

High-precision screen printing with camera-controlled positioning

For technical screen printing applications, Thieme has developed a special version of its proven model series THIEME 1000 and THIEME 3000. The flatbed screen printers are now optionally available with a camera-controlled print stock positioning system which automatically corrects position deviations of a tenth of a millimetre within one second.

These print systems have two CCD cameras fixed on a robust housing over the print table, which can be set for different print formats on a linear guide. The camera system used achieves a maximum resolution of one half a pixel (0.015 mm), which defines the smallest possible positioning range.

The Thieme designers placed special emphasis on the design of the print table. This consists of a stable basic frame on which three stepper motors are mounted to ensure precise positioning in the X1, X2 and Y directions. The main goal in this was to minimize alignment time. The new print table is able to correct positional deviations of 0.1 mm in just one second. In order to avoid problems in the alignment process due to vibrations, the machine frame is a stable steel construction, and a new guide and drive concept was developed especially for the mobile print table.

Mode of operation of the automatic print stock positioning system

For the first print run, the substrate is positioned at the guide pins and two register marks are applied with the print. For the subsequent print runs, the screen is aligned to the printed-on register marks. This is followed by the automatic fine positioning of the substrates by camera and motorized table adjustment, whereby a positioning accuracy of ± 0.05 mm is achieved.

Through the use of various lightings and lenses it can be ensured in advance that the camera system reliably recognises all of the colours used by the customer. The recognition of lasered register marks has also been successfully tested. It is even possible to eliminate errors in the manual alignment. The camera system is optionally available with additional software which recognises and automatically corrects any alignment errors in the subsequent prints.

Currently, the special version of the THIEME 1000 and THIEME 3000 is available for three different print formats (750 mm x 550 mm, 1050 mm x 750 mm and 1400 mm x 1000 mm). The system includes a computer with monitor for the operation of the camera system.



Pic. 1. The screen printing systems THIEME 1000 and THIEME 3000 with automatic print stock positioning were especially designed print table, positional deviations of 0.1 mm can be automatically recognised and corrected within one second.

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