



FLOATSCAN 21™

For Float Glass Temperature Monitoring and Control

INTRODUCTION

The FLOATSCAN 21 line scanner system enables measurement and control of thermal distribution over glass sheets, in real time. This is a great improvement over traditional pyrometers due to the great number of temperature measurement points (1250 over 90° angle) across the travelling object leading to display of an accurate thermal image of the glass sheet. Thus the system can be used to control automatically any heating or cooling devices for temperature profile rectification. Overall, the system enables improved glass quality for stress and hardness, and higher plant output (less rejects).

SPECIAL FEATURES

Floatglass application requires detection of small temperature differences across the glass sheet as it travels along. Usually, differences of less than 1 °C must be detected. Considering that the glass temperature is at say 500 °C, this means 0.3% thermal resolution. This requires a very precise instrument of high thermal sensitivity and response uniformity along the scanning line, hence high quality optics with minimised effect of indirect radiation. In addition, sighting through the lehr roof is via a relatively narrow and long slot. Any minor dis-alignment of the optical system will disrupt the temperature reading, making it necessary to have :

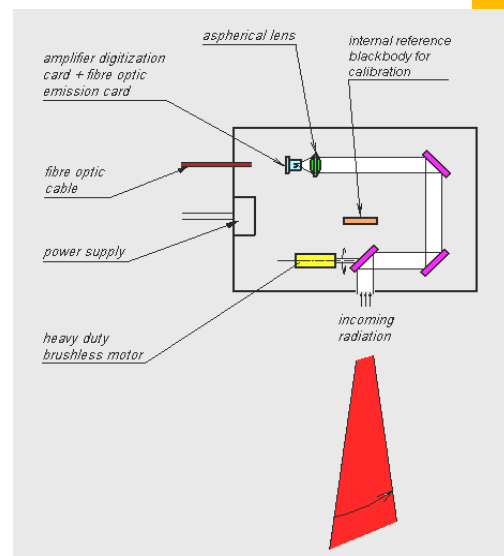
- a small detecting spot requiring a tiny sensitive area infra-red detector associated with sharply focused optic,
- a straight scanning line assured by fine alignment of the driving motor / rotating mirror/aspherical optics assembly,
- a precise and easy-to-operate scanner positioning system with a specifically adapted mechanical system.

SCANNING HEAD

Infrared radiation from glass sheet is reflected onto a single flat rotating mirror driven by a heavy duty maintenance free motor operating at constant digitally controlled speed. The rotating mirror is mounted directly on the driving motor shaft and properly balanced to avoid vibrations, for the best possible reliability results. Additionally, for every rotation, the mirror sweeps over an internal reference source of low temperature for a real time calibration. Then the infrared beam is focused onto a thermoelectrically cooled detector via a set of mirrors and aspheric lens of high angular aperture resulting in an extremely high thermal sensitivity, thus enabling detection of tiny temperature differences across the glass sheet.



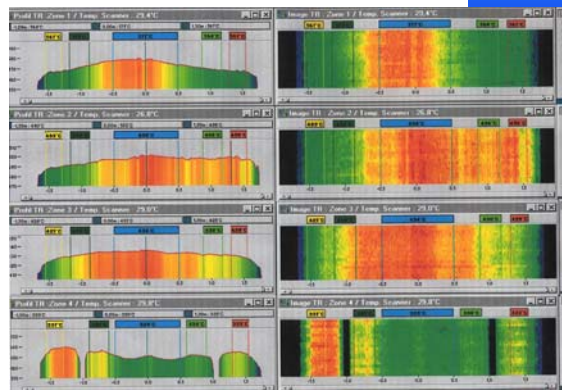
General layout



Scanner head principle



Electronic receiver, 19" rack mounted



Real time monitoring software



Scanner head utility connections



Scanner/lehr mechanical interface

ELECTRONICS

The scanner 16 bit digital output signal from each scanner head is transmitted to the remote processing equipment via fibre optic cables for non-interference with electromagnetic fields. The processing equipment comprises a single electronic receiver for acquisition of signals (infrared radiation + scanner head fault) from the various scanners. It also delivers 4-20 mA output signals for automatic cooling air flow control across the glass sheet.

DEDICATED SOFTWARE

Specially developed under Windows environment, the software insures real time monitoring. Main displays are glass sheet thermal profiles, alarms, trend curves, automatic data storage.

ADVANTAGES

- Compact and light scanning head for easy handling
- Wide viewing angle 90° for closer distance to lehr roof
- Very precise image of the glass sheet temperature thanks to :
 - high sensor sensitivity (0.3 °C at 500 °C),
 - high resolution (6 mm dia. detection spot at 2 m distance),
 - 16 bit fibre optic transmission.
- 4-20 m A output signals + alarm relays
- IP 65 - CEI 60529 / NEMA 12 enclosure

Above information is subject to changes without notice



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