Glass tank control

KS 98 application

Control of a glass tank

Heating regulation via gas flow control

Ratio control for combustion air

Gas and air flow control

Bumpless switchover of left/right burners

Profibus-DP interface

KEY WORDS

Glass tank, glass melting, burner control, burner sequencing, bumpless switchover.

DESCRIPTION

The production of high-quality glass, e.g. for the manufacture of TV picture tubes, is a very complex process, that places high demands on accuracy and availability.

A glass melting furnace, the tank, is lined with fireproof bricks and covered by a hood. Heating is provided by burners at both sides of the tank, which are operated alternately by a control program.
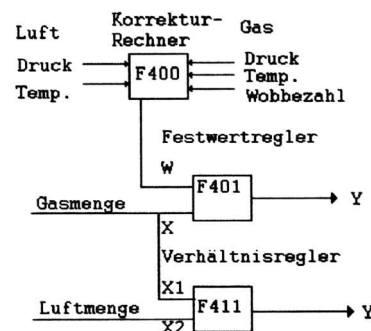
IMPLEMENTATION

To ensure an even temperature distribution, and to prevent overheating of the glass tank hood, the burners are fired alternately from both sides of the tank. This means, for example, that only the left-hand burners are in operation, whilst the left-hand burners are switched off. After a preselected time, heat input is switched over to the left-hand burners. Thereby, the left-hand burners automatically take over the output values of the right-hand burners, which are then switched off, thus providing a bumpless switchover. This alternate firing is continued for as long as required.
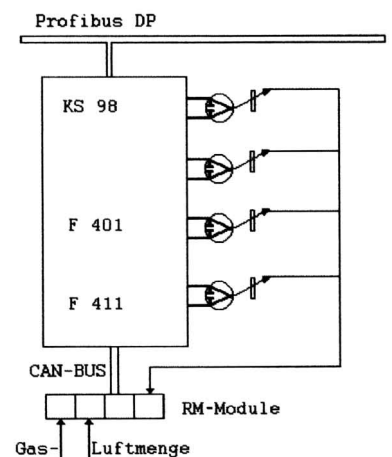
The controlled variable is not the temperature, but the gas flow, and the corresponding flow of combustion air in a fixed ratio.

In order to ensure uniform heating results, the gas flow measurement must be corrected by means of the following factors:

- **For gas flow:**
  temperature, pressure, and Wobbe index
- **For air flow:**
  pressure and temperature

Durchfluß- und Verhältnisregelung einer Glaswanne

Sequencing, control, and correcting functions of this application were carried out using KS 98plus controllers with Profibus-DP, and RM 200 extension modules.

Just one KS 98 was used to handle gas flow control, ratio control, and sequencing (burner switchover) for each set of burners. Data exchange between controller, PLC, and supervisory system is done via Profibus-DP. The data transmitted via Profibus is processed in the su-

pervisory system. From here, the controller status (automatic/manual), the set-points, and the output values can be changed remotely.

UNLIMITED VERSATILITY

The flexible configurability of the KS 98 enables the above application to be extended with pre-configured library functions such as password protection, timer, programmer, etc., or even „home-made" partial Engineerings. With additional operating screens, for example 6-line text display, trend display, and bargraphs, the projecting engineer is able to increase the plant's operational functions. Moreover, by means of a user-specific menu structure, the transparency of the process data can be adapted precisely to individual requirements.

Fliessbild Anzeige

F403   WAERMESTROM PORT 3   Index: 29   active

                                                                 Port /T52
                                                                 GID 0   UID 6

Regler Parameter   Conf

Parameter	aktuell	gespeichert	neu	Einheit
verfuegbar [J/N]	J			
Status [H,A,K]	K	K		
Verstaerkung	500.0	500.0		%
Intregalzeit	40.00	40.00		sek/min
Differenzierzeit	0.00	0.00		sek/min
Sollwert	5.227			MW
Modus [I,E]	E	E		
Sollwert links	4.600	5.920		MW
Sollwert rechts	4.600	5.920		MW
Verhaeltniswert	0.28			
Verhltnswrt links	0.28	0.35		
Verhltnswrt rechts	0.28	0.35		
Istwert	5.229			MW
oberer Alarmgrenzwert	6.500	6.500		MW
unterer Alarmgrenzwert	0.000	0.000		MW
Stellgroesse	67.70			%
Begrenzung hoch	80.00	99.99		%
Begrenzung tief	0.000	0.000		%
oberer Alarmgrenzwert	99.99	99.99		%
unterer Alarmgrenzwert	0.000	0.000		%

PAB

Ende   NEU -> TCS   DISK -> TCS   NEU -> DISK