

# Excellence in Pumps

for the Chemical Industry



# About FELUWA

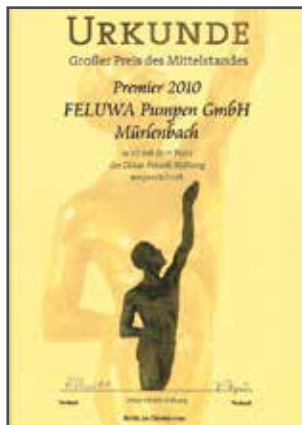
**F**ELUWA Pumpen GmbH has at its base in excess of 100 years' corporate history. In 1901, the parent company was established in Neuwerk/Mönchengladbach as a foundry and expanded in 1931 by the addition of a machine factory, based in Cologne. At that time, the company focused on the production of equipment of fire, air and water technology. The company name FELUWA is derived from the German words for the former business operating areas **"fire" (FEUER), "air" (LUFT) and "water" (WASSER).**

After a relatively short period of time, the company started concentrating on pump technology. In 1960, the company moved to Mürtenbach in the Eifel area. The integration of FELUWA Pumpen GmbH into the ARCA Flow Group in November 2000 provided the opportunity for further global growth. For in excess of 80 years, ARCA Regler GmbH has been one of the lead-

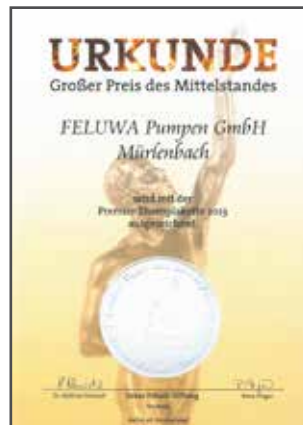
ing manufacturers of control valves, pneumatically activated actuators and positioners. With a diverse range of control valves, pumps and level indicators the ARCA Flow Group is firmly established in various fields of operation, such as chemical, petrochemical, power plants and synthesis gas plants, oil and gas, mining, food industries.

The continuous process of innovation and development of FELUWA Pumpen GmbH has been subject to multiple high-ranking recognition and awards.

The total company land area exceeds 100,000 m<sup>2</sup>, including more than 9,350 m<sup>2</sup> of building area for production and office facilities. FELUWA is continuously expanding and investing in new machinery and production halls in order to ensure constant and optimum quality standards.



*Premier  
Grand Prix of Medium-Sized Enterprises*



*Plaque of Honour  
Grand Prix of Medium-Sized Enterprises*



*Frost & Sullivan  
Best Practices Award*

# FELUWA Piston Diaphragm Pump

## Aggressive, Abrasive or Viscous

With their almost linear flow without deviations and minimum wear, FELUWA pumps are especially suitable to handle aggressive and/or abrasive, solids carrying media, e.g. any flowable kind of slurry and waste materials - even at high viscosity. The linear flow path of the medium and the fact that it is only in contact with the internal hose-diaphragm and the check valve reduces erosion and corrosion to a minimum. Therefore, the hose-diaphragm casing must not be made of any special material which may be required for medium-contacted pump components, allowing FELUWA to provide a most economic pump solution.



*FELUWA MULTISAFE®  
double hose-diaphragm pump  
Example application:  
TG 135 – 3 DS 100  
Triplex, single-acting pump:  
24 to 47 m<sup>3</sup>/h at 70 bar and 100 °C  
Medium: aggressive and abrasive  
chemical catalyst  
Media-contacting components  
made of 1.4410 (Super Duplex)  
and hose-diaphragms of EPDM*

Spray drying units are most convenient for the conversion of liquid-based products into dry materials with a defined powder or granule form. In this process, precise product characteristics of solutions or suspensions can be achieved, i.e. particle size, powder weight, moisture content, pourability and re-dispersibility.

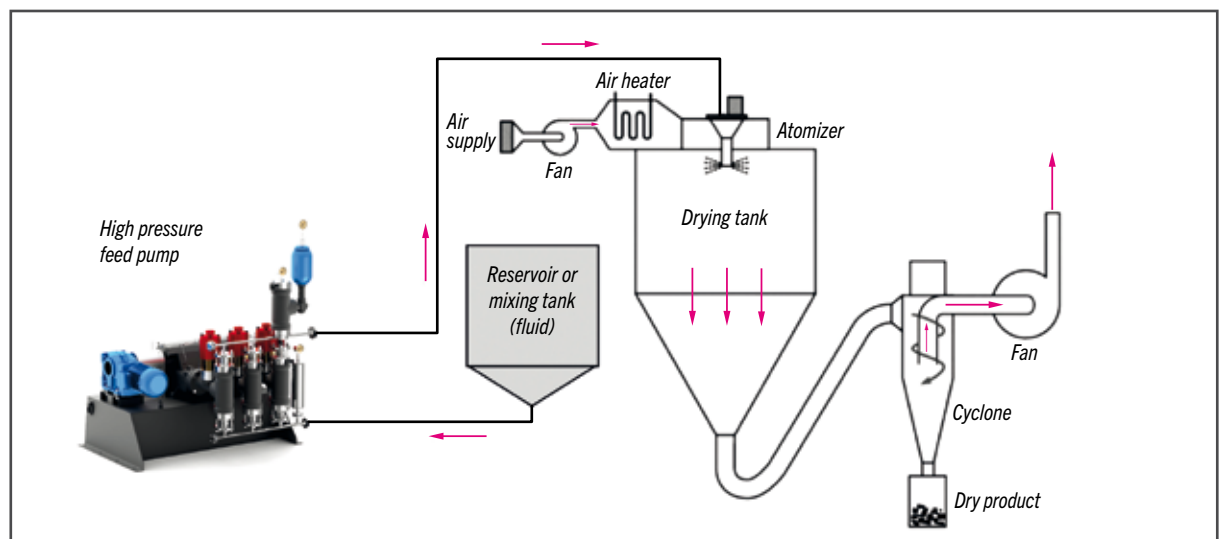
FELUWA pump technology is ideal for spray dryer feeding due to its intrinsically high operating safety, its easy, economical variation options for flow rate and pressure, the ability to minimise pulsations and the possibility to choose from a wide range of medium-contacted materials.

As mechanical wear is minimised, the end-product is free from contamination by any grit or abrasion.

*FELUWA MULTISAFE®  
double hose-diaphragm pump  
Example application: TG 70 – 3 DS 2  
Triplex, single-acting pump:  
1 to 2.1 m<sup>3</sup>/h at 100 bar and 120 °C  
Medium:  
Polyaluminium chloride slurry  
(highly corrosive and abrasive)  
Media-contacting components  
made of titanium Gr.2  
and hose-diaphragms of PTFE*



## Spray Dryer Feeding



# pumps in the Chemical Industry

**T**oxic fluids are a permanent danger for persons and environment. FELUWA process pumps are virtually predestined to guarantee absolutely safe transport of toxic fluids. The double hose-diaphragms, made from a wide range of elastomers or even of PTFE mixtures, are especially suitable for chemically aggressive and toxic media. The two hose-diaphragms, which are arranged one inside the other, create a double-walled barrier to the drive end. If one hose-diaphragm leaks, the functionality of the pump is maintained and it will remain hermetically sealed, because the second hose-diaphragm prevents the toxic media to come in contact with either pump casing, any operating personnel or the environment.

For example, hydrofluoric acid has a variety of uses in industry and research. It serves as a base material or intermediate material in industrial chemistry, mining, refining, glass finishing, silicon chip manufacturing and in cleaning. It should be noted that in its role in the above applications, hydrofluoric acid is a moderately strong corrosive acid capable of dissolving certain materials. However, it is always highly toxic!

## Handling of Toxic Media

Due to the hermetically sealed design of FELUWA pumps, our customers can benefit from highest operational safety when handling any toxic media.



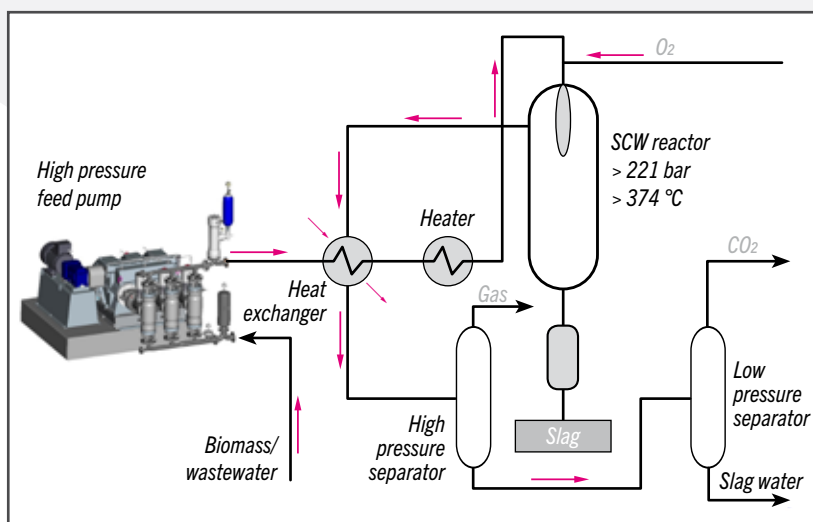
**FELUWA MULTISAFE®**  
double hose-diaphragm pump  
Example application:  
TG 130 – 3 DS 35  
Triplex, single-acting pump:  
5 to 20 m<sup>3</sup>/h at 35 bar and 30 °C  
Medium:  
70 % hydrofluoric acid solution  
Media-contacting metal  
components lined with PTFE  
and hose-diaphragms made of PTFE

**F**ELUWA pumps are predestined for any reactor feeding processes, for example in supercritical water (SCW) treatment of biomass or wastewater.

Being the initial reagents, biomass or wastewater slurries must be suitably preconditioned to a liquid, aqueous mix-

ture. This will then be fed to the reactor via a heat exchanger and a flue gas heated preheater, at the desired operating pressure, by means of a high-pressure pump. After a short dwelling time and under the supply of oxygen, a gaseous product, mainly hydrogen and carbon dioxide, is produced; carbon monoxide and methane are by-products. FELUWA

pumps offer exceptional availability and reliability, especially when it comes to steady, 24/7 reactor feeding processes.



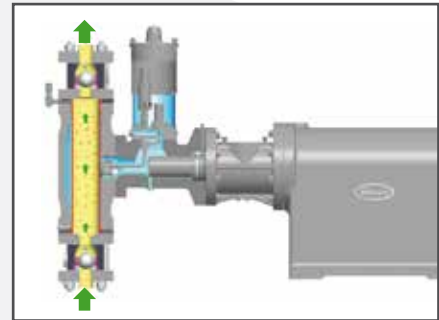
**FELUWA MULTISAFE®**  
double hose-diaphragm pump  
Example application:  
TGK 250 – 3 DS 35  
Triplex, single-acting pump:  
15 to 24 m<sup>3</sup>/h at 300 bar  
Medium:  
Biomass/wastewater  
Media-contacting components  
made of 1.4571 (AISI316Ti)  
and hose-diaphragms of NBR

## Reactor Feeding

FELUWA pumps are available for flow rates of up to 1,350 m<sup>3</sup>/h and discharge pressures of up to 350 bar. They are characterised by unique design features in favour of the overall performance, reliability, availability and cost of ownership. Some of these features are:

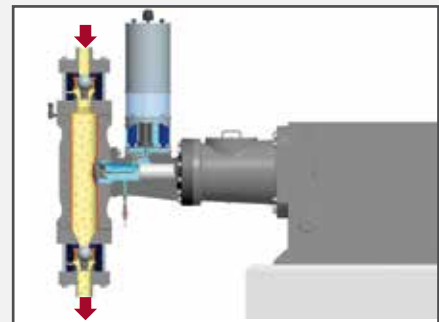
### FELUWA Double Hose-Diaphragms

At the heart of FELUWA MULTISAFE® pumps are two hose-diaphragms which are arranged one inside the other. They fully enclose the linear flow path of the product and provide for double hermetic sealing from the hydraulic drive end. The lifetime of hose-diaphragms is considerably extended beyond that of flat diaphragms. Standard materials are available for temperatures up to 200 °C.



### FELUWA DownFlow Technology (DFT)

For applications carrying solids that tend to settle and may cause breakdown of the pump resulting from blockages within the check valves, pump chamber or piping, FELUWA literally turns the traditional pumping principle upside down. By means of downflow configuration the flow is led from the top to the bottom of the pump. Sedimentation within the pump is thus reliably prevented.



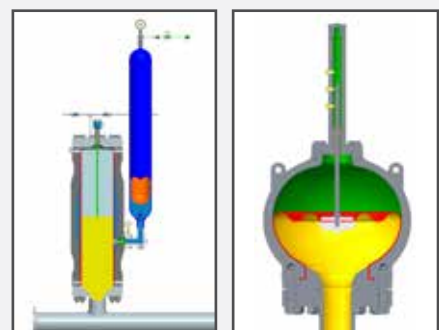
### FELUWA Double Valves and Quick Change System (QC)

Double valves with unique hydraulic clamping system (QC) are recommended for media with high solid content and applications which require a particularly high continuous flow. If, in the short term, a particle gets jammed between the ball or cone and the valve seat resulting in valve leakage, the second valve ensures effective sealing, thus preventing medium backflow and a resulting loss of volume.



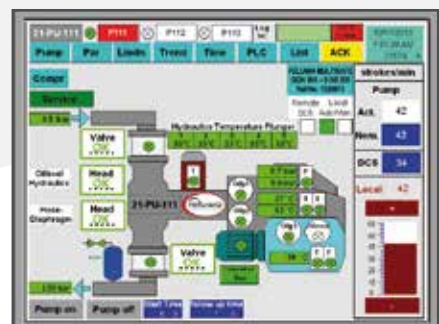
### FELUWA Pulsation Dampener

With displacement pumps the oscillating movement of the pistons may result in undesirable flow fluctuation and pressure pulsation. For conveyed fluids which do not allow for a contact with the air cushion in the pulsation dampener and for high pressure applications, FELUWA applies various options for pulsation dampening.



### FELUWA WebGuard (FWG)

By means of diagnostic systems and touch panels, FELUWA offers a Human Machine Interface with full integration of pump diagnostics into industrial control systems and also a web-based service option. Permanent monitoring includes for example hose-diaphragms, check valves, inlet and discharge pressure, flow rate, speed, pulsation, hydraulic oil temperature, lube oil flow and pressure.



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Your local representative:

