MiniTec
THE ART OF SIMPLICITY

SOLAR TECHNOLOGY

SOLAR TECHNOLOGY

Part. N° 95.0009/2

THE COMPANY

MiniTec was founded on the sales of miniature lineargui-des and has successfully evolved into designing comple-te machines and devices for many industrial processes around the world.

THE PRODUCTION PROGRAM

Our linear technology combined with the Profile System is the ideal partnership for machine builders. The components work together to provide optimum performance and the modular assembly system makes it possible to design and manufacture to unique specifications quickly and cost effectively.

THE QUALITY

To meet the demands of linear technology precision and to exceed quality expectations, we invest in the latest machines and newest technologies and manufacturing techniques. Our quality management has been certified according to ISO 9001 since 1994.

THE ENVIRONMENT

Our Company mission stresses an active role in environ-mental protection and the conservation of our natural resources. As an example we locate our service partners in close proximity to our customers to avoid long transits. Our environment managementsystem is certified accor-ding to ISO 14001.
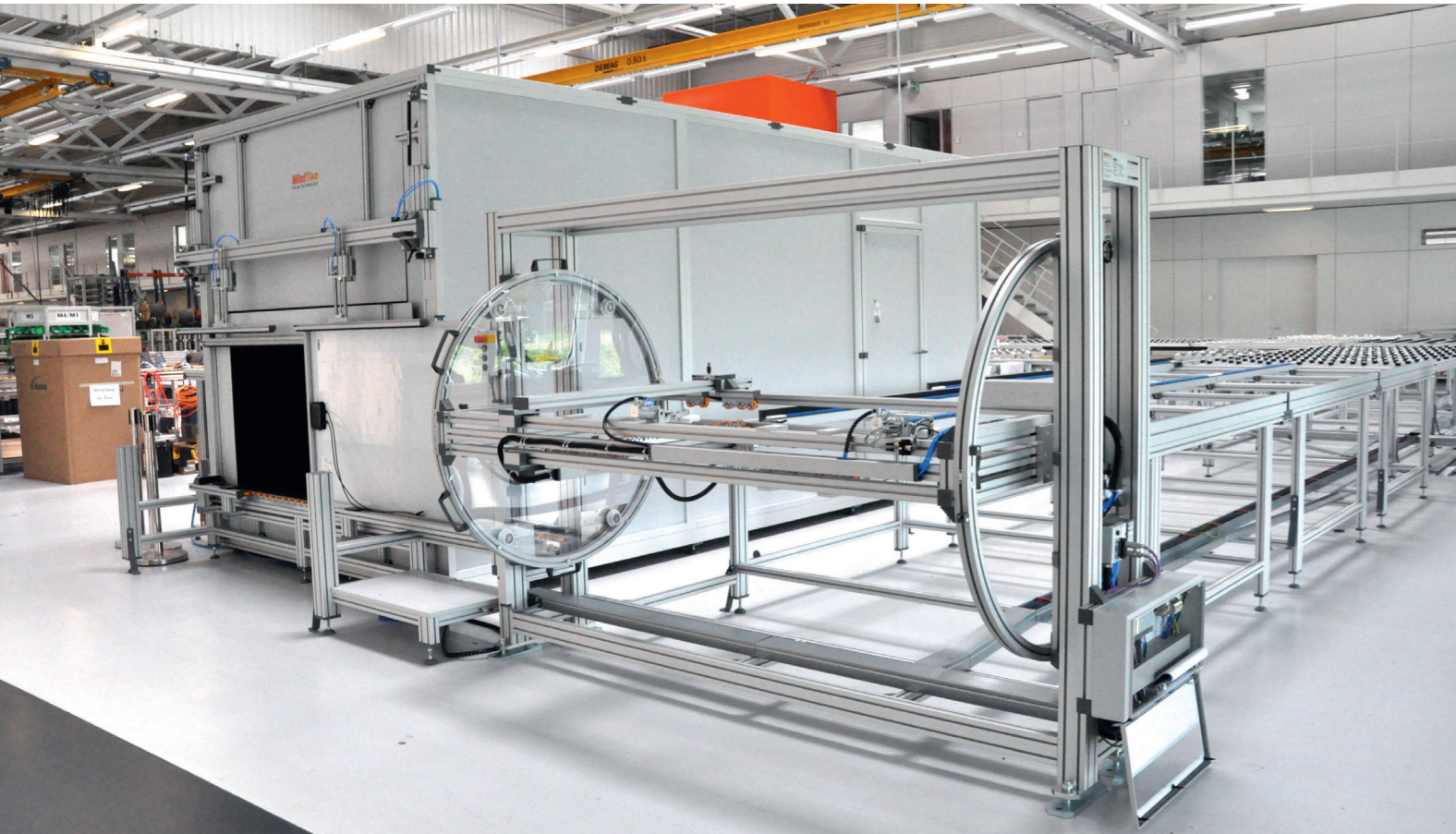
THE INNOVATION

For us innovation means more than just new products. All our processes are constantly optimized. Continuous training of our staff and close cooperation with research and education facilities are the base for a steady innovati-on process.
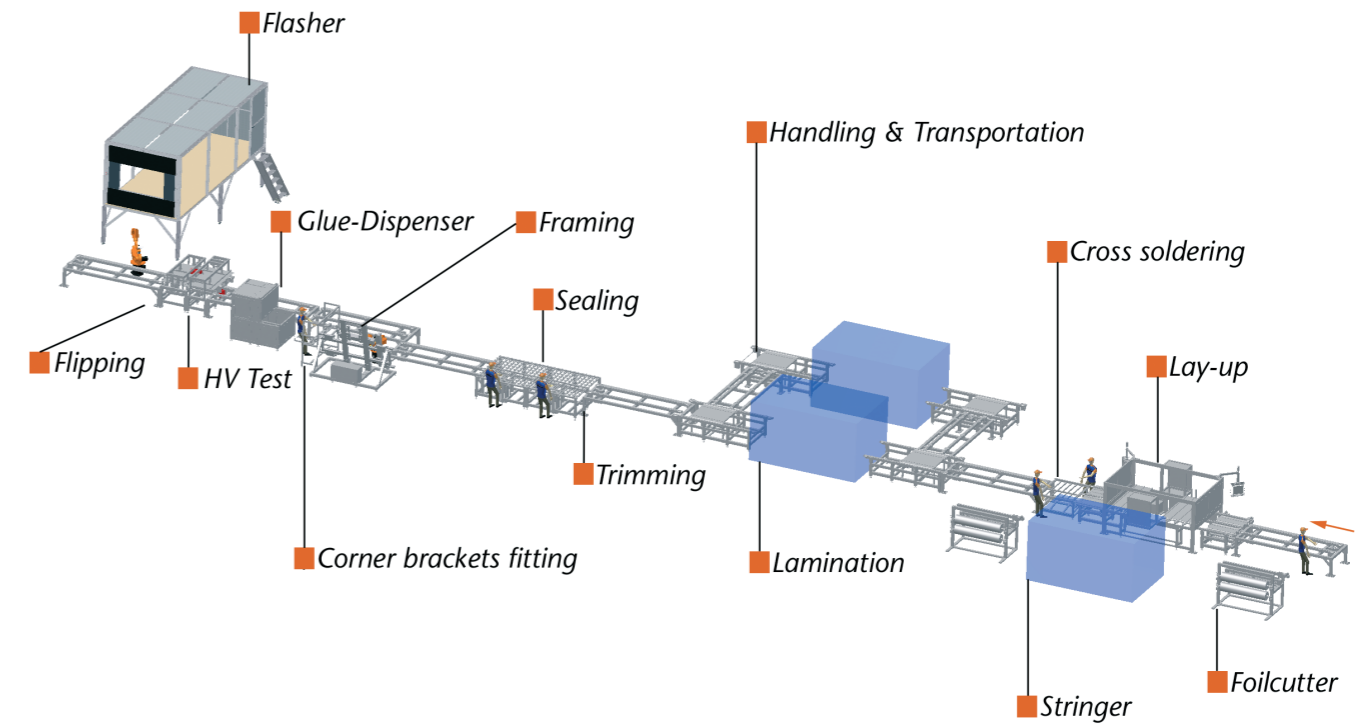
THE OCCUPATIONAL HEALTH AND SAFETY

Since 2006 our company is certified with the OHSAS 18001 – Occupational Health and Safety Assessment Series.

Vertical flasher unit in Production Hall

MiniTec Solar technology is concentrating on systems for the automation of Photovoltaic (PV) module assembly. Several lines are helping to increase productivity at PV producers in Europe, USA, Asia and Africa.

COMPONENTS FOR SUCCESSFUL PRODUCTION

- Crystalline moduletechnology
- Thinfilm moduletechnology
- Over 10 years of experience in PV-Industry
- Different grades of automation:
  - manual <10 MW/year
  - semi automatic 10-20 MW/year
  - full automatic >20 MW/year
- Customized solutions
- Upgrade of existing production

TESTING STATIONS

For Solar Simulators (e.g. BERGER Lichttechnik, H.A.L.M., Endeas, Pasan) MiniTec has built several handling stations around the flasher including automatic module loading, flipping, contacting, HV testing, labelling and sorting into different classes.

HANDLING/TRANSPORTATION

Some examples of other manufacturing steps where MiniTec is providing handling and assembly-automation:
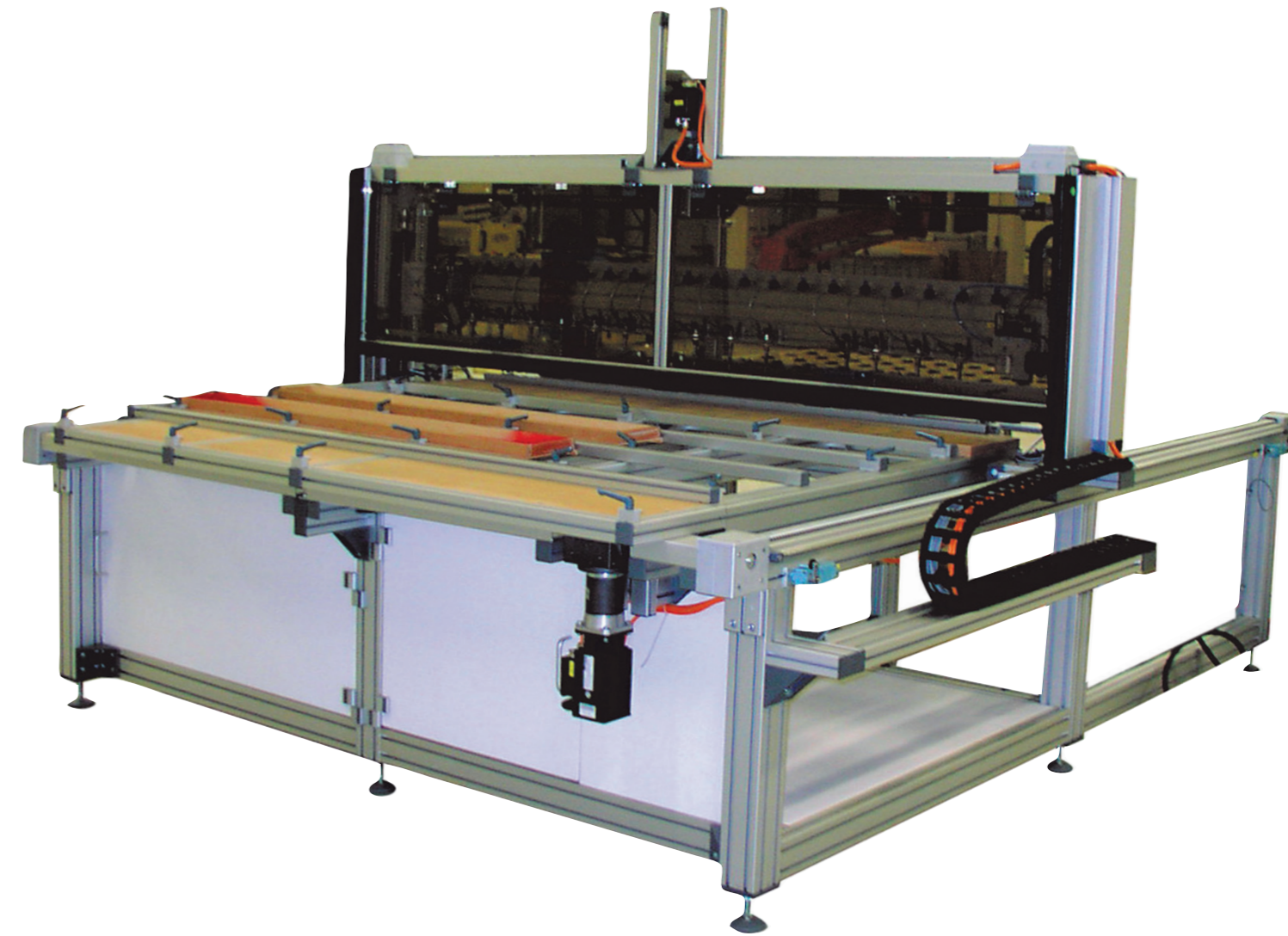
- Module- and glass-handling from incoming inspection up to module-packaging and labelling
- Framing
- Flipping
- Buffering

Solar Line with Flasher Unit

TECHNICAL DATA

Fully automatic operation.

- **Cycle Time:** <15s/string (with 2 portals, without camera-inspection)

- **Module size:** from 500 mm x 1000 mm up to 2000 mm x 3000 mm

- **Repeating accuracy:** 0.5 mm

- **Cell-dimensions:** min. 6", max 8" (others on request)

- **Power-supply:** 400 V, 50/60 Hz

- **Rated output:** 6 kVA

OPTIONS

- In-process string inspection with cameras

- Control of soldering-ribbons

- Interface for data-management, bar-code reader, labelprinter

- Telediagnostic service

- Connection with stringer

- Manual soldering table

- Connection to automatic soldering station
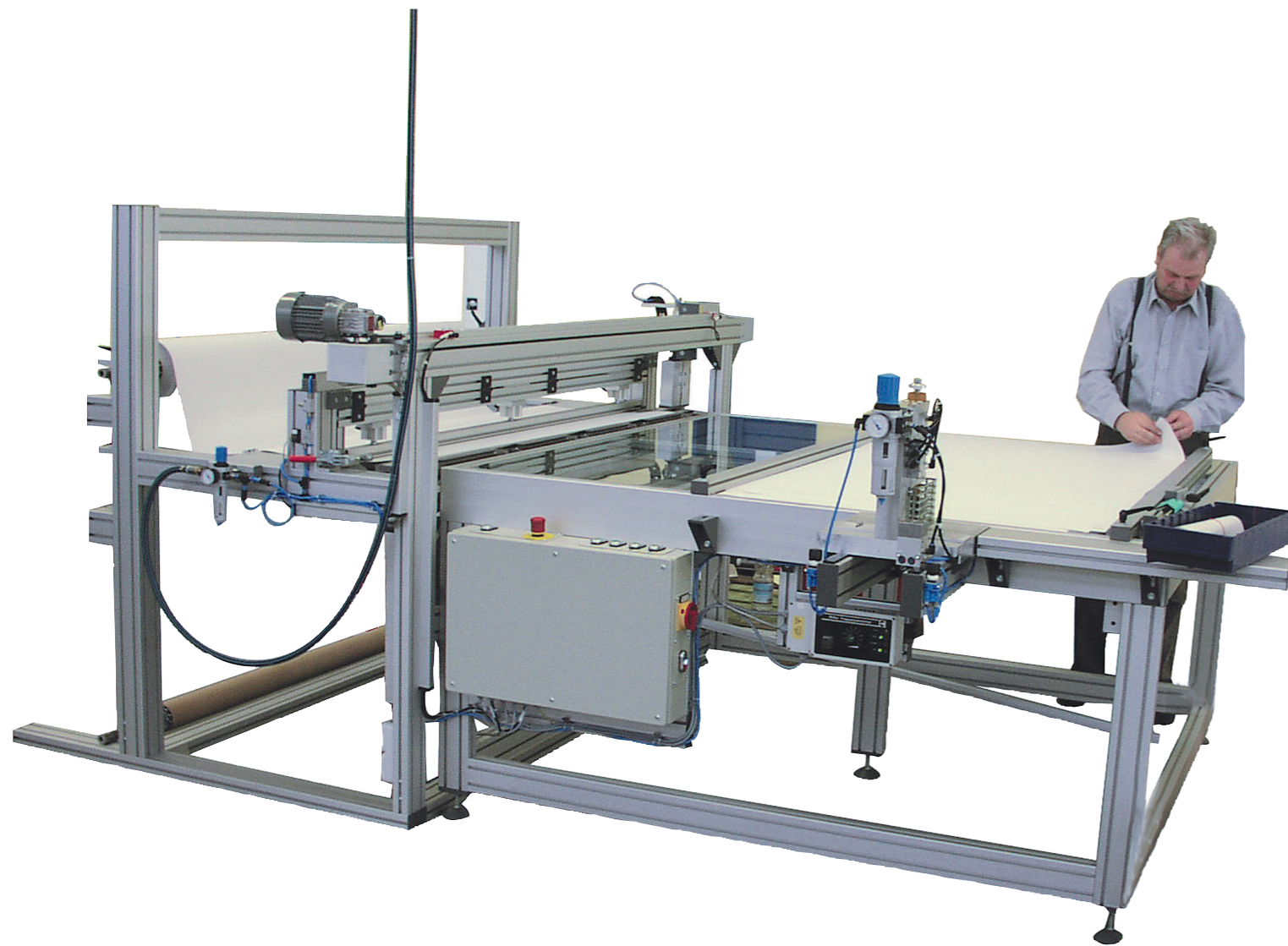
TECHNICAL DATA

Semi automatic operation.

- **Cycle Time:** <40s/string

- **Module size:** from 500 mm x 1200 mm up to 700 mm x 1960 mm (others on request)

- **Repeating accuracy:** 0.5 mm

- **Cell-dimensions:** min. 4", max 6" (others on request)

- **Power-supply:** 400 V, 50/60 Hz

- **Rated output:** 6 kVA

OPTIONS

- Automatic glass allignment

- Interface for data-management, bar-code reader, labelprinter

- Telediagnostic service

- Connection with stringer

- Transportation lines for assembled modules

FOIL-CUTTER

GLUE-DISPENSER

TECHNICAL DATA

Electric driven cutter on linear-portal, worktable with adjustable bed-stops.

■ **Foil sizes:**
- width min. 200 mm, max. 1700 mm
- length min. 500 mm, max. 2000 mm
- thickness max. 0.5 mm

■ **Recommended foil types:**
- Etimex Elvax 0.5 mm
- Icosolar 0.2 mm
- others on request

OPERATION

■ Manual unrolling of the foil in desired length

■ The machine is equipped with 2 adjustable bed-stops

■ Automatic clamping and cutting

OPTIONS

■ Stamping system for junction wires

TECHNICAL DATA

CNC glue applicator, volume controlled glue barrel pump, automatic attachment of self-adhesive strips.

OPERATION

■ Manual loading of connector box

■ Fully automatic attachment of 1/2 selfadhesive strips

■ Automatic spread of glue layer, following the outline of the connector box (different box types and different contours programmable)

■ **Cycle Time:** depending on box size 45-90 sec.

OPTIONS

■ Automatic box loading and attachment
■ Alternatively with or without self-adhesive-tape-application

HORIZONTAL FLASHER

VERTICAL FLASHER

TECHNICAL DATA

Output metering and classification of assembled modules with connector box.

- **Modul size (depending on flashing system):**
  - max. 3000 mm x 3000 mm
  - min. 1200 mm x 550 mm
  - others on request

- **Contacting of modules:** manual/automatic

- **Flasher-System:** Berger Lichttechnik, H.A.L.M., Endeas, Pasan

OPTIONS

- Automatic labelling

- HV test

- Framed modules/frameless modules

- Automatic or manual loading of modules

- Automatic or manual contacting

- Stand alone solution with PLC and interface standardized

TECHNICAL DATA

Output metering and classification of assembled modules with connector box.

- **Modul size (depending on flashing system):**
  - max. 2000 mm x 1500 mm
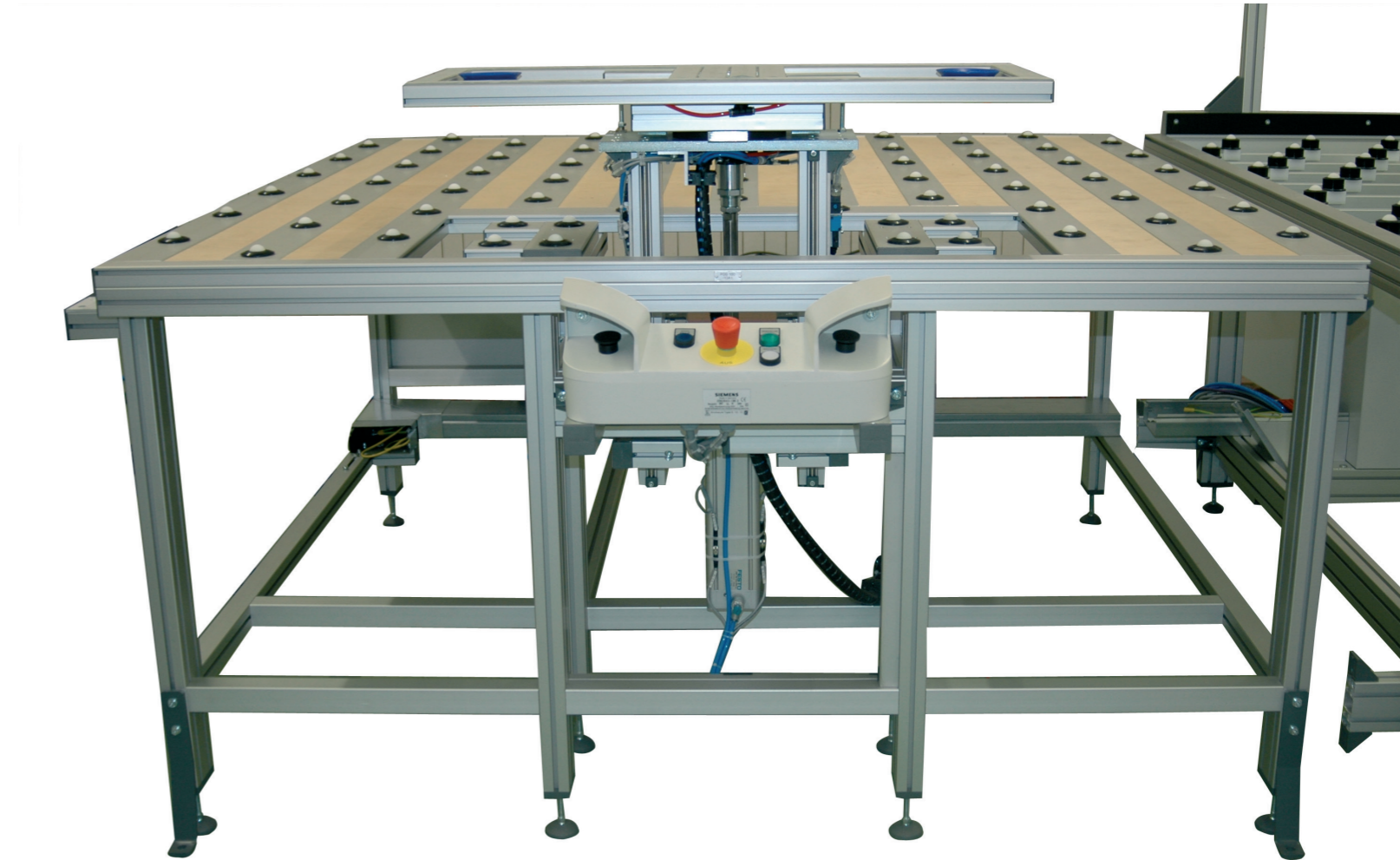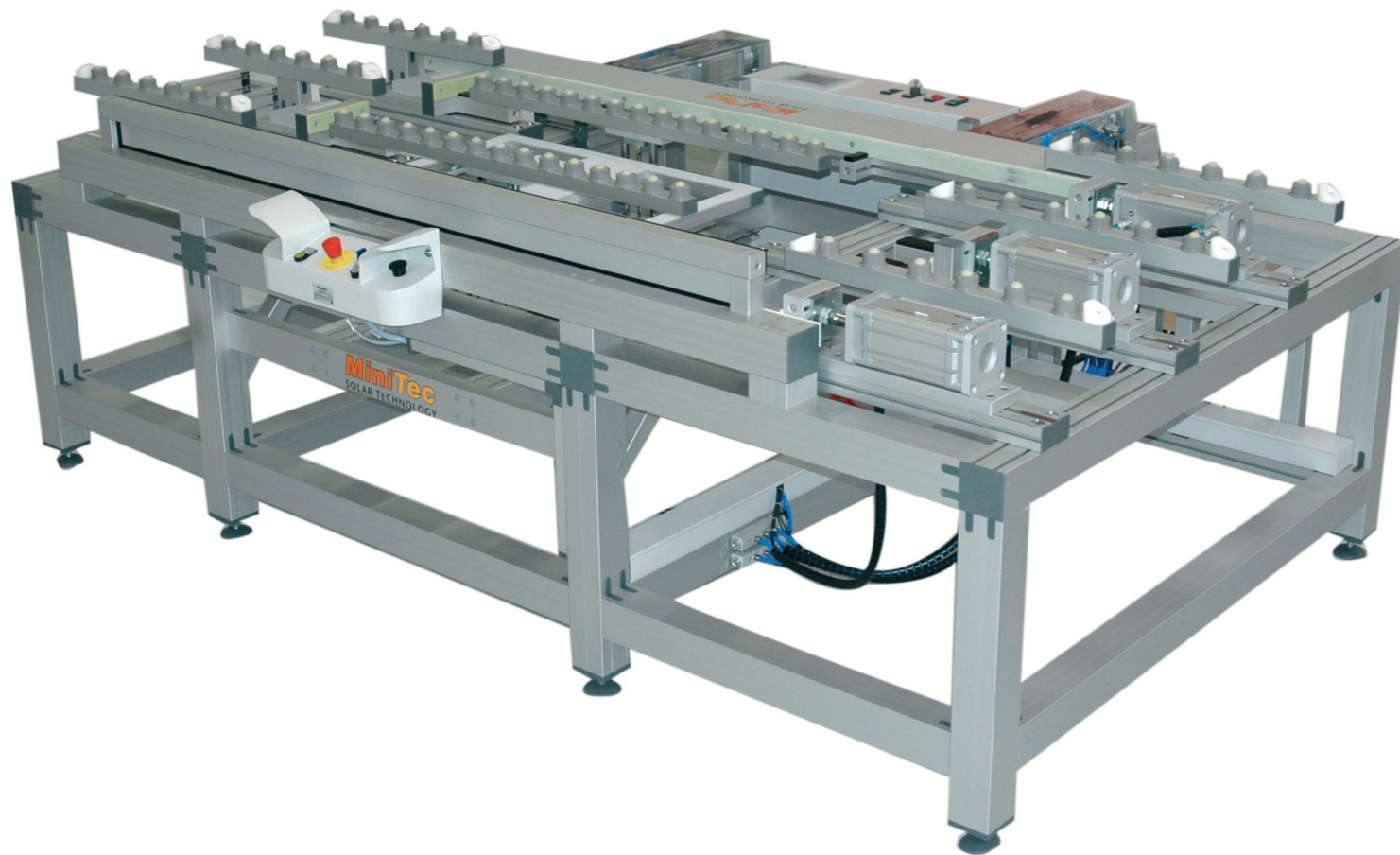 - min. 1200 mm x 550 mm
  - others on request

- **Contacting of modules:** manual/automatic

- **Flasher-System:** Berger Lichttechnik, H.A.L.M., Endeas, Pasan

OPTIONS

- Automatic labelling

- HV test

- Set upright station

- Framed modules/frameless modules

- Automatic or manual loading of modules

- Automatic or manual contacting

- Stand alone solution with PLC and interface standardized

TECHNICAL DATA

Assembling of module frame, PLC controlled, manual or automatic.

- **Modul size (depending on flashing system):**
  - max. Modulgröße Standard 2000mm x 1100mm
  - min. Modulgröße Standard 1300mm x 950mm
  - min. Modulgröße optional 1200mm x 660mm
  - kleiner Größen auf Anfrage

- **Cycle time:** 90s - 180s per module
  (depending on corner joint method, sealing and workflow)

OPTIONS

- Corner-key pre-assembly
- Screwed frame
- Different assembly flows
- 2 operator handlings
- Inline or stand alone
- Automatic srewing
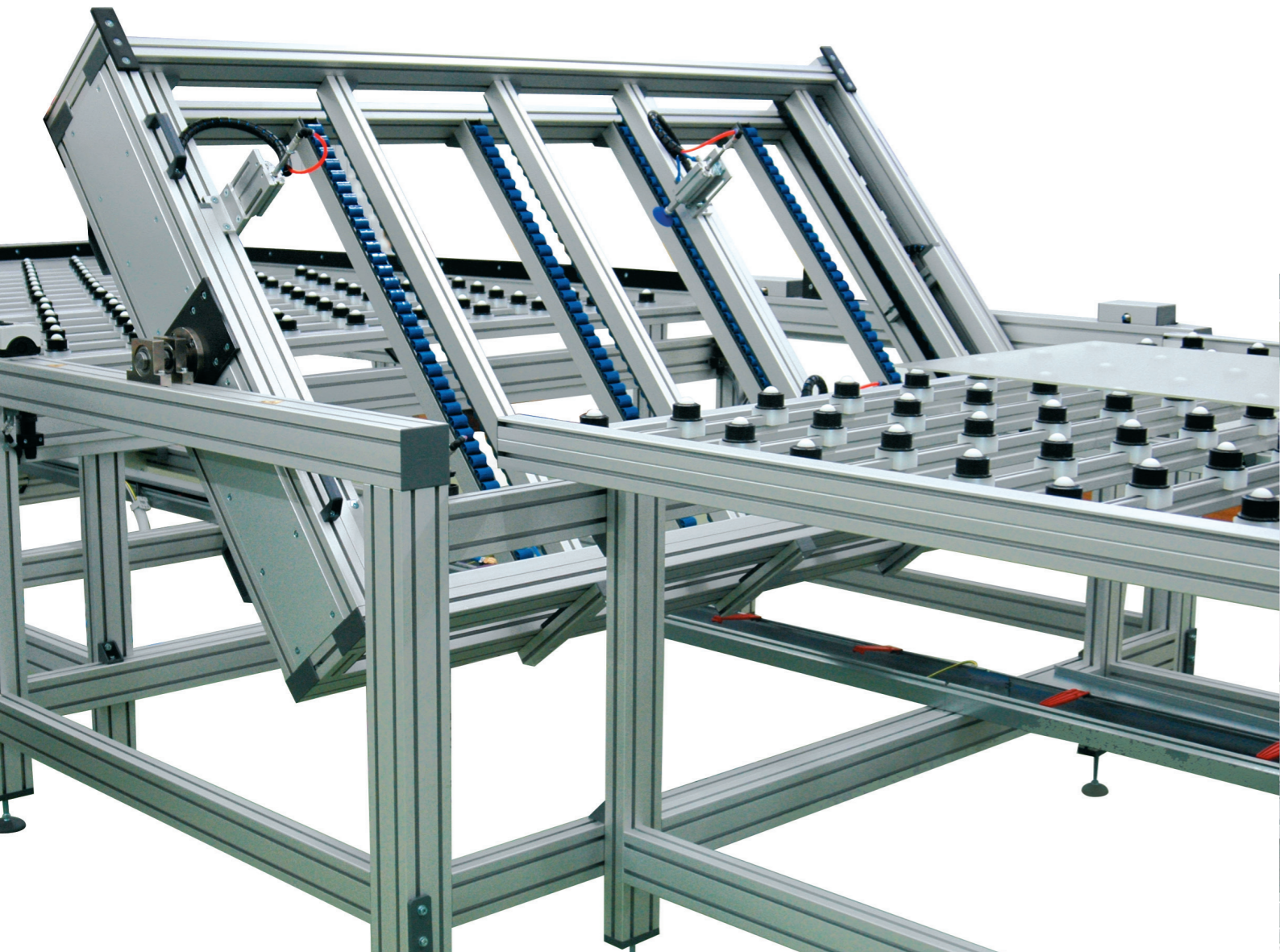- Sealing with tape or silicone

TECHNICAL DATA

Manual trimming of laminated modules. Laminated modules are fixed by vacuum on a pneumatic lifted turntable. Manual cutting of supernatant foil.

- **Pane dimensions:**
  - max. 2000 mm x 1500 mm
  - min. 1000 mm x 500 mm

- **Max. Pane weight:** 30 kg

OPTIONS

- Integrated in automatic conveyor system
- Pneumatic pane stoppers
- Also usable as cleaning-station for assembled modules
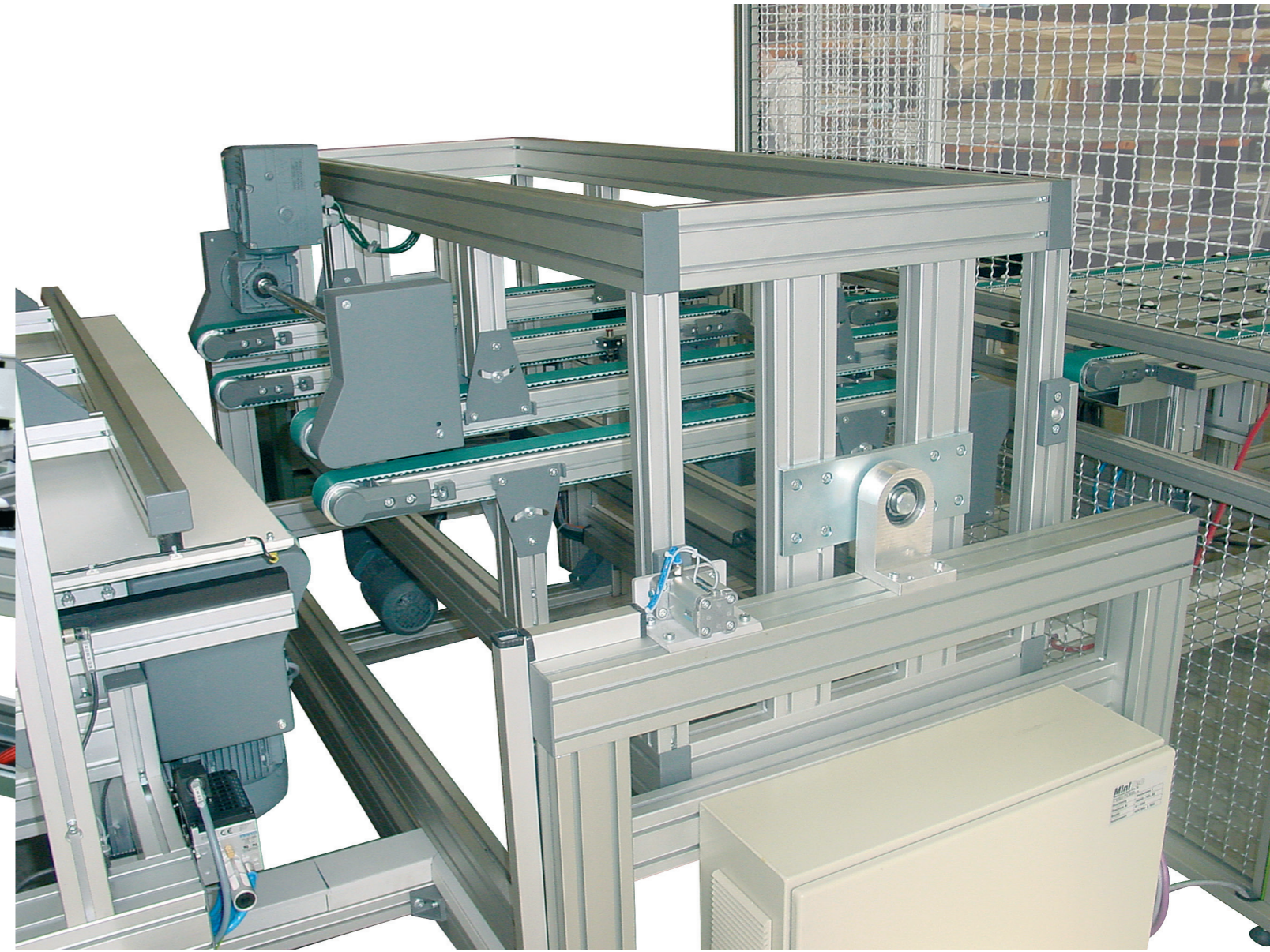- Stand alone pneumatic controlled
- PLC-controlled

TECHNICAL DATA

Manual rotation of laminated modules or frame moduls with or without connector box. The pane is fixed with pneumatic cylinders and vacuum while turning.

- **Pane dimensions:**
  - max. 2000 mm x 1500 mm
  - min. 800 mm x 500 mm

- **Max. Pane weight:** 60 kg, others on request

TECHNICAL DATA

Automatic rotating of laminated modules or frame modules with or without connector box.

- **Pane dimensions:**
  - max. 2000 mm x 1500 mm
  - min. 1000 mm x 500 mm

- **Max. Pane weight:** 60 kg

GLASS/MODULE BUFFER HD FIFO

GLASS/MODULE BUFFER HD LIFO

TECHNICAL DATA

Inline buffering of glass panes or laminated modules without frames (with frames on request)

■ **Pane dimensions:**
  - max. 2000 mm x 1100 mm
  - min. 1000 mm x 600 mm

■ **Max capacity:** 20 panes (others on request)

■ **Max total load:** 600 kg

OPTIONS

■ FIFO-Software

■ Buffer for framed modules

■ Storing of glasses with EVA-foil

TECHNICAL DATA

Inline buffering of glass panes or laminated modules without frames (with frames on request)

■ **Pane dimensions:**
  - max. 2000 mm x 1100 mm
  - min. 1000 mm x 600 mm

■ **Max capacity:** 20 panes (others on request)

■ **Max total load:** 600 kg

OPTIONS

■ LIFO-Software

■ Buffer for framed modules

■ Storing of glasses with EVA-foil
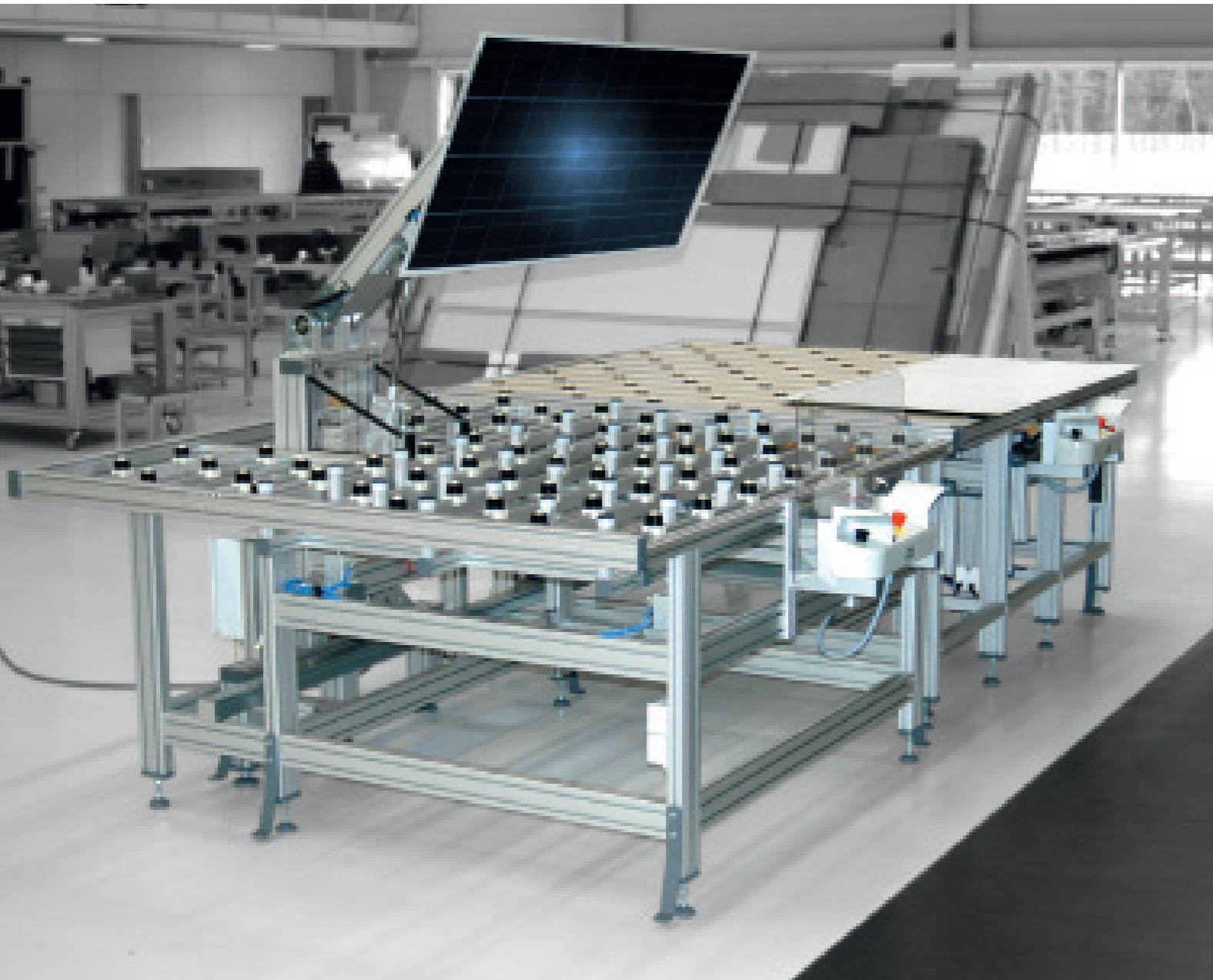
DESCRIPTION

- Repair of module sandwiches before lamination

- Vacuum handling system for strings

- 2 stringboxes for new/reject strings

- Transport trolley for handling of sandwich
  from line to repair table

- Luminaire and pneumatic and electrical connections

- Holders for soldering equipment

- Holders for soldering fume exhaust system

DESCRIPTION

- String repair table to repair broken cells
  after string process

- Vacuum handling to take string out of reject box

- Stringboxes flipping unit integrated

- Light box for functional string testing after repair

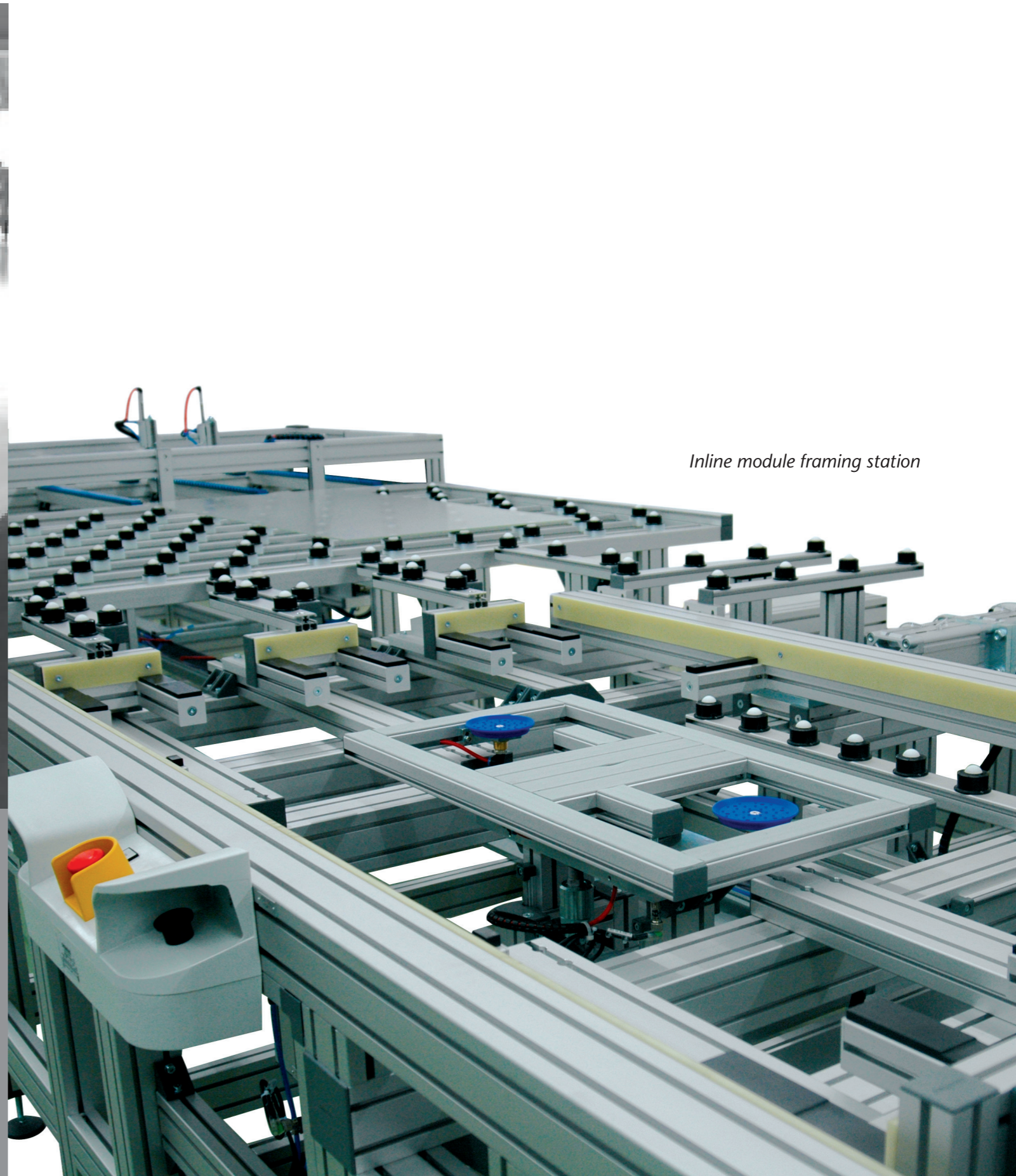- Luminaire and pneumatic and electrical connections

Inline module framing station

DESCRIPTION

- Visual inspection of panels after lamination

- Two hand operation

OPTIONS
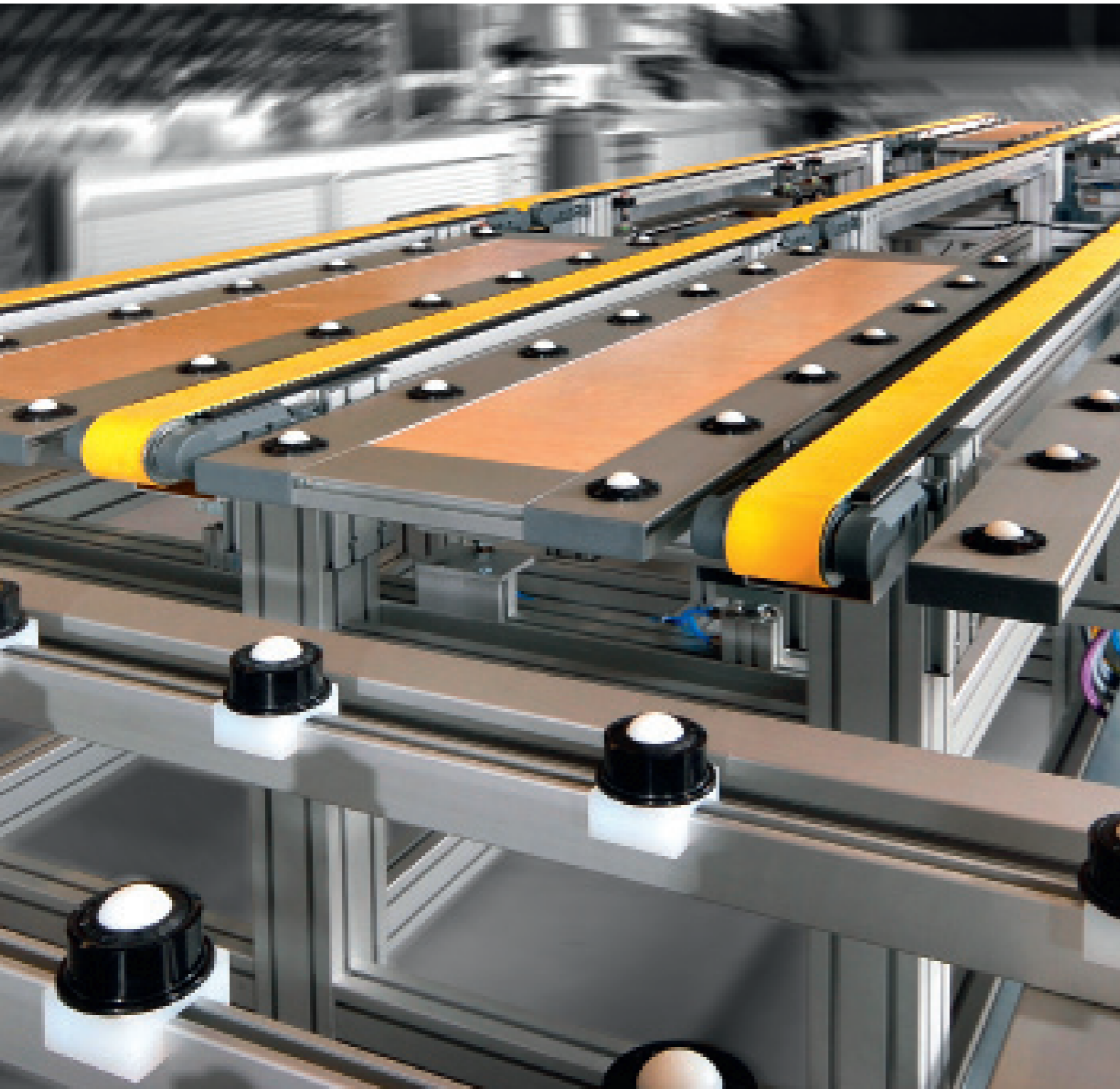
- Automatic transport with thoothed belt conveyor

- Several presentation levels selectable
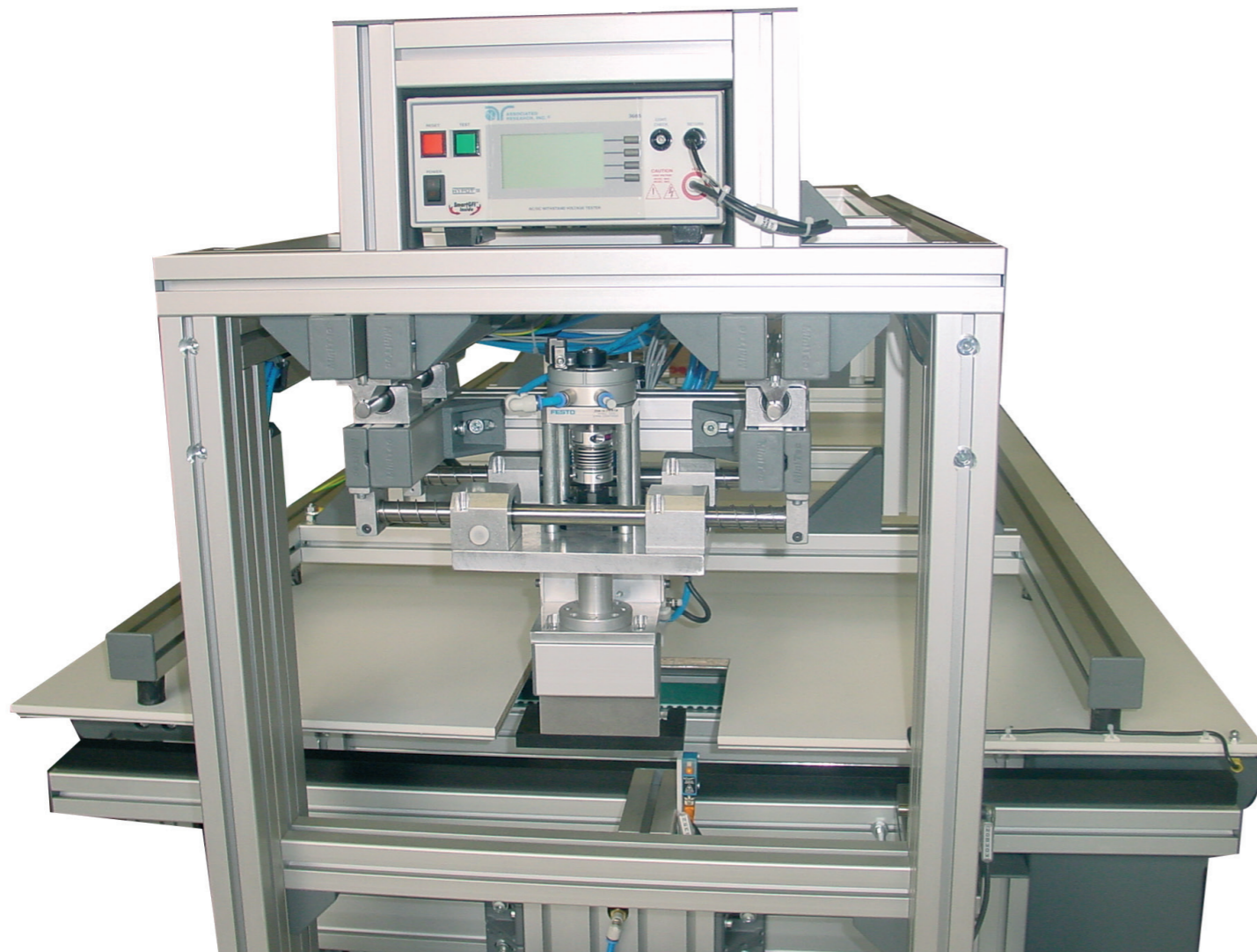
Connection between manual and automatic transportation

Semi automatic assembly line

Automatic HV-test / isolation-test

Roller conveyor with mechanical accumulation protection

Automatic lift from horizontal to vertical transport

Framing station (stand alone)

2-axis-handling system for transport/packing

Module flasher with integrated HV-test/isolation test

Solar Production Line
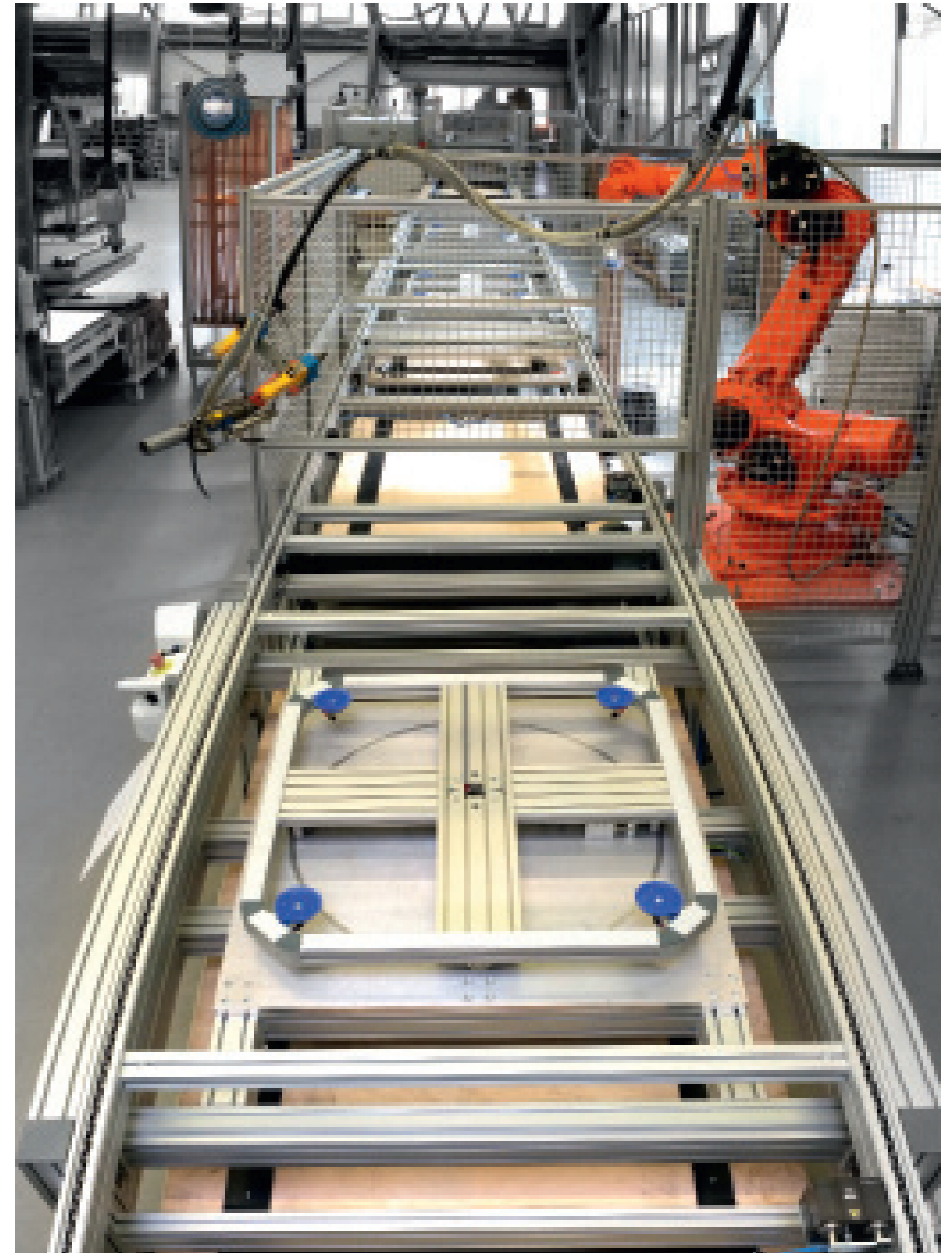

Highpot tester for solar modules

Solar Production Line

MINITEC LOCATIONS

MiniTec GmbH & Co. KG (Deutschland)
MiniTec Allee 1 | 66901 Schönenberg-Kübelberg
Tel. +49 (0)6373 81270 | Fax +49 (0)6373 812720
info@minitec.de | www.minitec.de

MiniTec GmbH & Co. KG (Deutschland)
Fürther Straße 33 | 90513 Zirndorf
Tel. +49 (0)911 2789000 Fax +49 (0)911 27890099
zirndorf@minitec.de | www.minitec.de

MiniTec España S.L.U. (España)
C/ Carlos Jiménez Díaz, 7. Pol. Ind. La Garena
28806 Alcalá de Henares, Madrid
Tel. +34 (0)91 6562652 | Fax +34 (0)91 6775304
info@minitec.es | www.minitec.es

MiniTec S.N.C (France)
2, rue Charles Desgranges | 57214 Sarreguemines
Tel. +33 (0)3 87276870 | Fax +33 (0)3 87276877
info@minitec.fr | www.minitec.fr

MiniTec Schweiz AG (Helvetia)
Industriestraße 19 | 8112 Otelfingen
Tel. +41 (0)44575 1500 | Fax +41 (0)44575 1501
info@minitec.ch | www.minitec.ch

MiniTec.at GmbH (Österreich)
Beethovenstraße 12 | 2380 Perchtoldsdorf
Tel. +43 (0)1865 9559 | Fax +43 (0)1865 955990
office@minitec.at | www.minitec.at

MiniTec Solutions România SRL (România)
Str. I.M. Pestalozzi Nr. 22 | 300115 Timis
Tel. +40 (0)728 115965 | Fax +40 (0)256 242266
office@minitec.ro | www.minitec.ro

MiniTec Slowenia d.o.o. (Slovenija)
Griže 24a | 3302 Griže
Tel. +386 (0)590 71390 | Fax +386 (0)590 71399
info@minitec.si | www.minitec.si

MiniTec Slovakia s.r.o. (Slovensko)
Rabčická 332 | 02944 Rabča
Tel. +421 (0)43 5524350 | Fax +421 (0)43 5524352
info@minitec-slovakia.sk | www.minitec-slovakia.sk

MiniTec System Sweden (Konungariket Sverige)
Strandbadsvägen 19a | 25009 Helsingborg
Tel. +46 (0)4214 0880 | Fax +46 (0)4214 088
info@minitec.se | www.minitec.se

MiniTec UK Ltd. (United Kingdom)
Unit 1 Telford Road | Houndmills Estate
RG21 6YU Basingstoke/Hampshire
Tel. +44 (0)1256 365605 | Fax +44 (0)1256 365606
info@minitec.co.uk | www.minitec.co.uk

MiniTec Framing System LLC (United States of America)
100 Rawson Road, Suite 228 | Victor, NY 14564 USA
Tel. +1 (0)585 9244690 | Fax +1 (0)585 9244821
sales@minitecframing.com | www.minitecframing.com
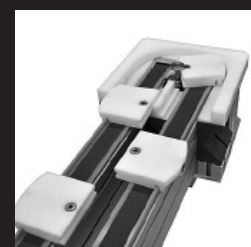
MINITEC PRODUCT LINE

PROFILE SYSTEM   LINEAR SYSTEM   CONVEYORS   WORKPLACE SYSTEMS   MACHINE PROTECTION   TURN-KEY SOLUTIONS