

**Energy. Natural. Endless.  
Solutions for Wind Power Plants.**



## KSB brings a fresh breeze to energy supply.

Wind power is one of the most important regenerative energy sources. Using it economically and profitably is a major challenge. High investment costs and service outlay need to be offset by long-term profitability. So it is all the more important to ensure reliable products are deployed in wind power plants.

Pumps and valves in these applications need to run efficiently and safely. The demands placed on them are high. They are used in cooling circuits, fire-fighting systems, pressure-boosting and cleaning systems as well as for tank filling and seawater extraction.

All pumps and valves are selected and designed to ensure that can be depended on to meet the specific requirements of the various processes.

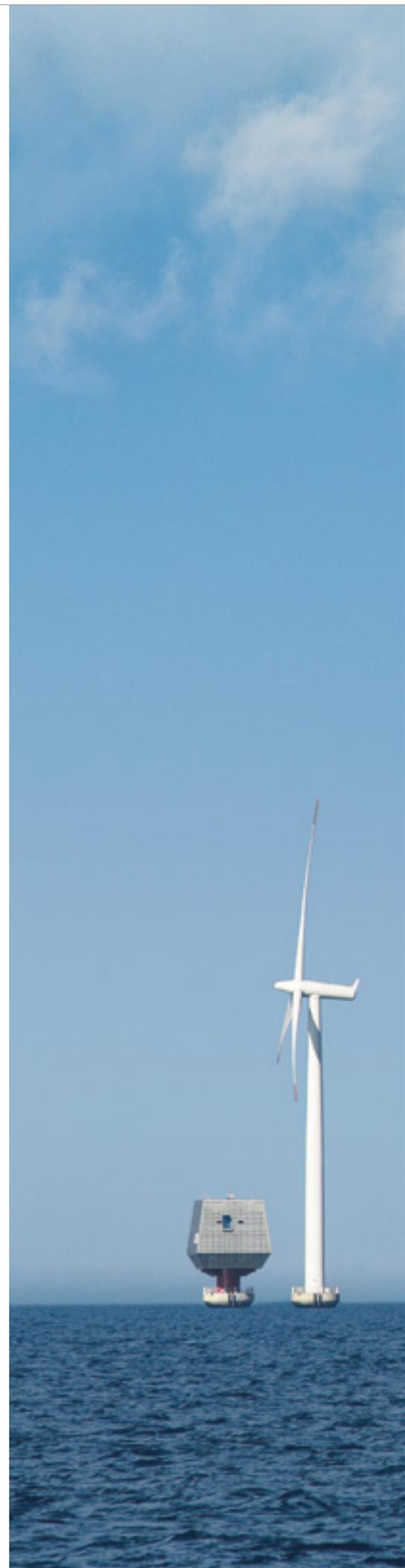
### Your partner for energy efficiency:

As a global market leader in the supply of pumps, valves and systems, KSB is the ideal partner for plant operators, consultants, planners and engineering contractors. We meet all the demands placed on our products by wind power plants, every step of the way from planning to production and right through to installation, commissioning, maintenance and repair.

In close cooperation with renowned research institutes, we continuously develop new materials and technologies. We tailor all the components individually so that we can offer our customers optimally designed products. Products with minimum life cycle costs and maximum efficiency. That is what we at KSB stand for. With more than 15 000 employees, over 160 service centres and 30 production facilities around the world, we are dedicated to supporting you with reliable and sustainable solutions.



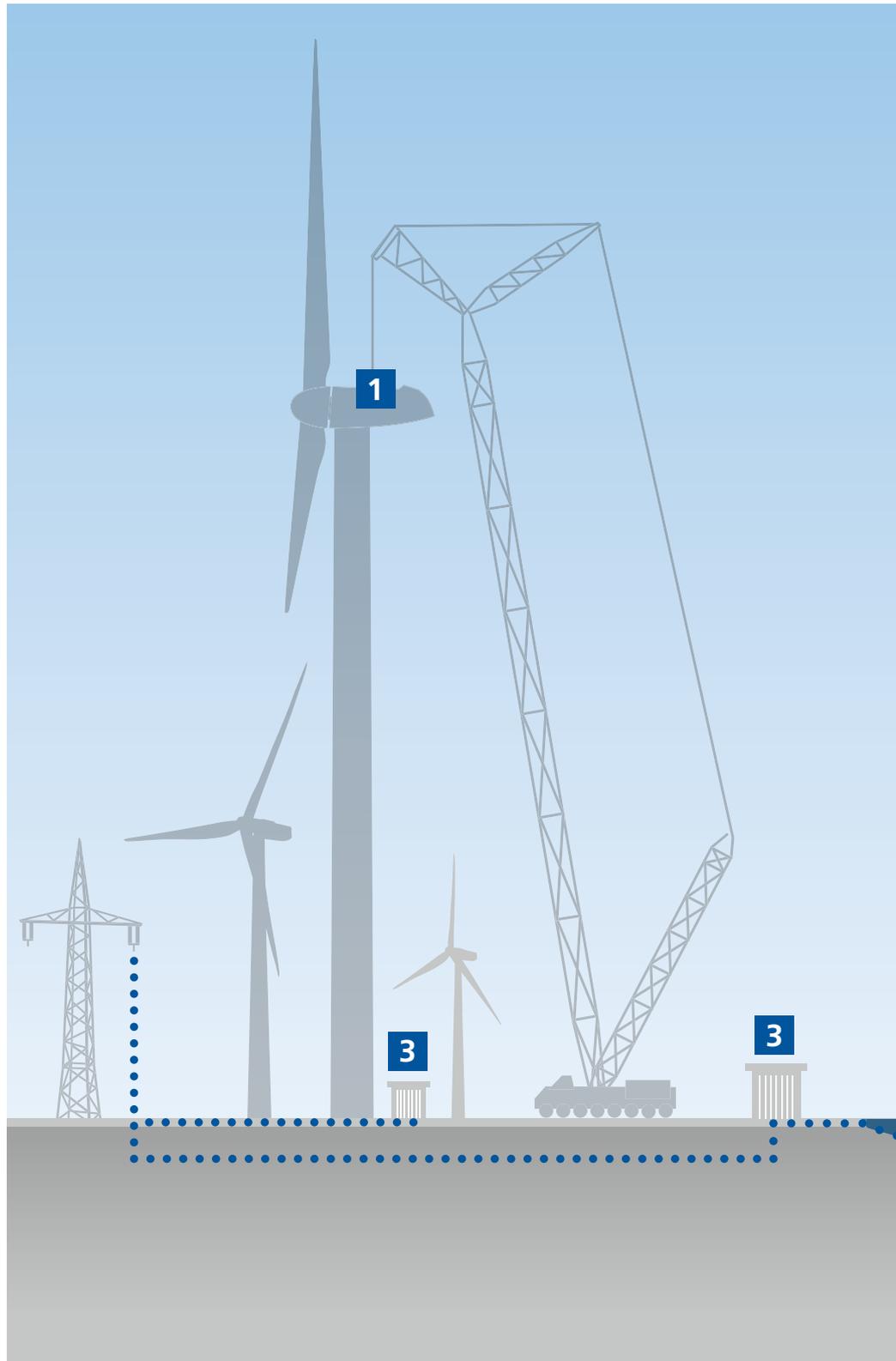
As a signatory to the United Nations Global Compact, KSB is committed to endorsing the ten principles of the international community in the areas of human rights, labour standards, environmental protection and anti-corruption.





# Our role in wind power plants:

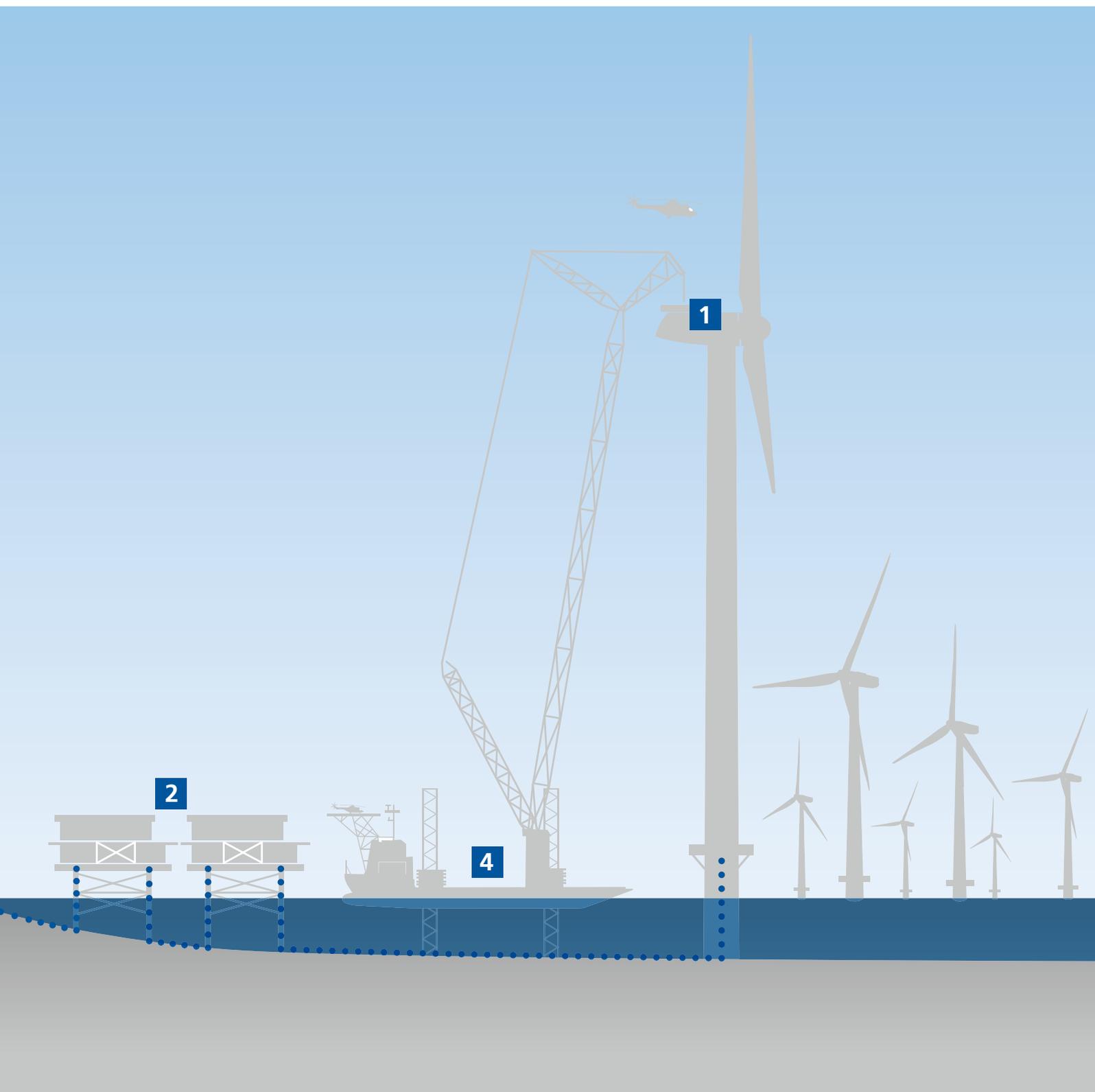
## Onshore



KSB pumps and valves are used in cooling circuits, fire-fighting systems and for seawater extraction.

- 1** Onshore and offshore wind turbines
- 2** Offshore transformer platforms
- 3** Onshore supply to the grid
- 4** Jack-up vessels

# Offshore



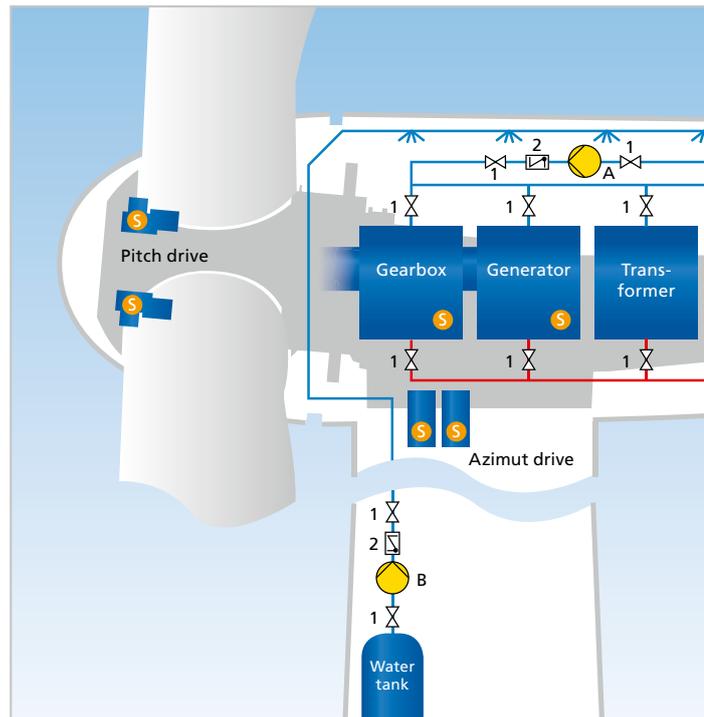
## Onshore and offshore wind turbines.

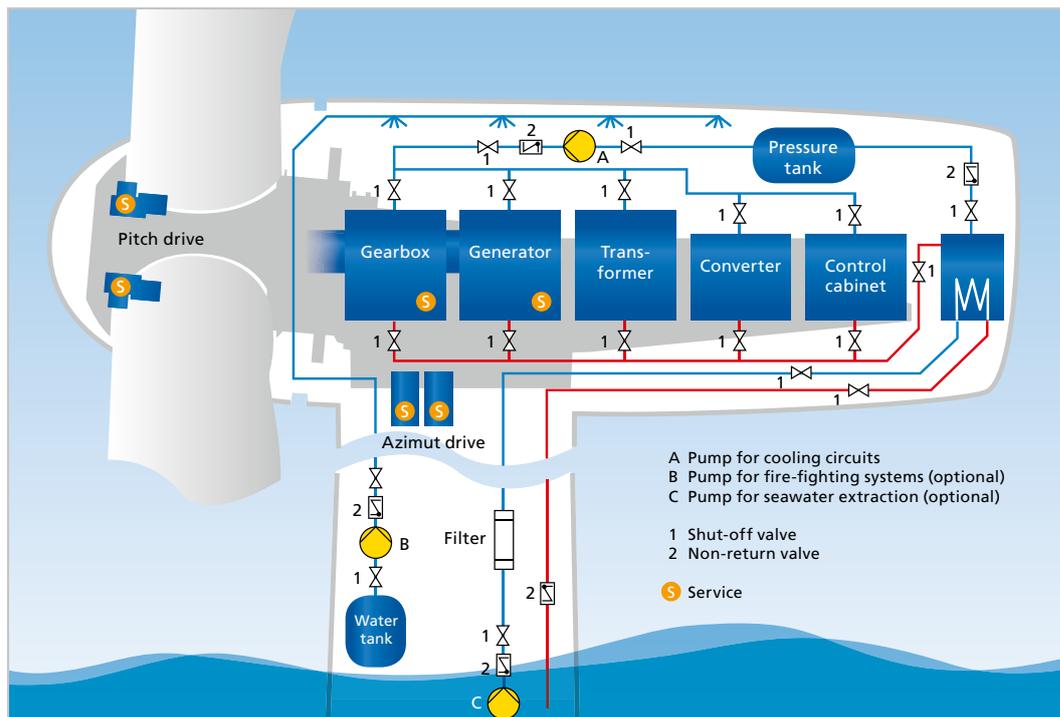
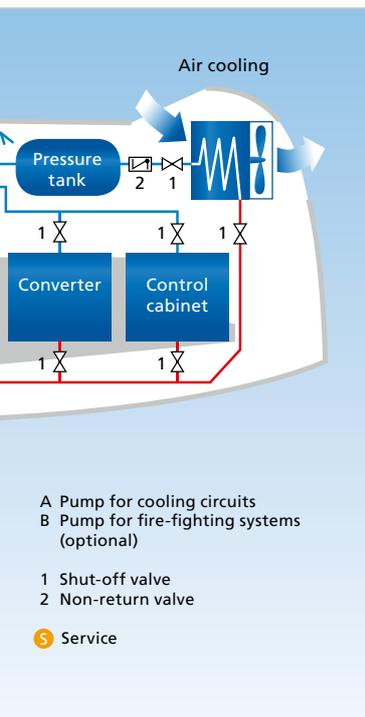
Wind turbines with an output of 2 MW and more are often cooled with a water-glycol mix. The heat is released into the environment via a heat exchanger.

Offshore turbines can be cooled with seawater as an alternative. This places high demands on the materials used.

KSB provides high-reliability pumps, valves and service support for the following applications in onshore and offshore wind turbines:

- Cooling circuits
- Fire-fighting systems
- Seawater extraction





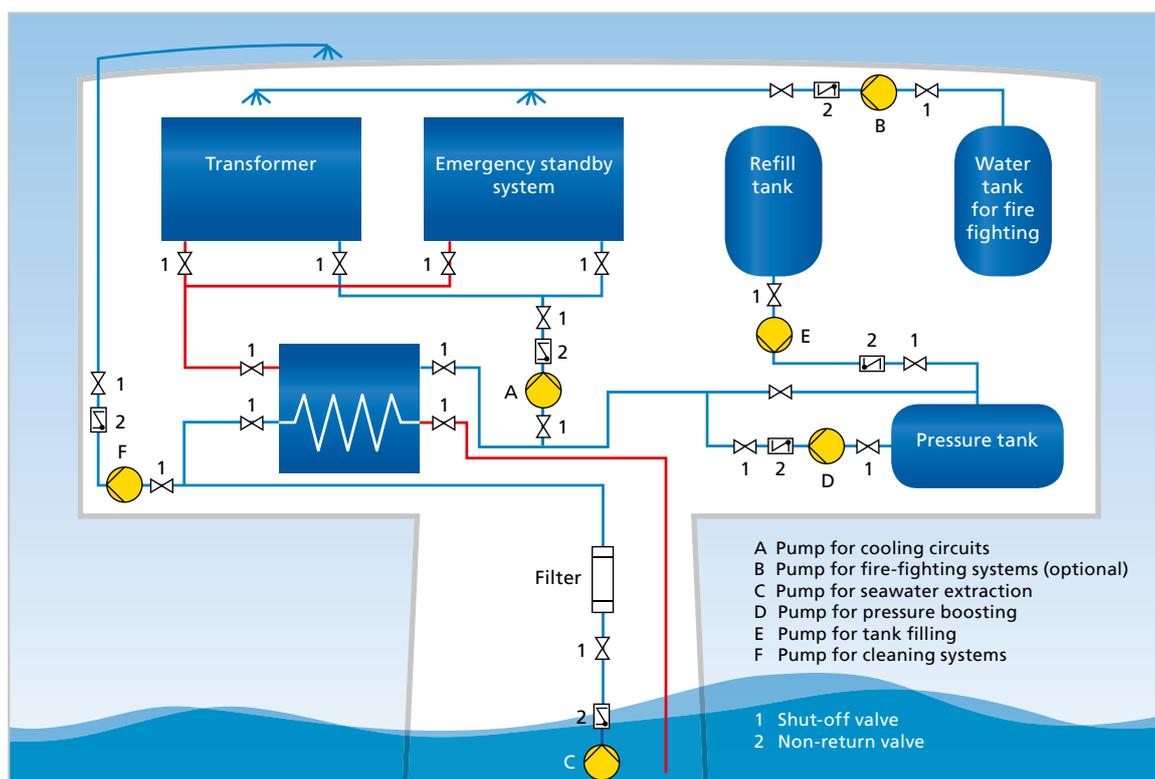




## Offshore transformer platforms.

In offshore wind farms located no further than 50 km from the coast, the electricity generated by the wind turbines is generally collected on offshore transformer platforms and transported onward via high-voltage link. When greater distances are involved, the electricity is stepped up to HVDC (High Voltage Direct Current) so that no losses are incurred during onward transmission. Multiple wind farms can be connected up to the platforms. KSB provides high-reliability pumps, valves and service support for the following applications on the platforms:

- Cooling circuits
- Fire-fighting systems
- Seawater extraction
- Cleaning systems



## Onshore supply to the grid.

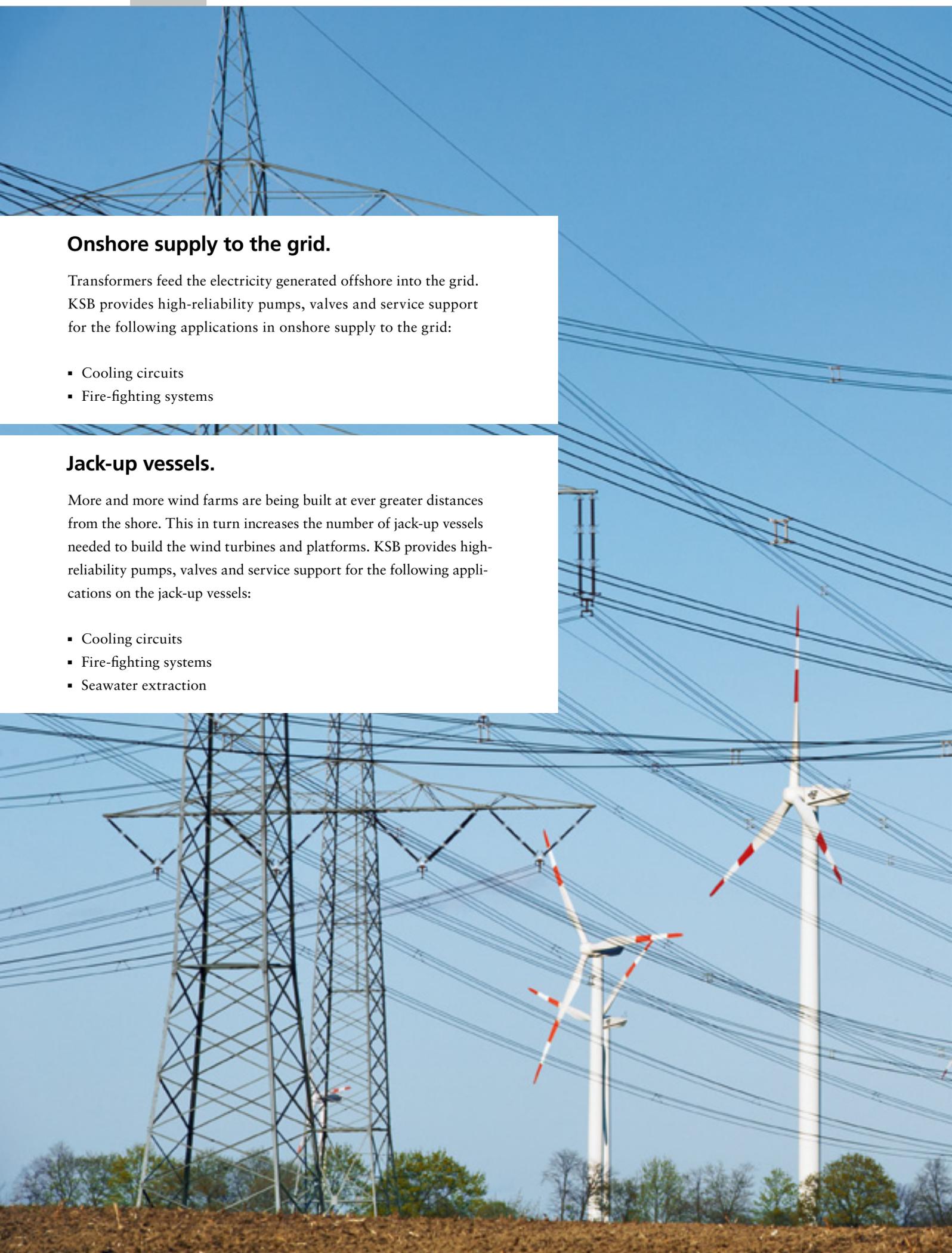
Transformers feed the electricity generated offshore into the grid. KSB provides high-reliability pumps, valves and service support for the following applications in onshore supply to the grid:

- Cooling circuits
- Fire-fighting systems

## Jack-up vessels.

More and more wind farms are being built at ever greater distances from the shore. This in turn increases the number of jack-up vessels needed to build the wind turbines and platforms. KSB provides high-reliability pumps, valves and service support for the following applications on the jack-up vessels:

- Cooling circuits
- Fire-fighting systems
- Seawater extraction





## KSB Service geared to wind power plants.

As an industry leader, KSB Service is continually expanding its service portfolio. With gear-tec GmbH in Eggebek, northern Germany, KSB can call on in-depth knowledge of wind turbine gearboxes and the corresponding service skills. The Motoren Jacobs service centre in Heide takes care of generator maintenance.

Drive trains can be maintained and repaired both in the workshop and on site at the wind farm. At the Eggebek site, the service specialists handle heavy components weighing up to 65 tonnes. These include gearboxes of all makes with power ratings ranging from 100 kW to 6.5 MW. The team of experienced engineers develops plannable, efficient solutions – whether it be for a maintenance job or optimisation measures.

### Their services include:

- Repair and maintenance of drive trains (rotor shaft, gears, transmission, generator)
- Mechanical overhaul and repair of generators, azimuth and pitch drives
- Repair of oil pumps and ventilators
- Laser alignment of drive trains
- Optimisation and retrofits
- Dismantling and reassembly, crane service and transport
- Gearbox replacement
- Thermal imaging
- Transformer service: maintenance according to manufacturer's instructions (annually)





### **State-of-the-art expertise: Original spare parts and improved bearing concepts.**

Using high-quality spare parts is a key element of professional maintenance. Replacement gear teeth manufactured today are of much higher quality than those originally mounted in the gearbox. The current range of rolling element bearings is manufactured exclusively for use in wind turbine gearboxes. High-grade materials and coated raceways, combined with a smart concept, improve the properties of the rolling element bearings and guarantee a longer service life.

### **Your benefits:**

- A single contact for all drive train service requirements
- Dependability based on many years of experience and in-depth know-how
- Quality to EN ISO 9001
- Warranty on all repairs
- Transparency thanks to a history file which lists all repair or modification work





## KSB expertise in wind power plants.

The following overview shows the possible applications for KSB pumps, valves and automation solutions.

	Etaseco®	Etaline®	Movitec®	CPKN	ITUR ILN	ITUR BEV	ITUR FFS	Omega®	UPA®
<b>Wind turbines</b>									
Cooling circuits	●	●	●		●				
Fire-fighting systems			●		●		●		
Seawater extraction						●			●
<b>Offshore transformer platforms Onshore supply to the grid</b>									
Cooling circuits		●		●	●	●		●	
Fire-fighting systems		●	●	●	●	●	●		●
Seawater extraction							●		●
Pressure boosting			●						
Tank filling		●	●			●			
Cleaning systems		●	●	●					
<b>Jack-up vessels</b>									
Cooling circuits				●	●	●			●
Fire-fighting systems				●	●	●	●		●
Seawater extraction				●	●				●



Amarex® KRT®	PumpMeter	PumpDrive	Hyamaster SPS	BOACHEM® ZXA/ZYA	BOAX®-B	ISORIA 10/16	BOACHEM® RXA	Serie 2000	BOA®-RVK	BOA®-S	BOACHEM® FSA
	●	●		●	●	●	●	●	●	●	●
●		●			●	●		●			
	●	●	●	●	●	●	●	●	●	●	●
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						●					
●		●				●					
●						●					

## Pumps for applications in wind power plants.

Etaseco®

Automation options: PumpMeter, Hyamaster, PumpDrive



### Design:

Cooling circuit pump with canned motor; in back pull-out design with fully enclosed canned motor, low noise emission, with radial impeller, single-stage, single-entry, casing connecting dimensions to EN 733.

- Lightweight
- Space-saving design
- Long service intervals
- No pressure losses

### Applications:

Handling aggressive, flammable, toxic, volatile, or valuable liquids in the chemical and petrochemical industries, as well as in environmental engineering and industrial applications.

### Technical data:

DN	32–100
Q [m <sup>3</sup> /h]	max. 250
H [m]	max. 100
p [bar]	max. 16
T [°C]	-40 to +160

Etaline®

Automation options: PumpMeter, PumpDrive, Hyamaster, LevelControl, Control units



### Design:

Close-coupled in-line heating pump with volute casing and standardised motor.

### Applications:

Hot water heating systems, cooling circuits, air-conditioning systems, water supply systems, service water supply systems and industrial recirculation systems.

### Technical data:

DN	32–200
Q [m <sup>3</sup> /h]	max. 700
H [m]	max. 95
p [bar]	max. 16
T [°C]	-30 to +140

## Movitec®

Automation options: PumpMeter, Hyamaster

### Design:

Multistage, vertical, high-pressure centrifugal pump in ring-section design with suction and discharge nozzles of identical nominal diameters arranged opposite to each other (in-line design), close-coupled. ATEX-compliant version available.

### Applications:

Spray irrigation, irrigation, washing, water treatment, fire-fighting and pressure-boosting systems, hot water and cooling water recirculation, boiler feed systems, etc.

### Technical data:

DN	25–100
Q [m³/h]	max. 113
H [m]	max. 401
p [bar]	max. 40
T [°C]	max. +140
n [min-1]	max. 2900



## CPKN

Automation options: Hyamaster, PumpDrive, PumpExpert

### Design:

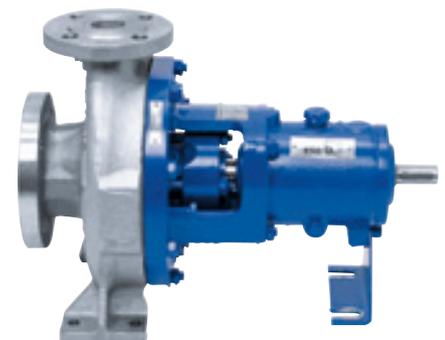
Horizontal, radially split, single-stage volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-entry, with radial impeller. Also available as variant with "wet" shaft, conical seal chamber, heatable volute casing (CPKN-CHs) and/or semi-open impeller (CPKNO). ATEX-compliant version available.

### Applications:

Handling aggressive liquids in the chemical and petrochemical industries, as well as in refinery systems, fire-fighting systems and brine transport.

### Technical data:

DN	25–400
Q [m³/h]	max. 4150
H [m]	max. 185
p [bar]	max. 25
T [°C]	max. +400



## ITUR ILN

Automation options: PumpDrive, Hyamaster, hyatronic



### Design:

Vertical in-line centrifugal pump, with closed impeller and mechanical seal. ILNS is equipped with a self-priming auxiliary pump and ILNE with an ejector. The back pull-out design allows the removal of the impeller without dismantling the piping and the motor.

### Applications:

Hot water heating systems, cooling circuits, air-conditioning systems, water and service water supply systems, industrial recirculation systems.

### Technical data:

DN	65–400
Q [m <sup>3</sup> /h]	max. 3500
H [m]	max. 110
p [bar]	max. 16
T [°C]	-20 to +70
n [min-1]	max. 3600

## ITUR BEF

Automation options: PumpDrive, Hyamaster, hyatronic



### Design:

Multistage deep-well turbine pump with closed impellers, column pipe with bearings, shaft sleeve, shaft sealed by gland packing, driven by electric motor or diesel engine ATEX-compliant version available.

### Applications:

Water and water supply, irrigation, fire protection, applications in agriculture and industry.

### Technical data:

DN	80–400
Q [m <sup>3</sup> /h]	max. 2800
H [m]	max. 350
p [bar]	max. 40
T [°C]	+5 to +50
n [min-1]	max. 3000

## ITUR FFS

Control panel



### Design:

Automatic fire-fighting system, comprising a jockey pump and one or several service pumps, with electric motor or diesel engine. The system includes a collecting line, valves, accessories, as well as switch and control panels. In accordance with EN 12845, UNE-23500, Cephren RT2-ABA, Cephren RT1 ROC, NFPA-20, etc.

### Applications:

Office buildings, hotels, industry, department stores, etc. in environmental engineering and industrial applications.

### Technical data:

DN	300
Q [m <sup>3</sup> /h]	max. 840
H [m]	max. 140
p [bar]	max. 25
T [°C]	+5 to +50
n [min-1]	max. 3000

## Omega®

Automation options: Hyamaster, PumpExpert

### Design:

Single-stage axially split volute casing pump for horizontal or vertical installation with double-entry radial impeller, mating flanges to DIN, ISO, BS or ANSI.

### Applications:

Handling raw, clean and service water as well as sea-water in water treatment plants, irrigation and drainage pumping stations, power stations, fire-fighting systems, shipbuilding and the petrochemical industry.

### Technical data:

DN	80–350
Q [m <sup>3</sup> /h]	max. 2880
H [m]	max. 170
p [bar]	max. 25
T [°C]	max. +70
n [min-1]	max. 2900



## UPA®

Automation option: Hyamaster

### Design:

Single- or multistage, single-entry centrifugal pump in ring-section design for vertical or horizontal installation. Mixed flow hydraulic systems with impellers that can be turned down. Pumps with check valve or connection branch on option.

### Applications:

Handling clean and slightly contaminated water in general water supply, irrigation / spray irrigation, groundwater drawdown and management, in mines, fountains, fire-fighting systems, etc.

### Technical data:

DN	100–650
Q [m <sup>3</sup> /h]	max. 3500
H [m]	max. 480
T [°C]	max. +50



## Amarex® KRT®

Automation options: PumpDrive, Hyamaster, PumpExpert, Amacontrol, switchgear, LevelControl

### Design:

Vertical single-stage submersible motor pump in close-coupled design, various impeller types, for wet or dry installation, stationary and transportable version. ATEX-compliant version available.

### Applications:

Handling all types of abrasive or aggressive waste water in water and waste water engineering, seawater desalination as well as industry, especially untreated sewage containing long fibres and solid substances, fluids containing gas/air as well as raw, activated and digested sludge.

### Technical data:

DN	40–700
Q [m <sup>3</sup> /h]	max. 10800
H [m]	max. 100
T [°C]	max. +60
n [min-1]	max. 2900



## PumpMeter – Intelligent pressure sensor



### Design:

The PumpMeter device is an intelligent pressure sensor for pumps, with on-site display of measured values and operating data. The device consists of two pressure sensors and a display unit. It records the load profile of the pump in order to indicate any potential for optimising energy efficiency and availability.

### Applications:

Monitoring the operation of a centrifugal pump.

### Technical data:

Number of pumps	max. 1
Type	See pump type series
Configuration	Fitted at the factory, IP 65
Voltage	24 V DC

## PumpDrive – Self-cooling motor-independent variable speed system



### Design:

Self-cooling frequency inverter, which allows the motor speed to be varied continuously by means of standard signals and a field bus. As it is self-cooling, it can be mounted on a motor, on the wall or in a cabinet. Control of up to 6 pumps without an additional controller (with PumpDrive Advanced).

### Applications:

Cooling circuits, filters, water supply systems, heating, ventilation and air-conditioning systems, spray irrigation systems, boiler feed systems, steam generation plants, process engineering circuits, cooling lubricant supply systems, service water supply systems and other process engineering applications.

### Technical data:

Number of pumps	max. 6
Frequency inverter	1 per pump/motor
[kW]	45
Voltage [V]	3~380 to 480

## Hyamaster SPS – Pump control system for continuously variable speed adjustment



### Design:

Control system for pumps with three-phase motors of all types and makes, consisting of a programmable logic controller (PLC) with display and operating panel and all required electric components housed in a control cabinet.

### Applications:

Process cycles, service water supply, cooling and lubrication, cogeneration plants, heat transfer and district heating stations, water extraction and treatment, water supply and waste water disposal.

### Technical data:

Number of pumps	max. 4
Frequency inverter	1 per pump
[kW]	650
Voltage [V]	3~400

## Valves for wind power plants.

### BOACHEM® ZXA/ZYA

**Design:**

Flanged end globe valve with gland packing, in stainless steel, conventional or Y-valve design, rotating stem, with on/off disc or throttling plug.

**Applications:**

Process engineering, industry, building services, food and beverages industry, for aggressive fluids. Other fluids on request.

**Technical data:**

PN 10–40  
DN 15–300  
T [°C] -60 to +400



### BOAX®-B

**Design:**

Centred-disc butterfly valve with elastomer liner (EPDM XC or Nitrile K). With lever, manual gearbox, electric or pneumatic actuator. Wafer-type body (T1), semi-lug type body (T2), full-lug type body (T4), U-section body with flat faces (T5). Body types T2, T4 and T5 are suitable for downstream dismantling and dead-end service. Valve disc made of nodular cast iron or stainless steel. EN, ANSI, JIS line connections possible.

**Applications:**

Plant engineering contractors, for water, crude oil and other oils. Shut-off and control duties in water management, water supply, water treatment, drainage and irrigation.

**Technical data:**

PN 10–40  
DN 40–1000  
T [°C] -10 to +110



### ISORIA 10/16

**Design:**

Centred-disc butterfly valve with elastomer liner. With lever, manual gearbox, pneumatic, electric or hydraulic actuator. Wafer-type body (T1), semi-lug type body (T2), full-lug type body (T4), U-section body with flat faces (T5). Body types T2, T4 and T5 are suitable for downstream dismantling and dead-end service with counterflange. EN, ANSI, JIS line connections possible.

**Applications:**

Shut-off and control functions in all industrial and energy applications.

**Technical data:**

PN [bar] 10/16  
DN 40–1000  
T [°C] -10 to +200



## BOACHEM® RXA



### Design:

Flanged end non-return valve made of stainless steel, check disc with closing spring, lapped seats.

### Applications:

Process engineering, industry, building services, food and beverages industry, for aggressive fluids. Other fluids on request.

### Technical data:

PN	10–40
DN	15–300
T [°C]	-60 to +400

## Serie 2000



### Design:

Dual-disc swing check valve, pressure class up to PN 25. Single-piece body made of grey or nodular cast iron. Metal/elastomer or metal/metal seated. Maintenance-free. EN, ASME, JIS line connections possible.

### Applications:

Building services: Heating, air-conditioning, water supply, irrigation, water treatment, etc.  
Industry: Water, air, gas, etc.

### Technical data:

PN [bar]	16/25
DN	50–600
T [°C]	-18 to +343

## BOA®-RVK



### Design:

Wafer-type non-return valve; centering aided by the body shape, shut-off by spring-loaded check disc or plug guided by three stainless steel guiding pins. Low-noise variants with plastic check disc (DN 15-100) or plug with O-ring (DN 125-200), maintenance-free.

### Applications:

Industrial and heating systems. Liquids, gases and steams. Hot water heating systems. High-temperature hot water heating systems. Heat transfer systems. The limits given in the technical codes shall be complied with. Not suitable for fluids liable to attack the valve materials. Other fluids on request.

### Technical data:

PN	6/10/16
DN	15–200
T [°C]	-30 to +250

## BOA<sup>®</sup>-S

### Design:

Flanged end strainer with standard or fine mesh; body made of grey or nodular cast iron; all nominal sizes with drain plug in the cover.

### Applications:

Hot water heating systems, high-temperature hot water heating systems, heat transfer systems. General steam applications in building services and industry. Other fluids on request.

### Technical data:

PN	6/16/25
DN	15–300
T [°C]	-10 to +350



## BOACHEM<sup>®</sup> FSA

### Design:

Flanged end strainer made of stainless steel with standard or fine mesh; all nominal sizes with drain plug in the cover.

### Applications:

Process engineering, industry, building services, food and beverages industry, for aggressive fluids. Other fluids on request.

### Technical data:

PN	10–40
DN	15–400
T [°C]	-60 to +400



**Your contacts:**

Pumps

Gerd Kaufmann

Tel. +49 9241 71-1619

E-mail [gerd.kaufmann@ksb.com](mailto:gerd.kaufmann@ksb.com)

Valves

Hannes Haas

Tel. +49 9241 71-1566

E-mail [hannes.haas@ksb.com](mailto:hannes.haas@ksb.com)

Service

Stefan Reutter

Tel. +49 6233 86-2703

E-mail [stefan.reutter@ksb.com](mailto:stefan.reutter@ksb.com)

**Your local contact:**


More space for solutions.



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**KSB Aktiengesellschaft**  
Johann-Klein-Straße 9  
67227 Frankenthal (Germany)  
[www.ksb.com](http://www.ksb.com)