

MEGATRON® MT 5100 S



Dispersing technology for your Pilot Plant

INLINE DISPERSING SYSTEM

for a variety of applications

« through-put of up to 65 l/min »



KINEMATICA
DISPERSING AND MIXING TECHNOLOGY

MEGATRON® - Inline Dispersing System

When testing and optimizing formulas, high process safety is paramount. This system enables processing of complex material systems with absolutely minimal loss of mass and minimal energy. This pilot plant format production system delivers efficient, replicable results like those of our in-line machines used in large volume production.

HIGHLIGHTS

Volume flow
up to approx. 65 l/min

Generators
Eight different rotor/stator variants,
single-stage

Product inlet
Single-phase (standard version)
Multi-phase (with optional injector)

Processing system
in-line product processing
primarily used in recirculating operations

Working chamber
Horizontal, single-stage arrangement
Working pressure up to 6 bar
Working temperature up to 90°C
Quick coupling for easy disassembly
Single-acting mechanical seal with pressureless quench system
Viton, EPDM or Kalrez seals
Product connections G1/2"

Materials
High-quality 316L stainless steel
Product contact parts electropolished,
Ra ≤ 0.8

Accessories
Large selection of recirculation systems

Motor
1500 W wear-free high-frequency AC motor
Gearless direct drive
Continuous speed control
Completely enclosed in stainless steel

Speed range
bis zu 21'000 min⁻¹

Sound level
< 62 dB(A) bei 21'000 min⁻¹

Supply voltage
100 - 230 V ± 10%, 50Hz / 60Hz

Maximum relative humidity
80% in storage
80% during operation

Betriebstemperatur
0 - 40 °C

Protection class according to DIN
IP 20

Drive dimensions
325 x 250 x 315 mm (L x W x H)

Weight (drive only)
approx. 23 kg

EMC Standards
IEC/EN 61000-6-2 / EN 61000-6-3

Safety norm
IEC/EN 61010-2-51

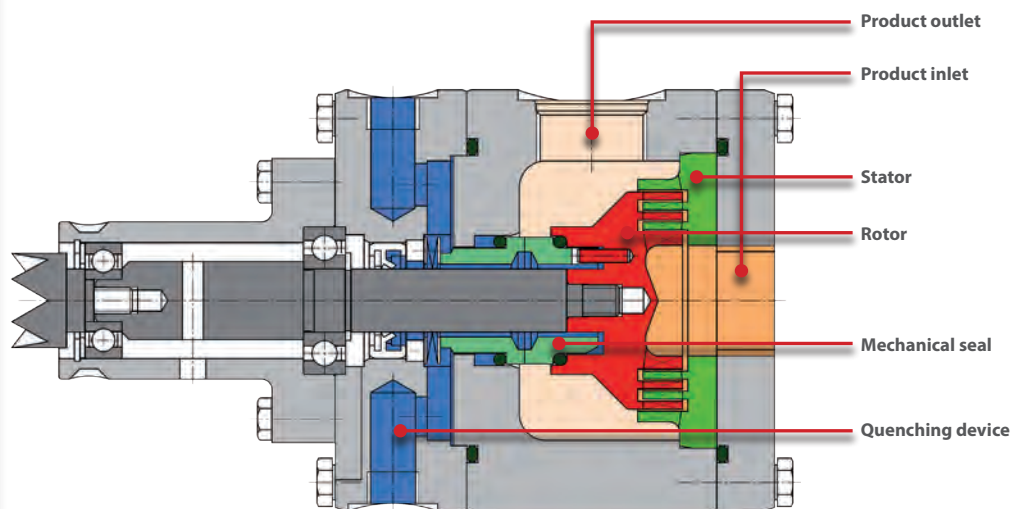
YOUR PILOT PLANT EXPERT

This system was developed to help you realize your ideas under as realistic conditions as possible in small economic quantities. During subsequent scale-up, the results can be replicated with our large machines. Applications are mainly in recirculation mode.

Depending on the materials system, the components bind into the finest emulsions or suspensions with droplet or particle sizes down to a few microns. These results are achieved by the machine's high speed and the resulting peripheral tip speeds as well as precise rotor/stator geometry. Depending on the materials system being processed, the desired fineness is achieved after a certain period of recirculations and/or using other rotor / stator geometries.

OVERVIEW

Mechanical rotor / stator system for homogenizing, dispersing, emulsifying and suspending. Depending on the dispersing generator, speed, and product features, flows rates of up to 65 l/min are possible. Optional injectors can be used for additional phases of product into the working chamber. Integrating a thermostat to cool the system is recommended for temperature-sensitive products.



DESIGN OF THE MT 5100 S INLINE DISPERSING MACHINE:

in-line working chamber

working chamber removable through quick coupling (Type F)

injector for additional phase (optional)

different standard R/S generator variants

parts coming in contact with the product in electro-polished, rust-free 316 L stainless steel

single mechanical seal with quench system

digital speed control with soft start

wear-free motor with direct drive

stable speeds as viscosity changes

standard product connection G1/2" (Clamp, milk thread, hose nipples)

complete recirculation systems upon request

Applications / Uses



preparing emulsions

pharmaceutical or cosmetics products

suspending solids in liquids (such as liquid polymers)

dispersing fine solids in liquids or molten phases

suspending additives and solid polymers in mineral oils

extracting enzymes from biomass

extracting active ingredients and substances from plants, for example (when used with REACTRON®)

grinding and shredding of solids and fibers in liquids or polymers

This list represents just a selection of the potential applications.

MEGATRON® MT 5100 S



Kinematic dispersion with the rotor/stator system

Who invented it?

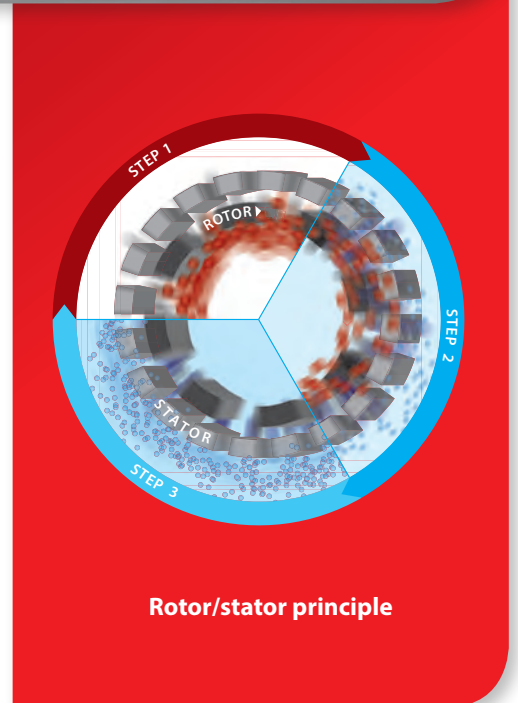
The roots of KINEMATICA go back to the 1950s at the former chemistry and physical sciences research center of Prof. P. Willems in Lucerne. He is the inventor of modern rotor/stator dispersion technology.

THE PRINCIPLE

The rotor creates a vacuum which sucks in the sample to be dispersed. Between the rotor/stator (shear gap), the sample is subjected to high braking and acceleration forces which tear apart the individual particles and crush them to just a few micrometers in size.

THE RESULT

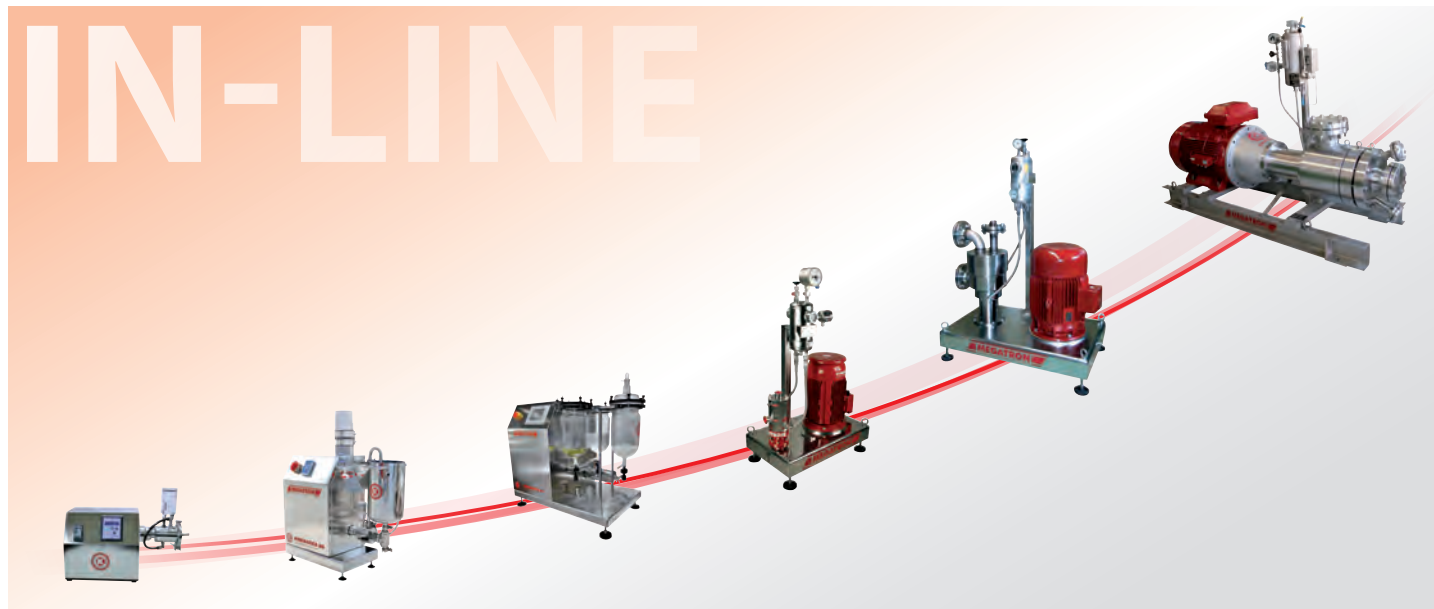
This process results in very fine homogeneous dispersions, emulsions, suspensions and foams. Droplets, particles and gas bubbles are reduced to a few micrometers or less. Products are dispersed in a more economical, faster and better way than with any other system.



Model	MTG 30/2M – standard model – rotor / stator with one teeth row each	MTG 30/4F – standard model – rotor / stator with two teeth rows each	MTG 40/2G – standard model – rotor / stator with one teeth row each	MTG 40/4M – standard model – rotor / stator with two teeth rows each
Order no.	23005012	23005011	23005013	23005014
Rotor- / Stator-Ø	29 / 37 mm	31 / 37 mm	37 / 46 mm	39 / 46 mm
Speed (max.)	21'000 rpm	21'000 rpm	18'000 rpm	18'000 rpm
Peripheral speed	max. 32 m/s	max. 34 m/s	max. 35 m/s	max. 37 m/s
Schear rate (max.)	58'000 1/s	62'000 1/s	63'500 1/s	67'000 1/s
Throughput (Water)				
Particle / Droplet sizes (depending on the medium being processed)				
Applications	<ul style="list-style-type: none"> – Dispersing and mixing of coarse solids into liquid – Size reduction of coarse solids in liquid – Extractions – Mixing of fluids – Crushing of lumps – Intensive mixing 	<ul style="list-style-type: none"> – Producing of emulsions and suspensions with medium droplet and particle sizes – Wet milling of solids up to medium particle sizes – Extractions – Accelerating of reactions – Crushing of lumps – Intensive mixing 	<ul style="list-style-type: none"> – Dispersing and mixing of coarse solids into liquid – Size reduction of coarse solids in liquid – Extractions – Mixing of fluids – Crushing of lumps – Intensive mixing 	<ul style="list-style-type: none"> – Producing of emulsions and suspensions with medium droplet and particle sizes – Wet milling of solids up to medium particle sizes – Extractions – Accelerating of reactions – Crushing of lumps – Intensive mixing

Scale-up for Inline dispersing machines

The collected data and experiences can seamless be used for upscaling to larger processing volumes. KINEMATICA has solutions for all kind of throughputs from lab to pilot plant to production. For in-line operation with throughputs up to 150'000 liters per hour we can always supply the most suitable and customer oriented process solution.



LAB

PILOT PLANT

PRODUCTION

	MTG 40/6F – standard model – rotor / stator with three teeth rows each	MTG 40/6FV – special model – rotor / stator with three teeth rows each	MTG 40/6FF – special model – rotor / stator with three teeth rows each	MTG 40/6FFV – special model – rotor / stator with three teeth rows each
	23005015	23005016	23005018	23005025
	41 / 46 mm	41 / 46 mm	41 / 46 mm	41 / 46 mm
	17'000 rpm	16'000 rpm	16'000 rpm	16'000 rpm
	max. 37 m/s	max. 35 m/s	max. 35 m/s	max. 35 m/s
	66'500 1/s	98'000 1/s	62'500 1/s	92'000 1/s
ns with ticle sizes	<ul style="list-style-type: none"> – Producing of emulsions and suspensions with fine droplet and particle sizes – Wet milling of fine solids – Extractions – Accelerating of reactions – Gassing of fluids – Desagglomerations – Cell disruption 	<ul style="list-style-type: none"> – Producing of finest emulsions with finest droplet sizes – Gassing of fluids – Desagglomerations – Extractions – Cell disruption 	<ul style="list-style-type: none"> – Producing of emulsions and suspensions with fine droplet and particle sizes – Wet milling of fine solids – Extractions – Accelerating of reactions – Gassing of fluids – Desagglomerations – Cell disruption 	<ul style="list-style-type: none"> – Producing of finest emulsions and suspensions with finest droplet and particle sizes – Wet milling of fine solids – Gassing of fluids – Desagglomerations – Cell disruption

Further configuration of MT 5100 S

WORKING CHAMBER

MTO 5100 Q / MTK 5100 Q



- horizontal, single-stage arrangement
- simple exchange of dispersing generators
- double jacket for working chamber (MTK version)
- removing the working chamber through quick coupling - no tools needed
- single acting mechanical seal
- fittings for quench system

- G1/2" fitting for inlet & outlet connections
- operational pressure up to 6 bar
- operational temperature up to 90 °C (standard)
- product wetted parts made from 316L stainless steel, surface Ra ≤ 0,8 and electro polished
- autoclavable versions available on request

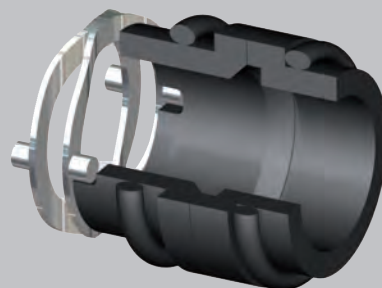
QUENCH SYSTEM / MECHANICAL SEAL

TS1 - QUENCH SYSTEM



- pressureless lubricating and cooling of the mechanical seal
- vessel and cover made from acrylic glass for easy supervising of operation
- easy connection to the working chamber by means of „Steck-Fix“ connections and flexible tubes
- other types (e.g. made from stainless steel) available on request

MECHANICAL SEAL



- single acting, standard material combination QBV-GG, SiC-Si – Carbon - Viton (others available on request)
- protect the ball bearings for shaft guiding and separates the product side from the atmospheric side
- the mechanical seal has to be lubricated and cooled by a non-pressurized quench system; the quench liquid has to be compatible with the product and the materials

FITTINGS FOR PRODUCT INLET & OUTLET

The following standard fittings are available:

TC-3/4"



- Tri-Clamp
- size: 3/4"

MR-DN15



- Milk thread
- size: DN 15
- DIN 11851"

S-DN15



- hose nipples
- size: DN 15

Order information and accessories

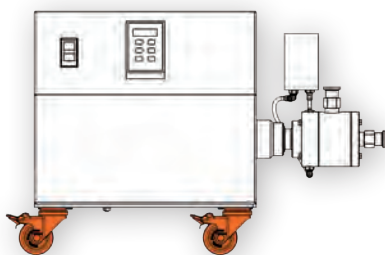
Our MT 5100 S drive can be expanded with functional accessories according to your wishes and requirements. Our experts will gladly assist you if you have any application-related questions or other concerns.

MT 5100 S «MOBILE KIT»

Order no.	Designation
23005026	MT 5100 S „Mobile Kit“

Description

Conversion kit to make the MT 5100 S mobile. Consisting of two supports with wheels and screws



PRODUCT CONNECTION FITTINGS

Order no.	Designation	Description
23005022	S-DN15	hose nipples DN15
23005023	MR-DN15	milk thread DN 15
23005024	TC-3/4"	Tri-Clamp 3/4"

COOLING / HEATING JACKET

Order no.	Designation
23005019	Cooling / heating jacket set for MTO 5100 Q consisting of: jacket with G1/8" connections, adapter with G1/2" product outlet connection, O-Rings made from VITON

DRIVES

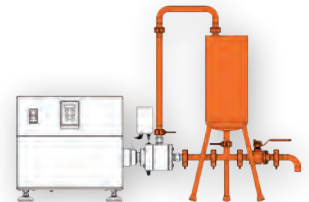
Order no.	Designation
23005050	MEGATRON® MT 5100 S, 230 V , consisting of: drive with control, assembly tool, CH device cable
23005051	MEGATRON® MT 5100 S, 230 V , consisting of: drive with control, assembly tool, EU device cable
23005052	MEGATRON® MT 5100 S, 230 V , consisting of: drive with control, assembly tool, GB device cable
23005053	MEGATRON® MT 5100 S, 100-120 V , consisting of: drive with control, assembly tool, device cable

WORKING CHAMBERS WITH QUENCH SYSTEMS

Order no.	Designation
23005010	MEGATRON® MTK 5100 Q , consisting of: chamber with G1/2" product connections and cooling jacket with G1/8"
23005017	MEGATRON® MTO 5100 Q , consisting of: chamber with G1/2" product connections, w/o cooling jacket
23005020	Quench system TS1 , consisting of: Quench vessel (acryl), PU tubes, „Steck-fix“ fittings G1/8"
23005021	Quenchsystem TS1 PTFE , consisting of: Quench vessel made from TEFLON, TEFLON tubes, Steck-fix" fittings G1/8"

RECIRCULATING SYSTEMS

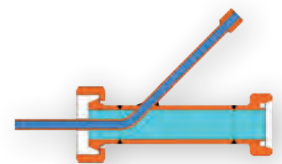
Complete recirculation systems according to customer specifications can also be delivered. Process containers (single- or double-walled, steel or borosilicate glass), system tubing, valves, thermostat for double-walled process container, vacuum pump for closed process container, temperature sensor



INJECTORS

Certain applications, such as chemical reactions, first require a controlled mixing process in the generator chamber.

- controlled mixing
- gas, oil or other phase inputs
- prevents uncontrolled reactions



COMPLETE SOLUTIONS TO MEET YOUR NEEDS

Research needs modular, adaptable systems. We offer solutions that are easy to handle and flexible enough not to restrict your creativity. Our MEGATRON® is available to order as a ready-to-use mini-system with all of the devices you wish. Your own devices can be integrated into our systems depending on their design.

- processing container (single or double-walled steel or borosilicate glass)
- system tubing (fixed or variable)
- thermostat for double-walled processing container
- vacuum pump for closed processing container
- temperature sensor
- injector with input pump
- REACTRON® laboratory reaction chamber with double-walled processing container with POLYMIX® anchor mixer and integrated batch disperser POLYTRON® for pre-crushing



YOUR APPLICATION IS OUR FOCUS!

KINEMATICA is a leading manufacturer of dispersing and mixing technology for standard and customized applications in the lab, pilot plant and production areas of pharmaceutical, chemical, food, cosmetic and biotech or life science companies worldwide.

Our POLYTRON® batch and MEGATRON® In-line Homogenizers are suitable for many applications:

- Dispersing of non-soluble liquids or solids into liquids to finest emulsions/multiple emulsions or suspensions
- Induction and dispersion of powders into liquids
- Foaming by gas induction into liquids
- Disintegration of tissue samples for preparation in further analysis
- Dispersing of various samples for quality control

We also deliver POLYMIX® Micro Dry Grinding Mills and a variety of POLYMIX® and MICROTRON® Overhead Stirrers and Mixers.

Whatever your application, we are confident that our team of specialists, with over 60 years of experience, will provide the best solution for you.

YOUR SATISFACTION IS OUR GOAL!



KINEMATICA
DISPERSING AND MIXING TECHNOLOGY



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BRAND NAMES WITH HISTORY

POLYTRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Batch dispersing/homogenizing units

BIOTRONA®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
High turbulent mixing

MEGATRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Inline dispersing/homogenizing units

REACTRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Dispersing/homogenizing Reactors

POLYMIX®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Stirrers and dry Mills

MICROTRON®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Mixer/Blender

POLYVISC®
DISPERSING AND MIXING TECHNOLOGY BY KINEMATICA
Viscometers