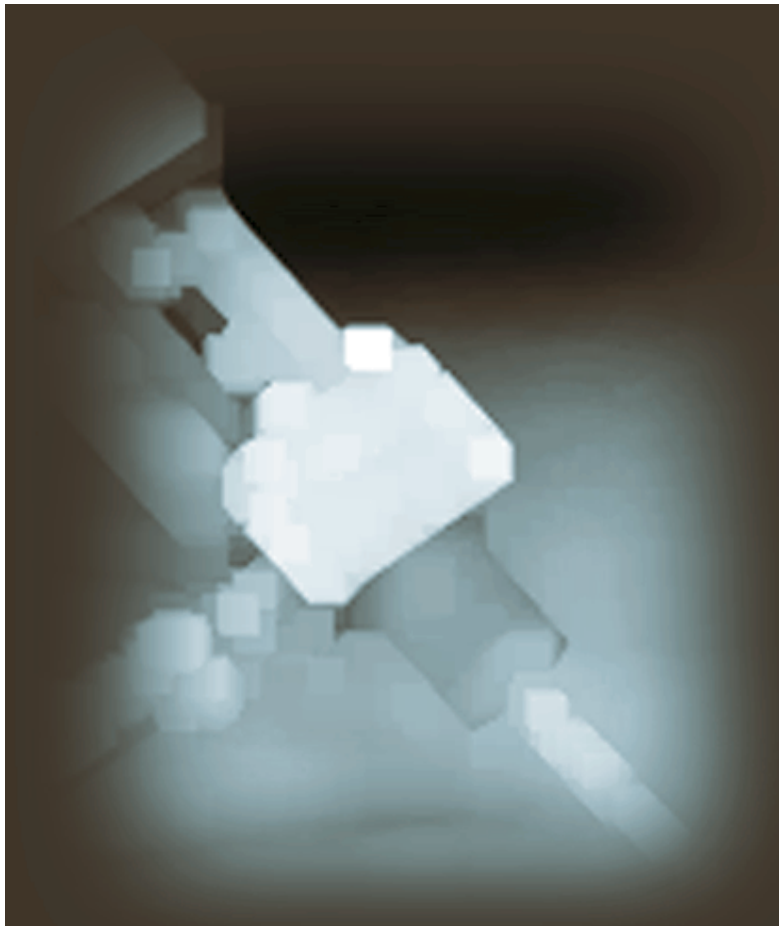


## Advanced Metering and Mixing Technology



HILGER u. KERN / DOPAG  
Metering Technology

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# Table of contents

GENERAL	4
MATERIAL SUPPLY PUMPS	6
	<b>Pumps</b> Transfer pumps Drum pumps Bung-mount pumps
COMPONENTS	8
	<b>Valves</b> Material pressure regulators Flow-regulating valves Dispensing valves Metering valves <b>Volume counter</b> <b>Metering computer</b>
1K-METERING SYSTEMS	12
2K-METERING AND MIXING SYSTEMS	14
	<b>Piston metering systems</b> MICRO-MIX ECONO-MIX VARIO-MIX SILCO-MIX POWER-MIX <b>Gear metering systems</b> ELDO-MIX <b>Metering systems using the VOLU-MIX® principle</b> LADO-MIX
MIXING SYSTEMS	20
	<b>Static mixers</b> <b>Static-dynamic mixers</b> <b>Dynamic mixers</b>
PERIPHERALS	22
	<b>Vacuum chamber</b> <b>Automated systems</b>

# DOPAG Metering and mixing systems – Individual solutions for every application



Thank you for your interest in DOPAG metering and mixing systems from the HILGER u. KERN / DOPAG Group. Naturally, as a user, it is important for you to know what benefits you will gain from collaboration with one of the largest international manufacturers of systems for processing polymers and single component media.

## Range of Products

Material supply pumps	Components	1K-Metering systems	2K-Metering and mixing systems	Mixing systems	Peripherals
<ul style="list-style-type: none"> <li>Transfer pumps</li> <li>Drum pumps</li> <li>Bung-mount pumps</li> </ul>	<ul style="list-style-type: none"> <li>Material pressure regulators</li> <li>Flow-regulating valves</li> <li>Dispensing valves</li> <li>Metering valves</li> <li>Volume counter</li> <li>Metering computer</li> </ul>	<ul style="list-style-type: none"> <li>Pumps</li> <li>Valves</li> <li>Volume counter</li> <li>Computer</li> </ul>	<ul style="list-style-type: none"> <li>Piston metering systems</li> <li>Gear metering systems</li> <li>Metering systems using the VOLU-MIX principle</li> </ul>	<ul style="list-style-type: none"> <li>Static mixers</li> <li>Static-dynamic mixers</li> <li>Dynamic mixers</li> </ul>	<ul style="list-style-type: none"> <li>Vacuum chambers</li> <li>Automated systems</li> </ul>

Firstly, DOPAG metering and mixing systems are developed and individually built for your application. You specify the parameters and we supply the tailor-made solution.

Our aim in the development of these systems is not just to give you advantages today; it is also important to us that future projects can be solved equally successfully.

## Possible applications

The HILGER u. KERN / DOPAG Group has various system designs available for your metering applications, to solve your operating problems:

- 1K-Metering systems
- Systems with piston metering pumps

- Systems with gear metering pumps
- Systems using the VOLU-MIX principle – patented by HILGER u. KERN

These systems will enable you to process all conventional materials – filled or unfilled – without difficulty.

## Areas of application

Bonding with Adhesive	Casting	Coating/ Laminating	Sealing/ Insulating	Filling	Greasing
<ul style="list-style-type: none"> <li>Spot application</li> <li>Bead application</li> <li>Application over a wide area</li> </ul>	<ul style="list-style-type: none"> <li>Under vacuum</li> <li>Multi-stage</li> </ul>	<ul style="list-style-type: none"> <li>Films</li> <li>Corrosion protection</li> </ul>	<ul style="list-style-type: none"> <li>Bead application</li> <li>Application over a wide area</li> </ul>	<ul style="list-style-type: none"> <li>Under vacuum</li> <li>Multi-stage</li> </ul>	<ul style="list-style-type: none"> <li>Single and multi-point systems</li> </ul>

## Your advantages

### Safety on the product side

As you can see, the HILGER u. KERN / DOPAG Group has the largest range of products available in this type of technology world-wide, covering a broad spectrum of applications – including individual development and testing.

### Service combined with reliability

When you need it, we will provide the same individual service you have enjoyed in the development of your customised DOPAG metering and mixing system. The sales offices in your area provide competent and immediate service on site close to you. We have 7 sales offices in Germany, 4 subsidiaries and 25 exclusive sales partners worldwide. An extensive stock of spare parts means rapid supply.

### Reliability for you

The choice of the best metering and mixing system for your needs is not always merely a question of simply fulfilling tasks.

Extra reliability for you comes from:

- Reliability of the system
- Future-proof technology
- Reliable service

Sufficient reason for using a DOPAG measuring and metering system.

Whatever system or components you are considering, this brochure can help you find the answer. If not, our specialist consultants will have the right answer to your questions and can offer the best solution for your application.

## Versatile pumping programme

### Transfer and drum pumps

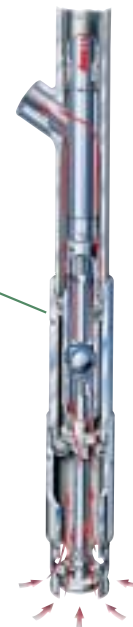
DOPAG transfer and drum pumps are used to transport low to high viscosity media directly from original drums.

These models are available for 10, 30, 80 litre pails and for 200 litre drums.

Bung-mount pumps round off the range of products available.



Drum pump P200





Pump P10



Pump P30

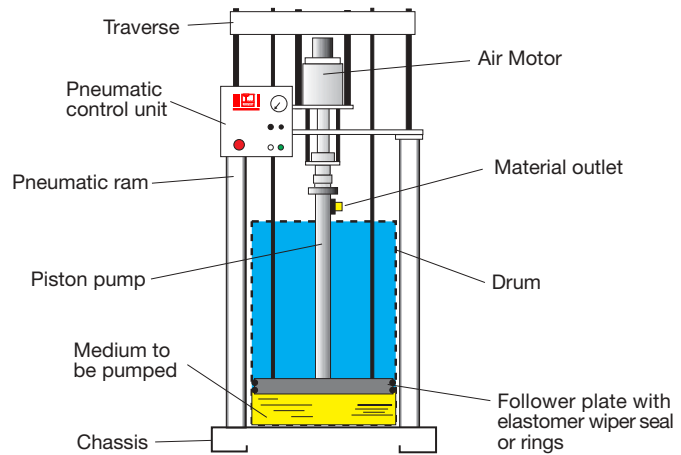
DOPAG pumps are modular in construction, robust and extremely durable. The follower plate is made of grey cast iron or aluminium with an elastomer wiper seal or elastomer rings. The pumps are equipped with twin post pneumatic rams, an automatic shut-off system when empty, and two-handed safety operating system. As an option, wetted parts can be supplied in stainless steel or with special surface treatment.



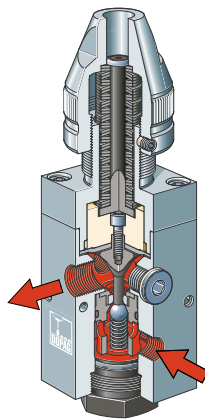
Bung-mount pumps



Pump P80



## Precision in detail



### **Material pressure regulator**

These valves are available with a conventional compression spring or with membranes. Material pressure regulating valves ensure constant material pressure.

### **Flow control valve**

These valves are used when very tight tolerances are required on the quantity to be metered. The valve reduces the flow speed of the material during metering and provides protection against overdosing.



### Dispensing systems

Dispensing or metering valves are used for delivering materials with a low to high level of viscosity.

DOPAG dispensing and metering valves are available in a number of designs and offer the user a wide range of benefits:

- High opening and closing force
- Short material paths
- Special design prevents the material forming crusts
- Needle stroke is infinitely variable
- Special seals
- Wear resistant
- Manual operation is possible
- Easy to clean and flush

### Dispensing valves

DOPAG dispensing valves deliver single component media with a viscosity level varying between low and paste consistency such as adhesives, sealants, oils, grease, solder paste and silicones.

Premixed two-component media can also be metering using these valves. The range includes a broad spectrum of very different versions:

- Various unobstructed cross-sections
- Tungsten carbide design
- Stainless steel design

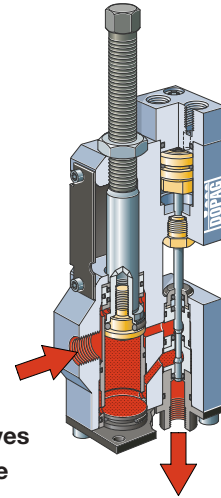




### Metering valves model 400

DOPAG metering valves work on the volumetric principle. These valves meter low to high viscosity media such as adhesives, sealants, oils, grease, pastes and silicones. Premixed two-component media can also be metered using these valves. The series includes several types of valves. These cover metering volumes from 0,001 to 100 cm<sup>3</sup>. A very wide range is available:

- Various unobstructed cross-sections
- Various pressure ranges
- Tungsten carbide design
- Stainless steel design
- Proximity switch versions



### Metering valves with cartridge

The valve block is made of aluminium and is combined with interchangeable valve cartridges of 1 cm<sup>3</sup> and 10 cm<sup>3</sup>. The metered quantity can be set as desired within the volume of the cartridge. To change the total quantity metered, simply change the cartridge.



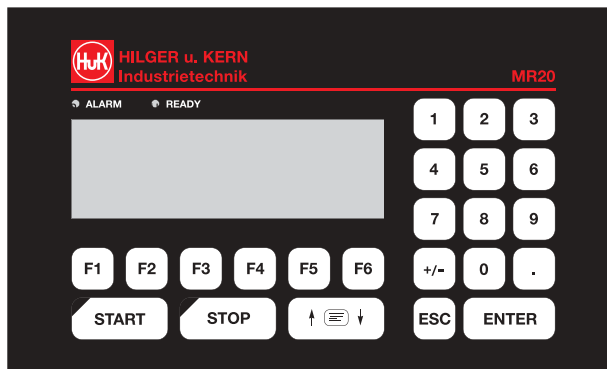


**Volume Counter**

The volume counter detects the quantity of medium to be metered by measuring the throughput.

**Metering Computer MR 20**

The metering computer MR 20 was designed specifically for use in metering and mixing systems.



This computer enables a wide range of production programs to be stored and retrieved. The user interface takes place via the membrane keypad. The operating instructions and information are shown on a clear display. This computer can be adapted to all customer-specific requirements via software modules and enables the implementation of any necessary monitoring, control and operating data capture functions. Interfaces for connection to higher ranking computer systems are fitted as standard.

## Precise metering of single component materials

A number of different designs of transfer pumps plus metering and dispensing valves are available to you from the DOPAG product range for metering 1K-materials such as silicone, grease, oil or adhesives.

A DOPAG 1K-metering system with material delivery and an application specific dispensing or metering unit can be used for:

- Emptying and filling
- Applying drops of fluid
- Applying beads
- Applying over a wide area
- Metering laminate adhesive

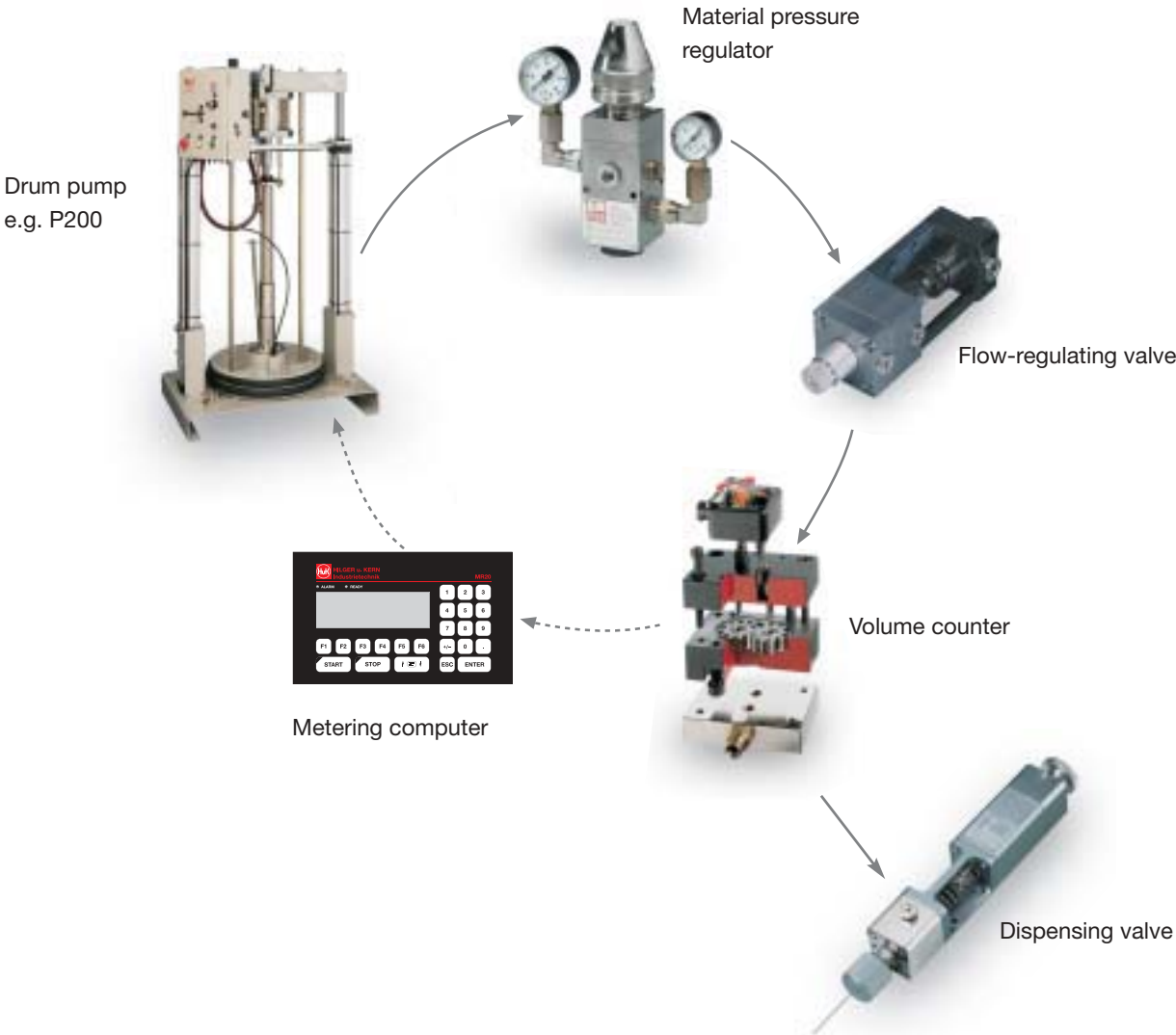
These systems are characterised by a number of benefits. These are:

- User-friendly
- Economical
- High quality
- Modular design

A system of this type consists of the following components as standard:

- Transfer pump
- Material pressure regulator
- Flow-regulating valve
- Dispensing or metering valve
- Volume counter
- Metering computer

1K-metering system design



## Systems tailored to your requirements for two component polymers

### DOPAG piston type metering and mixing system MICRO-MIX®

**MICRO-MIX®** is ideal for processing low to medium viscosity materials, even filled or abrasive. The range of application for this system consists mainly of the "shot-type" dispensing of minute quantities of evenly mixed material.

All polymers, e.g. polyurethanes, silicones and epoxy resins, can be processed using this system. The following **MICRO-MIX®** models are available:

- **MICRO-MIX S®**
- **MICRO-MIX E®**

Both systems are distinguished by economy in use, simple handling and ease of maintenance.



MICRO-MIX S®

**MICRO-MIX S®** is equipped with two piston type metering pumps, each driven via a stepper motor. The mixing ratio has a variable adjustment. The integral metering computer facilitates use in automated production.



MICRO-MIX E®

**MICRO-MIX E®** has two piston type metering pumps operated pneumatically via a lever system. The mixing ratio is set by changing the lever system.

**DOPAG piston type metering and mixing system ECONO-MIX**

The following ECONO-MIX models are available:

- **ECONO-MIX C®**
- **ECONO-MIX E®**

Both systems can process all polymers, e.g. polyurethanes, silicones and epoxy resins, even filled or abrasive. The systems are characterised by economy in use, simple handling and ease of maintenance. They are low-cost starter models for two-component technology. Both ECONO-MIX models are systems which do not use flushing agents.



ECONO-MIX C®

The **ECONO-MIX C®** is the preferred system for economical production of short runs. Customer-specific adjustments are possible to a limited extent.

**ECONO-MIX E®** is used for processing low to medium viscosity materials. Also suitable for rapid prototyping.



ECONO-MIX E®

## DOPAG piston type metering and mixing system VARIO-MIX®

The **VARIO-MIX®** is suitable for use in low to medium viscosity media, even filled or abrasive. This system can be used to process all polymers, e.g. polyurethanes, silicones and epoxy resins.

The following VARIO-MIX models are available:

- **VARIO-MIX A1/A2®**
- **VARIO-MIX S1/S2®**

VARIO-MIX A is used for continuous material output, e.g. in casting, coating and gluing.



VARIO-MIX A

**VARIO-MIX S** is particularly suitable if the material is batch-processed in larger quantities.

Both configurations of the VARIO-MIX work without flushing agents as standard.

A version with a low flushing agent requirement is available for special cases.

The **VARIO-MIX** may also be used in an amended design for supplying lamination systems with mixed material. This type of system is principally used in "intermittent production" and in multi-shift operations.



VARIO-MIX

### DOPAG piston type metering and mixing system SILCO-MIX®

SILCO-MIX is a special system for transferring, metering and mixing liquid silicone rubbers (LSR) from original drums.

The following SILCO-MIX models are available:

- **SILCO-MIX P**
- **SILCO-MIX PH**
- **SILCO-MIX H**
- **SILCO-MIX V**

SILCO-MIX P is an entry level system. The metering pumps are operated pneumatically via a lever system.

**SILCO-MIX PH** is a pneumatic/hydraulic system and works with a fixed mixing ratio. A patented process ensures high metering accuracy by absolute synchronicity of the metering pumps.

**SILCO-MIX H** is a version of the system in which the metering pumps are operated hydraulically. The system is used for processing high viscosity media.

**SILCO-MIX V** (VOLUME-MIX design) is used with low viscosity silicones to manufacture small components with a batch weight of up to approximately 150 gram with a variable mixing ratio which is continually monitored.



SILCO-MIX PH (housing optional)

### DOPAG piston type metering and mixing system POWER-MIX®

POWER-MIX is a hydraulically driven system for processing high viscosity media. It is used principally for airless spray coating surfaces and for applying sealant in bead form.

All polymers such as polyurethanes, silicones and epoxy resins can be processed using this system. In the POWER-MIX, material is supplied from original drums or from heated intermediate containers via feed pumps. The POWER-MIX is available with either a fixed or variable mixing ratio.



## DOPAG gear type mixing and metering system ELDO-MIX®

The following ELDO-MIX models are available:

- ELDO-MIX 101
- ELDO-MIX 201
- ELDO-MIX 301, 302, 303
- ELDO-MIX 701, 702, 703

There are many areas of application for ELDO-MIX. Here are just a few:

- Casting
- Coating
- Sealant application
- Gluing



ELDO-MIX range 101

The material delivery can be batched or continuous and is suitable for non-filled, non-abrasive, low to medium viscosity media.

All polymers such as polyurethanes, silicones and epoxy resins can be processed on this system.

A broad spectrum of mixing ratios can be obtained using the ELDO-MIX. The dispensing rate is also variable. A metering computer permits the systems to be operated automatically and enables an extremely varied range of monitoring, control and documentation functions to be implemented.

All ELDO-MIX models can be expanded to suit your needs by means of practical accessories. The standard version runs without flushing agents.



ELDO-MIX range 300/700

**DOPAG piston type metering and mixing system LADO-MIX V®**

The LADO-MIX V is specially designed to supply mixed material to laminating machines. The system is characterised by an extremely high metering accuracy and wide range of mixing ratios thanks to the VOLU-MIX principle patented by HILGER + KERN.



The system is user-friendly and easy to maintain, and is fully automated by the metering computer. This type of system is principally used in laminating machines which are in constant operation.

## Mixing systems

When processing multi-component materials, mixing of the components becomes extremely important.

Wide differences in media viscosity, short pot life, components which are difficult to mix etc., require different mixing systems.

DOPAG metering and mixing units today use three different mixing systems.



Plastic mixing systems

## Static mixers

The static mixer consists of a twin dispensing valve with "snuff back" effect and a plastic mixer tube. The valve is activated pneumatically or electrically. The static mixer operates without flushing agents because the components are routed separately until they enter the mixing tube.



### Static-dynamic mixers

Static-dynamic mixers are used for materials which are difficult to mix.

The static-dynamic mixer is a combination of dispensing valve and motor. The latter rotates the mixer element in the plastic tube.

The motor drive is either pneumatic or electric.

Static-dynamic mixers run without flushing agents because the components are supplied to the mixer tube intake separately.



### Dynamic mixers

Dynamic mixers can mix materials with an extremely short pot life, widely differing viscosities and mixing ratios. The mixing rotor in the mixing chamber mixes the components evenly within a very short time. The mixer head can be operated either cooled or heated. The mixer motor is driven pneumatically or electrically.

## Casting in a vacuum – beneficial for electronic components

### **DOPAG vacuum chamber**

Casting electrical and electronic components frequently requires the use of a vacuum chamber. Perfect casting is dependent on vacuum technology particularly when components have narrow gaps, tight bores or angular structures.

DOPAG vacuum chambers are available with manual control or an integral handling system.



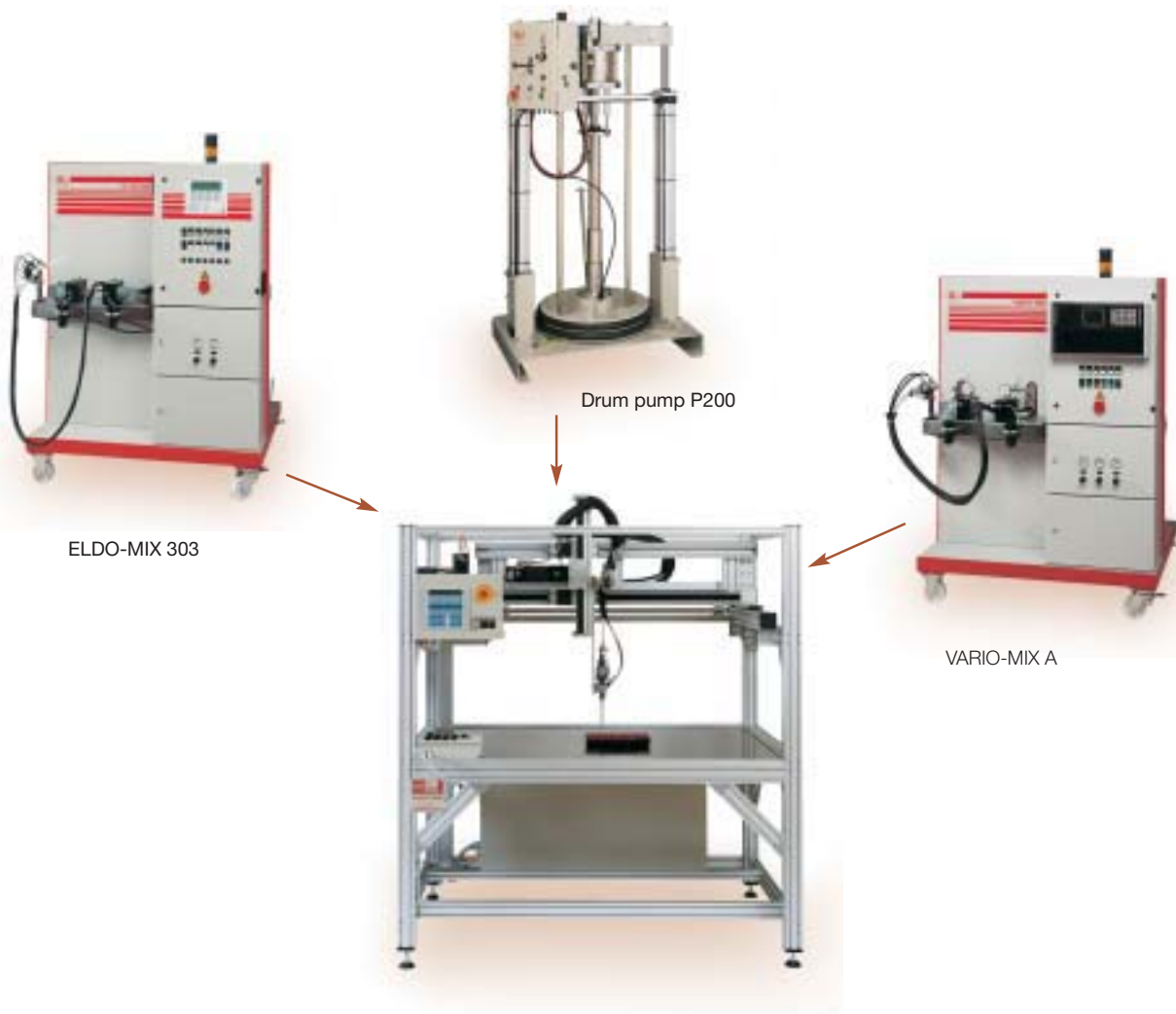
## Open to new areas of use

### Automated systems

Path- and/or distance-controlled automated systems in combination with DOPAG metering and mixing units open up new areas of application in metering technology. The major areas of use here are the application of single or two-com-

ponent media onto complex work pieces.

Automated systems can be operated in combination with all DOPAG metering and mixing systems.





# HILGER u. KERN / DOPAG Group

	<b>HILGER u. KERN GMBH</b> 68151 Mannheim Germany
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	<b>DOPAG</b> 6330 Cham Switzerland
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	<b>Drive Technology</b>
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NOVAMAX INTL LLC - 8200 S Quebec St Suite A-3 Englewood, CO 80112  
 (303) 470-7226 Fax (303) 470-5773 Toll-Free 1-800-594-3380  
[www.novamaxinternational.com](http://www.novamaxinternational.com)



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