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Proportional Ceramic Block Burner Unit “BLEU”

# — BLEU



## Proportional Ceramic Block Burner Unit “BLEU”

The newly developed burner-circulation fan unit (BLEU) has been designed to address customers' increased demands for an efficient and ecological combustion. This burner unit may even be installed on all conventional lehrs made by Pennekamp. The actual burner unit is integrated into the conventional air circulating fan assembly, in order to minimize the space requirements on either side of the lehrs. According to the design, the burner unit is now installed on the lehr top. The proportional operation of the unit, allows to accurately maintaining the set points which are even more accurate due to the proportional cooling function. In addition to the relevant and required safety features, this burner is furthermore equipped with various pressure sensors to compensate the pressures within the lehr tunnel

itself. Those sensors allow an operation, irrelevant from the lehrs' internal pressures, at a safe and economical use. Furthermore, the data, generated from the sensors, are used within the overall lehr control system, to evaluate the internal drift and to operate energy efficiently.

1. Potential of energy saving due to removal of the glass heat carried into the lehr by the product (cool), without implementation of additional energy (heating). Executed by the optimal, product related drift control. The use of BLEU Burners extends the drift control by adding the lehrs inner pressures to the control.

2. Very good thermal insulation of lehr tunnel combined with minimized radiating surfaces (lowering of lehr height). Reduction of heat losses of outer tunnel surfaces.

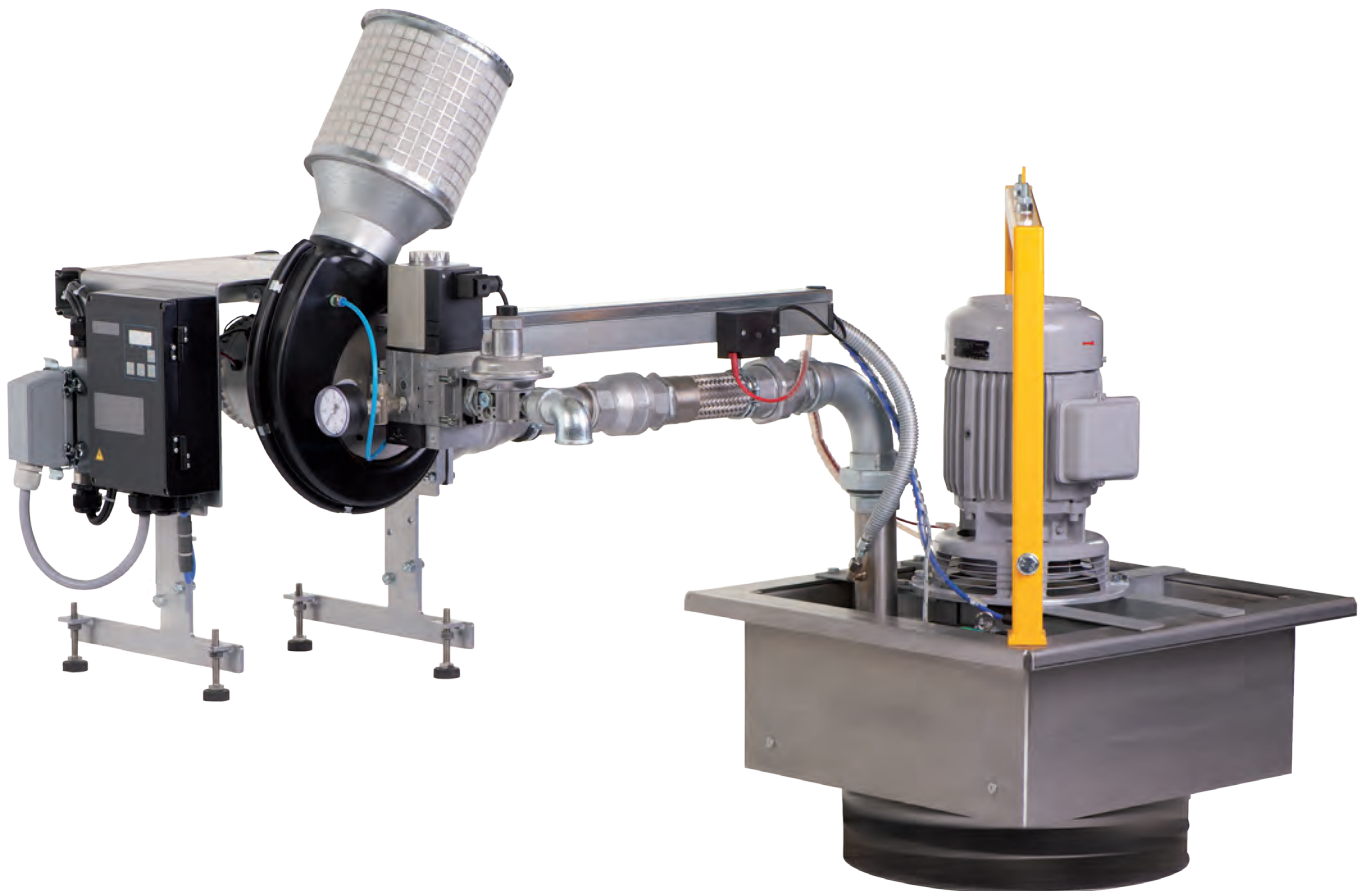
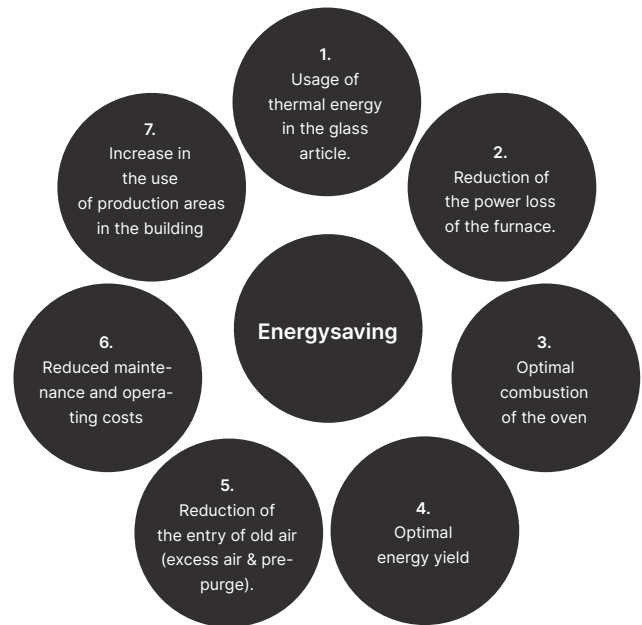
3. Optimal combustion of introduced gas quantity (energy) due to high efficiency of combustion. Will be achieved, when burners are operated with low excess of air (gas/air ratio  $\lambda = 1,0$  optimal quantity and mixture of gas and air). The BLEU Burner is therefore designed as premix burner and equipped with the “Whirlwind-System”. The combustion is executed independent from lehr inner pressure and combustion with reduced CO with minimal NOx emission.

4. Due to the patented burner system almost 100% of the used energy is transmitted as convective heat, which is supplied below the lehr belt to contact the ware base first and creates an optimal heat distribution throughout the zone.

5. BLEU Burners are operated as proportional burners, the capacities are linked to the actual requirement (modulating burner). Ignition procedures are minimized in comparison to ON/OFF burners.

6. The BLEU Burner is equipped with a ceramic, heat resistant burner head as well as with ceramic fiber insulation. The system is almost maintenance free. Only service/checks and cleaning/replacement of the air filter shall be executed.

7. By use of the BLEU Burner (on lehr roof top) the usual space requirement on either side for service and maintenance of the lehr (approx. 1000mmm each) is omitted. Optimization of production area use (building). In accordance to product type- and capacities, the use of the BLEU Burners achieves an energy saving of up to 35% in comparison to the classical gas burners.

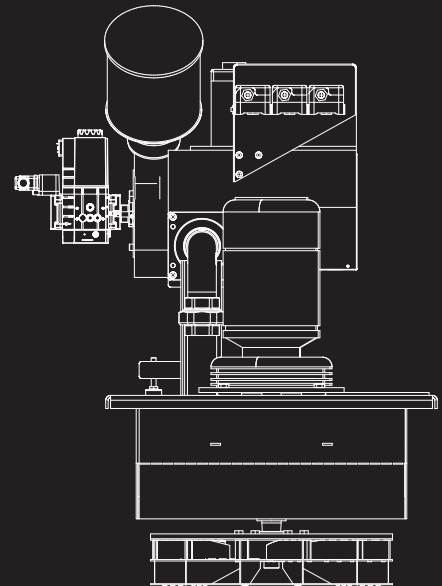
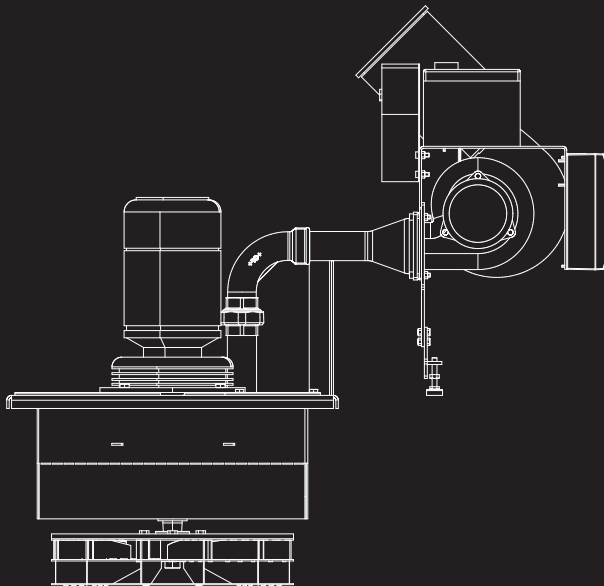


## Features

- Modulating, proportional operated burner with burner head from porous ceramic
- Monitoring and implementation of internal lehr tunnel pressures for the operation and control of burner
- Special air circulation fan wheel below the burner head to mix combustion gases with inner atmosphere
- Air filter
- Proportional operation for heat and cooling functions in ratio 1:10
- Operational capacities of 20 - 200 KW
- Gas heating according to EN 746-2

## Advantages

- Supplementary use for existing Pennekamp lehrs, without mechanical modification, may also be used within electric heated lehrs
- Proportional operation (heating and cooling function)
- Optimized temperature control
- Lowered energy consumption
- Abstinance of burner bricks and burner tubes
- Optimized combustion within any operational capacity by use of a premix burner system and minimization of NOx emission
- Space requirement of burner assembly on either side (approx. 1000mm each) omits, more space on production floor area
- Total height of lehr tunnel is reduced in comparison to classic designs
- Optimized heat distribution due to abstinance of burner tubes (radiation) and transmission of almost 100% of energy by convection
- Maintenance reduced operation



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