

Motors and Gearboxes for Biomass Heating Systems: Energy Efficient, durable, whisper quiet and compact

There are special demands for drive units in pellet stoves as well as pellet and woodchip heating systems. They must be energy efficient and durable. Whisper quiet operation is desired and a compact design simplifies integration into heating and conveyance systems. The division “Renewable Energies” of ABM Greiffenberger Antriebstechnik GmbH developed motors and gear motors for this application offering explicit advantages for equipment manufacturers as well as heating system operators.



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Heating with wood pellets and woodchips is „in“: Already 70,000 households in Austria heat with this environmentally friendly energy source from domestic production, there are more than 100,000 in Germany. Based on Germany’s 10-fold population the use of pellet heating systems in Austria is exemplary. The Austrians are also almost world-leaders if it comes to the parameter „pellet production per head“: only in Sweden the pellet production is higher compared to the number of residents.

A market with future

Forecasts are predicting a multiplication of biomass heating system installations in many nations over the next years. A bright future for equipment manufacturers and their suppliers.

ABM Greiffenberger occupied itself from the early stages on with the demands of manufacturers on these electric drive units for heating systems and developed spe-

cial series for these applications. Based on that, specialists of the division „Renewable Energies“ developed customized drive unit solutions together with the customer.

Special demands on the drive units

For this function electric drive units with high efficiency are required. Users of biomass heating systems are extremely environmentally and energy conscious after all otherwise they would not have invested in such a heating system. Additionally, the drive units have to run quiet as the “heart” of the machine due to their installation in residential buildings or even in living rooms. The drive units must show a high reliability, because nobody wants to be cold due to a failing gear motor.

High output – low weight

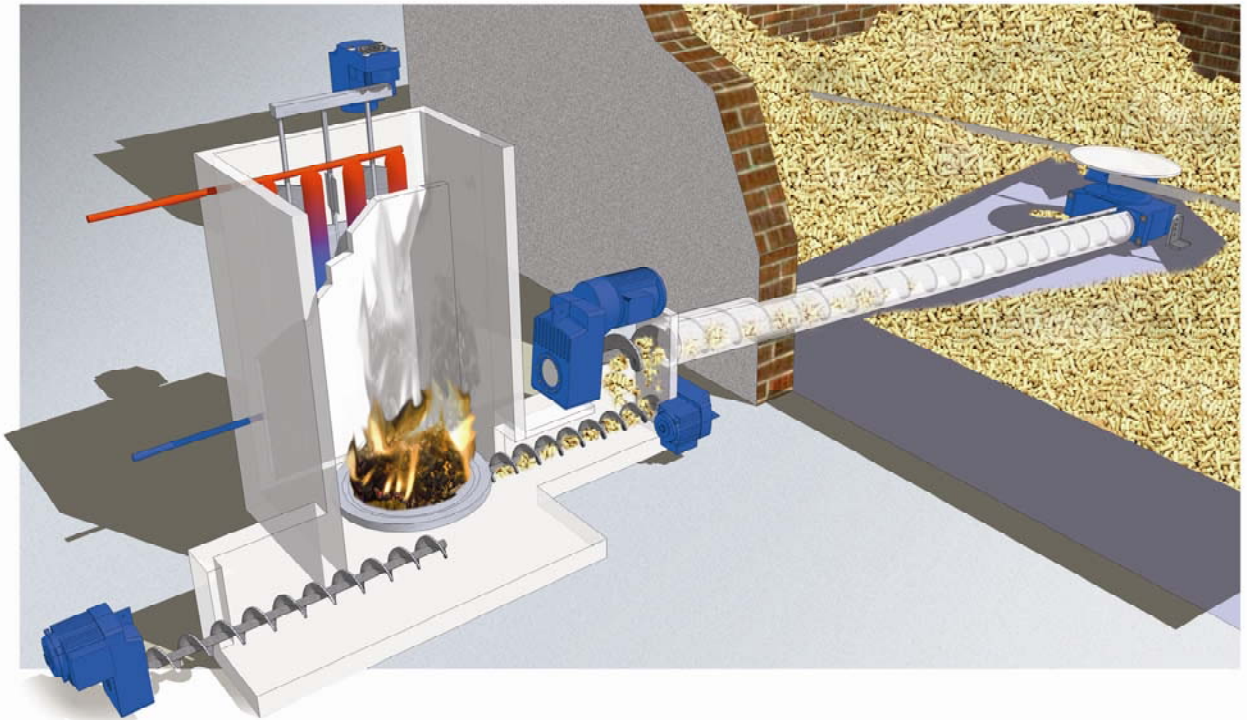
Electric motors and gearboxes from ABM Greiffenberger are downright predestinated for the use in pellet stoves as well as pellet and woodchip heating systems. The gearbox housings are designed with partially integrated motor housing, manufactured in the in-house foundry from aluminum die-cast, offering up to 30% weight savings compared to grey-cast housings. For that reason the drive units feature an extremely favorable output-to-weight-ratio. Another advantage, valid for the complete ABM range, lies in the high resistance against corrosion.

Premium drive units, carefully designed

A look inside the motors and gearboxes shows additional advantages for the operation in biomass heating systems. The premium helical gearing with ground flanks assures quiet operation and precise torque transmission at efficiencies up to 98% per stage – guaranteeing low energy consumption. All model range designs are based on a platform system assuring reduction of the number of different components while offering flexible adaptation of the gearbox to particular requirements. That applies for the gear ratios as well as for the position of the output shaft and the motor gearbox arrangement. The U-mounting for instance is an ideal solution for crowded areas with the motor adapting parallel to the auger.

Well sorted portfolio for biomass applications

ABM Greiffenberger offers a wide, well sorted portfolio for the conveyance of wood pellets and woodchips in biomass heating systems. The use reaches from removal of material from the bunker over rotary feeders, augers and cleaning of heat exchangers all the way to ash removal.



ABM drive units for pellet stoves as well as pellet and woodchip heating systems: From the removal of material from the bunker all the way to ash removal

The high overall efficiency of the parallel shaft gearboxes reduces the power input and therefore the energy consumption – ABM geared motors are true energy savers.



ABM Parallel shaft gearboxes for conveyance of woodchips

Due to the availability of two-, three- or four-stage units gear ratios up to $i = 2000$ can be realized allowing for instance also an economical operation of slow running augers. Special adaptation possibilities with hollow shafts and flanges allow for a simple and cost saving integration of the drive units.



ABM helical gearboxes for the conveyance of fuel

The program is not limited to three- and four-stage helical parallel shaft gearboxes in hollow shaft executions, optional with flange or torque arm and with integrated motor. Additionally, ABM offers two- and three-stage helical geared motors with gear ratios up to $i = 550$ and output torques up to 300 Nm to supply heating system manufacturers with an equally energy efficient, quiet and durable alternative for all applications parallel shaft gearboxes not desired.

For material removal from the bunker: Agitator drive units



ABM agitator drive unit SGS 125 for material removal from the bunker

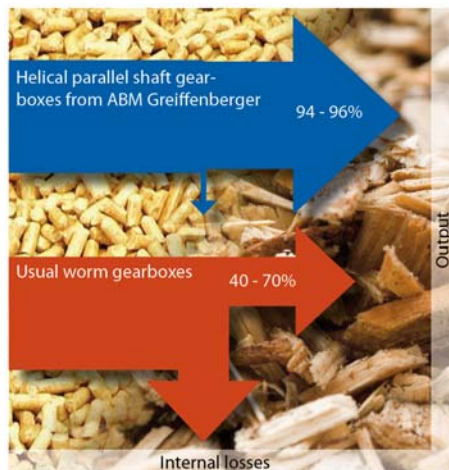
Besides parallel shaft helical geared motors, system solutions are part of the portfolio especially developed for biomass heating systems. The agitator drive unit SGS 125 transmits the force as well as reduces the output speed to the required value of the removal auger of the woodchip or pellet bunker. Due to the requirement of a flat design ABM Greiffenberger uses a worm gearbox made from special materials. The patented combination of material and lubricant allows for highest wear resistance. The

gearbox is designed for a lifetime of 10,000 operating hours – without maintenance. A custom developed sealing system effectively prevents penetration of dirt- and wood particles into the gearbox housing.

Exemplary energy efficiency

The agitator cares for even feeding of the removal system usually designed as auger and optionally economically and efficiently driven by an ABM parallel shaft- or helical

geared motor. By the way the energy efficiency is exceptional, resulting in an insignificant energy demand compared to the output of the heating system.



Efficiency comparison of an ABM helical parallel shaft geared motor vs. a regular worm gearbox.

A real world example: while worm gearboxes offer efficiencies of 40 to 70% similar compact helical parallel shaft gearboxes from ABM Greiffenberger reach efficiencies of 94 to 96%. The main reason is – besides a perfect matching of motor and gearbox as well as precise manufacturing of high-quality gearing – the use of helical instead of the usual worm gearing.

Result:

Comprehensive know-how for the good of equipment manufacturers and users

With the drive units and system solutions for pellet stoves as well as pellet and woodchip heating systems ABM Greiffenberger successfully developed a new area of applications. This evolution resulted from a base of know-how in other areas of application. Because the drive units from ABM operate everywhere a special demand on electric motors and gearboxes is required – e.g. in material handling, in textile machines, travel drive units for cranes, forklift trucks and elevators – and even in biomass heating systems. Additionally, the new business area “Renewable Energies“ moreover develops drive unit solutions for wind power plants and tracking systems for solar power plants.

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