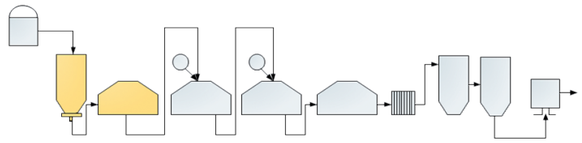
Energy-saving Components and Systems for the Brewing Industry

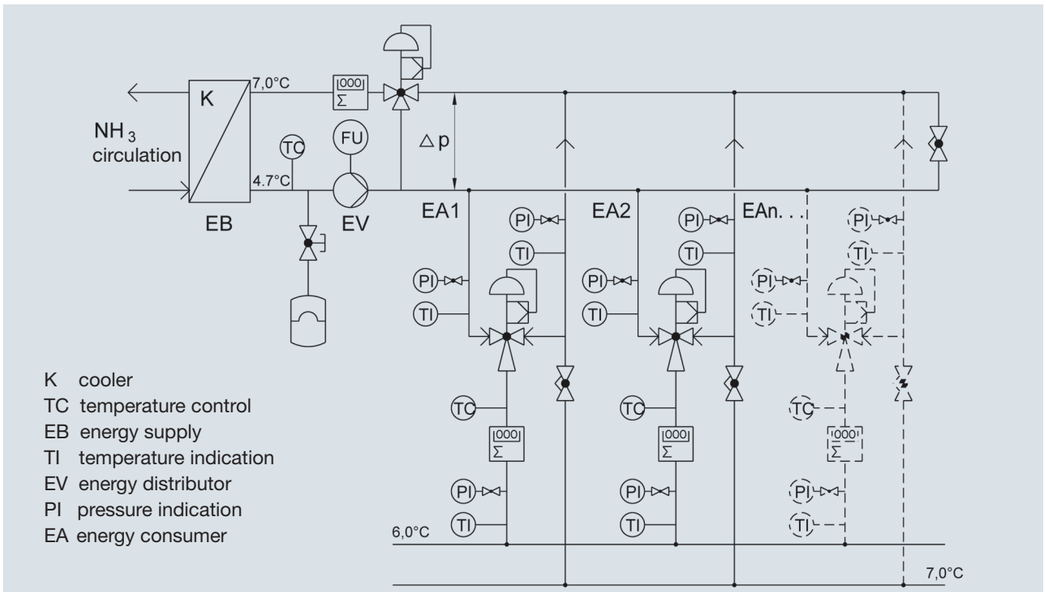
Optimization of the Beer Brewing Process using Baelz Technologies

www.baelz.de



MALT PRODUCTION.

Optimal germination conditions thanks to floor cooling using liquid ejectors.



The optimal temperature for grain germination is 14 to 20°C. However, germination produces heat, which would disrupt the process. Temperature control therefore improves germination, for instance by cooling the floor upon which the grains are spread out to germinate.

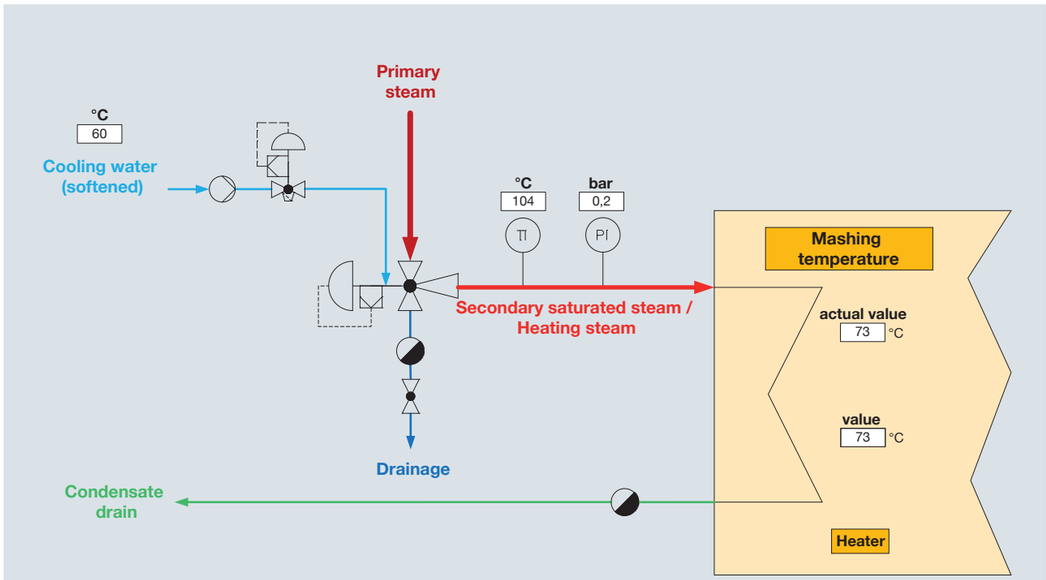
A plate heat exchanger uses NH3 to cool the secondary ejector circulation to 4.7°C. Mixing this with the return flow from the germination floor at 7°C results in a cooling temperature of 6°C. The ejector technology allows precise control and distribution, leading to a uniform floor temperature and making for optimal controlled germination.

KILN DRYING.

Malt is kiln dried for further use and better preservability, which involves heating it to a temperature of up to 100°C – depending on the desired properties of the malt – and drying it. A cost-effective form of kiln drying can be achieved with water ejectors and ventilation registers. Recirculation and high control quality lead to a very uniform, optimal drying temperature.

MASHING.

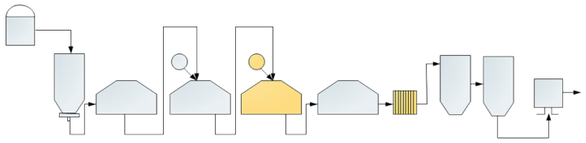
Exact control by the ejector ensures an economic mashing process.



The malt is then steeped in a mash tun whilst supplying heat. Further heating in several temperature and time stages ensures the enzymatic breakdown of protein and starch at an optimal reaction temperature. Amongst other products, this results in the maltose important for fermentation. The mashing process is crucial in achieving the desired type and quality of beer. A final temperature of 78°C is optimal and should not be exceeded. Exact control and uniform temperature distribution by the ejector ensure an optimal result.

Advantages at a glance

- Reduction of the thermal load for the mash
- Blending and circulation without additional circulating pump
- Temperature and quantity control in all load ranges
- Resistant to pressure fluctuations in the primary network
- No oscillation with partial loads
- Greater outputs can be controlled by means of a valve

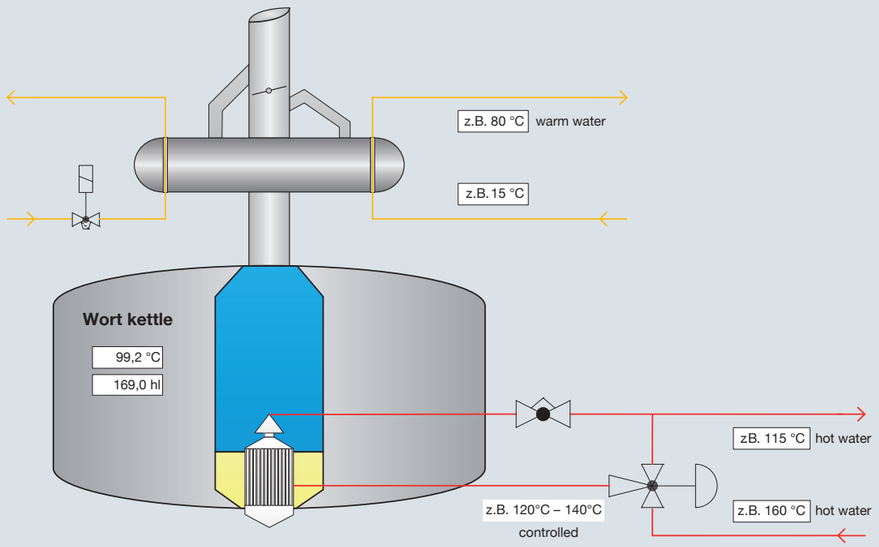


WORT BOILING.

Energy-efficient vapor utilization

Wort kettles are usually heated at high water or steam temperatures. However, this must occur uniformly and only up to a maximum of 100°C in order to prevent the wort from caking and to preserve the hops, the content and flavors.

Here, liquid ejectors are employed to optimize process conditions. The vapors from boiling the wort can be further utilized to save energy by compressing the steam using a thermocompressor. This is much more economical than the use of a vapor condenser.



COOLING.

Optimized absorption refrigeration technology boosts productivity.

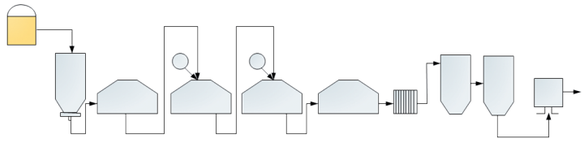
Thanks to their comparatively small outer dimensions, meaning that they fit through most doorways, as well as their relatively low output ranges, our compact absorption refrigeration systems are suitable for installation in existing buildings as well as for decentralized applications in the brewing industry. Examples here include cooled beer storage or additional cooling during germination.

The systems are especially interesting thanks to their consistently high efficiency (COP) and very low water inlet temperatures – from 55°C! As a result, even surplus heat, such as waste heat from industrial plants, can be used for cooling.

Type „Hummel“

Technical data

Description	Unit	Hummel	Biene
Type		Single-effect LiBr-H_2O	
Refrigerating capacity	kW	160	50
Thermal ratio	COP	0.80	
T_{min} (hot water / cold water)	°C	55.0 / 5.0	
T_{max} (cooling water)	°C	55.0	
L / H / W	m	1.95 / 2.05 / 0.86	1.75 / 1.59 / 0.68
Weight	kg	1750	650



ENERGY GENERATION.

The thermocompressor Baelz-vapordynamic®.

Flange thermocompressor (baelz 590) with the following functions:

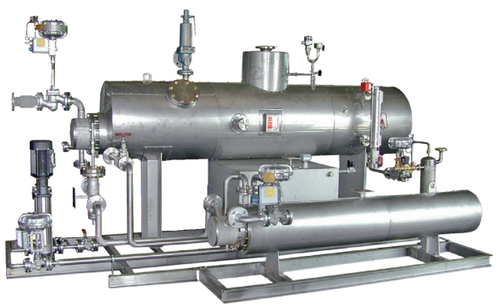
- Compression
- Internal/External recirculation

baelz 590 DN100

baelz 590 DN200

The pure steam generator.

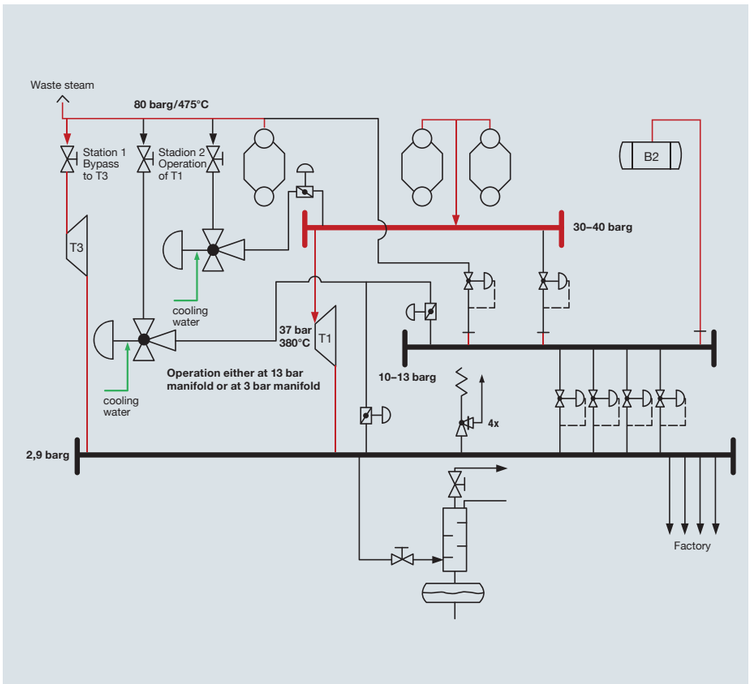
Description	Parameters
Pressure stages	PN6-40
Temperature range	110–400°C
Power range	hasta 10 MW
Live steam volume	hasta 30 t/h
Boiler feed water quality	Please consult our supplementary sheet regarding chemical water quality requirements for Baelz steam generators
Boiler water quality	



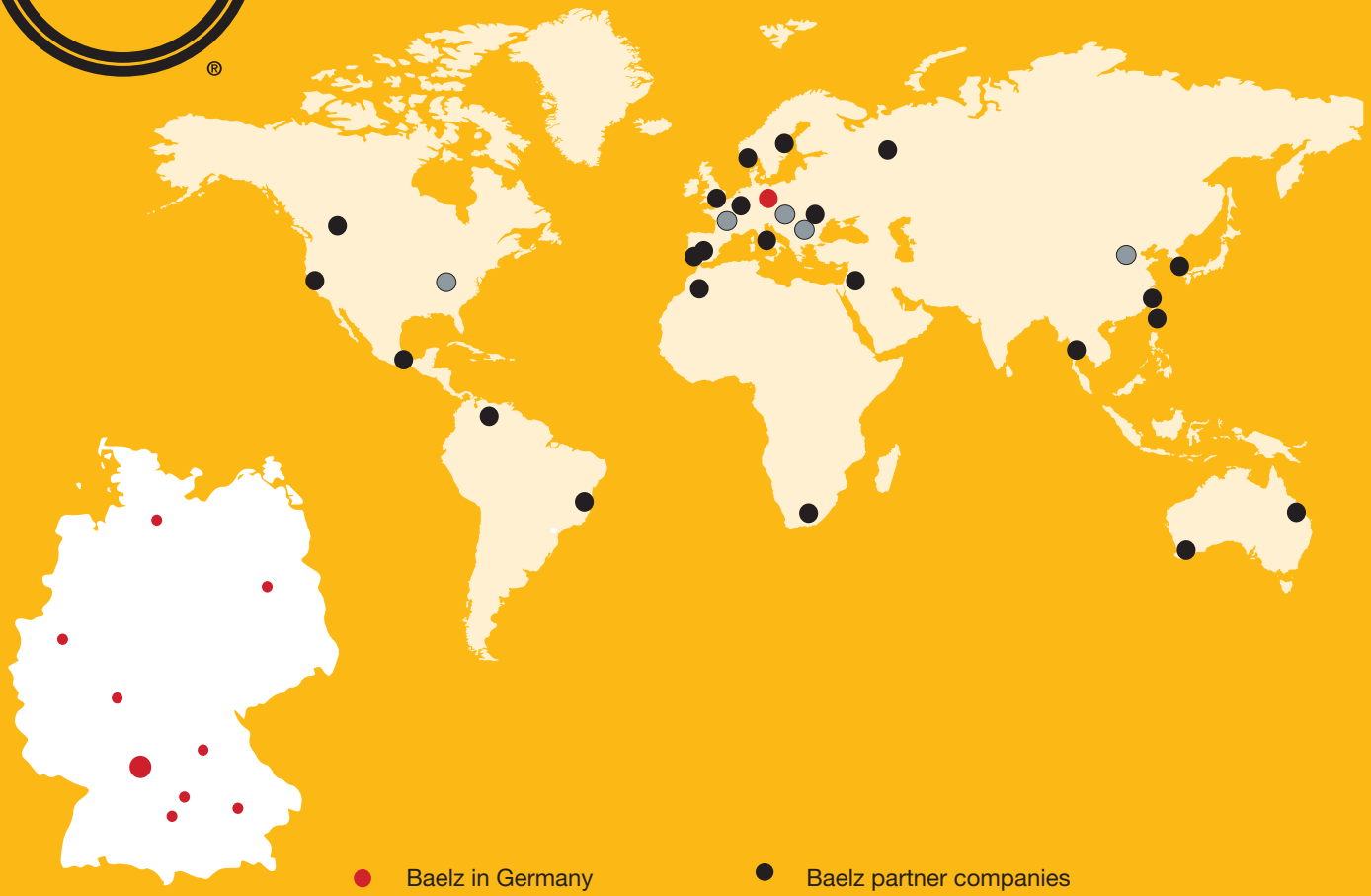
The hot steam cooler.

Use of a hot steam cooler to bypass the steam turbine allows waste steam to be used for downstream processes when starting up and shutting down the turbine. This solution also enables redundant operation in the event of a turbine failure.

Internal recooling enables saturated steam/wet steam/hot steam to be generated without overheating and with high precision for pressure and temperature control, accompanied by a very good atomization of the injected water.



baelz 591



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- **Climate control**
- **Food Beverages**

W. Baelz & Sohn GmbH & Co. · Koepffstrasse 5 · 74076 Heilbronn · Germany
Telefon +49 7131 1500-0 · Fax +49 7131 1500-21 · mail@baelz.de

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