

► Our technology. Your success.

Pumps • Valves • Service



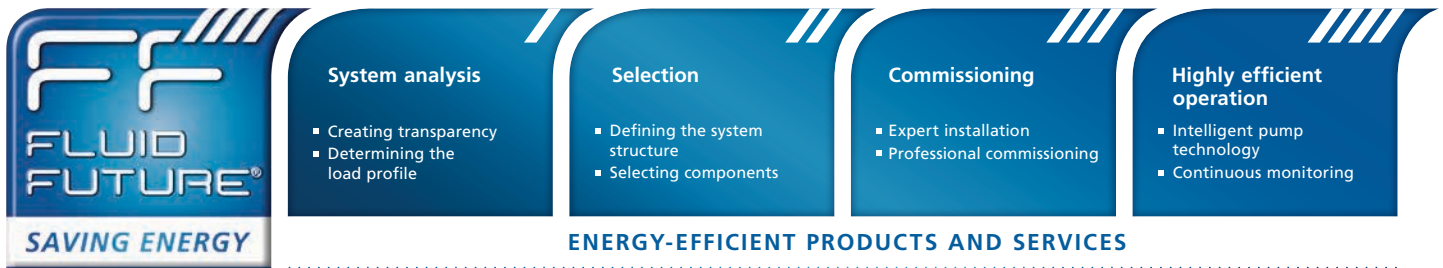
PumpDrive: flexible speed control for top efficiency

Optimum



Optimum operating speeds for maximum savings

Demand-driven operation allows maximum energy savings. PumpDrive makes sure that pump operation is both energy-efficient and reliable. As an element of our FluidFuture® energy efficiency concept, PumpDrive plays a key role in optimising the entire hydraulic system, enabling energy savings of up to 60 %.



FluidFuture®: systematic optimisation

With FluidFuture® we optimise your system's energy efficiency in four steps. We look at the hydraulic system as a whole and its entire life cycle. We take a systematic and targeted approach towards a maximum in savings at minimum costs. By combining our comprehensive experience and expert knowledge with smart products and services, we make use of all the potential savings.

Long-term cost savings

Energy costs account for approximately one third of all life cycle costs and can be substantially reduced by controlling power input, especially with fluctuating demands. PumpDrive not only increases energy efficiency, but also the availability of the pump itself. And this right from the start, since pump and PumpDrive are factory-set and perfectly matched to each other – for quick commissioning and maximum savings.

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



All benefits at a glance

Energy efficiency

- High-efficiency pump set with the world's most efficient magnet-less pump motor KSB SuPremE® and PumpMeter.
- Integrated multiple pump operation
- Dynamic pressure compensation function

Operating reliability

- Characteristic curve control
- Flow rate estimation
- Functions package for waste water applications
- Full redundancy by dual pump management

Flexibility

- Functions package for pressure boosting applications
- Motor-mounted up to 55 kW
- Ratings from 0.37 to 55 kW (up to 1.4 MW available on request)
- Several mounting options
- Various field bus modules

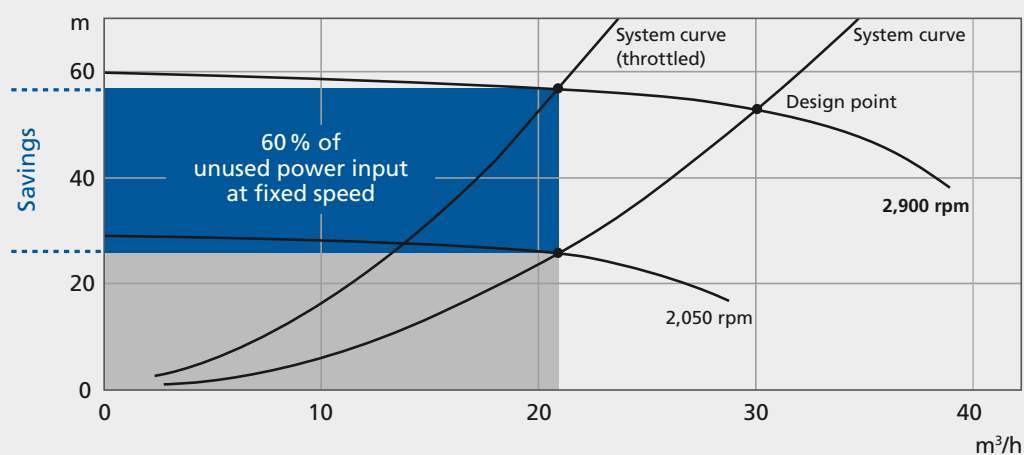
Ease of use

- Parameters factory-set for specific pump
- Integrated interfaces
- App for control and monitoring purposes

Top efficiency. And much more

In order to enable energy savings of up to 60 %, it is particularly important to recognise changing requirements and respond to them with suitable control concepts. This is why PumpDrive continuously matches the speed of the pump to actual demand.

Sample calculation



Etanorm PumpDrive 32-200/552. A demand-based reduction in the flow rate by just 30 % translates into savings of € 1,712/8,000 operating hours (at 12 cents/kWh).

Always running at **best efficiency point**

Demand-driven operation through speed control is just the beginning, as PumpDrive comes with numerous functions that save even more on energy. By means of continuous measurements and calculations as well as thanks to enhanced pump functions, the unit ensures optimum operation for any demand and at all times.

Together with the IE5 pump motor* KSB SuPremE®, PumpMeter and PumpDrive, pumps are operated as efficiently as possible.



Speed control – now more efficient than ever

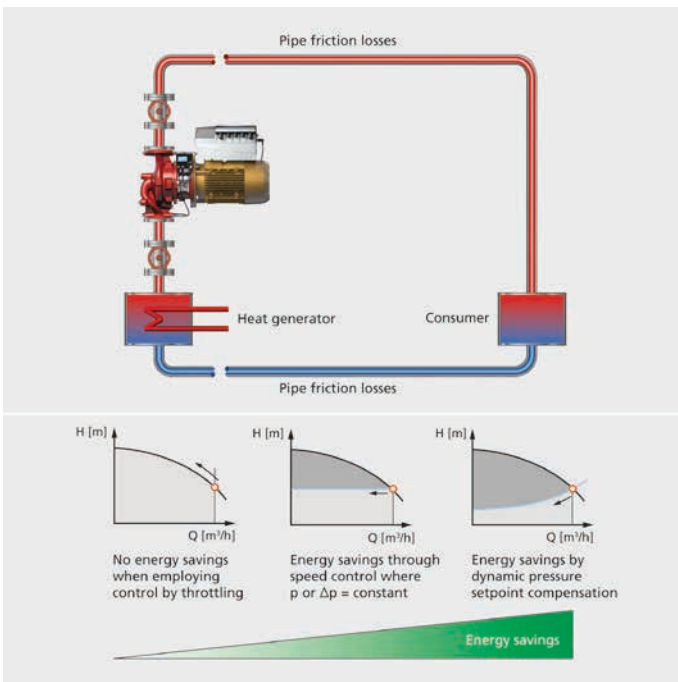
The PumpMeter monitoring unit, the world's most efficient magnet-less pump motor KSB SuPremE® and PumpDrive combine into a highly efficient unit. The values measured by PumpMeter enable even more precise operating point estimation and, hence, speed control. Connected by a pre-configured cable, the components can easily update themselves on site, including in retrofit applications. A special plug-type connector joins PumpDrive with the KSB SuPremE® IE5 motor*. The motor control method is also optimally designed for the highly efficient combination, since the MotionControl firmware enables optimum control of asynchronous motors as well as synchronous reluctance motors.

Dynamic pressure compensation function

Thanks to the differential pressure setpoint compensation function, PumpDrive is capable of automatically compensating for pressure losses. The unit calculates or estimates the pipe friction losses, which vary with the flow rate, and increases the pressure to match the setpoint defined.

Integrated multiple pump operation

During parallel operation of up to six pumps connected by preconfigured M12 cable, the speed control systems start up or stop pumps in line with demand.



*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)



Full transparency adds reliability

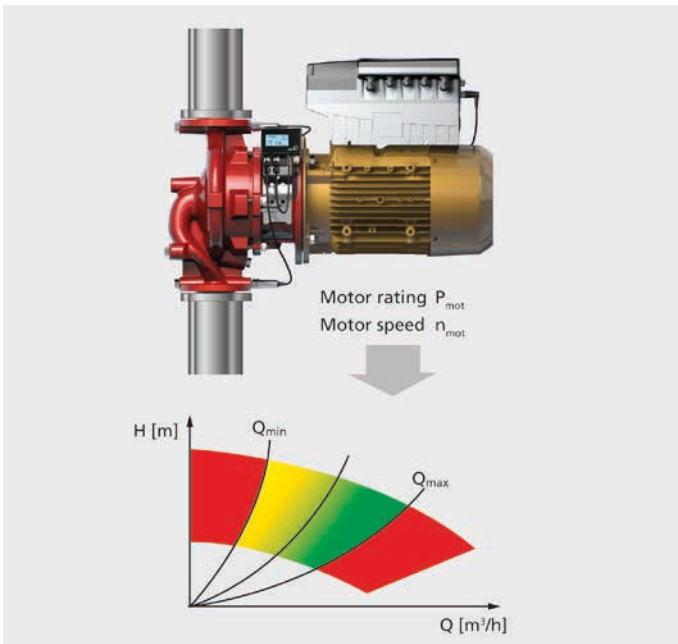
Continuous monitoring of the pumps' operating status lays the foundation for reliable operation. PumpDrive therefore continuously records and processes values, readings and data to monitor the permissible operating range at all times and ensure system availability.

Full redundancy by dual pump management

Thanks to integrated dual pump management, the predefined setpoint for the system is ensured at all times by way of two identical pumps. Two operating modes can be set.

- The setpoint is achieved with one pump operating at rated values (2 x 100 %).
- The system's rated operating point is achieved with both pumps operating at rated values (2 x 50 %).





Characteristic curve control and flow rate estimation

PumpDrive checks the operating status of the pump around the clock to avoid potential damage and failures. It controls the pump's characteristic curve and estimates the operating point on the basis of the motor input power and the current speed. This, in turn, allows PumpDrive to detect operation outside the permissible range such as extremely low flow, dry running, or overload. Messages are generated based on predefined settings and, upon request, the pump set is switched off before damage can occur.

PumpDrive also continuously estimates the flow rate. Based on power measurement or differential pressure measurement and characteristic curve function, it estimates the current flow rate which is also needed for dynamic pressure compensation and other important functions.



Waste water functions package

Waste water applications in particular place heavy demands on pumps, which is why PumpDrive increases their availability by leveraging functions designed to control speed in a targeted manner. The waste water pump is started at maximum speed. In addition, anti-contamination measures help keeping pipes free and unobstructed: PumpDrive never controls the operating speed below the minimum flow velocity to prevent the build-up of contamination and triggers a rinsing function.

Unlimited flexibility

For every requirement and every application: With a broad range of ratings from 0.37 kW to 55 kW (up to 1.4 MW available on request), PumpDrive provides for top levels of operating reliability and optimum efficiency.

Always where you need it

Mounted to the motor, the wall or in a control cabinet – PumpDrive can be positioned to meet customer requirements and conditions on site.



Motor mounting PumpDrive can be mounted on motors up to ratings of 55 kW, making it compatible with the constraints on site. Retrofit applications also do not pose a problem by eliminating the need for installation space in the control cabinet and making it unnecessary to search for a suitable section of wall.



Wall mounting allows the pump and PumpDrive to be arranged right next to each other for optimum control at a glance.



Cabinet mounting If the pump is installed in a demanding environment, PumpDrive can be mounted in a control cabinet. Cabinet-mounted PumpDrives can be used up to ratings of 1.4 MW.

Easy to operate

If the pump is installed in places where access is difficult, KSB offers the following easy-to-operate options:



FlowManager remote control app A Bluetooth connection and the free-of-charge KSB FlowManager app allow easy PumpDrive operation via a smartphone. Bluetooth gateway can also be retrofitted.



Connected via a cable The display can be removed from the actual PumpDrive. Connected via a cable it can be fastened to the wall some metres away from PumpDrive.



Mounted on the wall If space restrictions in the system are known right from the planning phase, the entire PumpDrive can naturally be mounted to the wall.

Very convenient with the simplest of commissioning procedures

- The commissioning wizard guides the user through all main commissioning parameters.
- The customer's system data is already saved in the device: pre-set at the factory.
- Ample space for cable connection.
- The pre-assembled PumpMeter can easily be joined to PumpDrive with a M12 plug-type connector.

Easy communication via external Bluetooth gateway:

- External Bluetooth interface enables communication with smartphones (iPhone and Android) or notebooks
- Can simply be plugged onto the service interface of PumpDrive
- Additional interface for mini-USB cable for communication with notebook or for battery charging

Functional and convenient: KSB FlowManager app

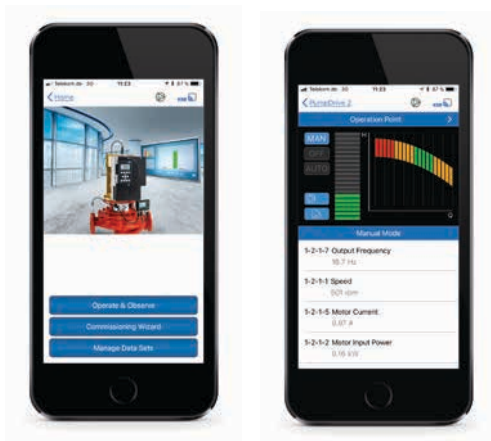
PumpDrive can be remote-controlled via a smartphone display. KSB's handy FlowManager app is available free of charge in English, French and German from the iTunes Store.

- **Operation and monitoring:** Access to key parameters, display of alerts and warnings, presentation of trends and graphical display of current parameters.
- **Commissioning wizard** for the three main applications: Open-loop control, discharge pressure control, differential pressure control.
- **Managing data records:** Send parameter sets from your smartphone to PumpDrive, from PumpDrive to your smartphone, or per e-mail to your PC for archiving.

Pressure boosting functions package

System pressure is influenced by many factors. PumpDrive integrates special functions that ensure operating pressure remains constant to safeguard the availability of water:

- **Lack-of-water function:** Should the pressure in the water supply network drop because large quantities of water are being withdrawn, PumpDrive stops the pump set. When the pressure in the network rises again, PumpDrive starts the pump up again.



Variety in its most efficient form

The PumpDrive is available in various configurations, each of which offers a different level of functionality to ensure optimum speed control: a fully equipped model for flexible applications and an Eco version that includes the full range of basic functions.

PumpDrive



Main applications

PumpDrive

- Air conditioning systems
- Heat generation/distribution
- Water supply systems
- Water extraction/withdrawal
- Water treatment/conditioning
- Water distribution/transport
- Refrigeration/distribution
- Fluid transport
- Cooling lubricant distribution
- Water extraction
- Service water supply
- Tank drainage
- Waste water transport

Housing sizes for different power ranges



Optionally integrated master switch for disconnection of the entire pump set from the power supply and protection against unintentional start-up.

PumpDrive Eco



Main applications

PumpDrive Eco

- Air conditioning systems
- Heat generation/distribution
- Water supply systems

Housing sizes for different power ranges



Technical data of PumpDrive/PumpDrive Eco:

Mains voltage	1 ~ 230 V AC (0.12 – 1.1kW) 3 ~ 380 V AC -10 % to 480 V AC + 10 %
Voltage difference between the three phases	±2 % of the supply voltage
Mains frequency	50–60 Hz ±2 %
Mains types	1 ~, TN-S, TN-CS, TN-C, TT and IT mains (to IEC/EN60364)
Type of protection	IP55 to EN 60529
Ratings	PumpDrive – 0.37 kW to 55 kW PumpDrive Eco – 0.37 kW to 11 kW PumpDrive R (cabinet-mounted) – 0.37 kW to 110 kW (up to 1.4 MW available on request)
In-service ambient temperature range	-10°C to +50°C



Technology that **makes its mark**

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