

Solid fuel quality control system and information system for optimizing coal charge preparation

Automatic sampling

Automatic sampling of solid fuel supplies is made by the PMS-P1 automatic sampler. Mechanic sampling in an automatic cycle eliminates the influence of the service staff and ensures work safety when the conveyor belt is in operation. A programmable control microprocessor enables automatic sampling depending e.g. on the number of wagons, weight of the material, etc., with the possibility of sampling frequency programming according to relevant standards. The sampling is made at the filling point by means of a mobile drawer while the conveyor is in motion. After the parameters are set and the device is started, the drawer is moved to its first operating position where it is filled by material from the whole flow on the conveyor belt. The drawer is emptied during its backward movement. The primary sample is crushed in a twin-cylinder or a four-cylinder crusher with adjustable grain size. The crushed sample is homogenized, a part is separated according to the standard, and the rest is returned to the conveyor belt. This cycle is repeated in time intervals which are programmed depending on the quantity of the sampled material.



Coal quality measurements

The basic element of this part of the system is the WILPO analyzer. Its advantage is instantaneous information about humidity, ashes, and sulfur contents, and about the heating value of the sampled fuel. The device analyzes an untreated sample which can be taken from the output of the sampler crushing mill. The graininess of the sample is approximately (lower than) 6 mm, otherwise it fully corresponds to the delivered fuel. The advantage of the WILPO analyzer is its ability to specify quality parameters of the sampled fuel immediately, no drying or additional crushing is necessary. It is possible to respond to the differences between the declared fuel quality parameters and the detected ones immediately.



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Information system for optimizing coal charge preparation

According to customer requirements, measurements of coal level in the reservoir can be performed. Coal charging into the reservoirs can be made according to the specification of its composition, obtained by the WILPO analyzer. Level meters for the fuel level in the individual reservoirs must be part of the system. The basic part of the information system is a control computer which can be located e.g. in the coal service room. Information about the measured coal parameter values from the WILPO system, assigned to the individual wagons, and level status in the individual reservoirs (samplers, analyzer, level meters) are automatically transferred to the computer. There are two data bases in the system which are used by different departments. They are the data base for coal entry from consumers, which is utilized by the logistics department for the control of parameters ordered by contract and of real parameters, and the reservoir filling data base.

Knowing the contents of the reservoir will make it possible to use this information to control the combustion process and to optimize the filling of furnace reservoirs. The furnace staff will be able to estimate the quality of the coal in the reservoirs and thus will be able to optimize the furnace operation.

The advantage of the system is the lowering of thermal energy costs by burning quality fuel in terms of negotiated contracts. If the supplier does not carry out his obligations, penalty payments from the suppliers can cover a part of the loss which originated due to poor quality supply. The usual penalty payment for poor quality fuel will amount to x% from the price of the supply according to usual practice of the heating plant contracts. Another advantage is the overview of quality of coal in the individual reservoirs; it is then possible to use lower quality coal mixed with a higher quality batch according to the instantaneous heat demand which enables delivery planning and fuel purchase costs saving.

Fuel reservoir

K9A		K9B	
Height	Material/wagon	Height	Material/wagon
70%	548643-K9A	45%	348629-K9B
	548642-K9A		348628-K9B
	548641-K9A		348627-K9B
	348640-K9A		348626-K9B
	348639-K9A		348625-K9B
	548638-K9A		348624-K9B
	348637-K9A		548633-K9B
	548636-K9A		
	348635-K9A		
348634-K9A			
348633-K9A			

Explanation:

	sulfur
	humidity
	ash
	normal

The catalogue sheet contains only some parameters important for your decision. For planning always require a corresponding user manual and eventually a technical consultation on the possibilities of use.

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Description:

The system is designed for the double utilization of the obtained information about delivered fuel quality parameters.

Its first benefit is the possibility of objective detection of quality parameters based on samples taken from the supply by means of the PMS-P1 automatic sampler according to ČSN ISO 13909-2001 and subsequent instantaneous analysis of the untreated sample by the WILPO analyzer, which will measure the contents of humidity, ash, sulfur, and the heating value of the coal sample within no more than tens of seconds. This data can be compared to the supplier's declared data and, if the quality parameters are not complied with, it can be used to claim the penalty payment after the data is verified by an independent laboratory.

The second benefit is the fact that the fuel insertion data can be used to optimize the furnace operation or to control the filling of fuel reservoirs.

The main parts of the system are the following:

- Automatic coal supply sampling, according to ČSN ISO 13909-2001
- Measuring of coal quality parameters
- Information system for optimizing the coal preparation

