

► Our technology. Your success.

Pumps • Valves • Service



FluidFuture®: the energy-saving concept for your system

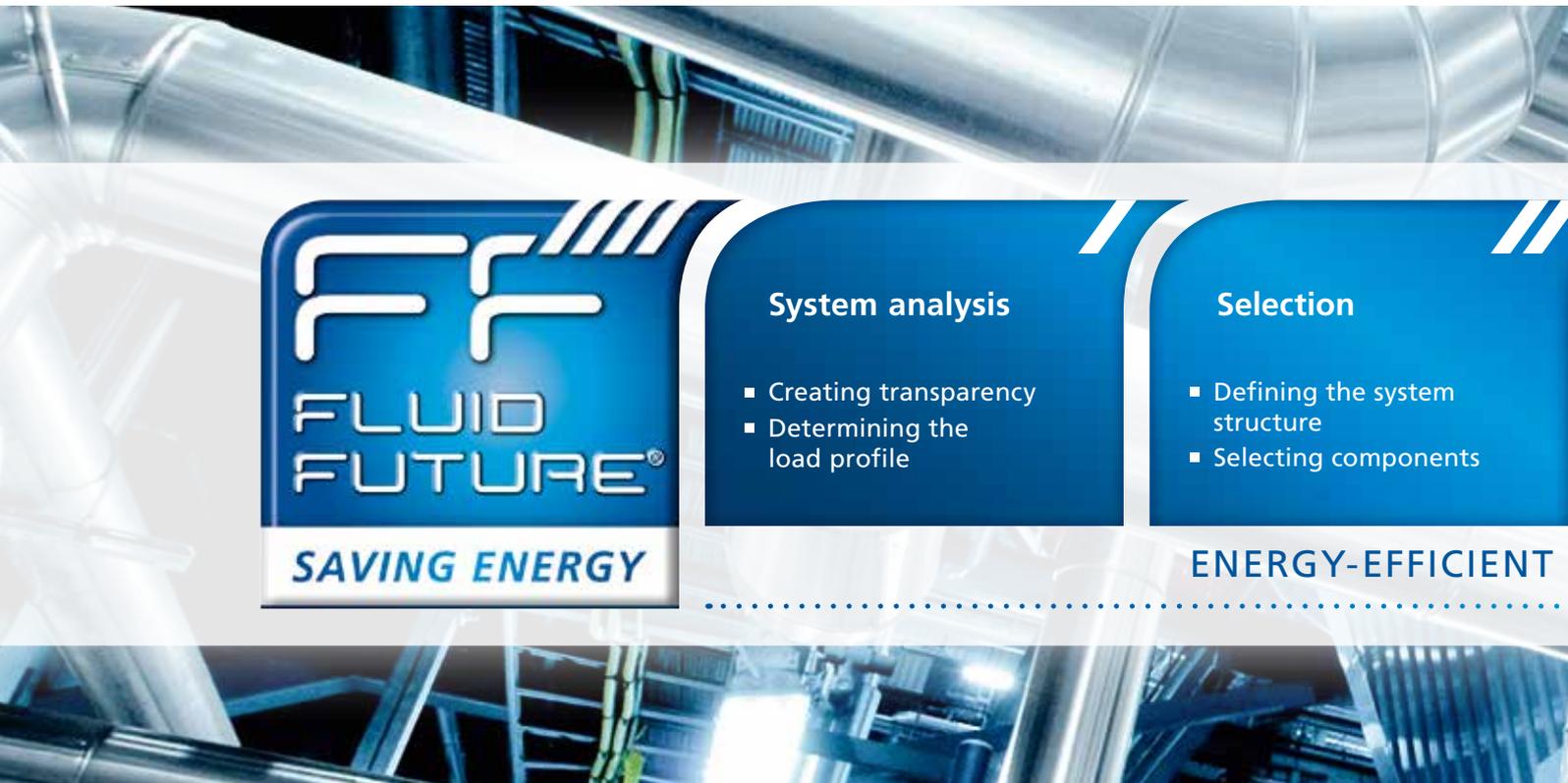


Optimise the **energy efficiency** of your hydraulic system

With FluidFuture® we optimise your system's energy efficiency in four steps, always looking at the entire hydraulic system over its entire life cycle. By combining our expert knowledge with smart products and services, we make use of all the potential savings. This is how we markedly reduce your operating costs and make a joint contribution towards an energy-efficient future.

All details are available for you online at: www.ksb.com/fluidfuture

The four steps of the FluidFuture® energy-saving concept



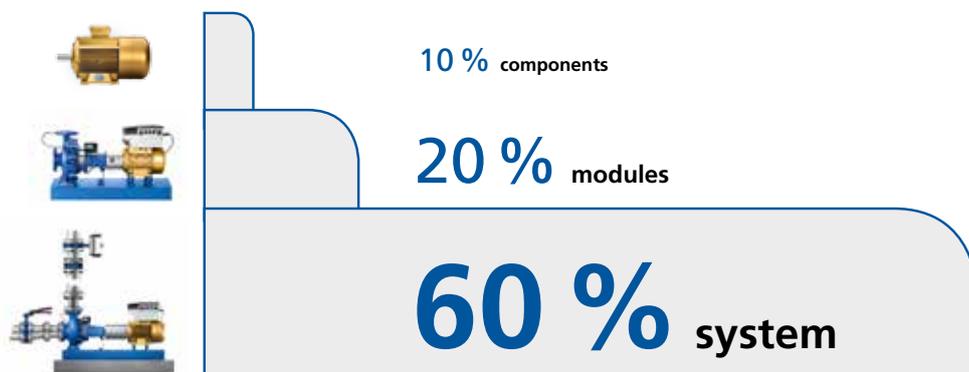
Your path to success: the FluidFuture® energy-saving concept

Our systematic and target-oriented approach ensures maximum savings when optimising hydraulic systems. Based on our expertise and comprehensive experience we have defined an energy-saving process in four steps. Your benefit: We quickly and economically optimise your system for maximum energy efficiency at minimum costs.

FluidFuture®: our contribution to a sustainable future

Mega trends such as a growing world population, climate change and dwindling resources are major challenges for us and the generations to come. One of the most important strategies for a sustainable future is saving energy. And pumps play a major part: They use the lion's share of all the energy consumed in industry. We are looking at a power input of 300 terawatt hours in the EU per year – much of which is used for water, heating and process pumps.

Energy saving potentials in your system



Highest saving potentials lie in the overall system.

Commissioning

- Expert installation
- Professional commissioning

Highly efficient operation

- Intelligent pump technology
- Continuous monitoring

PRODUCTS AND SERVICES

Highest savings through system analysis

KSB's products have been developed with energy efficiency in mind. The largest saving potentials can be tapped into when matching the system's components precisely to each other. Jointly optimising the hydraulic system, drive and automation products as well as the piping dimensions can result in savings of up to 60%.

Identifying saving potentials systematically and competently

The energy-efficient operation of pumps and other rotating equipment not only lowers the operating costs of industrial systems, it also increases their availability and operating reliability. Analysing the system using accurate measurement data is the first step, the basis for optimisation. KSB experts use their know-how to provide you with a clear picture of the plant situation.

All details are available for you online at: www.ksb.com/fluidfuture/analysis



System analysis

- Creating transparency
- Determining the load profile

Selection

Commissioning

Highly efficient operation



KSB's analysis tools offer full transparency

1. Potential identification with KSB Sonolyzer®

Whether or not detailed measurements of a pump are worthwhile depends on the potential savings. The free KSB Sonolyzer® app analyses the motor sound of fixed-speed asynchronous motors to identify whether the operating point is inside or outside of the part-load range. Performed during a site examination, this quickly and reliably shows saving potentials and prevents unnecessary measurements.

Discover your savings potential: www.ksb.com/sonolyzer



2. Pump Operation Check

At the heart of the analysis is the load profile, which is recorded and analysed. For single-pump applications, we perform a Pump Operation Check. KSB experts use the PumpMeter monitoring unit to record the exact operating data – without any impact on the operating process.

More information: www.ksb.com/poc



3. System Efficiency Service

For more complex systems, SES System Efficiency Service offers a detailed insight into the operation of the entire pump system, based on comprehensive measurement with a data logger.

We process this pump and system data to provide you with an as-is-analysis, first recommendations for optimisation and some profitability analyses. This is a good basis on which to make decisions for further optimisation. The aspect of profitability features very early in the process.

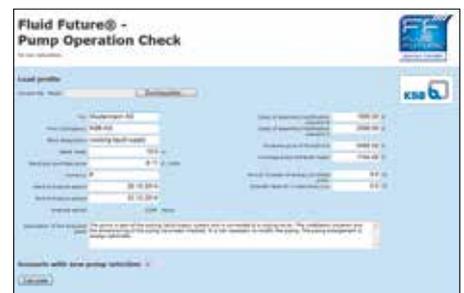
More information: www.ksb.com/ses



KSB Sonolyzer® app for
Android smartphones



KSB Sonolyzer® app
for iPhones





System analysis

Selection

- Defining the system structure
- Selecting components

Commissioning

Highly efficient operation



Using selection tools to find the best solution, fast

To jointly find an optimum solution for your system, we not only use the insight gained from the analysis as well as our expertise but also a range of selection tools. These tools are based on our experts' know-how; they offer you valuable support during selection, free of charge:

www.ksb.com/pumpselection

KSB EasySelect

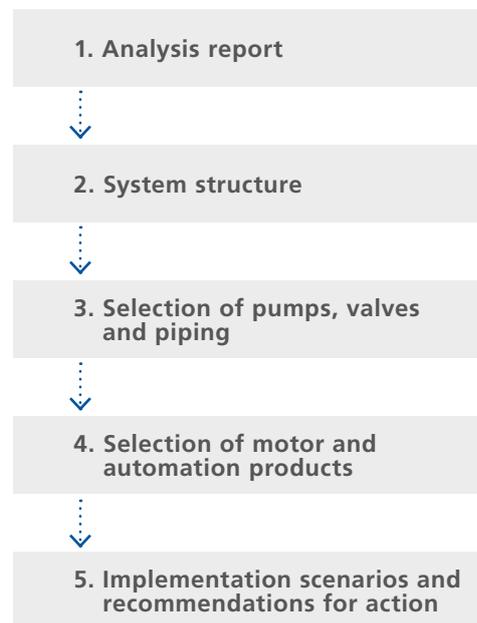
Our all-round tool for selecting pumps and valves for all applications: www.ksb.com/easyselect

Right from the start selected for efficiency

Selection is key for a system to be energy efficient. The individual components of the hydraulic system are matched to customer requirements and to each other. This is how we prepare the ground for efficient operation and maximum savings. We find the optimum solution for every application, through consultation and meeting with the customer.

The systematic approach: step-by-step selection

The best selection result is obtained by following a clearly defined process. All our process steps have been developed and perfected through scientific studies, comprehensive expertise and many years of experience. KSB's experts ideally accompany the entire process, which starts with the analysis report and, via the selection of individual components, results in an energy-efficient system.



.....>
Read more on the individual
selection steps

KSBbase Building Consult

In addition, the selection software for pumps and valves in building services supports building services consultants with information, curves, calculations and typical tenders:

www.ksb.com/ksbase-consult

KSB Helps

KSB Helps is a special selection software for waste water pumps. It helps select the right pump and also offers CAD files and typical tenders:

www.ksb.com/helps

Optimum selection outcome

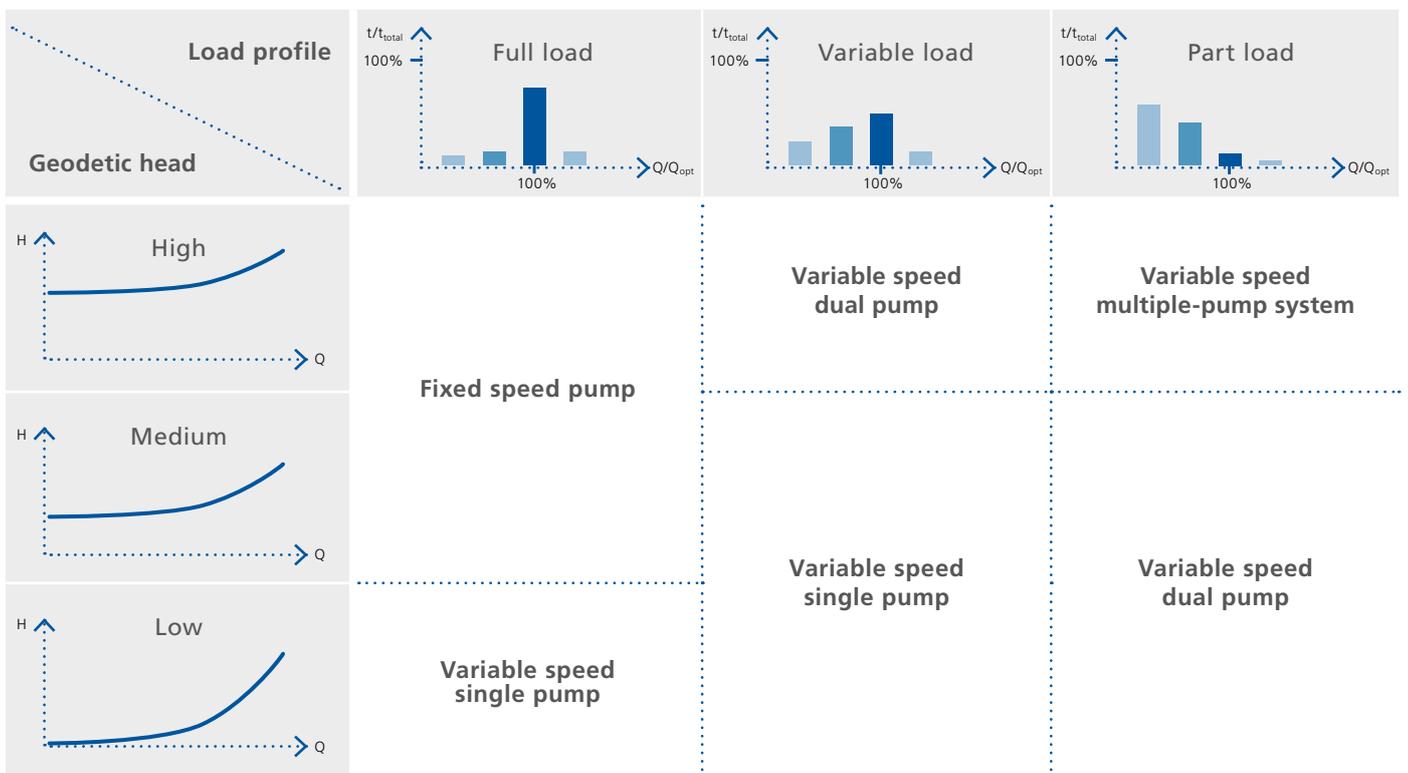
The selection outcomes are implementation scenarios and recommendations on how to optimise the hydraulic system. The optimum is not simply the highest energy efficiency. With FluidFuture® we always satisfy the following four criteria: An optimum solution meets the application-specific requirements, is energy-efficient, has an ideal ratio of savings to investment costs, and complies with the legal (ErP) energy efficiency regulations.

The optimum solution for every system

As a full-range supplier we have got a unique overall perspective of the entire system. Our product portfolio contains the right solution for every challenge. The decisive plus for our customers goes even further: As a technology leader on the market we are not only experts for each and every product but also for the overall system. Our holistic view is the key to finding the best solution for every system.

1. Determining the system structure

Based on the load profile, the geodetic head and other application-specific requirements we determine how many pumps should be used and in what operating mode. This is referred to as the system structure. For a variable load profile, adjusting the head to demand by means of speed control can save 60 % of the energy consumed in mains operation.



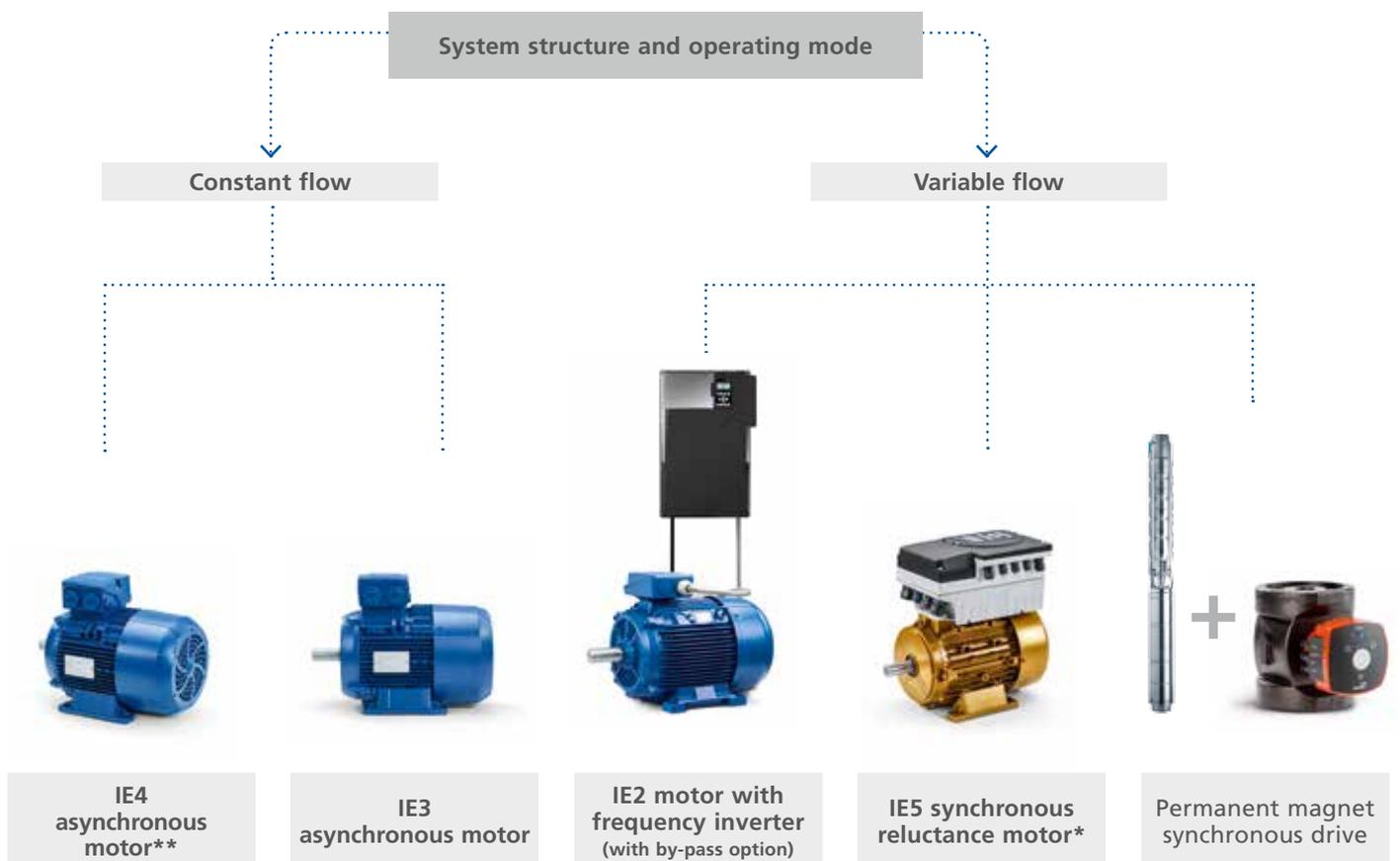
2. Selection of pumps, valves and piping

The components are selected for the determined system structure: For mains operation, the optimum hydraulic system has its maximum efficiency as close as possible to the actual operating point. To this end, we offer a range of closely spaced pump sizes, and we trim the impeller. For speed control, pump selection depends on the number of pumps and the load profile. Valves and piping are optimised regarding flow coefficients and flow velocities.

3. Selection of motor and automation products

KSB's motor concept offers the optimum drive for every system. The ideal combination of motor and automation product for the specific load profile is selected from the broad programme available. Apart from the customer requirements we naturally take into account economic efficiency, resource efficiency and compliance with ErP regulations.

For more information on selection the systematic way, see www.ksb.com/fluidfuture/selection



* IE5 in accordance with IEC/TS 60034-30-2 up to 15/18.5 kW (only for 1500 rpm types rated 0.55 kW, 0.75 kW, 2.2 kW, 3 kW, 4 kW: IE5 in preparation)

** IEC 60034-30-1

On track to success with professional commissioning

Commissioning is a critical step for optimising a system. Attention to detail is important for the system to run reliably and efficiently. Our 3000 service specialists support you with professional installation and commissioning. Further assistance is available through the special functions integrated in KSB products and our own software tools.

Professional commissioning kicks off savings

Having a single service partner means commissioning will run smoothly and at optimised costs. KSB helps you with installation and alignment at the site. Precision during start-up will save you trouble further down the line, and the costs that come with it. We are there for

you with more than 170 service centres worldwide and 3000 plus experts – capable of meeting the most stringent requirements thanks to SCC^P approvals. We are your dependable service partner for the whole spectrum of rotating equipment, including non-KSB products. Apart from commissioning we offer you inspection and maintenance as well as repair services. We are

there when you need us, around the clock. You can also obtain all spare parts from us, quickly and easily.

More about KSB's service at www.ksb.com/single-source-supplier



System analysis

Selection

Commissioning

- Expert installation
- Professional commissioning

Highly efficient operation



Start-up as required, with smart products and smart tools for commissioning

Various products and services support you during commissioning by providing information and functions such as:

- Operating and managing all key parameters
- Configuring automation products
- Local or centralised operation via laptop or mobile devices
- Managing data records
- Monitoring load profile and operating point

For more information on the individual functions of these solutions see the corresponding web sites:

.....> **PumpMeter**

The PumpMeter monitoring unit makes the operating point transparent for commissioning. PumpMeter is supplied completely assembled and pre-set. It simply needs to be connected via a pre-configured bus cable.

www.ksb.com/pumpmeter

.....> **PumpDrive**

.....> The PumpDrive variable speed system supports commissioning by monitoring the operating point. The parameters are set at the factory based on the specific pump and motor data.

www.ksb.com/pumpdrive

.....> **My PumpDrive app**

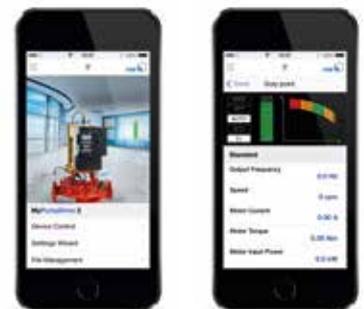
.....> Use the My PumpDrive app for your smartphone to operate PumpDrive via Bluetooth and access comprehensive information. The app includes a commissioning wizard for open-loop control, discharge pressure control and differential pressure control.

www.ksb.com/pumpdrive

.....> **KSB service tool**

.....> This software serves to parameterise and manage all KSB products for automation via PACTware.

www.ksb.com/servicetool



My PumpDrive app for iPhones

For further information go to: www.ksb.com/fluidfuture/commissioning

Efficient operation with **leading-edge technology and expertise**

Maximum energy savings during operation are made by highly efficient systems, comprising pumps, drives, valves and automation solutions from KSB. Intelligent pump technology autonomously optimises the operation, matching it to the demand. Continuous monitoring ensures major savings also in the long term.

Savings by innovative pump and valve technology

.....> **State-of-the-art hydraulic system for highest efficiencies**

One of the main ways KSB contributes towards energy efficiency is the hydraulic system design. Resulting from intensive research and development, KSB pumps have very high efficiencies.

.....> **Saving energy with first-class motors and automation products**

The highest savings during operation are achieved by KSB pump sets comprising the world's most efficient IE5 pump motor* KSB SuPremE® and the PumpDrive variable speed system. The latter adjusts the flow rate automatically and continuously to the actual demand of the system, reducing costs by up to 60 %. In addition, the pump set has the following advantages:

- High efficiency, even at part load
- Integrated multiple pump configuration
- Dynamic pressure setpoint compensation function minimises pipe friction losses
- Sleep mode
- Further valuable functions

.....> **Superior design makes valves more efficient**

Comprehensive optimisation includes valves that are specially matched to the system. Benefit from the advanced globe and swing check valves such as BOA-H and SERIE 2000:

- Excellent zeta values
- Easy-to-insulate BOA-H
- Savings of up to 50 % with both valve types



Etanorm with the world's most efficient pump motor KSB SuPremE® and the PumpDrive variable speed system

* IE5 in accordance with IEC/TS 60034-30-2 up to 15/18.5 kW (only for 1500 rpm types rated 0.55 kW, 0.75 kW, 2.2 kW, 3 kW, 4 kW: IE5 in preparation)

Continuous monitoring ensures efficiency

To ensure increased energy efficiency in the long term, the system parameters are monitored continuously. Complete transparency is crucial. KSB's intelligent automation products provide comprehensive information and many options for connection to a control system:

PumpMeter monitoring unit:

- Analog interface or Modbus RTU
- Further field buses, e.g. Profibus, can be used via gateways

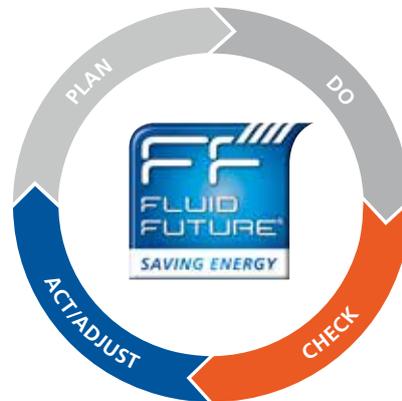
PumpDrive variable speed system:

- Characteristic curve control and operating point estimation
- Flow rate estimation
- Flexible connection via Modbus RTU, Profibus DP, LON BACnet TCP/IP, ProfiNet or Ethernet
- Energy savings meter

The availability of current, precise as-is information at all times enables successful monitoring with FluidFuture®. The systematic approach of continuous monitoring can be perfectly integrated in an energy management system based on the PDCA (Plan-Do-Check-Act) cycle to EN 16001/ISO 50001.

For further information go to

www.ksb.com/fluidfuture/operation



Highly efficient operation

- Intelligent pump technology
- Continuous monitoring



FluidFuture® **saves energy:** our success stories speak for themselves

FluidFuture® is the targeted optimisation and comprehensive analysis of the overall system. Our customers' satisfaction tells us that we are on the right track with this method. Being a partner you can trust is important to us; with FluidFuture® the figures speak for themselves. See for yourself.

→ **90 %**
energy savings with
FluidFuture®

Heidelberger Druckmaschinen AG

Optimisation of the cooling lubricant circuit of the grinding machines

- System analysis
- Replacement of fixed-speed pumps by Etanorm pumps with PumpMeter, PumpDrive and KSB SuPremE® IE5 motor*
- Replacement of the installed swing check valves by pneumatically actuated butterfly valves
- Update of the control system for part-load operation

40 %
less energy
consumption

Miele & Cie. KG

New refrigeration system in Gütersloh

- KSB pumps Etanorm and Etaline
- Automation with PumpMeter and PumpDrive
- Continuous operation with KSB SuPremE® IE5 motors*
- Reduction of CO₂ emissions by 400 tonnes per year

* IE5 in accordance with IEC/TS 60034-30-2 up to 15/18.5 kW (only for 1500 rpm types rated 0.55 kW, 0.75 kW, 2.2 kW, 3 kW, 4 kW: IE5 in preparation)



Heidelberger Druckmaschinen AG: Modernising the system with FluidFuture® has saved 90 per cent in energy.

60 % savings in energy input

ProMinent Dosiertechnik GmbH

Equipment for a new pump test facility

- Efficient, reliable water treatment
- KSB's Movitec pumps
- Automation with PumpMeter and PumpDrive
- Simple commissioning following the "Plug & Run" principle

53 % less power used

Salzgitter Flachstahl GmbH

General overhaul of the district heating system

- System optimisation, new control unit
- Planning and commissioning by KSB
- KSB Multitec pumps controlled as a function of demand
- Highest transparency in the control room

25 % reduction of energy costs

Solvay Fluor GmbH

Modernisation of a recooling plant in Bad Wimpfen

- Analysis with System Efficiency Service
- Scenario-based optimisation
- Single-source provider, including staff training
- Savings of up to € 20,700 p. a.

