Energy. Natural. Endless.
Solutions for Concentrated Solar Power.

KSB meets the solar challenge.

Concentrated Solar Power (CSP) ranks among the most promising fields of renewable energy sources. The challenge is harnessing the power efficiently. With many years of experience in power plant technology, KSB provides reliable solutions for parabolic trough systems, solar power towers and linear fresnel plants.

CSP applications place high demands on the design and materials of pumps and valves. With heat transfer fluids (HTF) reaching high temperatures and plants frequently being switched on and off, high performance pumps and valves are needed that are fit for the job.

In order to provide optimal pumps and valves for such extreme operating conditions, KSB has carried out intensive analyses on its proven product series and improved their design to be ideally suited for solar thermal energy applications.

Your partner for energy efficiency.

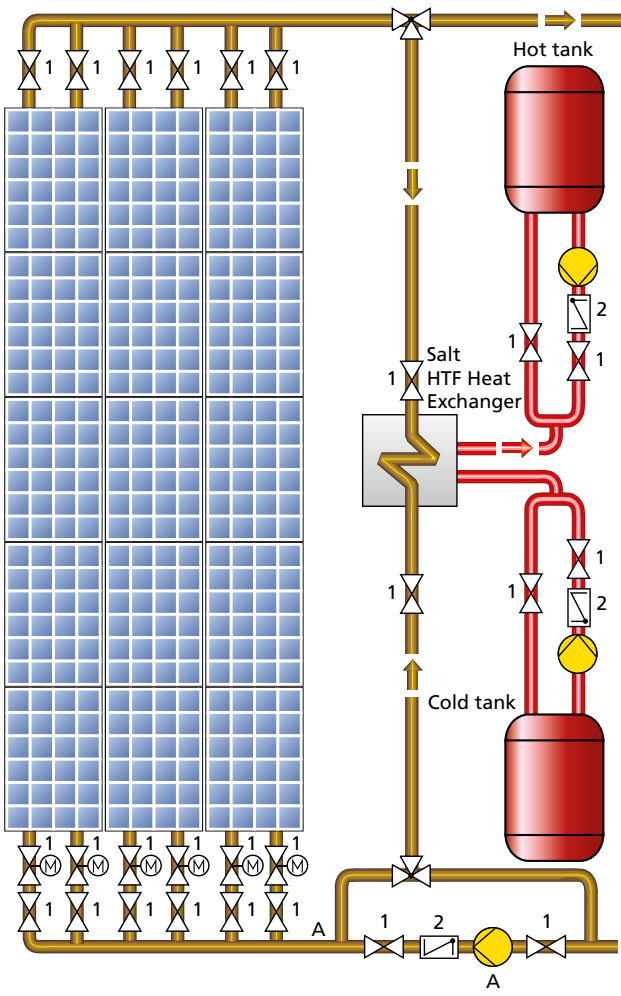
As a world market leader, KSB is the ideal partner for consultants, operators and contractors. Our pumps, valves, drives and automation products are already successfully used around the world. For the complex tasks connected with concentrated solar power, we supply the complete engineering and support – from design to implementation and throughout operation.

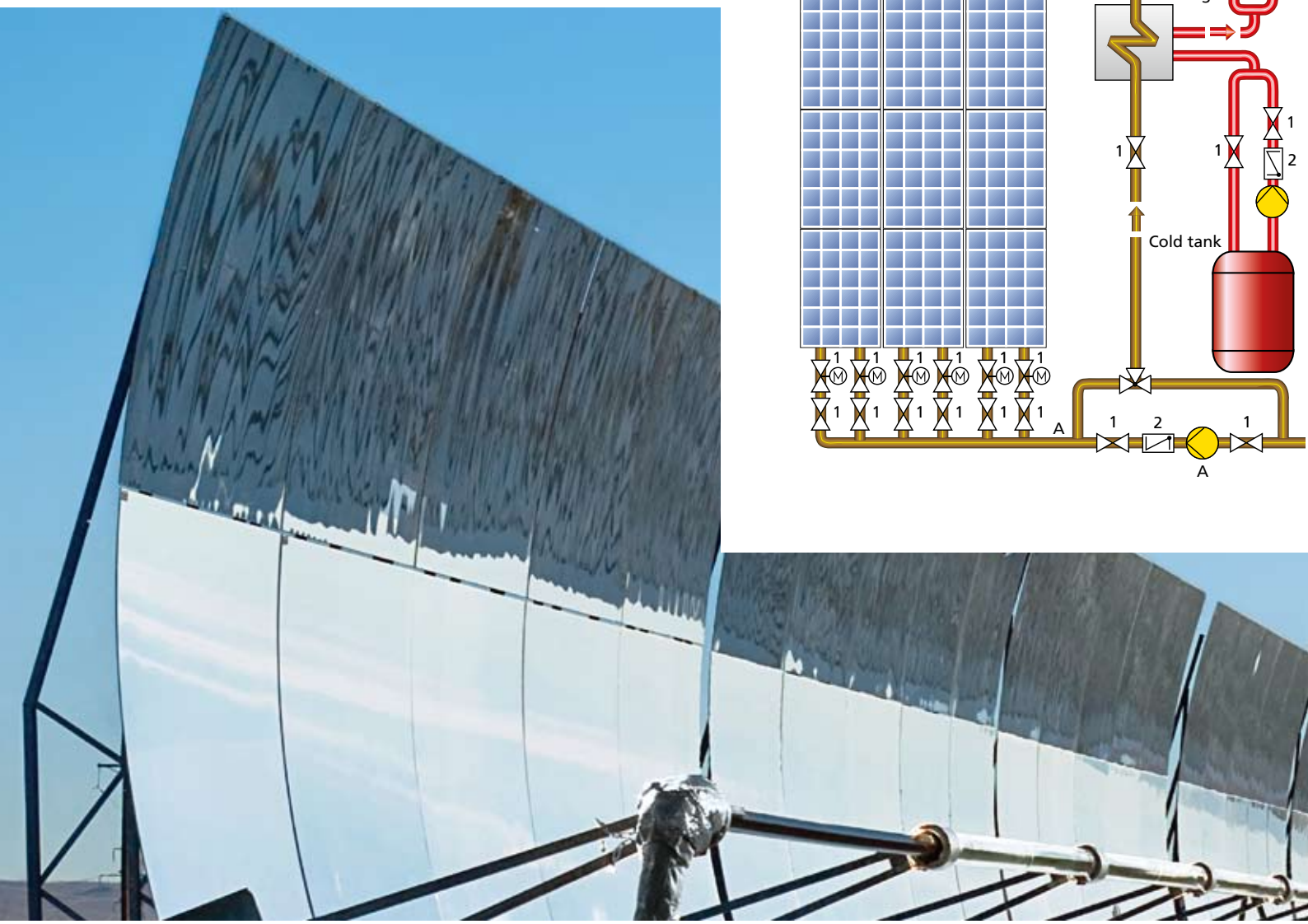
By carefully customizing all components, KSB produces optimized hydraulics combined with highly efficient drives for low life cycle costs and top performance. Together with scientific institutions, we are constantly researching new materials and technologies, while also ensuring high levels of component safety. With more than 14,000 KSB employees, over 120 service centers and 29 production sites around the world, we draw on all our strengths to support you with safe, efficient and sustainable solutions.

Parabolic Trough Systems.

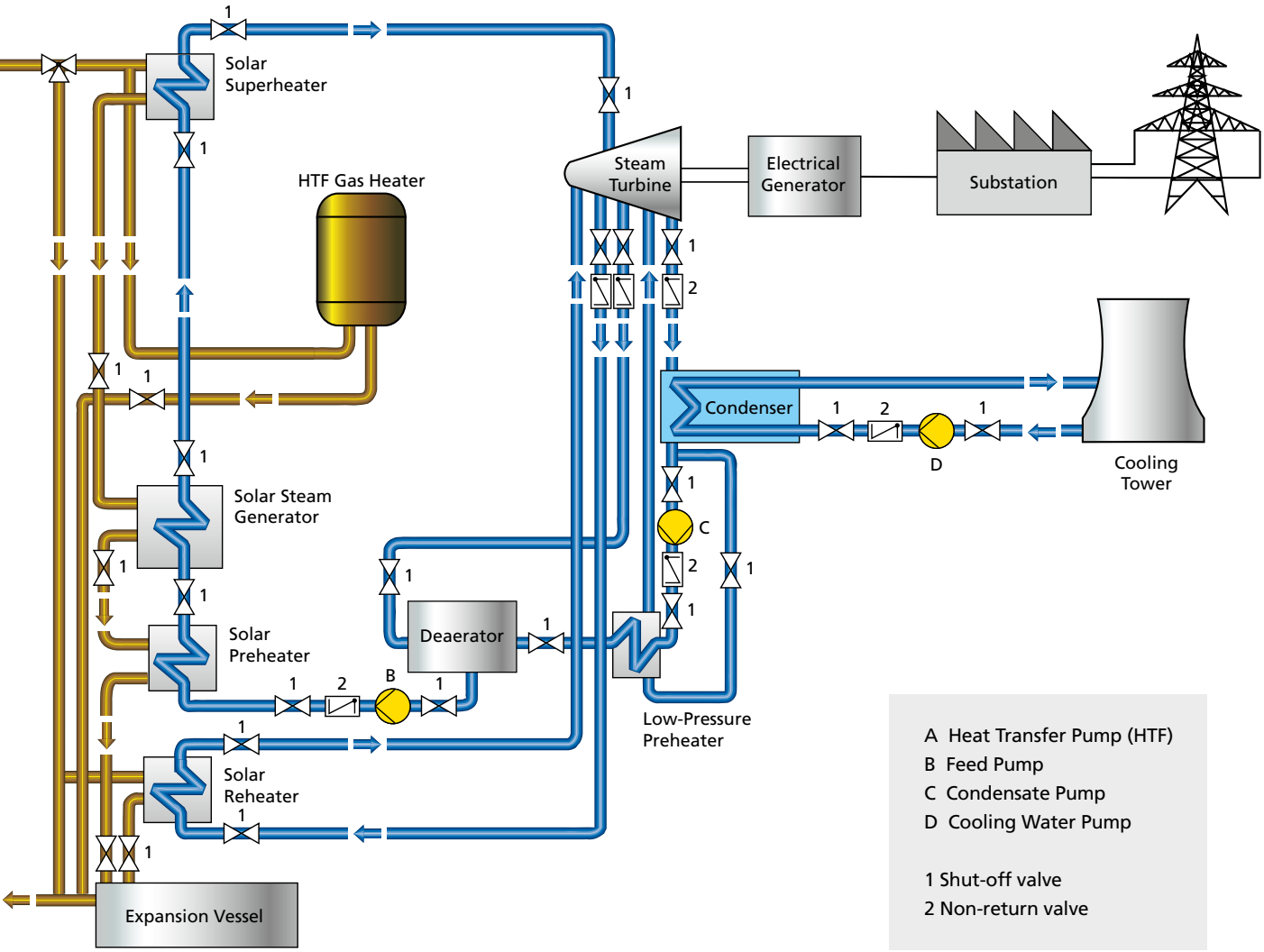
Parabolic trough power plants typically use thermal oil as heat transfer fluid (HTF) which is pumped through the solar field at variable flow rates and reaches temperatures up to 400 °C. Some systems additionally use molten salt to store the energy.

These plants thereby require a broad range of pumps and valves to handle the high-temperature liquids, feedwater, condensate and cooling water. KSB successfully meets these exceptional challenges with a complete program of pumps and valves for the solar field and power block, as well as shut-off valves for thermal storage with molten salt. On request, KSB also provides solutions for processes with direct steam circuit, or molten salt as heat transfer fluid.





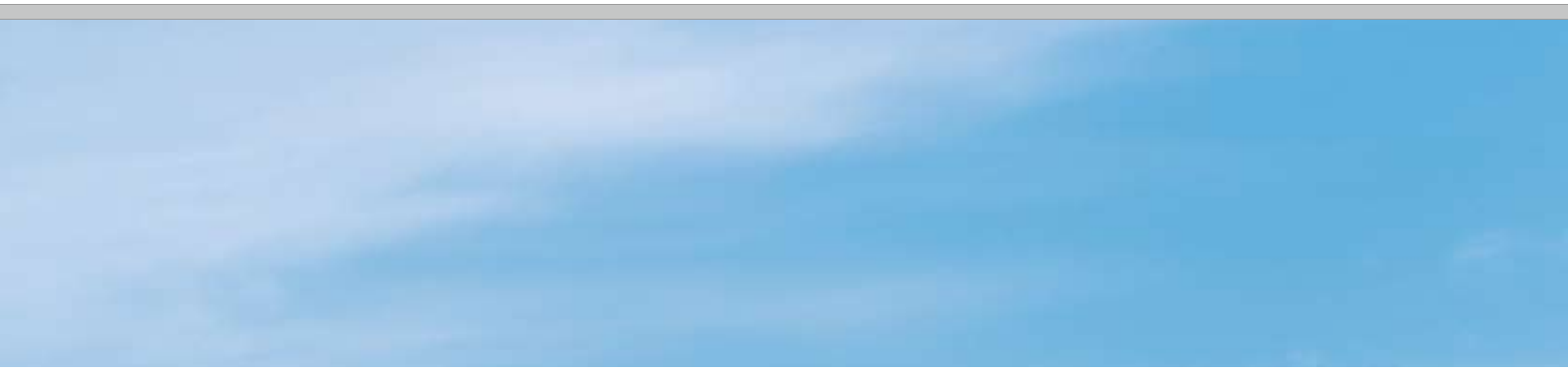
Power Block


Solar Superheater
HTF Gas Heater
Steam Turbine
Electrical Generator
Substation
Condenser
Cooling Tower
Solar Steam Generator
Deaerator
Solar Preheater
Low-Pressure Preheater
Solar Reheater
Expansion Vessel
A Heat Transfer Pump (HTF)
B Feed Pump
C Condensate Pump
D Cooling Water Pump
1 Shut-off valve
2 Non-return valve

Solar Power Towers.

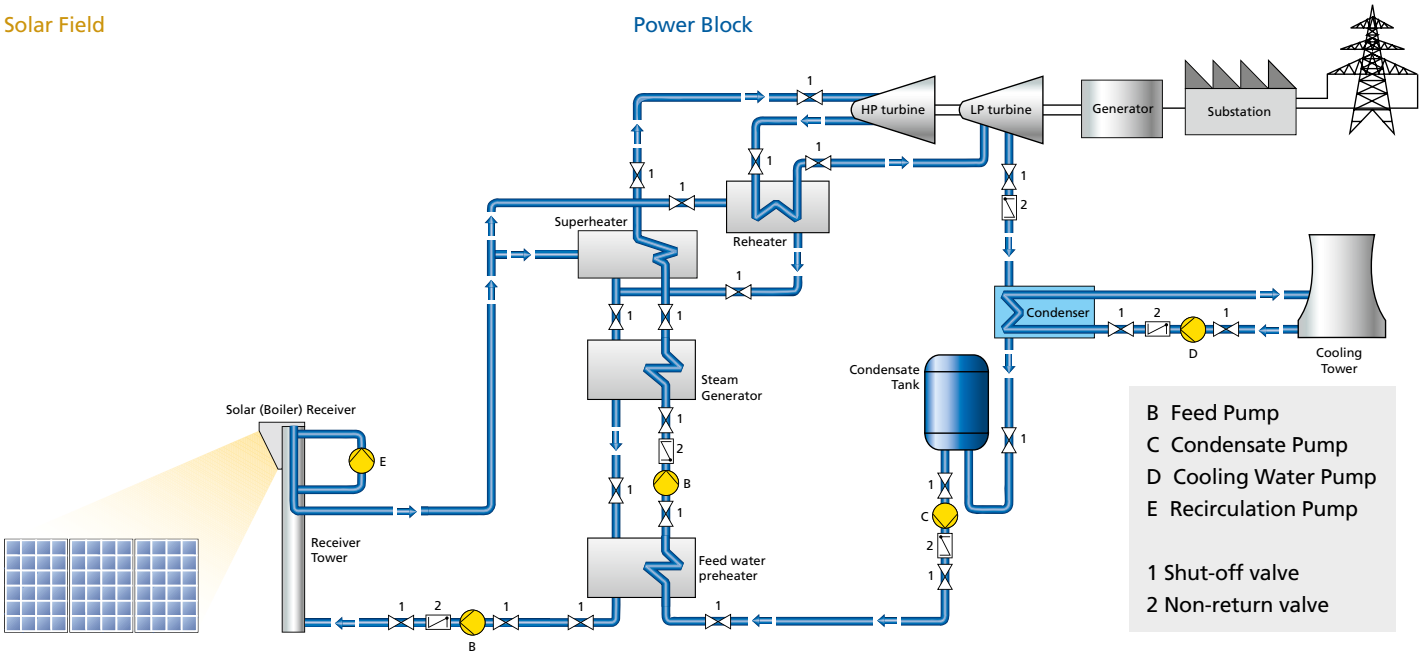
The heat transfer fluid in a Solar Power Tower may be superheated water or molten salt. As the heliostats in the collector field reflect sunlight onto the centrally located tower, temperatures can reach up to 650 °C. Solar Power Towers thereby require highly specialized pumps and valves to cope with high pressure and high temperature under extreme conditions.

KSB delivers reliable and successful customized solutions for Solar Power Towers: with pumps and valves for feedwater, condensate, cooling water and recirculation.



Solar Field

Power Block



Pumps optimized for Concentrated Solar Power.

A – HTF pump: **YNKR**

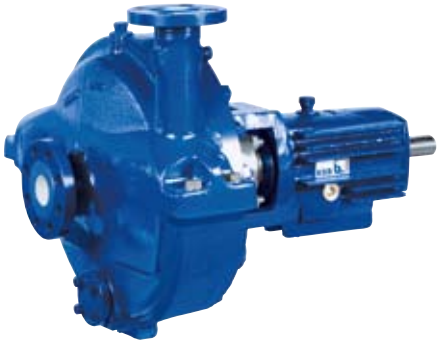
Design:
Horizontal, radially split, single-stage, double-entry boiler feed booster pump (booster system) with single or double cast steel volute casing.

Applications:
Heavy-duty BB2 process pump to ISO 13709 / API 610, 11th edition. Handling of Heat Transfer Fluid in solar power plants.

Technical data:

DN	500
Q [m³/h]	max. 3,800
H [m]	max. 390
p [bar]	max. 60
T [°C]	max. +400

A – HTF pump: **RPH**



Design:
Horizontal, radially split volute casing pump in back pull-out design to API 610, 10th edition, or ISO 13709 (heavy duty), with radial impeller, single-stage, single-entry, centreline pump feet; with inducer, if required. ATEX-compliant version available.

Applications:
Refineries, petrochemical and chemical industry, power stations.

Technical data:

DN	25 – 400
Q [m³/h]	max. 5,000
H [m]	max. 270
p [bar]	max. 51
T [°C]	max. +450

A – HTF pump: **HPKL**

Design:
Horizontal, radially split volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-stage, single-entry, with radial impeller. Equipped with heat barrier, seal chamber air-cooled by integrated fan impeller, no external cooling. ATEX-compliant version available.

Applications:
Handling of hot water and thermal oil in piping or tank systems, particularly in medium-sized and large hot water heating systems, forced circulation boilers, district heating systems, etc.

Technical data:

DN	25 – 250
Q [m³/h]	max. 1,600
H [m]	max. 222
p [bar]	max. 40
T [°C]	max. 400

B – Feed pump: **HG**

Design:
Horizontal, radially split, multistage ring-section pump with radial impellers, single- or double-entry.

Applications:
Handling of feed water and condensate in power stations and industrial facilities, generation of pressurized water for bark peeling machines, descaling equipment, snow guns, etc.

Technical data:

DN	65 – 300
Q [m³/h]	max. 1,440
H [m]	max. 4,200
p [bar]	max. 420
T [°C]	max. +200

B – Feed pump: **HGM**

Design:
Horizontal, radially split, product-lubricated, multi-stage ring-section pump with radial impellers, axial and radial single-entry inlet.

Applications:
Handling of feed water in power stations, boiler feed water and condensate in industrial facilities.

Technical data:

DN	25 – 100
Q [m³/h]	max. 274
H [m]	max. 1,400
p [bar]	max. 140
T [°C]	max. +160

C – Condensate pump: **WKT / WKTA / WKTB**

Design:
Vertical, multistage, can-type ring-section pump with radial and mixed flow impellers. Single- and double-entry suction impellers, flanges to DIN or ANSI.
The can is arranged in a pit below the installation floor. The pump is connected with the structure by means of a baseplate.

Applications:
Handling of condensate in power stations and energy systems.

Technical data:

DN	40 – 300
Q [m³/h]	max. 1,800
H [m]	max. 340
p [bar]	max. 40
T [°C]	max. +100

D – Cooling water pumps: **RDLO and Omega**

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

Technical data:

DN	80 – 700
Q [m³/h]	max. 10,000
H [m]	max. 240
p [bar]	max. 25
T [°C]	max. +70

D – Cooling water pumps: **SEZ / SNW / PHZ / PNZ**

Design:
Vertical tubular casing pump with open mixed flow impeller (SEZ), mixed flow propeller (PHZ) or axial propeller (PNZ). Pump inlet with bellmouth or suction elbow, pull-out design available, discharge nozzle arranged above or below floor, flanges to DIN or ANSI standards available.

Applications:
Handling of raw, pure, service and cooling water in industry, water supply systems, in power stations and seawater desalination plants.

Technical data:

Q [m³/h]	max. 65,000
H [m]	max. 100
T [°C]	max. +40

E – Recirculation pump: **HPH**

Design:
Horizontal, radially split volute casing pump in back pull-out design, single-stage, single-entry, with centerline pump feet and radial impeller. Optional TÜV certification to TRD. ATEX-compliant version available.

Applications:
Handling of hot water in high-pressure hot water generation plants and for use as boiler feed and recirculation pump.

Technical data:

DN	40 – 350
Q [m³/h]	max. 3,190
H [m]	max. 225
p [bar]	max. 110
T [°C]	max. +320

E – Recirculation pump: **LUV**

Design:
Vertical spherical casing pump, radial impellers, single-entry, single- to three-stage. Suitable for very high inlet pressures and temperatures. Integrated wet winding motor to VDE. Product-lubricated bearings, no need for oil supply systems. Design to TRD or ASME.

Applications:
Hot water recirculation in forced-circulation, forced-flow and combined-circulation boilers for very high pressures.

Technical data:

DN	100 – 550
Q [m³/h]	max. 7,000
H [m]	max. 275
p [bar]	max. 320
T [°C]	max. +420

Auxiliary Pump: **Multitec**

Design:
Multistage horizontal or vertical centrifugal pump in ring-section design, long-coupled and close-coupled variant, with axial or radial suction nozzle, cast radial impellers. ATEX-compliant version available.

Applications:
Water and drinking water supply systems, general industry, pressure boosting systems, irrigation systems, in power stations, heating, filter, fire-fighting, reverse osmosis and washing plants, snow guns, etc.

Technical data:

DN	32 – 150
Q [m³/h]	max. 850
H [m]	max. 630 (800)
p [bar]	max. 63 (80)
T [°C]	-10 to +200

Auxiliary pump: **Movitec**

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

Auxiliary pump: **Etanorm / Etanorm R**

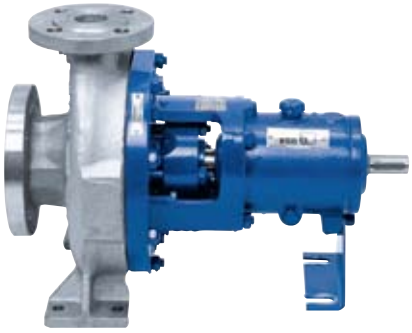
Design:
Horizontal, long-coupled, single-stage volute casing pump (pump size 125 - 500 with two stages) with ratings and main dimensions to EN 733, in back pullout design, with replaceable shaft sleeves / shaft protecting sleeves and casing wear rings. ATEX-compliant version available.

Technical data:

DN	32 – 300
Q [m³/h]	max. 1,900
H [m]	max. 102
p [bar]	max. 16
T [°C]	max. +140

Applications:
Spray irrigation, irrigation, drainage, district heating, water supply systems, heating and air-conditioning systems, condensate transport, swimming pools, fire-fighting systems, handling of hot water, cooling water, fire-fighting water, oil, brine, drinking water, brackish water, service water, etc.

Auxiliary pump: **CPKN**



Design:
Horizontal, radially split volute casing pump in back pull-out design to EN 22 858 / ISO 2858 / ISO 5199, single-stage, 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.

Technical data:

DN	25 – 400
Q [m³/h]	max. 4,800
H [m]	max. 250
p [bar]	max. 25
T [°C]	max. +400

Applications:
Handling of aggressive liquids in the chemical and petrochemical industries as well as in refinery and fire-fighting systems, handling of brine.

Auxiliary pump: **Amarex KRT**

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.

Technical data:

DN	40 – 700
Q [m³/h]	max. 10,800
H [m]	max. 100
T [°C]	max. +60

Applications:
Handling of all types of abrasive or aggressive waste water in water and waste water engineering 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; sea water desalination.

Auxiliary pump: **ILN / ILNCS / ILNCE**

Design:
Vertical in-line centrifugal pump, with closed impeller and mechanical seal. ILNS fitted with an auxiliary self-priming pump and ILNE with ejector. Process design that allows the removal of the impeller without removing the pipes and the motor.

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

Technical data:

DN	65 – 400
Q [m³/h]	up to 3,500
H [m]	up to 110
p [bar]	up to 16
T [°C]	-20 up to +70

Auxiliary pump: **FFS**

Design:
Automatic fire-fighting equipment and system, composed of jockey pump and one or several service pumps, with electric motor or diesel engine. It includes collector, valves, accessories and switch and control panels. In accordance with EN 12845, UNE-23500, Cepreven RT2-ABA, Cepreven RT1 ROC, NFPA-20, etc.

Applications:
Office buildings, hotels, industry, big surfaces.

Technical data:

DN	300
Q [m³/h]	up to 840
H [m]	up to 140
p [bar]	up to 25
T [°C]	+5 up to +50

Auxiliary pump: **EPV / EPVS**

Design:
Automatic pressurized water equipment and system with pump control system for continuously variable speed adjustment, composed of pumping pack with one or several pumps (standardized in stainless steel DPV series, optional on other series), valves, collector, small accumulation pack, pressure transducer, switch panels, frequency converter and integrated control unit.

Technical data:

DN	40 – 250
Q [m³/h]	up to 400
H [m]	up to 240
p [bar]	up to 25
T [°C]	+5 up to +50

Valves ideally suited to Concentrated Solar Power.

Solar Field

Globe valves

DIN

NORI 40
ZYLB/ZYSB

NORI 160
ZXL/ZXS

NORI 160
ZXLF/ZXSF

Power Block / Thermal Storage

NORI 40
ZXL/ZXS

NORI 40
ZXLF/ZXSF

NORI 160
ZXL/ZXS

NORI 160
ZXLF/ZXSF

NORI 320
ZXSV

Shut-off valves

Check valves

Gate valves			Butterfly valves	Non return / Swing check valves	
ANSI	DIN	ANSI	DIN / ANSI	DIN	ANSI
ECOLINE GL 150-600	STAAL 40 AKD/AKDS	ECOLINE GT 150-600		NORI 40 RXL/RXS	NORI 160 RXL/RXS
	STAAL 100 AKD/AKDS		DANAÏS MTII Class 300	STAAL 40 AKK/AKKS	STAAL 100 AKK/AKKS
					ECOLINE SC 150-600
SICCA 150-600 GLC	STAAL 40 AKD/AKDS	SICCA 150-600 GTC	DANAÏS MTII Class 300	NORI 40 RXL/RXS	NORI 160 RXL/RXS
					SICCA 150-600 SCC
SICCA 800 GLF	STAAL 100 AKD/AKDS	SICCA 800 GTF		STAAL 40 AKK/AKKS	STAAL 100 AKK/AKKS
					SICCA 800 PCF
SICCA 900 GLC	AKG-A/AKGS-A	SICCA 900 GTC		AKR/AKRS	
					SICCA 900 SCC

Subject to technical modification without prior notice

Your local KSB representative:

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Hannes Haas
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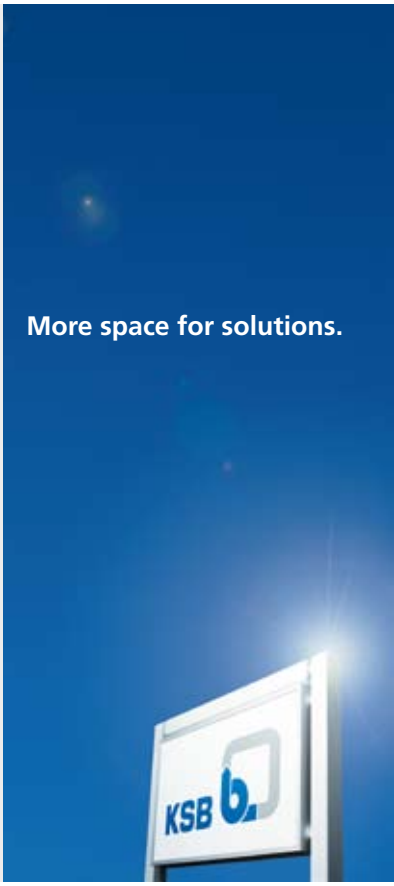

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