

Weighing technology in process plant engineering

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Hans-Jürgen Keil Anlagenbau GmbH & Co. KG, a company based in Hunteburg, Germany, designs and constructs complete production machines for batching and mixing liquid components and solids. Mixers and reactors which accommodate quantities of up to 20 t are not uncommon in these machines.

Weighing technology in process plant engineering

These days it would be hard to imagine solutions for batching and mixing processes without involving weighing technology. This is particularly true if the characteristics of the raw materials do not allow for any other method of measurement.

However, since the batching process has to be accurate and reproducible in order to achieve optimum results from the mixing process, the questions and tasks facing designers are frequently extremely difficult to solve:

- How to uncouple a reactor that has to be chilled or heated in the course of a process?
- What should the approach be if the mixer has to be fitted with a stirrer?



*10 t mixer tank on RTN load cells with
MLAR tank weighing module*



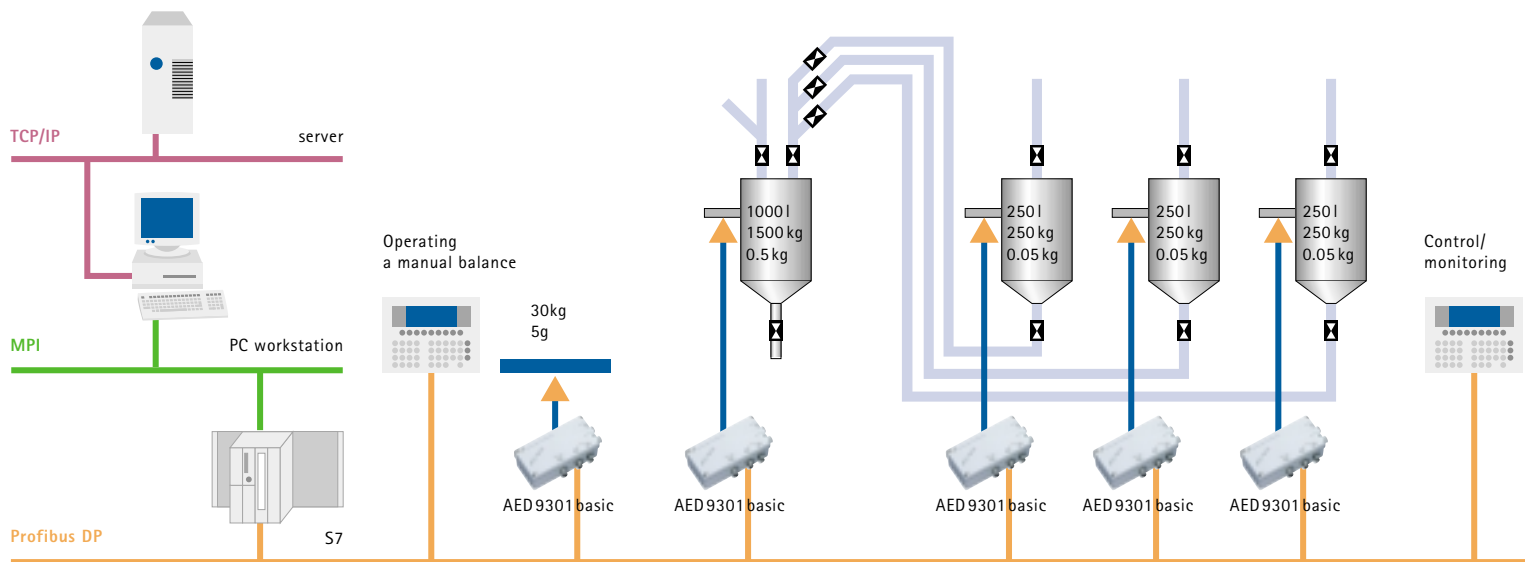
*300 liter open tank on HLC load cells with
Easy top elastomer bearings*

- How to design the platform if the mixer has to be supported on brackets?

Keil Anlagenbau answered the questions by making use of HBM weighing technology and analysis electronics.

The right load cells for every challenge

Keil Anlagenbau chose from HBM's extensive range of load cells and associated accessories bearing in mind the application and the ambient conditions. Their favorites include the HLC load cells with the Easy top elastomer bearing and the RTN load cells with the MLAR tank weighing module.



Layout diagram of a mixing and batching plant

The right analysis electronics for optimum process results

To determine weight data, Keil Anlagenbau used, among other things, HBM's AED 9301 analysis electronics. The AED 9301 is connected to a programmable logical controller (PLC) via Profibus DP. Once the current weight data is analyzed by the PLC, it can be displayed centrally on a process display screen, if necessary.

The AED 9301 can be set up and calibrated from a PC or laptop via user-friendly HBM Panel 32 software.

PC-driven batching and mixing equipment

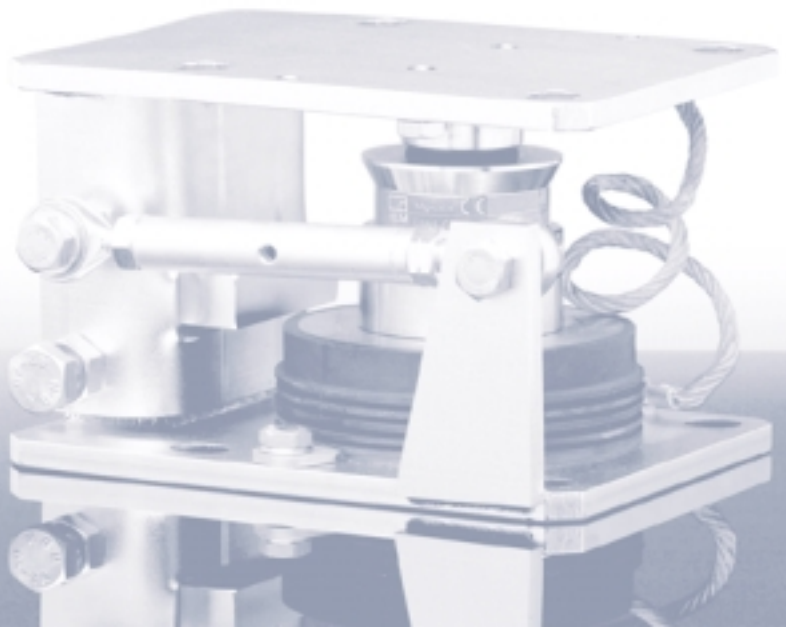
The plant diagram shows batching and mixing equipment consisting of a PC workstation, a PLC, a 1,000 liter mixer, three 250 liter feedstock tanks and a workstation for filling small components on a 30 kg manually-operated balance.

Raw materials and recipes are managed from the PC workstation. Captured production data is stored on the PC. The PC has a printer connected to it for producing batch reports, and a modem for remote diagnostics and maintenance.

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HBM's AED 9301 analysis electronics



Automation

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The PC is connected to the PLC over an MPI interface. Also connected to the PLC via Profibus DP are five sets of AED9301 analysis electronics, a control panel located in the mixer section and another control panel located in the small components manual filling section. The control panel located in the mixer section is used to call up the next recipe due for processing and start it when needed.

The liquid components included in the recipe are batched into the 250 liter feedstock tanks and emptied into the mixer tank. At the manual filling section, small



*120 kg reactor tank on HLC load cells
with Easy top elastomer bearings*

components are pre-weighed by hand according to the recipe and released into the mixer tank through a hopper. The finished batch is then packed in 200 liter canisters for forwarding to the next part of the production process. The 200 liter canisters are filled by starting a "batch draw-down" function on the mixer tank.