintenance.
- **Bypass Regulator Control Valve**  
Minimise water use. Local or remote hydraulically operated pressure control.
- **Internal Hazardous Area Lighting**
- **Maintenance Bench and Vice**
- **Gun Storage Racks**
- **Hose Storage Racks**
- **Dual Control** (for HP and UHP convertible units)

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## HAMMELMANN®



- **Hammelmann high pressure pump** embodies a high power-to-weight construction, built using the most advanced metallurgy and designed using F.E.M. analysis.

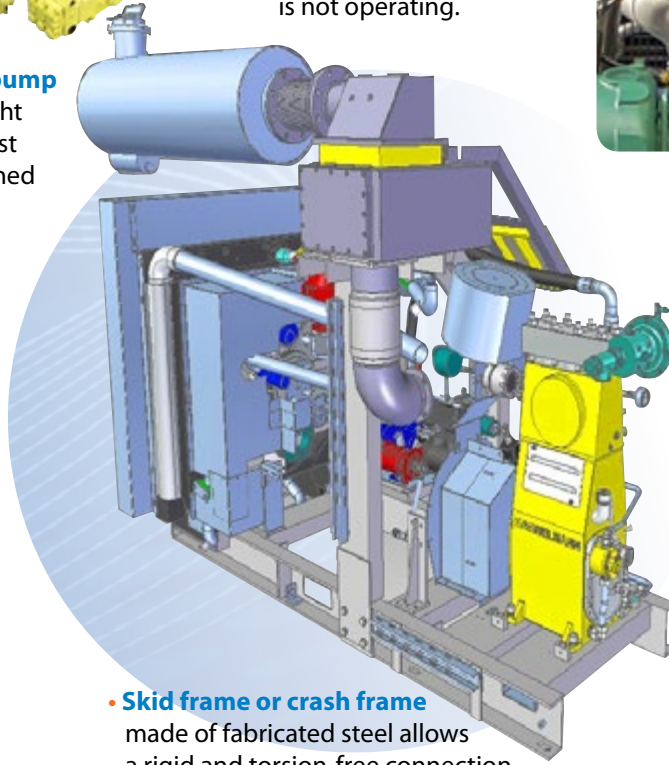
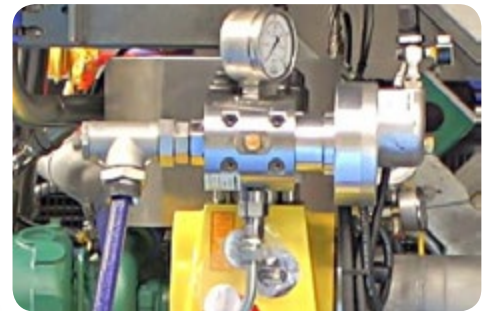


- **Inlet water filter** keeps the feed supply water clean, extending the life of key components within the pump, nozzle and jetting guns. The simple design allows quick replacement of filter.



- **Boost pump** combined with stainless steel water header tank, ensures optimum operating conditions for the pump unit.

- **Bypass/regulating valve** relieves system pressure and saves water when gun is not operating.



- **Skid frame or crash frame** made of fabricated steel allows a rigid and torsion-free connection between the high pressure pump and the prime mover.



- **Exhaust gas cooling system** supplied with flame trap or dummy, spark arrestor, and overspeed valve.

Maximise the potential of your pump unit and enable MultiJet to multi-task with our 'Performance Conversion Kits' which will enhance the range of applications you can tackle by increasing your operating pressure range up to 4,000 bar (58,000 psi).

### Performance Conversion Kits



Performance conversion kits can be fitted at any time during the life of your MultiJet and take less than 30 minutes to install. Typical conversions available include, but are not limited to, 3,000 psi, 5,000 psi, 7,500 psi, 10,000 psi, 15,000 psi, 21,000 psi, 36,000 psi, 43,500 psi and 58,000 psi.



# CALDER



Ideally situated for both Heathrow and Birmingham international airports, Calder's Worcester premises are a modern facility where our equipment is designed, built and tested by our skilled workforce.

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## | Standards & Specifications:

Calder pump packages can comply with most international standards and specifications including:  
**ATEX | IEC | GOST | EN | DNV | API | ANSI | PED | AS/NZ | Norsok | NACE | CE | PED**

| **ISO 9001** Quality standard has been practised by Calder since 1987 with award of certification in 1999. Our rigorous application of this highly respected International Quality Standard has ensured that we consistently meet and exceed our customers' most demanding expectations for both quality and reliability.

| **ISO 14001** Environmental Standard has been held by Calder since 1999. Careful and judicious management of our working environment with the application of sound and well informed design applications utilising the latest and most efficient technologies helps us to produce equipment which minimises the environmental footprint of our production facility and the operating equipment in the field.

| **OHSAS 18001** We at Calder pride ourselves on our safety record. As members of the British Safety Council we practise the strictest safety procedures within our factory and working environments, applying rigorous risk assessments to all activities and equipment which we design and build.

