

► Our technology. Your success.

Pumps • Valves • Service



PumpMeter: gain a deeper insight into your pump





System analysis

- Creating transparency
- Determining the load profile

Selection

- Defining the system structure
- Selecting components

Commissioning

- Expert installation
- Professional commissioning

Highly efficient operation

- Intelligent pump technology
- Continuous monitoring

ENERGY-EFFICIENT PRODUCTS AND SERVICES



FluidFuture®: the energy-saving concept for maximum efficiency

Many systems do run reliably but they also use a lot more power than necessary. With FluidFuture® we optimise your system's energy efficiency in four steps. We achieve top savings by always taking the whole hydraulic system into account. The resulting low operating costs pay off optimisation costs in no time.

FluidFuture® comprises four steps. From system analysis to highly efficient operation, our systematic and targeted approach provides a maximum in savings at minimum costs. By combining our experience and expert knowledge with smart products and services, we make use of all the potential savings, lowering your operating costs. The PumpMeter monitoring unit plays an important part

in this process: It offers complete transparency of the operating point during the analysis, which serves as the basis for the other steps towards optimisation.

More about FluidFuture®: www.ksb.com/fluidfuture

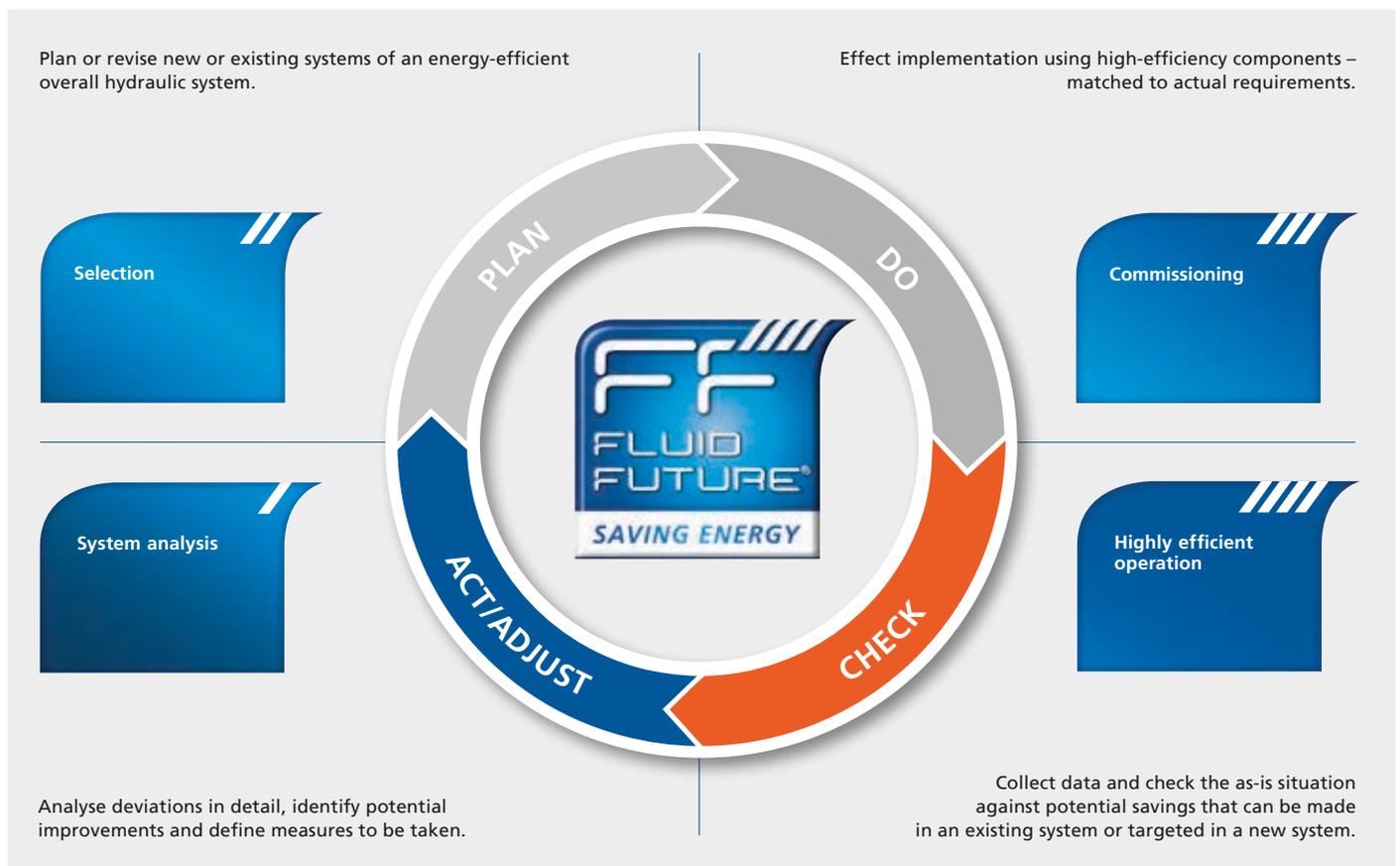
PDCA cycle: the systematic approach to increasing economic efficiency

In these times of rising energy costs, minimising energy consumption has become an important economic factor, which will continue to increase in significance. A good way of recognising and using savings potentials sooner rather than later is a systematic approach based on an energy management system to EN 16001/ISO 50001. These standards follow the so-called PDCA (Plan–Do–Check–Act) cycle for which FluidFuture® is an ideal match.

System analysis is key to success

A pump is a complex component in a larger system. For a sustainable efficiency increase, careful examination of the pump's load profile is required both under current operating conditions and with a view to future demands. The innovative PumpMeter provides transparency and helps you identify valuable savings potential.

Plan–Do–Check–Act cycle



The PDCA cycle – maximum energy efficiency and availability of the hydraulic system as well as support in implementing all phases.



PumpMeter – Your benefits at a glance:

- Transparency of pump operation
- Securing your pump's availability
- Identifying potential energy savings
- Saving time, energy and money

Efficiency is measurable – and so are your potential savings

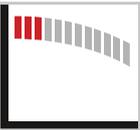
PumpMeter calculates the differential pressure and establishes your pump's operating point by measuring the pump's suction and discharge pressure around the clock. The measured and calculated values are shown in alternation on a user-friendly display. A typical pump curve graph shows you where your pump is currently operating. A load profile is established in the course of the operation using all data compiled to clearly demonstrate your pump's actual operating mode. You are thus provided with valuable data to optimise your system and save costs.

Our experts will help you interpret the operating data displayed and show you how to make perfect use of potential savings.

These benefits speak for themselves:

- Provides all important measurement variables
- Allows on-site display of all relevant operating data
- Calculates the pump's operating point
- Establishes a load profile
- Indicates optimisation potential by displaying the energy efficiency icon (EFF)

The extra benefit: PumpMeter costs less than conventional measuring equipment such as pressure gauges or transmitters.

Display	Interpretation of current operating point	Recommendation
	Very low to possibly zero flow rate.*	Necessary to take action if pump is permanently operated within this range.
	Low flow.*	Optimisation required in the long term.
	Optimum operating point.	The pump runs at its best efficiency point.
	Excessively high flow rate, possibly above the maximum.	Necessary to take action if pump is permanently operated within this range.

* For some pump characteristics, no differentiation is made between the low-flow operating conditions in the curve's first two quarters (both flashing simultaneously).

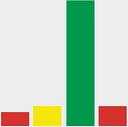
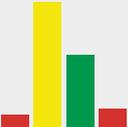
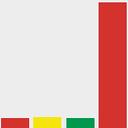
Measure, analyse, act, **save**

Efficiency can be controlled – for example with a PumpDrive

PumpMeter continuously analyses your pump's operating data and detects energy saving potentials. If the energy efficiency icon (EFF) is displayed, your pump could significantly benefit from measures to save energy. A PumpDrive variable speed system might be an appropriate option. Retrofitting PumpDrive is fast and easy. PumpMeter provides all parameters needed to employ PumpDrive. This, in combination with the plug & pump principle, greatly simplifies PumpDrive's parameterisation.

Your benefit:

When retrofitting your pump with a variable speed system, PumpMeter can be directly used as a feedback value transmitter for pressure/differential pressure.

Display	Load profiles (examples)	Recommendation
	 <p>Operation at or around the best efficiency point.</p>	No action required. The pump runs at its best efficiency point.
	 <p>The operating point moves across a wide range of the pump's characteristic curve.</p>	Take action for optimisation. Significant energy saving potential can be realised, e.g. by using a variable speed system.
	 <p>Borderline operating range; risk of pump and/or motor overload.</p>	Take action for optimisation: Trim the impeller to increase energy efficiency and availability.



Two ways towards **more efficiency**

For single pumps: Pump Operation Check

Efficiency analysis with PumpMeter measures pressures for a representative period of time. The measured data is read from PumpMeter without any impact on the operating process and without any risk of interfering with the operation of the system. Based on the measured pressure our experts not only provide you with the qualitative load profile of the pump to be analysed, they also recommend actions for optimisation, such as installing a variable speed system or trimming the impeller to the optimum duty point. You will also be given a profitability analysis and, on request, a quotation for KSB to implement the suggested measures.

Analysis of complex systems: SES System Efficiency Service

Next to PumpMeter, which places all focus on the pump, our SES System Efficiency Service analyses pump operation as part of the overall system. A data logger records process and vibration measurements over a prolonged period and generates load curves over time. Our experts are able to see if and when constant or fluctuating loads are prevalent. By comparing the actual, measured load profile with the design conditions, they identify potential for savings and possible causes of damage. Our system analysis is geared towards increasing the economic efficiency of your entire pump system.

For more information on SES see
www.ksb.com/ses



Pump Operation
Check with
PumpMeter



SES measurements
using a data logger

PumpMeter	SES System Efficiency Service
PumpMeter focuses on fixed-speed pumps in single-pump applications	SES analyses the operating range of pumps and their interaction with the overall system
Qualitative analysis of the operating range of volute casing pumps and small to medium ring-section pumps of all makes (up to a drive rating of 45 kW)	Detailed assessment of the operating range and operating behaviour of all types and makes of centrifugal pumps (with a drive rating of 30 kW and above)
Basis of analysis: measured pressures	Extensive analysis: pressure, effective power, flow rate, speed, vibration acceleration and process data for assessing the overall system
Recording of the load profile	Recording of the load profile as well as load curves over time
For application outside of potentially explosive atmospheres	For application outside of as well as in potentially explosive atmospheres
Report of findings includes recommendations for optimising the pump, e.g. fitting a variable speed system (on pumps with variable demands on the flow rate)	Report of findings includes detailed information and a multitude of recommended actions to optimise the operation of the entire system
Payback analysis on request	Payback analysis included



The easy route to new insights

PumpMeter comes mounted to the pump as standard, making commissioning straightforward. Naturally, ordering the pump without PumpMeter is also an option.

PumpMeter simplifies commissioning of both the pump and the retrofitted PumpDrive variable speed system by giving you an insight into your pump's operating point at all times. The connec-

tion of PumpMeter to your process control system using standardised interfaces allows you to have central access to all relevant data. This makes further analysis fast and convenient.

Bernhard Neumann, Miele:

“What connects us to KSB? Pushing the boundaries in energy efficiency technology.”

Spent a little, **saved a lot**

KSB can already refer to many case studies which demonstrate the significant benefits of PumpMeter. Let us show you two examples.

Miele & Cie. KG, Gütersloh

Starting point:

Commissioning a new system for centralised cooling water supply

Measures taken:

Use of 2 high-efficiency refrigeration units in combination with

- 11 x Etaline GN and 7 x Etanorm G pumps – each fitted with PumpMeter and PumpDrive
- 2 x high-efficiency KSB SuPremE® IE5 motors*
- Data measured by PumpMeter as well as PumpDrive data on power input / speed are transmitted to the central energy management system via Profibus

Result:

- 40 % less energy required for refrigeration
- Annual reduction of CO₂ emissions by 400 tonnes



Etaline PumpDrive dual-pump sets



2 Etanorm PumpDrive pumps for continuous operation with high-efficiency KSB SuPremE® IE5 motors*

* 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)



Movitec pumps with PumpDrive and PumpMeter



Pump test bed

ProMinent Dosiertechnik GmbH, Heidelberg

Starting point:

Construction of a new pump test bed with water treatment unit

Measures taken:

- 6 x Movitec pumps with PumpMeter and 5 x PumpDrive MM Advanced IP 55 as pre-set units
- This configuration maintains constant pressure and provides the flow rate required at the test stand for process dosing pumps

Result:

- PumpDrive adjusts the rotational speed of the motor – and with that the pump's flow rate and head – to match current demand
- Thanks to PumpMeter, the pumps are continuously monitored and any faulty operation is immediately identified
- Energy savings of up to 60 %



Walter Hetzel, ProMinent:

"PumpDrive makes for energy efficiency, PumpMeter for transparency and system reliability."

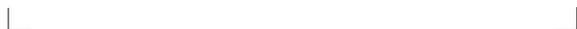


Technology that **makes its mark**

The KSB newsletter –
don't miss out, sign up now:
www.ksb.com/newsletter



Your local KSB representative:



KSB SE & Co. KGaA
Johann-Klein-Straße 9
67227 Frankenthal (Germany)
www.ksb.com

You can also visit us at
www.ksb.com/socialmedia