
Deviating from the standard:

IEF-Werner: 2-axis positioning system for short cycle times

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Deviating from the standard

Short cycle times and little space - these were the requirements of a customer who had to handle small components with a high output in a pick & place application. IEF-Werner designed a double 2-axis positioning system made of linear units in which the motor is not carried along during the movement but is mounted externally. The weight saving speeds up the processes by up to 15 percent.

Furtwangen, 07.04.2021 – Providing small, lightweight components for assembly? These are common tasks in automation applications, such as in medical technology, micro-assembly or in the electrical industry. It is common that, positioning systems which deviate from the standard are required for this. "Customers demand fast, precise positioning with high repeatability," Thomas Hettich, product manager at IEF-Werner GmbH, explains. One of these customers is a company that needs a pick-and-place solution for assembly that handles compact components at high cycle rates. There was little space available for this demanding task.

"We have developed systems that achieve significantly shorter cycle times compared to other two-axis Cartesian solutions," Hettich says. For this purpose, the automation specialist from the Black Forest builds positioning systems consisting of Module 160/15 and Module 115/42 linear units for the X-axis and the Module 33 ZOM and Module 55 ZOM cantilever axes, which handle the Z-movement. The cantilever axes are specialised linear units for vertical or horizontal operation. Their greatest advantage is the fixed motor. This is mounted next to the motor of the x-axis. Because the motor of the cantilever axis does not have to travel with it in this way, this solution achieves a considerable weight saving - and thus enables faster movements. Via a toothed belt, the power of the motor is diverted to the cantilever axis Module 55 ZOM or Module 33 ZOM and thus moves the cantilever of the Z-axis.

Due to the special kinematics, the extension arm can be completely retracted from the working area. This means that no disturbing contours remain. The maximum speed of the ZOM series is three metres per second and the load to be picked up is four kilograms. "We have limited the maximum stroke to 1,500 millimetres of the x-axis," Hettich explains. "We chose that quite deliberately. Because: the longer the stroke, the longer the toothed belt has to be - because it is carried along, this would be at the expense of speed and repeatability." Since the cables for the cantilever axis do not have to be moved, there is no wear at this point and the worst case, a cable break, is no longer an issue.

Back to back: double handling

"The solution we developed for the customer consists of two of these positioning systems, which we installed back to back," Hettich reports. "We have the two horizontal axes at the front and at the back. On top of each are the vertical axes to which grippers are attached." To drive the axes, three motors are installed on one side and one motor opposite. The drive technology itself was specified by the customer. But that was no problem because the motors could be easily integrated into the positioning systems, Hettich says. The reason: "No interpolation is required as in comparable systems. "With our solution, the user can simply programme and control the axes," the IEF expert describes. The IEF technicians have adapted the positioning systems to the customer's design with levelling elements. The IEF solution is inherently rigid: it supports itself without the linear units sagging.

The automation specialist could have solved this task in a different way, for which they had various options available in-house - for example, with the 115/42 module for horizontal movement and the 68 module as the cantilever axis. "We can move heavier loads with this combination, but we have to carry the motor with us in each case. The stroke could also be increased by using a longer toothed belt. However, the advantage provided by the solution installed at the customer's would be lost," Hettich says. And that is quite clear in this application: "With our multi-axis positioning system, we achieve cycle time savings of ten to 15 percent. This is particularly noticeable with high quantities," the IEF expert says with satisfaction. In addition: "Because less mass has to be moved, the user also saves energy.

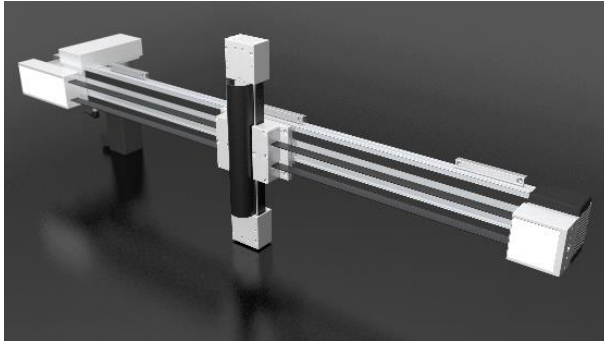
Meta-Title: IEF-Werner 2-axis positioning system for fast cycle times

Meta-Description: Automation specialist IEF-Werner supplies a double 2-axis positioning system consisting of linear units in which the motor is not carried along during the movement - this leads to processes that are up to 15 percent faster.

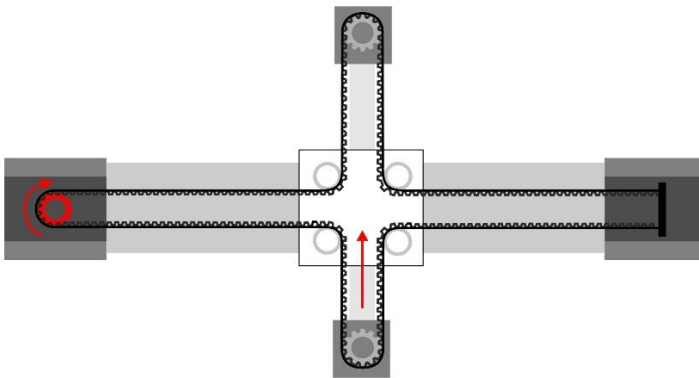
Keywords: IEF-Werner; 2-axis positioning system; linear unit; cantilever axis; Module 33 ZOM; Module 55 ZOM

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Captions:



Picture 1: Example module 55 ZOM: This cantilever axis is a specialised linear unit for vertical or horizontal operation. Its biggest advantage is the fixed motor.



Picture 2: Functional principle of the 2-axis positioning system for vertical or horizontal operation.

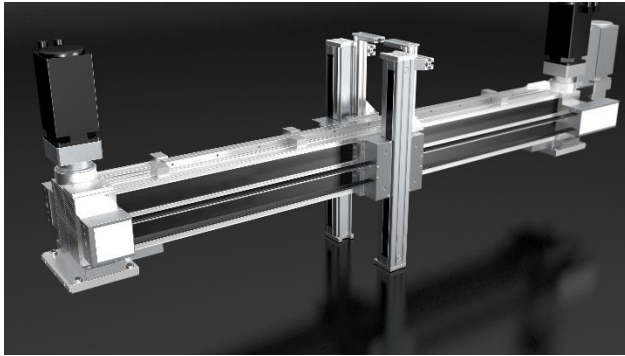


Picture 3: The "traditional" alternative: Module 115/42 for horizontal movement and Module 68 as cantilever axis. More power, more stroke, but slower.

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Picture 4: The positioning systems were installed back to back. At the front and back are the two horizontal axes. On top of these are the vertical axes to which grippers are attached.



Picture 5: Thomas Hettich: "We achieve cycle time savings of ten to 15 percent with our multi-axis positioning system."

Images: IEF-Werner GmbH