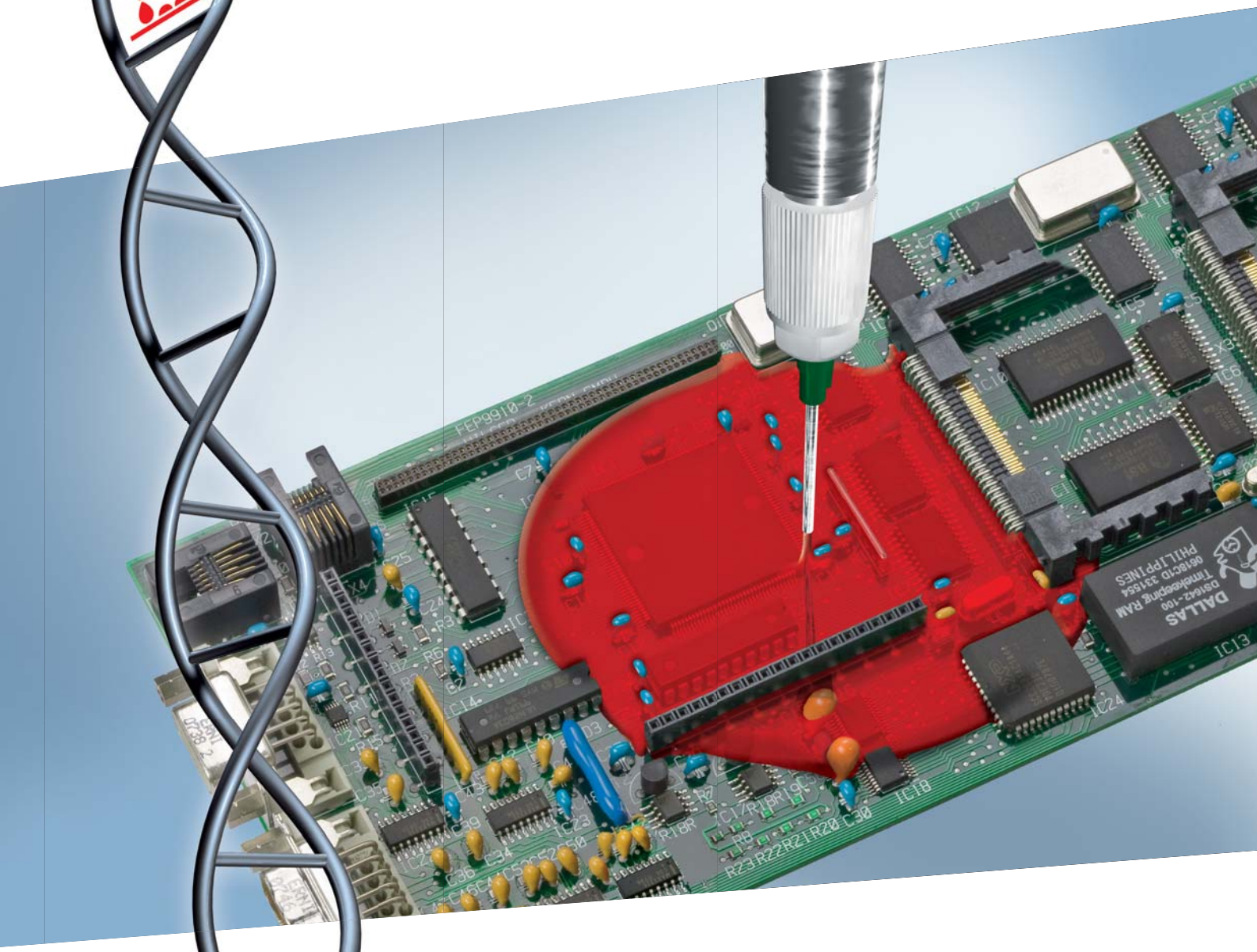
Metering Technology



DOPAG Metering and Mixing System for vacuum encapsulation applications

Hilger u. Kern / Dopag Group

General

Electrical and electronic components are encapsulated for protection against environmental influences such as the ingress of moisture as well as against mechanical damage.

Such measures also serve to protect against unauthorised interventions into complex board constructions and guard against product piracy.

For this type of application, polymers such as epoxy resins, polyurethanes, silicones and other materials are used.

One of the principal requirements during the production of these components is that the encapsulation should be bubble-free, since air inclusions in the material have a negative influence on the dielectric constant of the encapsulation material resulting in a low insulating and protective effect.

Additionally, air inclusion in the material will result in reduced mechanical strength.

System concept

Metering and mixing system

The preferred metering and mixing system for use in vacuum encapsulation applications is one of the eldomix series.

These are solvent free gear pump metering and mixing systems, which is are built onto a transportable chassis.

The material is fed from material storage containers, which are installed on the chassis.

Features and benefits

- Variable mixing ratio
- Variable flow rate, continuous or shot by shot metering
- Solvent free

Equipment

Standard

- 2 working vessels on chassis with automatic refilling, level probe and agitator
- Gear pump with over pressure protection
- One suction lance each for automatic refilling
- Static mixing system
- Metering Computer MR15 or MR30
- Thin-film degassing system

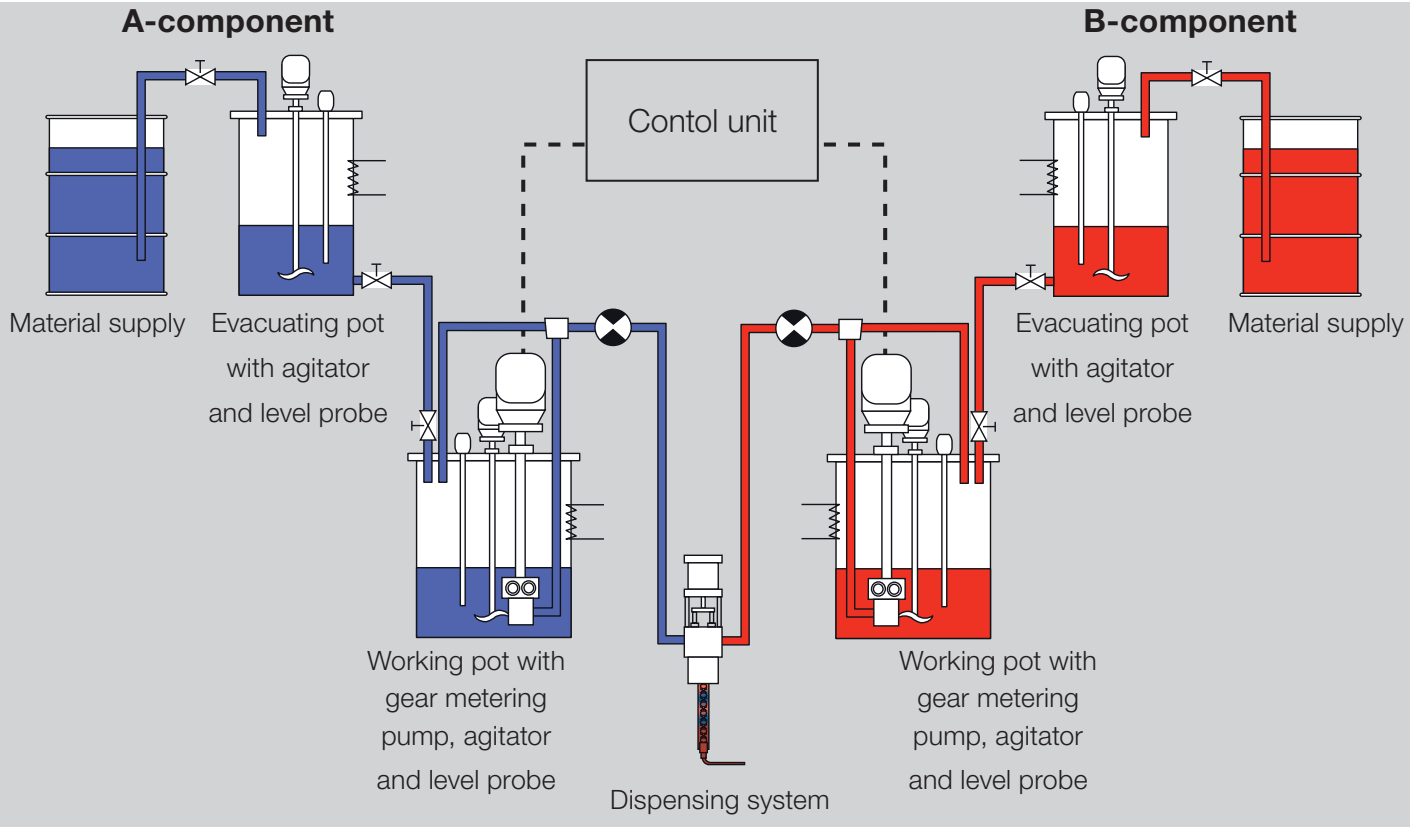
Optional

- 4 vessels on chassis

– 2 evacuating pots with automatic refill, level probe and agitator

– 2 working vessels with gear metering pumps, level probe and agitator

- Servo drive for the gear metering pumps
- Volume counter to control the mixing ratio
- Static-dynamic mixer with plastic mixing tube
- Mixing element monitoring
- System operation via touch panel
- Heating of selected or all assemblies



Function

Material is supplied from the original containers, whereby material is automatically refilled by a suction lance, by means of the vacuum in the storage container that has to be refilled.

For particularly fluid media it may be necessary for a flow control valve to be installed to regulate of the velocity of the flow.

For more viscous media and under certain circumstances it may be necessary to pump the media from the supply containers.

In the case of the extended version with 4 storage containers, the material is also automatically transferred by brief ventilation of the vacuum in the working pot. Near the bottom of the working pot beneath the material level (under level), gear pumps are positioned to pump and meter the material.

The pumps are protected against over pressure as standard and are driven by AC induction motors, or optionally by servo motors.

Hilger u. Kern type MR15 or MR30 metering computers are used to control and regulate the system

For these systems, the following points are particularly important:

- high accuracy of metering
- high constancy of the mixing ratio even with varying flow rates
- high reproducibility of the set shot volumes.

The system is equipped with dispensing systems specifically developed for the specific application, in combination with a plastic mixing tube, which can be cost-effectively disposed of after the material has cured.

Technical Data

Flow rate	5 cm^3/min to 2,000 cm^3/min, depending on viscosity and mixing ratio
Mixing ratio	100:100 bis 100:10
Maximum working pressure	Gear pump 150 bar Storage container <5 mbar absolute
Mixing system	Static mixing system consisting of a double snuff back valve and a static plastic mixing tube
Material supply	from the original containers via material storage with thin-film degassing
Viscosity range	< 10.000 mPa s; Processing of higher viscosites by request
Evacuation pot	60 litres
Working pot	60 litres
Power supply	400 V
Air inlet pressure	6 bar
Dimensions (L x W x H)	1300 x 1200 x 1710 mm without vacuum cell and depending on the design
Weight	approx. 725 kg

Achieve the optimum together

Synergies of a co-operation create results, which none of the partners involved could achieve alone.

For more than 30 years the core competence of Hilger u. Kern has been the metering and mixing technology of polymers and single component media.

In order to realise the tasks within the field of vacuum encapsulation, we have competent partners at our side with whom we work together in close co-operation.

Particularly in the development and construction of vacuum encapsulation systems these partners have long-term experience and competence and are able to show a high degree of flexibility in order to comply with the requirements of our common customers.

Combined know-how

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The Hilger u. Kern / Dopag Group, with more than 300 employees, 8 subsidiaries and 24 distributors, is one of the leading manufacturers of metering and mixing systems in the world for plural component polymers and single component media such as greases, oils and pastes. For more than 30 years the group has developed systems and components to suit your individual needs.