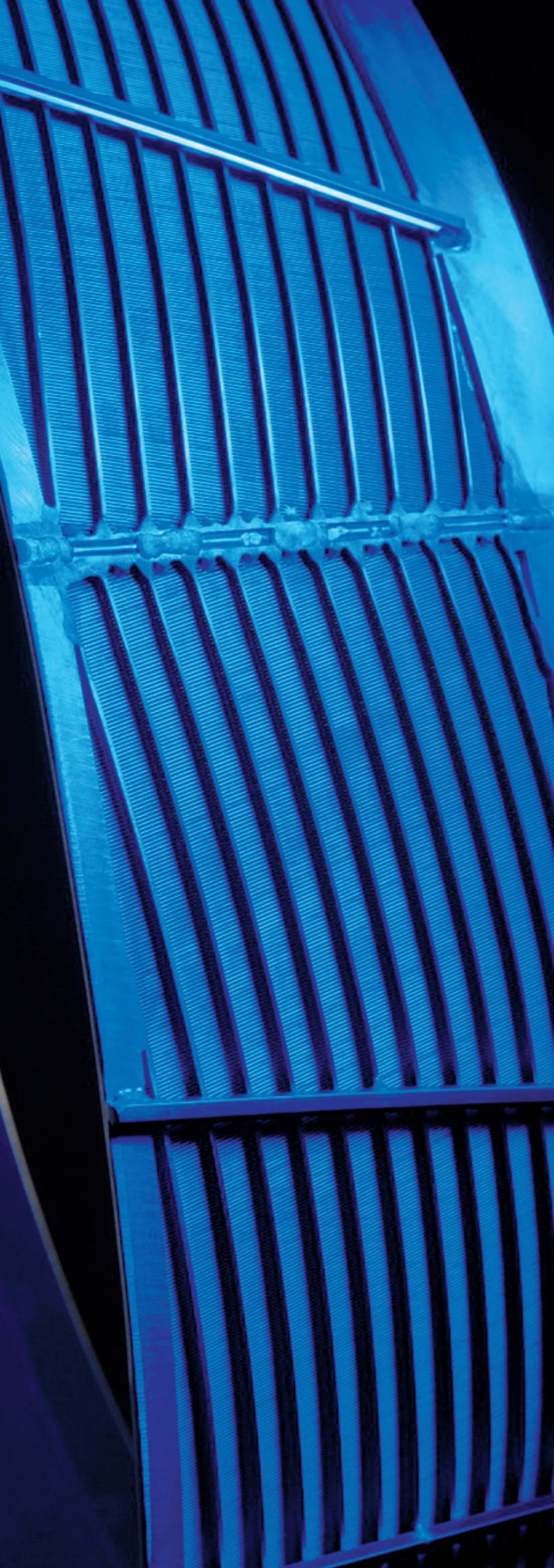




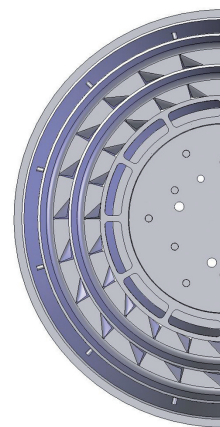
tech-info

► *Continuous centrifugals of the K3000 series*

Fields of application:

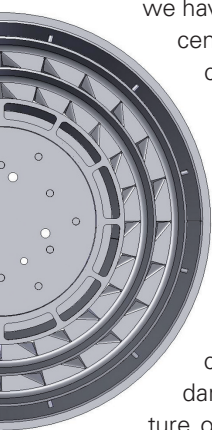
The BMA continuous centrifugals of the new K3000 series are used in the cane and beet sugar industries, and also in sugar refineries.

The separated sugar is processed in the dry state or after melting or magmatising inside the centrifugal.



BMA 

With more than 150 years of experience in the construction of machinery and equipment for the sugar industry, BMA is among the world's leading companies in the design and manufacture of continuous and batch centrifugals. Since 1947, we have delivered more than 8,000 centrifugals, about 4,200 of them continuous centrifugals, to our customers.



As the market-leading manufacturer of centrifugals, we at BMA have always attached great importance to manufacturing centrifugals ourselves in order to safeguard our customers' high quality standards right from the manufacture of the individual components up to commissioning by BMA specialists.

A dense network of representations and branch offices all over the world ensures proximity to our customers, allowing us to act quickly and reliably.

The continuous centrifugals of BMA's completely newly designed K3000 series are highly sophisticated machines that are unequalled so far, developed by specialists to allow safe and efficient operation.

The reduced installation height and the small space requirements of the new design make the K3000 series centrifugal easy to install. It is clearly arranged and easy to assemble.

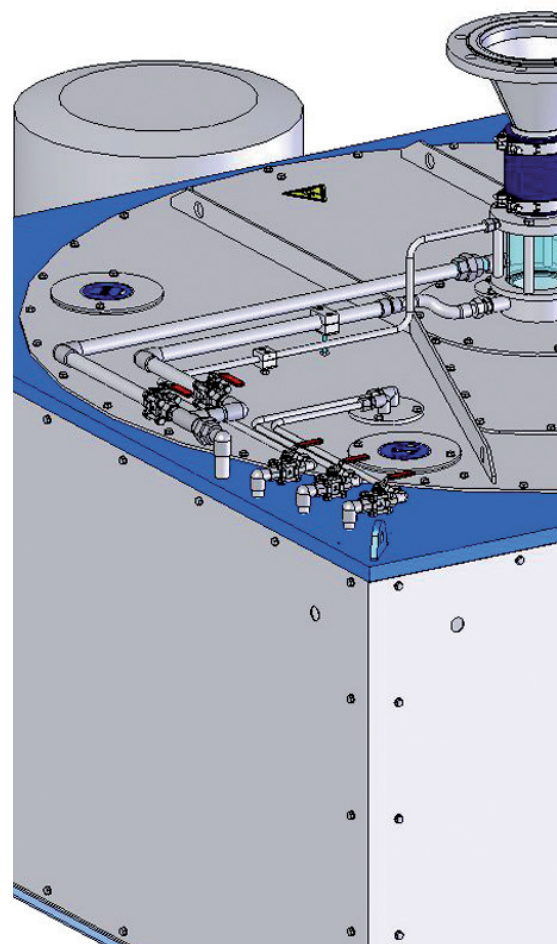
Thanks to the more efficient massecuite processing using the new standard product distributor or the Turbo3 execution, the downstream separation of syrup and sugar crystals can be performed with maximum efficiency, allowing excellent technological results.

By reducing the number of wear parts and using components with a longer service life, we have been able to enhance the availability of the centrifugals. Moreover, far less maintenance is required, which minimises maintenance costs.

All important components have undergone FEM analysis, to ensure high safety. Additional safety and monitoring functions have been integrated into the improved centrifugal control unit.

The turbo product distributor and parts of the basket are patented.

*The new
K3300
centrifugal*



Applications for continuous K3000 centrifugals

BMA's continuous K3000 centrifugals are used in the cane and beet sugar industries as well as in sugar refineries, where separated sugar is processed in the dry, melted or magmatized state. Melting or magmatizing can take place inside the centrifugal.

K3300

The K3300 centrifugal has been developed specially for high throughputs of low-raw product from beet or cane sugar factories.

Further sizes with special executions adapted to specific requirements are scheduled to follow.

Operation of the K3300 centrifugal

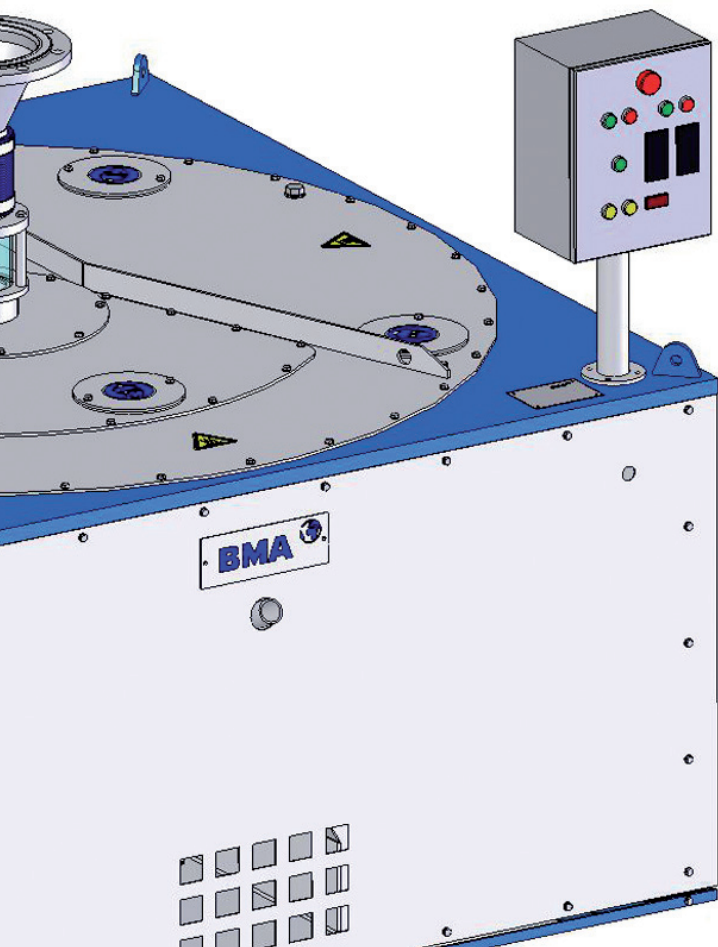
The feeding system – consisting of an electro-pneumatic butterfly control valve that is steplessly variable with the motor current, a feed duct, compensator, sight glass, and feed pipe – delivers the massecuite, water and steam con-

tinuously to the product distributor. In the distributor head, the media are thoroughly mixed, evenly distributed and accelerated.

This processed massecuite is fed from the distribution cone of the product distributor into the preseparation stage of the basket, where a large part of the syrup is already separated from the crystals. The crystals then float smoothly onto the working screen of the second basket stage.

The greater the diameter, the greater the centrifugal force. The residual mother liquor is separated from the sugar crystals that are retained on the screen.

The crystals are washed by addition of water via the washing system. Owing to the separate washwater addition in the preseparation stage and in the upper stage, the crystal loss can be reduced and the sugar quality decisively improved. With the effect of the centrifugal force, the washed sugar crystals move over the basket edge into the sugar compartment. From there the sugar continuously falls into the conveying element to be installed below the centrifugal, or it is melted or magmatized inside the centrifugal and passes through a pipe for further processing.



Design and execution

Its new look alone makes the K3000 series centrifugal stand out from other continuous centrifugals. Its compact design requires only little space and is clearly arranged.

As a self-discharging, conical centrifugal, it is executed vertically and operated continuously. The basket is driven from below via a V-belt drive by the external three-phase AC motor. All rotating parts are enclosed in the housing. The closed design of the housing and the feeding system prevents the ingress of cold air, which favours separation, particularly with highly viscous massecuites.

All housing parts that come into contact with the sugar crystals are made of stainless steel, even in the standard execution.

As basket material, stainless steel with a particularly high strength and resistance to stress-corrosion cracking is used, which is also highly resistant against chlorine ions. The patented outlet openings in the basket shell ensure quick syrup discharge.

The baskets have been optimised for centrifuging massecuites of low or high purity. Following many years of testing with basket angles from 24° to 35°, the best option for each product has been defined, with some involving equipping the baskets with preseparation stages. The proven design of the backing screen ensures unhampered removal of the syrup on the basket shell and provides optimum support for the working screen.

The screens installed in the basket are fixed by means of a clamping ring. Its specific geometry optimises the distribution of the crystal suspension on the working screen even further. The new way of fixing the screen with clamping rings makes further auxiliary means for screen assembly redundant. The preseparation stages are equipped with a wear-resistant wedge-bar screen, in order to reduce maintenance costs and downtimes.

The housings are equipped with large removable screw-on covers, which provide free access to the entire inside of the centrifugal. In addition, a smaller inspection door has been provided, which allows easy replacement of the screens and even of the product distributor when required.

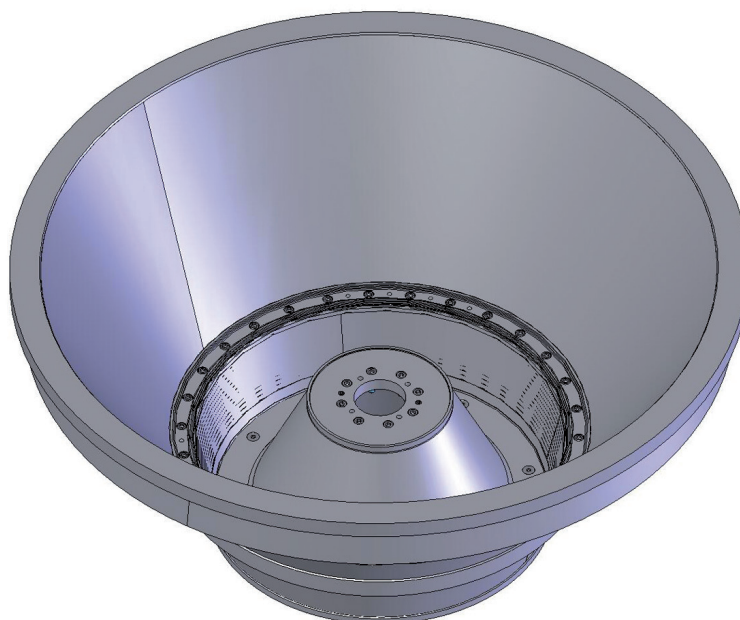
The new construction of the centrifugal with a vibration-isolating support of the basket, the bearing assembly, the inner casing with V-belt duct and the motor provides for a smoother and more stable running of the centrifugal. This structure also allows positioning the rubber buffers outside the heat-affected zone, which makes them easier to replace. Moreover, a non-contacting gap sealing between the upper basket edge and the inner casing can be provided, which avoids wearing seals.

The grease-lubricated bearing assembly of the K3000 series centrifugals has been made even sturdier and the application of lubricants reduced drastically. The bearing points to be lubricated are easily accessible for the operator.

As the new centrifugal is easy to inspect and access, soiling in the centrally located product distributor and the basket can be easily and quickly removed through a hand-hole inspection cover. The feeding system projecting into the product distributor is equipped with connections for water and steam addition. The divided nozzle assembly allows for a well-aimed washwater application in the lower and upper stages of the basket.

Glass elements have been completely eliminated from the continuous K3300 centrifugal. The flow rate of the washwater is measured by a magneto-inductive flow meter and indicated on the display of the operator panel.

*The completely
newly designed
basket of the K3300
centrifugal*



In order to improve operational reliability, all important components have undergone FEM calculation. The standard equipment including electronic vibration control not only enhances safety, it also meets the requirements for an unattended centrifugal station.

The new K3000 series is also characterised by improved operator friendliness. For example, insufficient V-belt tension is indicated to the operator. Visible mild steel parts are painted (RAL 5015), and the outer housing is clad with stainless steel plates.

The continuous centrifugals can be equipped with numerous additional modules:

- To achieve high processing rates, the centrifugals can be equipped with the new Turbo3 product distributor to process highly viscous massecuites. This can increase performance by 15-25%. Moreover, the new Turbo3 distributor allows a significant increase in the purity of the low-raw sugar and thus a reduction in the undesired non-sugar recirculation.
- BMA's continuous centrifugals can be supplied as melting and also as magmatizing centrifugal. The sugar is melted / magmatized with a suitable medium in the sugar compartment

of the centrifugal housing. The resulting liquor, or the homogeneous and lump-free affination magma leaves the centrifugal via two pipe connections.

For this purpose, the centrifugal is equipped with a ring pipe that has boreholes for feeding the melting medium, and a stainless steel conduit for collecting the liquor / magma. Medium dosing is controlled as a function of the processing rate. This allows achieving a largely constant dry substance content of the liquor / magma, about 72°Brix for liquor and up to 93°Brix for magma.

When using continuous centrifugals as melting or magmatizing machine, there is no need for sugar screw conveyors or melting tanks with stirrers, so the machine is less complex, and savings in space and energy as well as maintenance and repair costs result.

- In addition, BMA's continuous centrifugals can be equipped with a disc brake for emergency shutdown.
- The housing can be optionally executed in stainless steel for all surfaces that come into contact with massecuite, sugar, syrup, and water.
- An efficient syrup separator considerably relieves the downstream crystallisation stage.



Range of equipment configurations and additional modules

Our range of modules allows you to tailor the centrifugal to your specific operating conditions and desired equipment features.

Function:

- Use of different baskets optimised for the product to be processed
- Adaptation of screening and operating speed
- Use of the Turbo3 product distributor
- Execution including internal syrup separation
- Housing with magmatising/melting execution

Material and design:

- Housing completely made of stainless steel
- Painting of visible mild steel parts according to customer's request
- Monitoring of bearing temperature and antifriction bearings
- Additional flushing and steam-out line inside the housing
- Automated lubricant dosing

Additional modules:

- Tool box including special tools
- Product discharge hopper for dry sugar
- Spring-operated DN200 butterfly control valve as safety device that closes in the event of a malfunction or an emergency and thus interrupts the crystal suspension flow into the centrifugal
- Lump strainer for installation in the feed pipe

Drive and control concept

Drive:

The performance of the standard motors used depends on the application. The compact control cabinet includes a soft starter for a smooth startup of the centrifugal. This feature allows you to reduce motor cabling by 50%.

The control cabinet accommodates a lockable mains switch.

Operator panel:

The operator panel (IP55) attached to the centrifugal is made of stainless steel and clearly structured. It provides for the

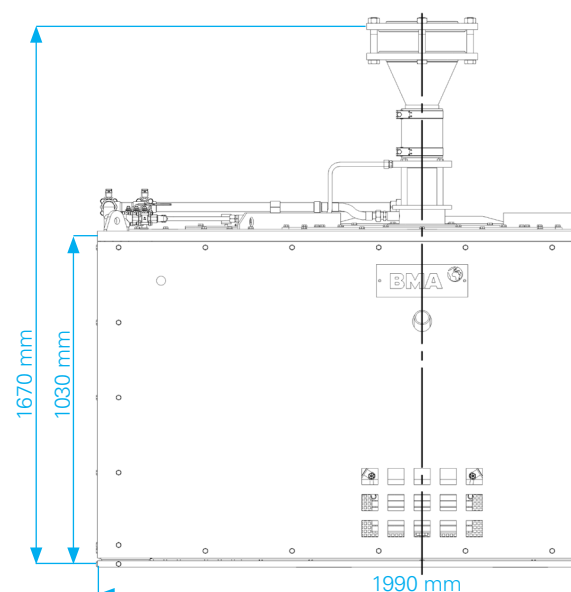
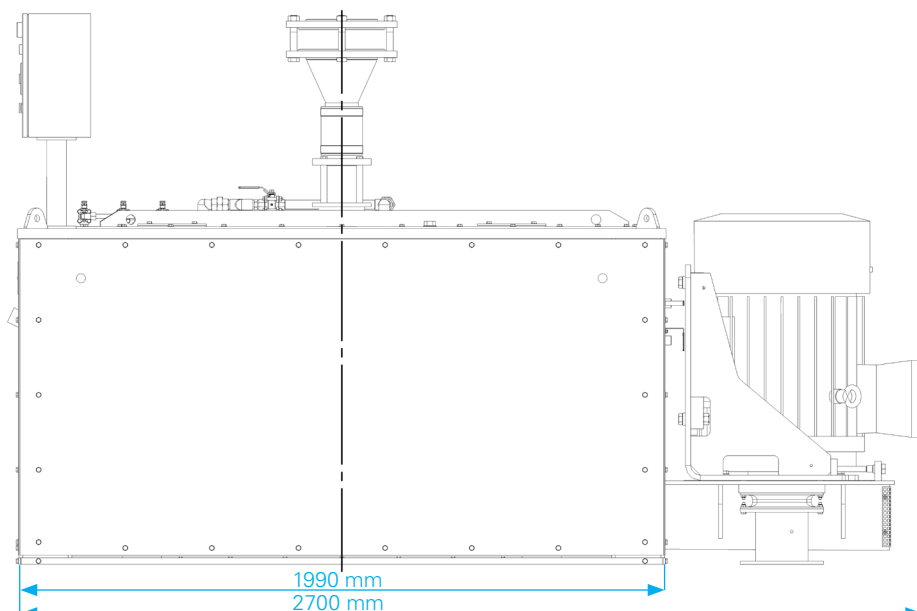
necessary protection of the electronics and for easy cleaning. All sensors and actors directly mounted onto the centrifugal are cabled to the operator panel, which allows performing a comprehensive functional test prior to delivery of the centrifugal and to minimise the commissioning time.

As an option, the controllers can be supplemented by a Profibus DP connection to a higher-level process control system.

All variables required for monitoring of the centrifugal and modification of parameters are already stored as defaults in data modules.

Warning lights on the operator panel will indicate when re-tensioning of the sensor-monitored V-belts is required. The vibrations of the centrifugal are monitored by an electronic vibration sensor, which is part of the standard specification. If a limit value is exceeded, a warning light is activated.

The flow rate of the washwater is indicated via a display.



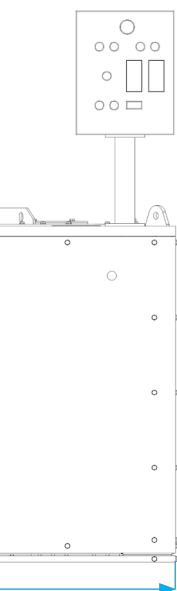
Advantages and features

Technical aspects:

- Small space requirements and low installation height allow a simple replacement of old centrifugals
- High processing rate and best technological results
- Optimum massecuite treatment prior to separation thanks to closed filling system and large product distributor or Turbo3 product distributor
- Excellent separation effects thanks to quick syrup discharge and shifting of the crystals within the basket
- Optimum running smoothness of the centrifugal thanks to newly designed overall structure
- Higher availability and fewer malfunctions thanks to high degree of automation with automatic feed control and monitoring of important functions
- Easy adjustability of the centrifugals for the product to be processed
- High operational safety since the world's strictest regulations are fulfilled
- Also usable for other crystalline massecuites

Economic aspects:

- Excellent value for money
- High processing rates
- Improved process flow
- High availability and low operating costs
- Long service life thanks to use of stainless steel for parts in contact with product and syrup
- Time and cost savings in installation due to complete assembly including control unit at the manufacturer's
- Quick and safe commissioning by BMA specialists or your own trained personnel
- Minimised maintenance costs thanks to reduction of wearing parts and improved access possibilities
- Qualified after-sales service by BMA Assistance



The supply line

K3300		
Upper basket diameter	[mm]	1,300
Basket angle		14° / 30°
Screen area	[cm²]	19,500
Required ground area	[mm x mm]	1,990x1,990
Depth incl. motor	[mm]	2,700
Housing height	[mm]	1,030
Height incl. butterfly control valve	[mm]	1,670
Maximum gravity factor		2,906
Maximum speed	[rpm]	2,000
Low-raw massecuite, beet*	[t/h]	17 (up to 19)
Low-raw massecuite, cane*	[t/h]	19 (up to 22)
High-raw massecuite, beet*	[t/h]	33 (up to 42)
High-raw massecuite, cane*	[t/h]	35 (up to 45)

**maximum throughput depending on the massecuite quality*

The maximum throughput rates listed above assume the use of a Turbo3 product distributor for low-raw massecuite processing.

() for particularly easily separable massecuite and, if applicable, for special technical configuration of the centrifugal



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