

# Fast, precise and fully automated handling of fragile solar cells



**FESTO**

## Highlights

- Permanent quality control via integrated, intelligent compact vision system
- A high-end solution: low-contact gripping according to the Bernoulli principle
- Optimum dynamic response with up to 100 picks/min:  
High-speed motion in a rectangular working space with up to 4 degrees of freedom

## Project

Handling fragile wafers when producing solar cells represents a big challenge. During the manufacturing process, the wafers will be unloaded from a machine several times and transported to the next station for the next processing step. This must be done at maximum speed and at the same time reliably and accurately in order to maximise the output.

## Requirements

- Maximum dynamic response, speed and optimised cycle times
- Permanent checks without interfering with the throughput
- Vibration-free handling of the solar wafer
- Residue-free and soft gripping of the wafers

## Solution

### High-speed surface gantry EXCH

The extremely flat Cartesian high-speed handling unit with robotic functionality can be easily integrated into existing system concepts.

### Bernoulli grippers OGGB

No contamination, no loss of quality: the OGGB grips the wafer with minimal contact and without leaving any residue.

### Compact vision system SBOx

For completely reliable quality and position control.

# Fast, precise and fully automated handling of fragile solar cells: Products and solutions



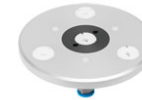
## High speed H-gantry EXCH

- Two sizes: EXCH-40, EXCH-60
- X stroke: 500 ... 500 mm
- Y stroke: 400 ... 1500 mm
- Rated load for max. dynamic response:  
4 or 6 kg
- Max. speed
  - Horizontal: 5 m/s
  - Vertical: 4 or 3 m/s
- Max. acceleration
  - Horizontal: 50 m/s<sup>2</sup>
  - Vertical: 30 m/s<sup>2</sup>
- Repetition accuracy: ±0.1 mm
  
- Low vibration
- Can be expanded with a Z-axis or rotary/linear module for 3D applications
- Ready-to-install complete system, fully assembled and wired
- Optional control package CMCA (as a control cabinet or mounting plate)



## Compact vision system SBOx Q

- Resolution: 640 x 480, 752 x 480, 1280 x 1024
- Frame rate (full image): 150fps, 60fps, 27fps
- Max. number of inspection programs/jobs: 256
- Ethernet interface:  
TCP/IP, EasyIP, Telnet, ModbusTCP, EtherNet/IP
- CAN interface: CPI system, I/O expansion, CANopen with integrated CODESYS
  
- Intelligent vision systems for precision positioning of the axes
- Position and rotary orientation detection of moving and stationary parts for quality inspection
- Integrated PLC



## Bernoulli gripper OGGB

- Suction cup size: 60, 100, 140 mm
- Connection: G1/8
- Holding force: 10 N
- Supply pressure: 0.1 ... 6 bar
- Ambient temperature: 0 ... +60°C
- Volume: 65 dBA
- Air consumption: 110 l/min (at 1 bar)
  
- The ideal solution for minimal contact gripping, and for gripping pliable, porous and brittle workpieces
- The workpiece floats on an air cushion and only comes into contact with the gripper at a few stops

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