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New Stirrer Drive Units for Laboratories

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The market for laboratory stirrers and mixers is dominated mainly by frequency inverter controlled drive units. The typical design is a frequency inverter driving an electric motor attached to an impeller. Unfortunately, these drive units do not satisfy all user demands in laboratories and pilot plant facilities. Most frequency inverters do not typically provide infinitely variable speed down to zero, nor do they typically provide full torque down to zero speed.

Controlling speed and torque in the stirring process is of significant importance in many applications. Developing high torque at very low speeds is of particular concern. Adding torque multiplying reduction gearboxes only provides a partial solution because the stirring media, in many cases, has high viscosity, or has changing viscosity during processing. It is necessary to have a sufficiently high torque reserve available at all operating speeds.

planetroll GmbH & Co. KG, located in Southern Germany, is now offering a solution for these complex process problems. At this year'sACHEMA Fair held in Frankfurt, Germany last May, the company introduced their new stirrer drive units for laboratories and pilot plants. Two models, the plaroJet® and the babyJet®, were introduced. The two designs were developed to satisfy different power range requirements.

Speed and torque control of the new stirrer drives is based on the well-know planetroll plaromaster® variable speed gearbox, which is the dominant brand in the mechanical speed control marketplace. The design is based on the unique angular contact rolling ball elasto-hydrodynamic power transmission principle. For decades, the planetroll® concept has satisfied a variety of demanding speed control requirements. The latest generation of this gearbox type, brand named plaromaster®, was introduced in the Fall of 2003. The two smallest sizes (MRV and MRI), in the seven size standard range, were used to develop the new Jet series of stirrers.

An advantage of this new drive design is that constantly higher motor speeds are possible providing better power utilization. Stirring speed variations are controlled by the variable speed gearbox. DC motors are used as an input power source to improve efficiency and provide smoother, more consistent speed. This design also reduces potential heat issues.

Speed monitoring is included in the plaroJet® and babyJet® by means of a digital data readout. Speed ranges from 0 to 1200 rpm are measured directly on the output of the gearbox for highly accurate feedback control.

The standard stirrer shaft connection is achieved by using a drill chuck design. A hard-chrome plated drill chuck, with drill chuck key, is preferred over a fast action collet style chuck as a more reliable shaft retaining safety measure. However, because different processes and different agitator elements may have unique requirements, additional connection methods are available.

Speed variation is achieved by means of a hand wheel controller. Adjustments have a linear characteristic over the entire speed range. The variable speed gearbox is lubricated for life and is rated for continuous trouble free duty.

Hygienic requirements were also taken into consideration. The housing design is a continuous surface with no pockets where fluids and debris can collect to improve cleaning and sanitation. The plaroJet® and babyJet® can also be used in situations where silicone-free processing is a requirement.

Both stirrer models can be mounted onto tabletop mixer stands or directly integrated into larger system designs. At theACHEMA Fair, planetroll displayed these units installed on high quality, automated height adjustable stands made of high grade steel.

plaroJet® and babyJet® represent a significant alternative to present agitator drive technology for laboratories and pilot plants. The advantages of a wider speed range and torque control allow the drive to be used on a much wider range of mixing processes and procedures offering the agitator and mixer industries a wider range of applications and capabilities.

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