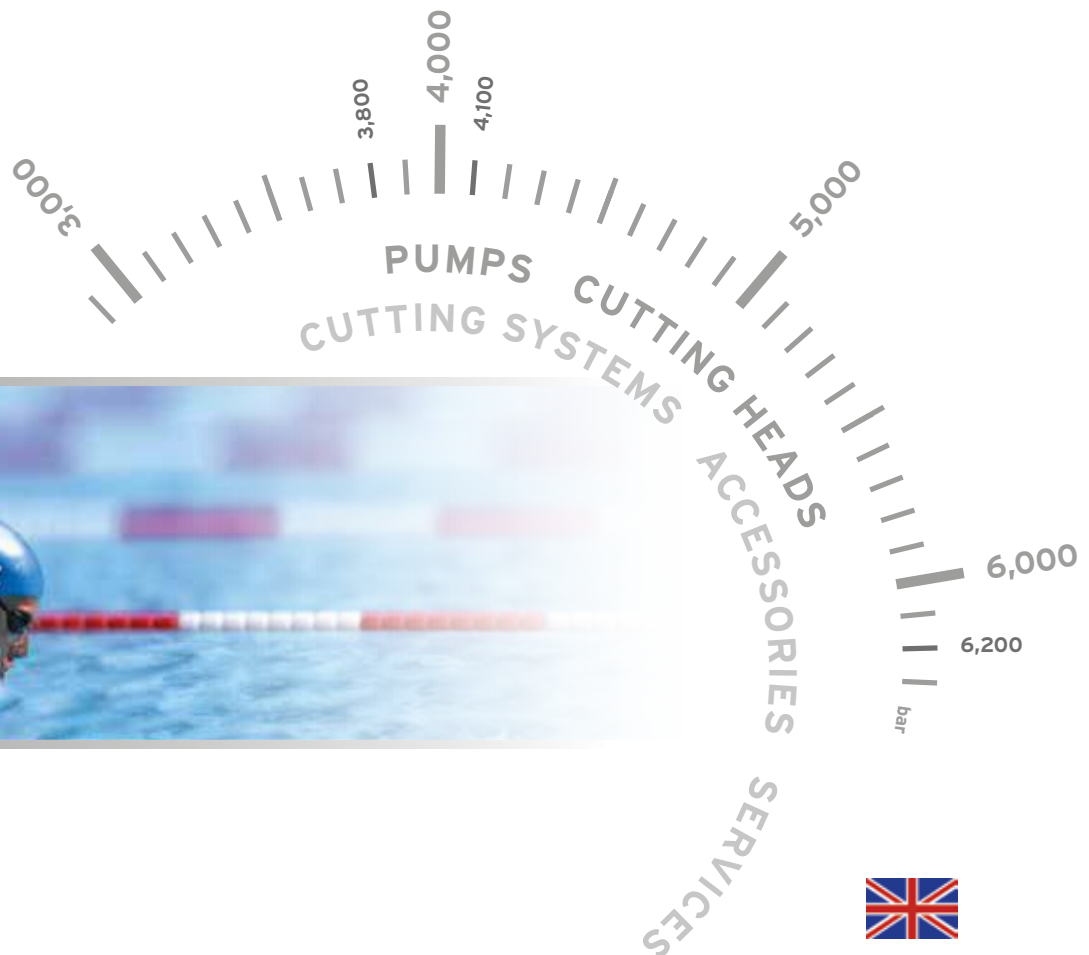




WORLD'S FASTEST WATERJET



PRODUCTS & SERVICES





KMT Waterjet Systems World's Fastest Waterjet

In the early 1970s, the technology of cutting material with water came up. Right from the start, KMT Waterjet Systems has been deeply involved: In 1971, we developed the first waterjet cutting machine for commercial use. Since those early days, the waterjet cutting technology has taken big steps to become a valuable addition and alternative to conventional cutting methods.

When it comes to advancing the technology, KMT Waterjet Systems has always played a big role, and thanks to our consistent and innovative product development, we have been among the technology leaders in the industry for over 40 years now. During this time, we have continuously expanded our sales and service network. Therefore, we are able to offer our customers qualified support by many local offices all over the world.

Our products are well-known for reliability, sophisticated design and ease of maintenance - qualities which our engineers have in mind right from the first draft for a new product. Thus, you can be sure that KMT technology always fulfills the highest quality standards. In our portfolio, we offer you solutions for all kinds of applications: From entry level systems for occasional cutting needs to high-end technology for reliable high-capacity production in multi-shift operation.

The experience gained over the years of course is a big benefit when it comes to continuously improving cutting machines and developing further innovative products. Therefore, the KMT experts have become sought-after advisers for production planning. They can find solutions for all kinds of cutting tasks bringing in the company's know-how concerning waterjet cutting.

- Trained and certified technicians
- Worldwide sales and support network
- State-of-the-art research and development center
- ISO 9001:2008 Certification and TSSA Certification
- CSA and CE compliance
- Highest quality products made using the most advanced processes
- A focus on advancement of our customers



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System Technology

Cutting Systems

One-, two-, or three-dimensional waterjet cutting and robot applications

Due to the universal applicability of the waterjet cutting technology, it is used for a very wide range of cutting applications. Consequently, there is a big variety of available waterjet cutting systems:

- 1D slitter systems for cutting web material
- 2D cutting tables for cutting sheet material
- 3D robot applications for complex three-dimensional outlines
- Further customized solutions

One-dimensional cutting

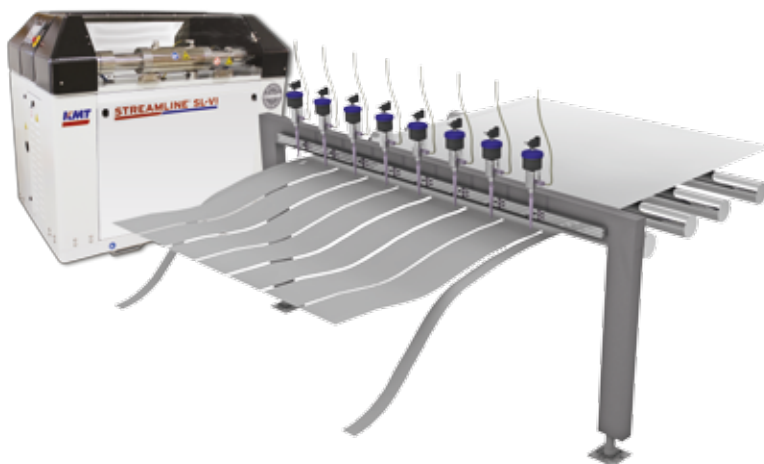
One-dimensional systems are mostly used for cutting web material. The material is placed on a conveyor chain, which carries it at high speed through a portal construction. This construction is equipped with several cutting heads. The space between the cutting heads determines the width of the material stripes. As these kinds of systems are often used in multi-shift operation, high cutting speed and reliability of the production process are very important.

Two-dimensional cutting

The most frequently used system is the 2D cutting table (see picture on the next page). For cutting intricate outlines, the cutting head is guided by a central CNC control system along the x- and y-axis. Very often, the z-axis (height) is adjustable, too. That is necessary because the cutting head has to be positioned very close to the material to obtain optimal cutting results. This type of system is the ideal solution for the quick production of different workpieces from different sheet materials.

A 5-axes-system enabling the cutting head to tilt via a rotation axis can realize angular and cone-shaped cuts as they are necessary for weld preparation. Also available are systems for cutting holes in pipes or tubes.

The main system features include high cutting speeds and the ability to cut a large number of parts at the same time - very often, these systems are equipped with multiple cutting heads for multiplying the production output. These systems are also adapted for mirrored cuts or reverse cutting. 2D cutting tables are available in various sizes.



1D-Online Portal with high pressure pump
STREAMLINE SL-VI 50 STD



Robot applications for three-dimensional cutting

Especially in the automotive and mechanical engineering industry, there are complex requirements which can only be realized by a system for three-dimensional cutting. For these kinds of applications, the cutting head is installed on a robot arm and run along a three-dimensional workpiece for trimming the material or cutting holes.

Robot systems are often equipped with rotating shuttle tables. These enable the time-saving loading and off-loading of the system while simultaneously cutting workpieces in the cutting box. Typical applications are:

- Abrasive cutting:
Engine components made in titanium, aluminum and stainless steel; turbine blades; marble and other decorative stone
- Pure water cutting:
Components for car interiors such as carpets, door panels, bumpers, dashboards, instrument panels, glove compartments, etc.

KMT - The Heart of Waterjet Cutting

For over 40 years now, our heart has been beating for waterjet cutting. You can benefit from the experience and expertise: Just let us know about your personal cutting demands. Taking your requirements into account, we will work out a cutting system concept which best fits your needs so that you can run your production efficiently and economically.



2D-Cutting Table with high pressure pump
STREAMLINE SL-VI 60 PRO-III



3D-Cutting Box with high pressure pump
STREAMLINE SL-VI 100 PLUS

KMT Waterjet Cutting 4,100 vs. 6,200 bar



The ideal solution for every application

With a comprehensive portfolio of high pressure pumps, KMT Waterjet Systems offers the ideal technology for every requirement - from occasional cutting needs to multi-shift operation. Basically, KMT distinguishes between the PRO series for working pressures of up to 6,200 bar and the pump models STREAMLINE SL-VI PLUS and STD, JETLINE JL-I and NEOLINE NL-I which operate in a maximum pressure range of 3,800 to approx. 4,100 bar.

Unsurpassed productivity

The advantages of the high operating pressure of 6,200 bar are particularly relevant for efficiency where operators need to cut thick and/or very hard materials. The high operating pressure improves conformity as well as the quality of the cut edge compared to traditional 4,000 bar applications.

- Depending on the material and its thickness, cutting with 6,200 bar allows operators to increase the cutting speed by up to 50%. In some applications, the increase is even higher.
- Higher operating pressures improve conformity as well as the quality of the cut edge. In many cases, there is no need for reworking cut edges.
- Cutting with 6,200 bar significantly reduces the consumption of abrasive.
- Thanks to the increased cutting speed, more workpieces can be cut in the same time. This leads to lower costs per piece.
- The high working pressure when piercing and cutting the workpiece reduces the delamination for composite material.

Choosing the right pressure system

The following tables can be used to find the high pressure system that is best for a specific application. There are three main variables driving the choice:

1. Type of material
The quality and thickness of the material crucially determines the possible cutting speed and the necessary orifice size. Moreover, the material's hardness determines whether to apply pure water or abrasive cutting.
2. Cutting speed
The possible cutting speed determines the number of orifices needed to meet your production requirements. Speed per cutting head will vary based on the thickness of the material, the operating pressure, the quality and quantity of abrasive, the shape to be cut and type of edge finish desired.
3. Size and number of orifices
The water consumption of the cutting machine depends on the size and number of orifices. The more orifices are operated simultaneously and the larger these orifices are, the higher are the requirements for the pump's performance.

For personal assistance in selecting the high pressure system which is right for a specific application, call KMT. If you do not find your individual material in the list below, our KMT experts will help you to determine the relevant cutting speeds for you.



Explore the KMT Cut Calculator App and compare Waterjet Cutting speeds at 6,000 bar and 4,000 bar.

Android



iOS





Step 1 - Determine the approximate Cutting Speed Rates required. By knowing the speed rate and estimating the orifice size range, a decision can be made on the number of cutting heads required.

Possible Cutting Speed*

| Material | Cutting Speed [mm/min] | | | | |
|-----------------|--------------------------------------|-------------|-------------|-------------|-------------|
| | Pressure [bar] | 6,200 | 4,100 | 6,200 | 4,100 |
| | Ø Water Orifice / Focusing Tube [mm] | 0.20 / 0.60 | 0.25 / 0.75 | 0.25 / 0.75 | 0.35 / 1.05 |
| | Abrasive Flow [g/min] | 400 | 500 | 650 | 750 |
| | Material Thickness [mm] | | | | |
| Aluminum | 10 | 600-750 | 400-500 | 850-1,100 | 600-850 |
| | 20 | 250-300 | 150-200 | 300-450 | 250-350 |
| | 40 | 80-110 | 50-90 | 120-170 | 80-110 |
| Stainless Steel | 10 | 200-250 | 110-160 | 250-350 | 190-250 |
| | 20 | 60-90 | 40-60 | 100-150 | 70-100 |
| | 40 | 25-40 | 15-25 | 35-55 | 25-40 |
| Black Granite | 10 | 550-700 | 350-450 | 750-1,000 | 550-800 |
| | 20 | 200-270 | 130-180 | 300-400 | 200-300 |
| | 40 | 70-100 | 55-75 | 100-150 | 80-110 |

* Surface Quality: medium - smooth

The values in the table are only approximate values as the actual cutting speed may be influenced by further variables (water quality, orifice wear, etc.).

Step 2 - Determine the size of the machine, based on the orifice size and number of cutting heads. The KMT high pressure pumps differ according to maximum pressure range and motor power which affects the water flow rate.

Maximum No. of Orifices at Maximum Pressure†

| Orifice Size [mm] | PRO-III 125 ¹ | PRO-III 60 ¹ | SL-VI 100 PLUS ² | SL-VI 50 PLUS ² | SL-VI 30 PLUS ² | SL-VI 100 STD ³ | SL-VI 50 STD ³ | JL-I 50 ³ | NL-I 40 ³ | SL-VI 15 ² |
|-------------------|--------------------------|-------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|---------------------------|----------------------|----------------------|-----------------------|
| 0.10* | 15 | 7 | 23 | 13 | 8 | 25 | 14 | 12 | 8 | 4 |
| 0.12* | 10 | 4 | 14 | 8 | 5 | 16 | 9 | 8 | 5 | 2 |
| 0.17 | 5 | 2 | 7 | 4 | 2 | 8 | 4 | 4 | 2 | 1 |
| 0.20 | 3 | 1 | 5 | 3 | 2 | 6 | 3 | 3 | 2 | 1 |
| 0.25 | 2 | 1 | 3 | 2 | 1 | 4 | 2 | 2 | 1 | |
| 0.28 | 2 | | 2 | 1 | 1 | 3 | 1 | 1 | 1 | |
| 0.30 | 1 | | 2 | 1 | | 2 | 1 | 1 | | |
| 0.35 | 1 | | 1 | 1 | | 2 | 1 | 1 | | |
| 0.40 | | | 1 | | | 1 | | | | |
| 0.45 | | | 1 | | | 1 | | | | |

† The maximum no. of orifices can be increased by reducing the working pressure.

The actual number of orifices depends on quality and wear of the orifice and may deviate from the given values minimally.

* This orifice size is used for pure water cutting only.

¹ at 6,200 bar ² at 4,100 bar ³ at 3,800 bar

Pumps 6,200 bar

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Cutting heads 6,200 bar

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Pumps 3,800-4,136 bar

page 16 - 23

Cutting heads 3,800-4,136 bar

page 25 - 27



KMT - High Pressure Technology The Intensifier

The best possible reliability as well as simple and quick maintenance are the key features in the development of all KMT high pressure pumps. The simple modular design enables the replacement of every single wear part. This design principle ensures that each component can be used to its maximum lifetime.

Built-in safeguards

High-tech software and built-in sensors provide protection and immediate access to information. More control and information is available faster.

Long-term competitiveness

We are continually adding new technology to our pumps and making it available as retrofit kits for older pumps. Buy a KMT pump today and be assured that you will have access to the most efficient and latest technology long into the future.

THE INTENSIFIER - The reliable heart of all ultra-high pressure pumps

The source of the power in high pressure systems is found in the intensifier. KMT has modified that source to set new standards in terms of user friendliness, maintenance requirements and overall reliability.

Plunger

The plunger consists of a ceramic material; compared to a metal plunger, the harder and smoother surface resists better against wear, eliminates scoring and increases seal lifetimes.

Exclusive long stroke

Reduced maintenance at extended seal life are a result of the longer (8") stroke generating less stress reversals than alternative products.

HYPERLIFE seal kit

Patented high pressure seal design ensures optimized lifetime.

Weep hole indicators

Weep holes reveal the condition of internal seals to protect all high pressure components from major damage due to wear and to achieve maximum lifetimes of the components.

"One-Step" seal and valve replacement

Low and high pressure valves installed in the check valve body can be replaced in one step within a period of 5-10 minutes only.

Hydraulic seal

The convenient, cartridge-style seal in the intensifier combines 6 seals on one cartridge; it can be changed quickly without the need to disassemble the entire hydraulic section of the intensifier.

Electronic shifting

Electronics provide reliable signals for smoother shifting to contribute to a stable pressure signal, which is needed to achieve best cutting edge quality.

Soft Seal End Cap Design „SSEC“

Several thousand intensifiers of the SSEC type are currently in use all over the world, many of them in multiple shift operations. A tried and tested seal assembly ensures a reliable sealing and preloaded jack bolts in the end cap of the intensifier, which can be loosened and tightened without special tools, guarantee simple maintenance. The models JETLINE and NEOLINE are equipped with such an intensifier.



Hard Seal End Cap Design „HSEC“

8

The innovative end cap design provides a metal-to-metal seal which eliminates rubber seals thus reducing consumables and saving operating costs while simultaneously increasing the uptime of your cutting system. The HSEC Design is used in all pumps of the STREAMLINE series. It further includes a larger version (intensification ratio 23:1) for high pressure pumps with 100 HP and more as well as a smaller version (intensification ratio 20:1) for 50 HP pumps.

Bolted end cap for the cylinder

8

The sophisticated design of the end cap enables the more than 4,000 bar (6,000 bar) to be restrained by a torque of only 48 Nm (96 Nm). Furthermore, it is not necessary to completely dismantle the intensifier for maintenance works.

Curve-on-Curve Intensifier

The new patented Curve-On-Curve Design of our intensifiers allows for a longer lifetime of the cylinder body / seal head connection. The optimized geometry of the metal-on-metal seals facilitates the installation and endures more maintenance cycles than conventional technologies.

“Quick Release” plunger concept

9

Thanks to patented design, the removal of the ceramic plunger from the hydraulic piston needs just 4 steps without the necessity to disassemble the entire hydraulic section.



Intensifier Pumps TECHNICAL DATA

SL-VI 125 PRO-III

SL-VI 60 PRO-III

SL-VI 100 PLUS

SL-VI 100 STD



| Description | Unit | SL-VI 125 PRO-III | SL-VI 60 PRO-III | SL-VI 100 PLUS | SL-VI 100 STD |
|---|---------|--|------------------------|------------------------|------------------------|
| Motor Rating | kW/hp | 93 / 125 | 45 / 60 | 74 / 100 | 74 / 100 |
| Pressure Range | bar | 800 - 6,200 | 800 - 6,200 | 500 - 4,136 | 500 - 3,800 |
| Max. Flow Rate at max. Pressure | l/min | 6.0 | 2.8 | 7.1 | 7.6 |
| Length | mm | 2,238 | 2,095 | 2,095 | 2,095 |
| Width | mm | 1,500 | 1,320 | 1,320 | 1,320 |
| Height | mm | 1,552 | 1,508 | 1,508 | 1,508 |
| Weight | kg | 3,107 | 1,973 | 2,173 | 2,128 |
| Cutting Water Circuit | | | | | |
| Intensifier Design | | PRO-III | PRO-III | HSEC 23-C | HSEC 23-C |
| Intensifier System | | Dual | Single | Single | Single |
| Intensification Ratio | | 38.5 : 1 | 38.5 : 1 | 23 : 1 | 23 : 1 |
| Max. Stroke Rate | l/min | 2 x 54 | 54 | 75 | 79 |
| Attenuator Volume | l | 1.6 | 1.6 | 3 | 2 |
| Cutting Water Inlet Pressure | bar | 2.4 - 5.5 | 2.4 - 5.5 | 2.4 - 5.5 | 2.4 - 5.5 |
| Min. Cutting Water Inlet Flow | l/min | 24 | 12 | 30 | 30 |
| Low Pressure Filter | µm abs. | 10 | 10 | 10 | 10 |
| Controls & Electric | | | | | |
| Control System | | Eaton Moeller | Eaton Smartwire | Eaton Smartwire | Eaton Smartwire |
| User Control Display | | 5.7" Color Touchscreen | 5.7" Color Touchscreen | 5.7" Color Touchscreen | 5.7" Color Touchscreen |
| No. of Display Languages | | 11 ¹ | 11 ¹ | 11 ¹ | 11 ¹ |
| Motor Start | | Softstarter | Softstarter | Softstarter | Softstarter |
| Nom. Current at 400V/50Hz | A | 158 | 80 | 124 | 124 |
| Fuse Size at 400/50Hz | A | For the necessary fuse size please adhere to your local requirements | | | |
| Pneumatic, Hydraulics & Cooling Circuit* | | | | | |
| Hydraulic Tank Capacity | l | 416 | 211 | 211 | 211 |
| Oil Level and Temperature Control | | Sensor | Sensor | Sensor | Sensor |
| Oil/Water Heat Exchanger | | ● | ● | ● | ● |
| Oil/Air Cooler | | ○ | ○ | ○ | ○ |
| Standard Features & Options | | | | | |
| Redundant Intensifier | | - | ○ | ○ | ○ |
| High Pressure Transducer | | ● | ● | ○ | ○ |
| Dual Pressure Setting | | - | - | ● | ● |
| Proportional Control | | ● | ● | ○ | ○ |
| Cutting Water Inlet Shut-Off Valve | | ● | ● | ● | ● |
| Safety Dump Valve | | ● | ● | ● | ● |
| Adjustable Booster Pump | | ● | ● | ● | ● |
| Oil Drip Pan | | ● | ● | ● | ● |
| Control Cabinet | | ● | ● | ● | ● |
| Electrical Controls | | ● | ● | ● | ● |
| Doors | | ● | ● | ● | ● |
| Top Cover | | ● | ● | ● | ● |
| Others | | | | | |
| Label According to EC-Machinery Directive | | CE mark | CE mark | CE mark | CE mark |
| Max. Sound Level | dB(A) | <82 | <84 | <84 | <84 |
| Max. Number of Orifices at max. Pressure^a | | | | | |
| 0.10 ^b / 0.12 ^b / 0.15 ^b | | 15 / 10 / 7 | 7 / 4 / 3 | 23 / 14 / 10 | 25 / 16 / 11 |
| 0.17 | | 5 | 2 | 7 | 8 |
| 0.20 | | 3 | 1 | 5 | 6 |
| 0.25 | | 2 | 1 | 3 | 4 |
| 0.30 | | 1 | | 2 | 2 |
| 0.33 | | 1 | | 2 | 2 |
| 0.35 | | 1 | | 1 | 2 |
| 0.38 | | 1 | | 1 | 1 |
| 0.40 | | | | 1 | 1 |
| 0.43 / 0.45 / 0.48 / 0.51 | | | | 1 / 1 / 1 / 0 | 1 / 1 / 1 / 1 |

¹ English, German, Finnish, French, Italian, Polish, Russian, Spanish, Swedish, Czech, Chinese

² English, German, Finnish, French, Italian, Polish, Spanish, Swedish, Czech

³ English, Chinese

⁴ English



| SL-VI 50 PLUS SL-VI 50 & 30 also available as STRIPPED version (values in parentheses) | SL-VI 50 STD | SL-VI 30 PLUS | JL-I 50 | NL-I 40 STRIPPED | SL-VI 15 |
|---|--------------|---------------|---------|------------------|----------|
|---|--------------|---------------|---------|------------------|----------|



| | | | | | |
|---------------|---------------|-------------|-------------|-------------|-------------|
| 37 / 50 | 37 / 50 | 22 / 30 | 37 / 50 | 29 / 40 | 11 / 15 |
| 500 - 4,136 | 500 - 3,800 | 500 - 4,136 | 500 - 3,800 | 500 - 3,800 | 500 - 4,136 |
| 4.1 | 4.3 | 2.6 | 3.8 | 2.7 | 1.3 |
| 1,689 | 1,689 | 1,689 | 2,006 | 1,436 | 1,422 |
| 1,114 | 1,114 | 1,114 | 914 | 1,167 | 711 |
| 1,477 | 1,477 | 1,477 | 1,183 | 1,005 | 940 |
| 1,324 (1,201) | 1,302 (1,179) | 1,131 | 1,111 | 975 | 816 |
| HSEC 20-C | HSEC 20-C | HSEC 20-C | SSEC | SSEC | HSEC 20-C |
| Single | Single | Single | Single | Single | Single |
| 20 : 1 | 20 : 1 | 20 : 1 | 20 : 1 | 20 : 1 | 20 : 1 |
| 60 | 62 | 40 | 54 | 39 | 19 |
| 2 | 1 | 1 | 1 | 1 | 0.5 |
| 2.4 - 5.5 | 2.4 - 5.5 | 2.4 - 5.5 | 2 - 4 | 2 - 4 | 2 - 4 |
| 16 | 16 | 11 | 15.1 | 10.8 | 5.2 |
| 10 | 10 | 10 | 10 | 10 | 10 |

| | | | | |
|------------------------|------------------------|--------------------|----------------------|---------------|
| Eaton Smartwire** | Eaton Smartwire** | Siemens | Eaton Moeller ○ | Relay |
| 5.7" Color Touchscreen | 5.7" Color Touchscreen | 4-Line-Display b/w | 4-Line-Display b/w ○ | - |
| 11" | 11" | 2 ³ | 1 ⁴ ○ | - |
| Softstarter | Softstarter | Y / D Starter | Y / D Starter | Y / D Starter |
| 76 | 76 | 66 | 54 | 22 |

For the necessary fuse size please adhere to your local requirements

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| 150 | 150 | 150 | 151 | 144 | 53 |
| Sensor | Sensor | Sensor | Switch | Switch | Sensor |
| ● | ● | ● | ● | ● | ● |
| ○ | ○ | ○ | ○ | ○ | ○ |
| ○ | ○ | ○ | - | - | - |
| ○ | ○ | ○ | - | - | - |
| ● | ● | ● | ● | ● | ● |
| ○ | ○ | ○ | ● | ● | ● |
| ● | ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● | - |
| ● | ● | ● | ● | ● | ● |
| ●(○) | ●(○) | ●(○) | ● | ● | ● |
| ●(○) | ●(○) | ●(○) | ● | ○ | ● |
| ●(○) | ●(○) | ●(○) | ● | ● | ● |
| ●(○) | ●(○) | ●(○) | ● | ● | ○ |

| | | | | |
|--|------------------------------|-----|-----------------------------|---------|
| CE mark (Declaration of incorporation) | CE mark (Declar. of incorp.) | - | Declar. of incorporation*** | CE mark |
| <76 | <76 | <80 | <78 | <75.5 |

| | | | | | |
|------------|------------|-----------|------------|-----------|-----------|
| 13 / 8 / 5 | 14 / 9 / 6 | 8 / 5 / 3 | 12 / 8 / 5 | 9 / 5 / 4 | 4 / 2 / 1 |
| 4 | 4 | 2 | 4 | 3 | 1 |
| 3 | 3 | 2 | 3 | 2 | 1 |
| 2 | 2 | 1 | 2 | 1 | |
| 1 | 1 | | 1 | 1 | |
| 1 | 1 | | 1 | | |
| 1 | 1 | | 1 | | |
| | 1 | | | | |

* The following applies to all pumps:
 Min. pneumatic air pressure 5.9 bar
 Max. pneumatic air flow rate 28.3 l/min
 Ambient temperature at Oil-to-Water cooling circuit 5 - 40°C
 Ambient temperature at Oil-to-Air cooling circuit 5 - 30°C

** Model STRIPPED without control system
 *** Full version with CE mark.
 a The actual number of orifices depends on quality and wear of the orifice and may deviate from the given values minimally.
 b This orifice size is used for pure water cutting only.
 ● Standard ○ Option

High-Pressure Pumps - 6,200 bar STREAMLINE PRO-III



With its PRO high-pressure range, KMT Waterjet Systems sets new standards in the field of waterjet cutting. PRO stands for waterjet cutting technology with operating pressures of up to 6,200 bar, and the range of products includes all necessary components and accessories - from high-pressure generation units to orifices that guide the cutting jet with great precision onto the material.

- STREAMLINE PRO ultra high-pressure pumps
- ACTIVE AUTOLINE PRO abrasive cutting head
- ACTIVE IDE PRO abrasive cutting head
- AQUALINE PRO pure water cutting head
- AMS PRO abrasive management system
- PSC PRO valves, pipes and fittings

Taking into account the increased exposure to high pressure, the PRO products were designed to ensure economical operation with enhanced service life. The original PRO series by KMT Waterjet thus offers you optimized high-pressure equipment meeting the highest requirements as regards reliability and cutting quality in heavy-duty continuous operation.

Advantages of Waterjet Cutting at 6,200 bar

Compared to conventional waterjet cutting at 4,100 bar, the increased maximum pressure range features the following benefits:

- Higher cutting speeds
- Improved cutting edge quality
- Lower abrasive consumption
- Higher productivity
- Optimized machine utilization
- Improved conformality
- Reduced delamination

STREAMLINE PRO

The high pressure pumps of the STREAMLINE PRO series have significantly enhanced the productivity and efficiency of the waterjet cutting technology. The innovative high pressure pumps have been designed for both pure water and abrasive waterjet cutting at operating pressures of up to 6,200 bar.

The STREAMLINE PRO is available in two models with 45 kW or 93 kW. At a pressure of 6,200 bar, the two machine versions offer volumetric flows of 2.8 l/min and 6.0 l/min respectively. This enables the operator to cut with either single or multiple heads.

Two pressure intensifiers for an optimized pressure signal

In the PRO 125 with 93 kW, the cutting pressure of 6,200 bar is produced with the help of two pressure intensifiers, which are operated with a phase shift. These intensifiers pump the cutting water through a 1.6 l pressure accumulator to the cutting heads. The standard model comes with a proportional pressure control system for the stepless adjustment of the cutting pressure. It is also equipped with a pressure transducer monitoring the cutting pressure in the high pressure line. This control circuit ensures equal utilization of the two pressure intensifiers and optimizes the pressure signal, which significantly affects the cut edge quality of the workpiece.





With the introduction of the 6,200 bar PRO technology, KMT Waterjet Systems brought waterjet cutting to a new level. As a result of the continuous efforts to further advance this technology, KMT developed the new optimized SUPRAlife Seal for the intensifier of the STREAMLINE PRO-III offering the industry's most powerful combination of horsepower and pressure with significant improvements in uptime.

Improved uptime thanks to optimized SUPRAlife Seal design

To achieve longer uptimes and a more efficient high pressure pump, KMT revised the design of the high pressure seal construction: Instead of installing the seal package into the cylinder bore, it is integrated into a cartridge housing which seals against a chamfer at the end of the cylinder. This prevents damage from the cylinder bore. The **new design significantly increases the seal life** compared to the previous technology.

To benefit from a maximum seal life, a consistent pre-load needs to be applied to the assembly. Therefore, a hydraulic pre-tensioner is included in the dedicated tool kit. This facilitates the maintenance and always guarantees the exact tightening torque thus ensuring maximum seal life.

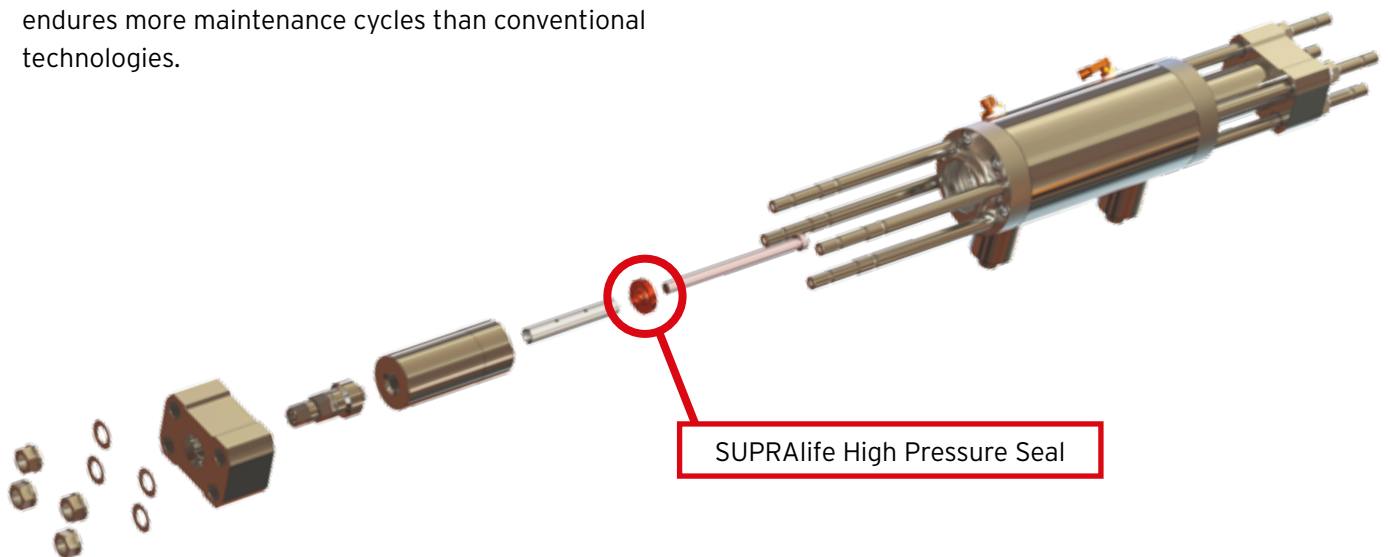
Patented intensifier technology

The new patented Design of our PRO-III intensifiers allows for a longer lifetime of the cylinder body / seal head connection. The optimized geometry of the metal-on-metal seals facilitates the installation and endures more maintenance cycles than conventional technologies.

| Technical Data PRO-III | | | | | | |
|--|----------------------------------|------|-----------------|--------------------------------|------|------|
| | 125 ¹ | | 60 ² | | | |
| Motor Rating | 93 kW / 125 hp | | 45 kW / 60 hp | | | |
| Pressure Range | 500 - 6,200 bar | | | | | |
| Max. Flow Rate at max. Pressure | 6.0 l/min | | 2.8 l/min | | | |
| Intensifier Design | PRO-III | | | | | |
| Label acc. to EC-Machinery Directive | CE mark | | | | | |
| Max. Number of Orifices at max. Pressure | | | | | | |
| | Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | |
| | 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.38 |
| 1 | 15 | 10 | 7 | 5 | 2 | 1 |
| 2 | 7 | 4 | 3 | 2 | 1 | - |

Benefits of KMT's PRO-III Intensifier

- Revised high pressure seal design using the optimized SUPRAlife Seal for a longer lifetime
- Patented Intensifier Design
- Sophisticated heat treat of the seal head body
- Titanium discharge check valve
- Stainless steel liners
- Optimized hydraulic piston design for a better sense of the proximity switch
- Super polished plunger



Abrasive Cutting Heads - 6,200 bar

ACTIVE AUTOLINE PRO + ACTIVE IDE PRO

The PRO abrasive cutting heads from KMT WATERJET SYSTEMS have been specially designed for waterjet cutting with 6,200 bar. Their design and materials can withstand huge forces while focusing the energy to the point where it is needed, namely to the cutting jet.

ACTIVE AUTOLINE PRO abrasive cutting head

Among the outstanding features of ACTIVE AUTOLINE PRO cutting heads are automatic precision positioning, perfect repetition accuracy, high cutting speeds, long service life and easy maintenance. It takes only seconds to replace the few wear parts of the head, such as the orifice, mixing chamber and focusing tube, and no tools are required. In order to keep routine maintenance to a minimum, these parts are made from tough wear-proof materials. The typical features of KMT products based on the innovative approach for efficiency and economy in continuous operation have thus been successfully integrated into the design of the cutting head.

ACTIVE AUTOLINE PRO cutting heads can be integrated into all waterjet cutting systems with rigid or multiple head connections.

ACTIVE IDE PRO Improved cutting performance thanks to high precision

The ACTIVE IDE PRO cutting head features a diamond orifice which is firmly integrated into the orifice body. A specially devised manufacturing method ensures that the waterjet is properly aligned at all times and connected to the mixing chamber located below the orifice body. In the mixing chamber, the abrasive is added to the waterjet. The stringent production tolerances for the mounted cutting head guarantee that the cutting jet is always properly aligned along the axis. As the waterjet exits the focusing tube at the correct angle, the power of the waterjet is focused for optimum impact. This allows for maximum cutting speeds at minimum cutting gaps combined with excellent cutting edge quality.

HYPERTUBE PRO focusing tube for 6,200 bar applications

With the HYPERTUBE PRO, KMT Waterjet has developed a patented design that considerably prolongs the service life of the focusing tube. In most cases, the focusing tube shows asymmetric wear, which results in an elliptic deformation of the outlet opening. HYPERTUBE PRO focusing tubes are equipped with an index that enables operators to repeatedly turn the tube by a set angle in the housing of the cutting head. This results in a uniform wear pattern so that the waterjet cross-section remains circular.

The jet remains properly focused for a longer period of time, which further helps reduce the operating costs of the waterjet cutting unit. Experience shows that this patented solution prolongs the service life of focusing tubes by around 100%.

ACTIVE IDE PRO

ACTIVE AUTOLINE PRO

ABRASIVE MANAGEMENT SYSTEM

The abrasive cutting heads ACTIVE AUTOLINE PRO and ACTIVE IDE PRO are also available in the attractive AMS package, which additionally includes the components ABRALINE (see page 30) and FEEDLINE (see page 31) thus representing the simple complete solution for the abrasive feed.



Pure Water Cutting Head - 6,200 bar AQUALINE PRO

The nozzle valve for maximum stress

The wide range of cutting tasks and numerous switching cycles puts a heavy strain on the nozzle valve. With the AQUALINE PRO pure water cutting head, KMT has developed the perfect solution for 6,200 bar applications. As the cutting speed is higher than with 4,000 bar, delamination is significantly reduced and in many cases completely eliminated. Depending on the actual requirements, the valves are available as normally open (N/O) or usually closed (N/C) valves. These high-pressure valves usually open in less than 50 ms, depending on the operating pressure. High precision, sturdy design and extremely short switching times are the key features of the AQUALINE PRO waterjet cutting head range.

PSC-PRO installation parts for 6,200 bar valves, connectors and pipes

PSC stands for Precision System Components, which include all installation parts required in high pressure cutting technology to feed the cutting water from the pump to the connected cutting stations. The PRO series of PSCs has been specially developed to meet the requirements of waterjet cutting with 6,200 bar. The comprehensive PSC-PRO range of products allows for the flexible and reliable installation of pipeline systems suitable for all commonly used cutting systems. PSCs from KMT offer unrivalled reliability, availability and wear-resistance.



AQUALINE PRO





High-Pressure Pump - 4,136 bar

STREAMLINE SL-VI 100 / 50 / 30 PLUS

With the new series of STREAMLINE SL-VI high pressure pumps for waterjet cutting, KMT Waterjet Systems optimizes their complete range of high pressure intensifier pumps. Based on four frames in different sizes, the SL-VI series will grant the KMT customers an unprecedented choice of configuration possibilities. And while being based on tried and tested technology, the SL-VI comes up with some considerable improvements compared to the predecessor model.

Working pressure of up to 4,136 bar

The pump units are available in three different power rates (22, 37 and 74 kW). Wherever required, the STREAMLINE SL-VI supplies high pressure water of up to 4.136 bar. In those areas where such a high pressure is not needed, the STREAMLINE SL-VI can cut material at a lower pressure.

Improved motor performance

The motor of the STREAMLINE SL-VI pumps allows for multi input voltages and has been upgraded to IE3 according to the norm EC 640/2009. This leads to an optimized motor efficiency: Compared to previous models, the pump can create a higher flow rate of the high pressure water at the same motor rating, thus increasing the maximum possible orifice size and with it the cutting system's productivity.

Patented intensifier technology

The new patented Curve-On-Curve Design of our intensifiers allows for a longer lifetime of the cylinder body / seal head connection. The optimized geometry of the metal-on-metal seals facilitates the installation and endures more maintenance cycles than conventional technologies.

| Technical Data SL-VI PLUS | | | | | | |
|--|-------|------------------|--------------------------------|-----------------|------|------|
| | Unit | 100 ¹ | 50 ² | 30 ³ | | |
| Motor Rating | kW/hp | 74 / 100 | 37 / 50 | 22 / 30 | | |
| Pressure Range | bar | 500 - 4,136 | | | | |
| Max. Flow Rate at max. Pressure | l/min | 7,1 | 4,1 | 2,6 | | |
| Intensifier Design | | HSEC 23-C | HSEC 20-C | HSEC 20-C | | |
| Label acc. to EC-Machinery Directive | | CE mark | | | | |
| Max. Number of Orifices at max. Pressure | | | | | | |
| Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | | |
| | 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.35 |
| 1 | 23 | 14 | 10 | 7 | 3 | 1 |
| 2 | 13 | 8 | 5 | 4 | 2 | 1 |
| 3 | 8 | 5 | 3 | 2 | 1 | 0 |

Top cover guard interlock design

The top cover is made of transparent material. Therefore, a visual inspection of the intensifier assembly is possible without the necessity to open the cover. Moreover, the top cover guard interlock design meets the EN ISO 13849-1 safety performance standard thus providing increased operational safety when working with the pump.

High Pressure Pump - 3,800 bar STREAMLINE SL-VI 100 / 50 STD

For application which do not require a maximum pressure of 4,136 bar, KMT WATERJET SYSTEMS offers the STREAMLINE SL-VI STD high pressure pump as a lower priced alternative still featuring KMT's advanced pump technology. The STD models can be operated both independently as a stand-alone unit or communicating with the central control system of the entire cutting machine.

Applicable for pure water & abrasive cutting

The STREAMLINE SL-VI STD is designed for flexible production in pure water as well as in abrasive applications. It is dedicated to those kinds of cutting jobs which require cutting pressure of up to 3,800 bar. The high reliability and lifetime performance equal those of our more sophisticated PLUS models.

Durable components

The plunger of every SL-VI pump model consists of a ceramic material. Compared to a metal plunger, the harder and smoother surface resists better against wear, eliminates scoring and increases seal lifetimes.

Softstarter saves electricity costs

The included softstarter additionally helps you to decrease your operating cost by reducing peaks in the consumption of electricity. Your local current supply usually does not have to get modified to install the STREAMLINE SL-VI unit.

| Technical Data SL-VI STD | | | | | | |
|---|----------------------------------|------|------|--------------------------------|------|------|
| | 100 ¹ | | | 50 ² | | |
| Motor Rating | 74 kW / 100 hp | | | 37 kW / 50 hp | | |
| Pressure Range | 500 - 3,800 bar | | | | | |
| Max. Flow Rate at max. Pressure | 7.6 l/min | | | 4.3 l/min | | |
| Intensifier Design | HSEC 23-C | | | HSEC 20-C | | |
| Label acc. to EC-Machinery Directive | CE mark | | | | | |
| Max. Number of Orifices at max. Pressure | | | | | | |
| | Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | |
| | 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.35 |
| 1 | 25 | 16 | 11 | 8 | 4 | 2 |
| 2 | 14 | 9 | 6 | 4 | 2 | 1 |

Individual configuration

As both pump models SL-VI PLUS and SL-VI STD are based on the same technology and the same frame, operators of an STD pump can benefit from the advanced hi-tech design of the PLUS model. By choosing different configuration possibilities, the pump can be customized to fit the operator's demands.



High Pressure Pump - 3,800 bar STREAMLINE SL-VI 15



The STREAMLINE SL-VI 15 pump was specifically designed for light-duty applications demanding a reliable source of high pressure. It is dedicated to cutting systems using one to three cutting heads to cut soft materials with a pure waterjet such as food, textiles, paper, foam, gypsum cardboard or insulation material.

Compact Design for Convenient Integration

The compact design of the STREAMLINE SL-VI 15 pump supports the machine manufacturer to integrate the pump in his individual systems design communicating with the control system of the entire machine. On the other hand, it can also be installed as a stand alone unit. It does not require much space and all components are very easy to access for maintenance. For better visibility and ease of maintenance, it provides an open view to the high pressure generating intensifier.

Safety functions and features

The safety dump valve kit releases the pressure from the system as soon as the pump shuts off by pressing the emergency stop. It shuts off automatically if the oil level is below the minimum level or if the oil overheats. In these cases, a red light flashes in order to indicate the faulty operating condition to the operator.

| Technical Data SL-VI 15 | | | | | |
|--|-----------------|------|--------------------------------|------|------|
| Motor Rating | 11 kW / 15 hp | | | | |
| Pressure Range | 500 - 4,136 bar | | | | |
| Max. Flow Rate at max. Pressure | 1.2 l/min | | | | |
| Intensifier Design | HSEC 20 | | | | |
| Label acc. to EC-Machinery Directive | CE mark | | | | |
| Max. Number of Orifices at max. Pressure | | | | | |
| Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | |
| 0.10 | 0.12 | 0.15 | 0.17 | 0.20 | 0.25 |
| 4 | 2 | 1 | 1 | 1 | - |

Abrasive cutting also possible

The SL-VI 15 pump also has the capability to supply one abrasive cutting head for cutting harder materials of smaller thickness. It allows operating the lowest orifice combinations needed for abrasive cutting. If you intend to use your system mainly for abrasive applications and if the thickness of the materials varies case by case, you should consider the installation of a more powerful KMT pump.





High Pressure Pump - 4,136 bar STREAMLINE SL-VI 50 / 30 STRIPPED

KMT WATERJET SYSTEMS offers an intensifier manufactured for complete system integration. The SL-VI STRIPPED pumps are designed for those users who prefer to design and build the pump control logic themselves, including shutdown due to overstroking, overheating, loss of water pressure and all other aspects of pump control.

Compact size fits any machine

The high pressure pump SL-VI STRIPPED features all options of a fully equipped STREAMLINE SL-VI pump but comes without control cabinet, electrical controls, doors or cover. Therefore, it is suitable for the integration into the centralized control unit of an entire turnkey system and can easily be adjusted to fit every waterjet cutting system design. The pump operates at up to 4,100 bar (model PLUS) but is also available as a lower priced version with an operating pressure of up to 3,800 bar (model STD).

Junction box

The intensifier's electrical control panel, motor controls and PLC are replaced with an interface wiring junction box, allowing the system builder to supply all power, control and logic interface to the intensifier from the motion control panel. The entire waterjet cutting system can then be operated and controlled from one convenient location.

| Technical Data SL-VI STRIPPED | | | | | | |
|--|-------|------------------------------|--------------------------------|----------------------|------|------|
| | Unit | 50 PLUS ¹ | 50 STD ² | 30 PLUS ³ | | |
| Motor Rating | kW/hp | 37 / 50 | 37 / 50 | 22 / 30 | | |
| Max. Pressure | bar | 4,136 | 3,800 | 4,136 | | |
| Max. Flow Rate at max. Pressure | l/min | 4.1 | 4.3 | 2.6 | | |
| Intensifier Design | | HSEC 20-C | HSEC 20-C | HSEC 20-C | | |
| Label acc. to EC-Machinery Directive | | Declaration of incorporation | | | | |
| Max. Number of Orifices at max. Pressure | | | | | | |
| Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | | |
| | 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.35 |
| 1 | 13 | 8 | 5 | 4 | 2 | 1 |
| 2 | 14 | 9 | 6 | 4 | 2 | 1 |
| 3 | 8 | 5 | 3 | 2 | 1 | 0 |

Options

The pump is designed for experienced waterjet machine manufacturers with the necessary high pressure technology implementation skills and the ability to add all control and safety features. Optional kits are available to be installed by the manufacturer.





High Pressure Pump - 3,800 bar NEOLINE NL-I 40 STRIPPED

The NEOLINE NL-I 40 High Pressure Pump features KMT's proven and reliable SSEC intensifier technology in an affordable entry-level product, thus offering a great value at a reasonable price. It is the perfect solution for everyone who is looking for an economical waterjet cutting solution for occasional cutting needs using the best technology the industry has to offer.

Tried and tested concept helps reduce operating costs

As the intensifier contains only a small number of wear parts, operating costs are kept low in comparison with conventional pumps. Also contributing to the outstanding economy of the pump is the long service life of the components subject to wear. Costly downtimes are thus virtually eliminated.

Fit-to-need electric controls

The full version of the NEOLINE pump uses basic PLC based controls for pump on/off and E-Stop with a user-friendly operator interface including an electrical junction box. However, for system manufacturers who want to control the pump by their turnkey system-PLC it is also available without any pre-installed electric controls.

Elaborate design for ease of operation and a long product life

The NEOLINE pump has been developed with the aim of creating a robust, easy to operate pump. It is driven by a 40 hp (29 kW) three-phase motor which is equipped with vibration isolation pads to protect the rest of the pump from the motor activity. Furthermore, the NL-I 40 features a rugged powder-coated finish protecting the surface from environmental influences. For ease of operation, the KMT engineers developed a new low profile cabinet design which grants easy access to the pump controls and other components.

| Technical Data NL-I 40 | | | | | |
|--|-------------------------------|------|--------------------------------|------|------|
| Motor Rating | 29 kW / 40 hp | | | | |
| Pressure Range | 500 - 3,800 bar | | | | |
| Max. Flow Rate at max. Pressure | 2.7 l/min | | | | |
| Intensifier Design | SSEC - PL | | | | |
| Label acc. to EC-Machinery Directive | Declaration of Incorporation* | | | | |
| Max. Number of Orifices at max. Pressure | | | | | |
| Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | |
| 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.35 |
| 8 | 5 | 3 | 2 | 1 | - |

* Full version with CE mark

Further features of the NEOLINE NL-I 40 (full version) include:

- Dual Pressure Compensator
- Manual Pressure Control
- Auto Bleed Down Valve
- Booster Pump with 10 micron Filter
- Low Inlet Water Pressure Safety Switch (2 bar)
- Variable Displacement Axial Piston Pump
- Y / D Starter
- CE-marked



High Pressure Pump - 3,800 bar JETLINE JL-I 50



The JETLINE high pressure pump is equipped with an SSEC intensifier and combines all the advantages of KMT Waterjet Systems for waterjet cutting applications. As the pump has been especially designed for the Asian market, it is not CE marked. Nevertheless, it meets all expectations regarding cost-efficient waterjet cutting.

Economic waterjet cutting in one-shift operation

The high pressure pump JETLINE JL-I is available with 37 kW and can serve waterjet cutting machines operating with single or multiple cutting heads. Due to the intelligent control system and the intensifier design, the JETLINE pump is best used in one-shift operation.

Built-in safety thanks to intelligent control system

To ensure highest safety and reliability, the JETLINE is equipped with a PLC system including a text display. This four-line display provides the machine operator with valuable information regarding the operating status of the pump. Information that might be relevant for proper servicing is thus easily available, and the display acts as an indispensable tool for troubleshooting.

Suitable for stand-alone operation or integration into overall system

Depending on the customer's requirements, the pump can be run as a stand-alone unit or integrated into the control system of the overall plant. The messages of the four-line display can be transferred to the control desk display of the plant control system.

| Technical Data JL-I 50 | | | | | |
|--|-----------------|------|--------------------------------|------|------|
| Motor Rating | 37 kW / 50 hp | | | | |
| Pressure Range | 500 - 3,800 bar | | | | |
| Max. Flow Rate at max. Pressure | 3.8 l/min | | | | |
| Intensifier Design | SSEC - PL | | | | |
| Label acc. to EC-Machinery Directive | - | | | | |
| Max. Number of Orifices at max. Pressure | | | | | |
| Orifice Sizes Pure Water Cutting | | | Orifice Sizes Abrasive Cutting | | |
| 0.10 | 0.12 | 0.15 | 0.17 | 0.25 | 0.35 |
| 12 | 8 | 5 | 4 | 2 | 1 |

Energy-efficient motor start

To prevent voltage peaks that affect the energy costs, each JETLINE pump is equipped with a Wye-Delta starter unit. Your power system is thus not subjected to unnecessarily high loads.





High Pressure Pump - 3,800 bar TRILINE TL-I 30

With the direct-drive high pressure pump TRILINE TL-I 30, KMT Waterjet Systems broadens their product range by adding an alternative pump technology to their portfolio. The new pump has an excellent cost of ownership value and can be used as a stand-alone unit for everyday cutting needs.

Efficiency for everyday cutting

The TRILINE TL-I 30 is best used as a continuous duty water pressure generator. It achieves a very high degree of efficiency when the cutting time reaches at least 80% of the motor running time. Its small footprint and high efficiency at continuous operation is ideal for little job shops doing conventional shapecutting. However, it may also prove valuable in a more demanding environment with high running times.

Modern reliable design for continuous operation

The heart of the TL-I 30 direct-drive Pump is the crank case, which has been designed to allow for top performance and easy maintenance. It features a machined stainless steel subplate with integral cooling passages so that the rods are not exposed to environmental influences. Engineered vibration and noise dampening ribbing in the case ensure quiet and smooth operation. For further ease of use, a sight glass enables the operator to instantly check the oil level without using a dip stick and to easily inspect oil dirtiness.

Patented pressure valve for flexibility

The patented Pressure Control Valve allows for quick changes to the water pressure or flow which is directed from the pump to the cutting heads. The valve controls the water pressure/flow by pressurized air and reduces maintenance as well as enables cutting at any pressure. It features fast response times and is highly reliable and very simple to maintain.

| Technical Data | |
|--------------------------------------|----------------|
| Motor Rating | 22 kW / 30 hp |
| Voltage | 400 V / 50 Hz* |
| Max. Pressure | 4,137 bar |
| Operating Pressure | 3,800 bar |
| Flow Rate | 3.1 l/min |
| Max. Orifice Ø | 0.30 mm |
| Strokes/min per plunger | 720 |
| Water Inlet Temp. | 12.7 - 21°C |
| Air Supply Pressure | 6.2 - 8.3 bar |
| Label acc. to EC-Machinery Directive | CE mark |

* all units available for 480 V / 60 Hz on request

Features of the TRILINE TL-I 30 direct-drive pump

- The TRILINE TL-I 30 pump combines patented seal technology used in 6,200-bar-machines with direct-drive efficiency
- Patented valve for running multiple independent cutting heads
- Softstarter reduces the startup current needed for the motor
- Small footprint
- Improved efficiency
- Low sound level
- Efficient IE3 compliant motor
- CE-mark
- No necessity for separate cooling water
- Adjustable high and low pressure
- Excellent pressure signal thanks to the phased movement of three pistons
- Power transmission from motor to topworks via an easily maintainable belt and pulley drive system
- The direct-drive pump can run larger orifices at the same motor rating than an intensifier pump



The direct-drive technology for high pressure pumps has been developed in the 1990s and constitutes an alternative to hydraulic intensifier pumps when it comes to waterjet cutting machines. Direct-drive pumps are based on a comparably simple technology with the power being transmitted from the motor to the topworks via a belt and pulley drive system. This design makes direct-drive pumps more efficient than intensifier pumps and allows for a smaller footprint of the machine.

Direct-drive power transmission

An electric motor directly powers three crankshaft-driven plungers via an easily maintainable belt and pulley drive system. The plungers are operated with a phase-shift thus delivering a constant stream of high pressure water. Due to this direct power transmission, a direct-drive pump has a relatively high efficiency of up to 85%. Moreover, this method of power transmission is very simple and consists of far fewer parts than a hydraulic circuit. Operators of direct-drive pumps therefore benefit from an easy troubleshooting when it comes to the drive system. In comparison to hydraulically driven systems, belt-and-pulley systems are quieter and cleaner.

Components of the direct-drive pump

- Efficient IE3 compliant electric motor
- Easily maintainable belt and pulley drive system in a covered transmission housing
- Expertly engineered crankcase featuring vibration and noise dampening as well as a steel subplate
- Wet end including three plungers and 6,200-bar-technology seals
- High pressure manifold
- Patented Pressure Control Valve (PCV) for variable water pressure and flow



Technology Overview

Intensifier vs. Direct Drive

Hydraulic intensifier pumps and direct-drive pumps feature different technologies to reach the same goal: Generating a stream of high water pressure for waterjet cutting systems. Both technologies have been tried and tested over many years and proven their value in different applications. To determine which of the systems should be used for a given application, you have to take into consideration the demands each application makes on the necessary high pressure pump.

Advantages of the intensifier pump

- The intensifier technology enables waterjet cutting at up to 6,200 bar. The ultra-high pressure technology proves particularly valuable when cutting thick and/or very hard materials (see also pp. 6 & 7 of this brochure).
- Intensifiers tend to feature a longer seal life than direct-drive pumps, even at very high duty cycles (especially regarding the advanced PRO-III SUPRALife Seal - see page 13).
- As the water flow is interrupted during cutting pauses, there is no water drain when changing orifices.
- Multiple intensifier pumps can be combined to a pump network thus bundling the performance of the pumps to create a highly reliable and constant stream of high pressure water.

➔ **These advantages combined make the intensifier technology the perfect choice for highly demanding applications including multi shift operation, high volume production and extremely hard and thick materials.**



Advantages of the direct-drive pump

- Direct-drive pumps are generally at least 15% more efficient at converting electrical power into high pressure cutting power. This increase in efficiency allows the use of a larger orifice than an intensifier of equivalent horsepower and pressure.
- There is no need for additional cooling water as the cutting water is sufficient to cool the system.
- Direct-drive pumps do not use hydraulics, which makes them quieter, cleaner and smaller than intensifier pumps.
- The cost of purchase for a direct-drive pump is lower than for an intensifier pump.
- The footprint of the direct-drive pump is considerably smaller.

➔ **The direct-drive technology is very well suited for less demanding applications where the machine is used as a stand-alone pump. Also, it is a suitable alternative for an intensifier pump if installation space or initial capital investment are an issue.**



Pure Water Cutting Head - 4,136 bar AQUALINE I

Especially automotive applications are among the most demanding of subcontracting jobs in the industry. Demands put on waterjet components are certainly not an exception, but a confirmation of this rule. Production units usually run 3 x 8-hour shifts throughout the complete week highlighting a need for extremely high reliability and speed.

Reliability under extreme conditions

Our AQUALINE I pure water cutting head has gained an industry-wide reputation for being amongst the quickest and the most reliable pure water cutting heads under extreme working conditions, through fastest reaction times and high component lifetimes and quality.

High performance nozzle valve

The multiple cutting cycles found in these industries place huge requirements on the on/off cycle speed and reliability of the cutting valve. The KMT AQUALINE I provides the industry's top quality leading solution in this area. Depending on the application, normally closed (N/C) and normally open (N/O) cutting valves are available. The nozzle valve opens in less than 50 ms depending on the operating pressure.

Compact design for flexible use

The AQUALINE I head weighs only 1.8 kg (3.9 lbs) guaranteeing high flexibility and making multi-head and 3-D applications easy. It can be equipped with both sapphire and diamond orifices, whatever fits the individual process needs best.

Pre-filter protects the water nozzle

The pre-filter is installed between the HD line and the nozzle valve body in the adapter. This component reduces the mechanical impact on the water nozzle, as particles are removed from the cutting jet so that they do not cause abrasion to the nozzle. This significantly prolongs the service life of the nozzle and lowers the operating costs.

| Technical Data | |
|------------------------------|-------------|
| Length | 91 mm |
| Width | 91 mm |
| Height (with 8" Nozzle Tube) | 448 mm |
| Weight | 1.8 kg |
| HP Connection | 3/8" UNF |
| Mounting Screws (2x) | 1/4" x 7/8" |

| Cycle Times at 3,450 bar | |
|--------------------------|----------|
| N/C Valve open | < 50 ms |
| N/C Valve close | < 160 ms |
| N/O Valve close | < 50 ms |
| N/O Valve open | < 115 ms |

| Cutting Speed | | |
|--------------------|----------------|------------------------|
| Material | Thickness [mm] | Cutting Speed [mm/min] |
| Rubber | 2 | 27,000 |
| | 10 | 11,500 |
| | 20 | 2,200 |
| Synthetic material | 2 | 22,500 |
| | 5 | 8,900 |
| | 10 | 3,400 |
| Foamed material | 10 | 27,500 |
| | 100 | 5,500 |

at 4,136 bar; orifice sizes: 0.10 mm-0.25 mm;
surface quality: medium - smooth

Abrasive Cutting Heads - 4,136 bar

ACTIVE AUTOLINE II + ACTIVE IDE II

With the cutting heads ACTIVE AUTOLINE II and ACTIVE IDE II, KMT WATERJET SYSTEMS has developed abrasive cutting head assemblies that provide the best efficiency by utilizing long life components. Thus, maintenance efforts can be reduced and running times extended. The KMT cutting heads feature the following characteristics:

Design ensures correct alignment of the jet

There is no need to adjust the water jet alignment at the nozzle. The construction design ensures that the water-abrasive mixture is ejected at the center of the nozzle and at maximum speed.

Instant indication of preventable faults

The cutting head is equipped with a leakage bore near the water nozzle. It indicates whether the nozzle is installed correctly and the cutting head is properly secured. Damage to the sealing surfaces of diamond or sapphire nozzles or to the nozzle pipe can thus be easily detected and eliminated.

Pre-filter protects the water nozzle

The pre-filter is installed between the HD line and the nozzle valve body in the adapter. This component reduces the mechanical impact on the water nozzle, as particles are removed from the cutting jet so that they do not cause abrasion to the nozzle. This significantly prolongs the service life of the nozzle and lowers the operating costs.

Superior edge quality

Thanks to the longer service life of the diamond orifices, a more consistent waterjet can be achieved over a longer period of time. This in turn helps increase the lifespan of the focusing tube and results in smoother cutting edges and less waste.

Reduced setup time

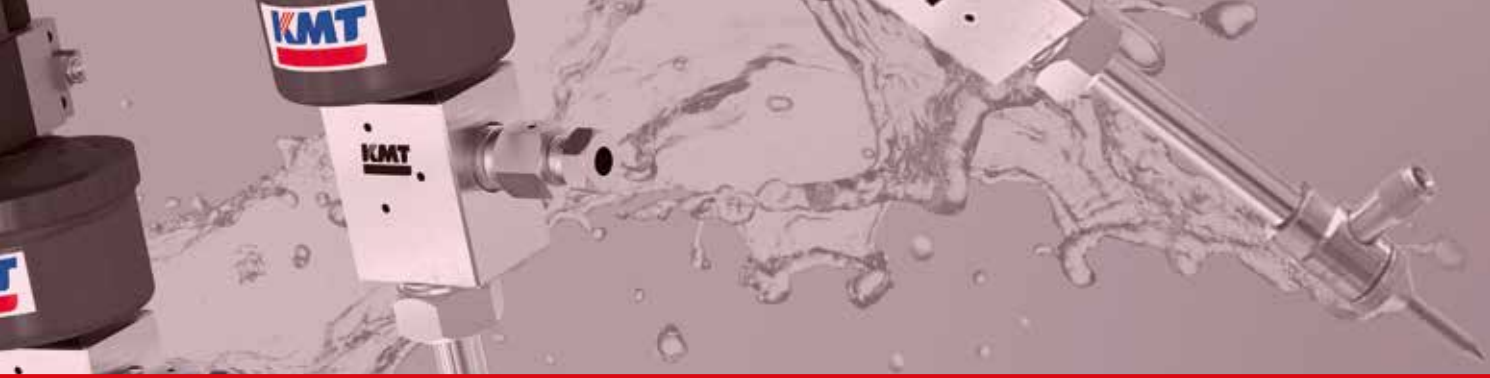
The pre-aligned orifice and focusing tube reduce the operator setup time by maintaining an accurate Tool Center Point (TCP), and ensuring an effective cutting stream.

| Standard Nozzle Configurations [mm (inch)] | |
|--|---------------|
| Orifice | Focusing Tube |
| 0.17 (0.007) | 0.54 (0.021) |
| 0.23 (0.009) | 0.76 (0.030) |
| 0.25 (0.010) | 0.76 (0.030) |
| 0.30 (0.012) | 0.90 (0.035) |
| 0.33 (0.013) | 1.10 (0.043) |
| 0.35 (0.014) | 1.10 (0.043) |

ABRASIVE MANAGEMENT SYSTEM

The abrasive cutting heads ACTIVE AUTOLINE and ACTIVE IDE are also available in the attractive AMS package, which additionally includes the components ABRALINE (see page 30) and FEEDLINE (see page 31) thus representing the simple complete solution for the abrasive feed.





ACTIVE AUTOLINE II - Easy solution for top level performance

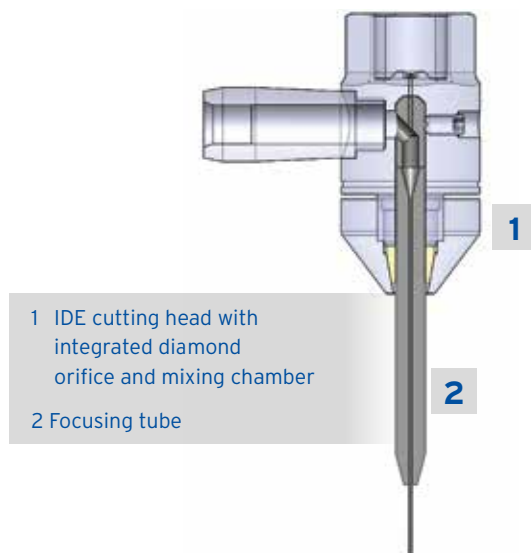
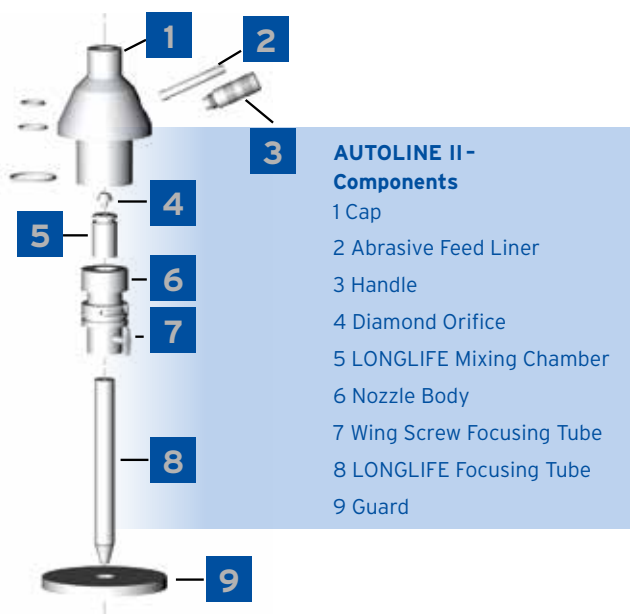
- The patented tool-free attachment allows for the quick exchange of the water and focusing nozzles without the need to dismantle the abrasive feed hose.
- The unique non-metallic welded nozzle base caters for high precision and repetition accuracy.
- The AUTOLINE II cutting head includes only three wear parts, namely the orifice, the mixing chamber and the focusing tube, which are made from extremely wear resistant materials.
- The nozzle body consists of an exchangeable insert. If worn, simply replace the mixing chamber.
- Pure-water cuts can be made with the same orifice, so retooling takes only a few seconds.

| Technical Data | |
|----------------------|-------------|
| Length | 91 mm |
| Width | 115 mm |
| Length Nozzle Tube | 6" |
| Total Height | 448 mm |
| Weight | 3 kg |
| HP Connection | 3/8" UNF |
| Mounting Screws (2x) | 1/4" x 7/8" |

ACTIVE IDE II - Breakthrough in performance and simplicity

- As the cutting head contains a minimum number of individual components, it is particularly easy to handle while producing high-precision cuts.
- Important features are the low maintenance effort, the exact targeted cutting jet, the pre-filter protecting the orifice and the advanced nozzle valve design.
- The diamond orifice and the mixing chamber are combined in a single nozzle body. Both professional users and workers who have only recently been introduced to abrasive cutting benefit from the simple design of the unit as the focusing tube and the pre-filter, which are the only wear parts, can be exchanged easily and quickly.

| Technical Data | |
|----------------------|-------------|
| Length | 91 mm |
| Width | 97 mm |
| Length Nozzle Tube | 5.75" |
| Total Height | 448 mm |
| Weight | 3.2 kg |
| HP Connection | 3/8" UNF |
| Mounting Screws (2x) | 1/4" x 7/8" |



Redundant intensifier

Adding a redundant intensifier provides a completely identical high pressure production system to a high pressure pump. Activating the redundant system takes just a few minutes and maintains a continuous flow of maximum high pressure for continuous production. The option is well worth the investment for shops under tight production schedules and in need of continuous, reliable production from just one machine. It is nearly the equivalent to having two pumps in one, while consuming less space - and far less capital. Please ask us which pump models can be equipped with a redundant intensifier.

Proportional control

The Proportional Control enables automatic changes to the pressure generated by the pump, even mid-job, in order to maximize machine time and vary the cutting speed. It can dramatically reduce the complexity of cutting and the cutting time required, especially when working with fragile materials such as ceramic tile and glass. Using the Proportional Control, pressure can be lowered to one level for starting new holes, ramped up for cutting lines, and adjusted again for cutting curves. Pressure can be instantly adjusted to any level.

Ability to feed into one common network

Many companies expand their business year by year. If more capacity is required, additional STREAMLINE pumps can be connected in order to feed into one common network supplying several cutting stations with high pressure water. Step by step, you can increase productivity depending on your business' needs.

Pump networking with "Stroke Control"

Installing this option makes it possible to connect multiple pumps to a common high pressure line for the ultimate in continuous production shops: a networked pump system where the pumps are monitored by the Stroke Control system. Exclusively available from KMT, it is the perfect tool for connecting multiple pumps and creating a much more reliable source of high pressure. The Stroke Control controls the output of each pump to be consistent with the size of the pump and proportional to the total load required from the pump network. With the Stroke Control, the stroke rate of each pump is monitored so the total system demand is distributed equally among all pumps. It is the ultimate in automated, reliable, high pressure production.

Additional tools and options

Tool and spare part kits as well as threading and coning tools are available to run your equipment most securely. Accessories such as closed loop cooling systems, waste water filtration, the BOOSTERLINE for the continuous water supply of high pressure pumps or water treatment systems can be supplied in accordance to the equipment installed.



Original Parts & Installation Material KMT GENUINE PARTS

KMT Genuine Parts are manufactured in the USA to the exact standards as the original parts found on new KMT Waterjet products. Our expertise and operating experience extends from the original SL-I operating at 3,800 bar all the way to today's industry-leading KMT PRO pumps cutting at 6,200 bar. No other provider has this breadth of experience and you can rest assured that your KMT waterjet equipment will operate at peak performance when you use KMT Genuine Parts

Benefits of KMT Genuine Parts

- Robust quality control inspection process to ensure superior fit and durability
- Manufactured to precise specifications best suited for your KMT pump
- Improvements made to KMT pumps are incorporated into KMT Genuine Parts
- KMT Customer Service and Technical Support is available 24/7

Remember to use KMT Genuine Parts to maintain your pump warranty and ensure that your investment pays off over the long-term. The use of imitation parts voids warranty coverage, compromises safety and may result in reduced component lifetime.



Installation Parts for Waterjet Cutting

KMT Waterjet provides reliable installation parts for the efficient installation of high pressure pipeline systems for waterjet cutting. Catering for rated pressures of up to 6,900 bar, our product range covers all applications in the field of waterjet cutting.

Safety is of course a key aspect for the development of KMT installation material, as all parts must be able to withstand the high pressure in the supply system. Durability, high availability and reliability are the main factors here and have therefore been laid down as mandatory criteria for the product range. Our installation parts were developed in response to demands from our customers. Their design is based on the experience of KMT Waterjet in ultra high pressure applications acquired over many years.

The KMT product line of Precision System Components includes the following items:

- Manual Valves
- Ball Valves
- Check Valves
- Swivel Joints
- Connectors
- Adapters
- Pipes
- Pressure Gauges

KMT WATERJET PARTS CATALOG

In our spare parts catalog, you will find comprehensive details concerning our product range - from spare parts for intensifiers to cutting heads to installation material. You can Download the pdf-version of the catalog from our website or order your hard copy at info@kmt-waterjet.com.





Abrasive Bulk Transfer System ABRALINE

Production reliability requires constant monitoring of the entire cutting process. An economical and successful cutting process depends greatly on a constant abrasive flow rate. This fact becomes even more important when cutting brittle materials such as stone, marble or glass.

Abrasive flow monitoring saves time and costs

Our ABRALINE feeding system precisely monitors the availability of sufficient abrasive closely during the entire cutting process. This protects your valuable material from damage and saves unnecessary costs and time. Its concept assures process stability, security and a very high degree of reliability.

Two tanks for a continuous abrasive flow

The ABRALINE transfer system consists of a big silo for the abrasive and a smaller tank which lies directly underneath. This vessel contains abrasive sand pressurized by compressed air. The connected flexible hose guides the abrasive directly to the abrasive metering system of each cutting head. Additionally, the system features a control cabinet with a control relay which continuously monitors operating states and relays the corresponding signals to the pneumatic system and the control lights.

Sensors monitor abrasive availability

Both of the tanks contain level sensors in the sand exit slot areas. Their signals are constantly monitored in the control station located in the electrical cabinet. When the abrasive level in the vessel reaches its minimum, the respective sensor gives a signal to the control relay which then opens the valve at the vessel inlet to automatically refill the vessel with abrasive. If the abrasive level in

the upper tank is lower than required, a warning light begins to flash thus informing the operator to replenish the feeding hopper with abrasive sand.

The convenient solution for different demands

KMT offers the ABRALINE feeding system in two different sizes suitable for different requirements. The smaller version ABRALINE V is sufficient for ensuring the abrasive feed for average cutting needs. For large cutting machines which operate continuously and with multiple cutting heads, we recommend the model ABRALINE IV Advanced.

| Technical Data | | |
|-------------------------------|----------------------|-------------|
| | ABRALINE IV Advanced | ABRALINE V |
| Max. Flow Rate | 4,000 g/min | 4,000 g/min |
| Continuous Operating Pressure | 2 - 6 bar | 2 - 4.4 bar |
| Supply Voltage | 115 - 240 V | 110 - 240 V |
| Vessel Volume | 24 l | 25 l |
| Silo Volume | 1,000 kg | 425 kg |
| Length | 1,060 mm | 858 mm |
| Width | 1,060 mm | 858 mm |
| Height | 1,915 mm | 1,392 mm |
| Net Weight | 250 kg | 112 kg |



ABRASIVE MANAGEMENT SYSTEM

The abrasive bulk transfer system ABRALINE is also available in the attractive AMS package, which additionally includes one or more abrasive cutting heads and the FEEDLINE thus representing the simple complete solution for the abrasive feed.

Abrasive Metering System **FEEDLINE**

Stable and repeatable operating parameters are a fundamental requirement for high-quality water-jet cutting. This applies in particular to abrasive applications used to cut brittle materials, where a constant flow of abrasive is simply a must. KMT WATERJET SYSTEMS responded to this demand by developing the FEEDLINE abrasive metering system. Controlled through a central CNC controller or a potentiometer, the FEEDLINE supplies the cutting head with the optimized flow of abrasive. This helps save material and costs.

The FEEDLINE technology

The FEEDLINE system supplies the cutting head with a constant metered quantity of abrasive. Without this controlled supply, the mixing chamber for abrasive, air and water would become clogged up. With the FEEDLINE, this is effectively prevented. It feeds a metered flow of abrasive by means of compressed air into a 0.8-litre transfer tank. At the base of the tank, the abrasive collects on the metering and transfer wheel whose rotational speed determines the feed rate to the cutting head.

Lower costs thanks to accurate control

It requires different quantities of abrasive to cut different materials. The thicker the material, the more abrasive is needed. Accurate metering settings help lower operating costs especially in units used to cut many different materials on a daily basis. The adjustment range of the FEEDLINE caters for flow rates of 0 to 1,000 g per minute. Greater quantities can be catered for by changing a shim.

Technical Data

| | |
|-------------------------|------------------|
| Flow rate (adjustable*) | 0-1,000 g/min |
| Operating voltage | 24 VDC |
| Control voltage | 0-10 V / 4-20 mA |
| Net weight | 3.1 kg |
| Length | 124 mm |
| Width | 130 mm |
| Height | 470 mm |

* Flow rates of greater than 1,000 g/min can be achieved by replacing a shim.



ABRASIVE MANAGEMENT SYSTEM

The abrasive metering system FEEDLINE is also available in the attractive AMS package, which additionally includes one or more abrasive cutting heads and the ABRALINE thus representing the simple complete solution for the abrasive feed.

Mobile Desludging System **CLEANLINE**

The mobile desludging system CLEANLINE removes sand deposits from the cutting basin during the ongoing cutting operation. Therefore, laborious manual basin cleaning, expensive suction services or long production stoppages are a thing of the past. The CLEANLINE is run on compressed air only; thus it can be used anywhere and without the risk of a short circuit.

Efficient desludging

Per minute, the CLEANLINE system removes approx. 50-60 kg of used abrasive from the basin. At this rate, a 3 m x 2 m cutting basin can be desludged in about 90-100 minutes.

Extracting and flushing in one go

The desludging system is equipped with a tube lance which swirls up and sucks in the sludge while at the same time jetting the filtered water back into the cutting basin. The tube lance is manually placed in the required position where it remains during the cutting process until the dispersion of the abrasive in the basin makes a change of position necessary or the basin is completely desludged.

Specialized pump for a long lifespan

The CLEANLINE system is actuated by reliable pneumatically driven diaphragm pumps which have been developed specifically for handling aggressive, abrasive and viscous liquids. The pumps are protected against running dry, feature a maintenance-free air control valve, have no shaft seals, are self priming and are protected against overload.

Minimal maintenance

The CLEANLINE is manufactured from high quality components and materials thus guaranteeing long product life and low wear. The pump diaphragms, valve balls and valve seats are tried-and-tested industrial standard products which are easily exchangeable. Feel free to ask your KMT contact to purchase the necessary spare parts.



Technical Data

| | |
|-----------------------------------|------------------------------|
| Fill volume without cutting basin | 1 m ³ |
| Circulating volume | 3-4 m ³ /h |
| Compressed air supply | 4-6 bar, 1 m ³ /h |
| Standard hose length | 5 m |
| Net weight | 200 kg |
| Length | 1100 mm |
| Width | 1000 mm |
| Height | 1750 mm |

CLEANLINE is supplied with CE mark and declaration of conformity according to Machinery Directive 2006/42/EC.

Cutting Water Supply System **BOOSTERLINE**

The steady cutting water supply of high pressure pumps is a significant factor when it comes to the reliability and economic efficiency of a waterjet cutting machine. The BOOSTERLINE cutting water supply system is KMT's innovative solution to guarantee a constant inlet pressure of the cutting water for ultra-high pressure pumps.

Constant pressure ensures safety of production

The constant supply of water to the ultra-high pressure pump through the BOOSTERLINE system prolongs the service life of wear parts in the intensifier. The maintenance interval of the intensifier and the downtimes of the cutting unit are reduced as the high pressure pump is operated at ideal conditions.

STREAMLINE high pressure pumps should be operated at a constant inlet pressure of 3.5 bar. Where pressure fluctuations occur in the public water supply, the BOOSTERLINE water supply system guarantees a steady volume flow to the high pressure pump. The system is automatically switched on and off, depending whether the intensifier is activated or not. Thanks to the fully automated operation, the BOOSTERLINE is very easy to operate.

On the safe side with the 750l water tank

A tank with a capacity of 750 liters ensures that there is always sufficient water available for your cutting application. The tank is made of non-transparent high-quality plastic, preventing the growth of algae, etc. Thanks to its compact design with a square base, the tank is easy to install. It guarantees continuous water supply to the high pressure pumps. If the quality of the water from the public supply does not meet the required standard, the BOOSTERLINE can be complemented with an upstream treatment unit.

Everything under control - sensor monitoring of the fill level

To optimize the fill level of the BOOSTERLINE, it is monitored with two sensors. When the maximum fill level in the tank is reached, a 230 V solenoid valve closes the water inlet to the tank. When the water level reaches its minimum, the control system switches off the BOOSTERLINE pump, thus preventing damage from dry running. The control unit is mounted on top of the tank and is operated at 230 V.

| Technical Data | |
|----------------------------|---------------------|
| BOOSTERLINE - Tank | |
| Weight | 25 kg |
| Length | 780 mm |
| Width | 780 mm |
| Height | 1600 mm |
| BOOSTERLINE - Pump | |
| Weight | 10.4 kg |
| Length | 191 mm |
| Width | 504 mm |
| Height | 217 mm |
| Voltage | 230 V |
| Motor capacity | 1.5 kW |
| Max. delivery height | 45 m |
| Max. fluid quantity | 7 m ³ /h |
| Max. operating temperature | 40 °C |



KMT Waterjet Systems assists its customers all over the world with competent advice, support and services in all matters concerning waterjet cutting - irrespective of whether you purchased your unit from us or elsewhere. We are always there for you with 24/7 customer service!

Products on the cutting edge

We permanently optimize our products to keep them state-of-the-art. You can benefit from that even if you have an older model of one of our pumps: In most cases, we offer upgrade kits of our technical improvements for retrofitting preceding models. Thus, you can always be equipped with the latest technology even without a completely new acquisition.

Optimal availability of spare parts

In our central warehouse, we permanently have a large amount of immediately available spare and wear parts in stock. And if you need your parts really quick, ask our satellite offices for their stock of fast-moving items. In this way, you will receive your order within 24 hours or even faster.

Sustainable procurement

Our service engineers gladly advise you in the optimal procurement of spare and wear parts. Thus, you can be sure that you always have available the right item at the right time.

Identify your spare parts anytime, anywhere

The PARTSLINE Anywhere online spare parts catalog helps you to identify the original spare parts you need at any time and from anywhere in the world, thus simplifying the easy order process via our customer service.



Expertise for our customers

Our European headquarters in Bad Nauheim, Germany, has a service facility with highly trained and experienced engineers. We regularly run **group and individual training courses** in multiple languages for customers from all over the world - either in-house or at your facility. Investing a small amount of time and resources into learning the best practices and maintenance methods with KMT will prove beneficial.

Proactive maintenance

Maintaining your Waterjet equipment in top operating condition is important to ensure optimal efficiency. The KMT Genuine Service **Maintenance Program** will positively impact your business as regular inspections and proactive maintenance of your high pressure pumps will save you both time and money by improving the pump's overall performance.

Extended Warranty

KMT Waterjet Systems provides you with a clear-cut guideline concerning warranty cases. We successfully use a classification system which unambiguously categorizes all components of the high pressure pumps for waterjet cutting machines - and we offer the possibility to **extend the warranty period**. Just ask your KMT representative for further information.



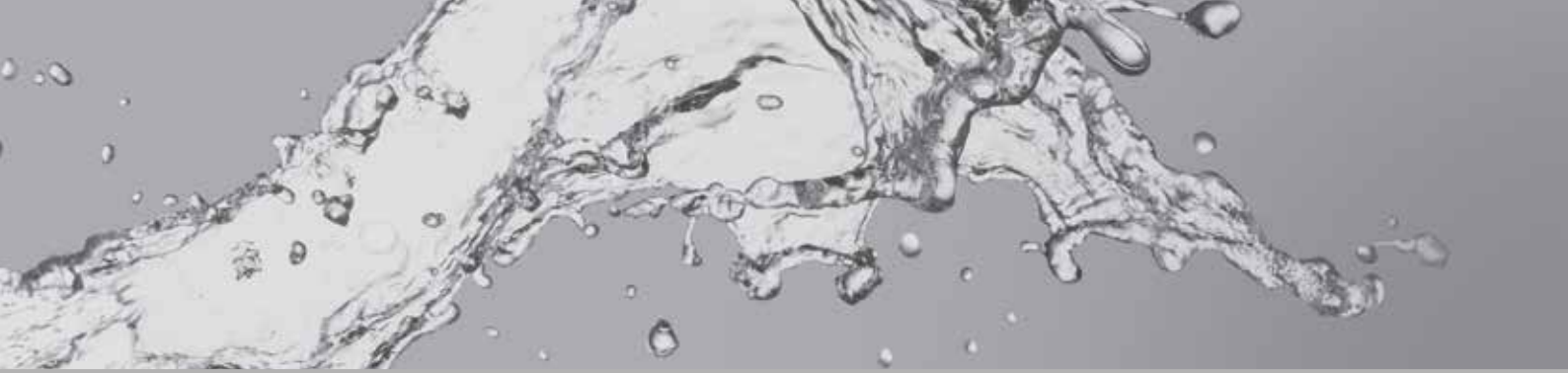
Explore the KMT Cut Calculator App and compare Waterjet Cutting speeds at 6,000 bar and 4,000 bar.

Android



iOS





Within reach at any time

Our 24 Hour Service Hotline guarantees that one of our service employee is there for you around the clock and at any day of the year. Thus, you are saving time and money because technical questions can quickly be discussed over the phone.

Service around the corner

In case you should need direct help, our service engineers can be at your site very quickly: Certainly, one of our many service locations is located near you. Therefore, downtimes of your production can be minimized.

KMT

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