

## Production plant for liquids



GEMÜ 688  
with 2-stage actuator



GEMÜ 1231  
Electrical position indicator



GEMÜ 612 - manual  
diaphragm valve



GEMÜ 673 - manual  
diaphragm valve



GEMÜ 687 - pneumatic  
diaphragm valve

### Application

The plant is used for manufacturing liquid pharmaceutical products and consists of raw material supply, preparation and mixing of liquids and cleaning. 3 tanks are available for the preparation of liquids (2 x 1000 l and 1 x 2000 l). The tanks are pressure and vacuum resistant from -1 bar to +3 bar. Each tank is equipped with a separate heating/cooling system. The prepared products are mixed in 3 different mixing tanks with a contents of 2000 l each or in movable containers. The plant is designed according to GMP and qualified.

### Plant design

The tanks, all other parts of the plant and the pipelines are made from stainless steel 1.4404 316 L. All medium wetted surfaces are Ra 0.8 µm. The plant is intrinsically safe. The switch gear cubicles for the control system of the plant are located in a non hazardous area. For the operation of the automated plant there is a touch panel in the hazardous area and a PC in the control centre. The PC visualizes all the operating sequences via WINCC. PM-Batch and PM-Quality are used to make recipes, manufacture preparations, generate

preparation and cleaning protocols. The raw materials are DI water, ethanol and isopropanol which are directly batched from the raw material storage tanks, solid and other liquid components are batched by means of vacuum suction from drums.

### Solution

The DI water, ethanol and isopropanol supply is controlled by GEMÜ 688 diaphragm valves with pneumatic two-stage actuators. The end positions are monitored by means of GEMÜ 1231 electrical position indicators with proximity switches according to NAMUR. The GEMÜ 688 two-stage batch valve in conjunction with a totalizer enables exact batching of the raw materials and shortest possible batch times. GEMÜ 612/673 manual diaphragm valves and GEMÜ 687 pneumatic valves are also used in this application.

**GEMÜ®** VALVES, ACTUATORS  
AND CONTROL SYSTEMS

Gebr. Müller Apparatebau GmbH & Co. KG · Fritz-Müller-Str. 6-8  
D-74653 Ingelfingen · Phone +49 (0)7940/123-0 · Fax +49 (0) 7940/123-224  
<http://www.gemu.de> · e-mail: [info@gemu.de](mailto:info@gemu.de)