INTELLIGENT PRODUCTION TECHNOLOGY

STRINGER TT2100
AND 145 MW SYSTEM

teamtechnik’s high volume production STRINGER with 72,5 MW capacity

STRINGER TT2100

- High throughput at 1.71 seconds cycle time
- Low breakage rate < 0.1 – 0.3 %
- Separation of handling steps from soldering process
- Non-contact IR light soldering process
- Homogeneous temperature distribution on cell
- Very precise ribbon handling and positioning
- Industry leading availability and uptime
- Cost-effective and economical production
- Compact footprint
- Ready for the future: 6 busbars possible (as an option)
- Full and half cell processing capability

145 MW SYSTEM

- One 6-axis robot for 1 or 2 STRINGER TT2100
- Vacuum gripper for string handling
- Positioning station for glass panel
- Safety guarding
- Control cabinet and operating panel

teamtechnik lives 360° e-mobility

With its own e-fleet, photovoltaic system, storage battery and charging station, sustainable e-mobility is in daily use at teamtechnik since 2013 and is part of the business model. Today, teamtechnik is leading in test benches for e-drive systems used in e-vehicles. Additionally, teamtechnik supplies assembly and test systems for batteries as well as PV stringers.

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Get inspired for the future.
www.teamtechnik.com

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Precise cell and ribbon handling with hold-down device system

Closed loop IR light soldering process

STRINGER TT2100
High flexibility and technical availability

Extensive practical experience with string soldering machines at teamtechnik led to the development of the STRINGER TT2100, a highly flexible production system with a compact footprint.

teamtechnik uses hold-down devices in its systems to separate the soldering process from the cell handling process. This guarantees 2,100 cycles/hour on a single-track – a technology that is already being used successfully in over 700 systems throughout the world. At the same time the devices ensure safe and reliable process steps and minimal breakage rates as well as precise positioning and alignment of cells and ribbons. The resulting strings offer impressive geometrical quality, linearity, length tolerance and cell gaps with excellent cell and ribbon positioning.

All teamtechnik STRINGER feature non-contact, controlled soldering technology using IR light. The closed loop controlled process technology compensates for variations in cell material to minimize breakage while ensuring consistent string quality. This gentle processing guarantees the lowest possible breakage rate.

STRINGER TT2100

Soldering technology
IR light

Cell technology, types
mono-poly-crystalline, front & back side contacted, bi-facial, all commercially available types

Cell alignment
optical alignment via camera & robot for busbar or edge positioning

Cell inspection
vision system (camera), detection of accuracy for cracks, broken edges and scratches: 0.5 x 0.5 mm, grid-completeness check

Suitable for lead-free (Pb) ribbons
yes

Number of interconnection ribbons
4 - 5 - 6 (as option)

Range of solar cells
156 x 156 mm - 156,75 x 156,75 mm (6") as standard; half cells, changeover parts required

Cell thickness processing capability
180 - 250 µm, 180 µm as standard

Busbar spacing
26 - 39 mm; 26, 31.2, 39 mm as standard, other dimensions require changeover parts

Cell spacing (varies with cell size)
2.0 - 8.0 mm as standard

Positioning accuracy, string on matrix
± 0.8 mm as standard

Max. length of strings
max. 2,000 mm, accuracy in length ± 1 mm

Throughput
max. 2,100 cycles/h, 1,938 cells/h for a 12 cell-string including cell fluxing, 62/67/72.5 MW p.a.

Module size
- max. 2,000 x 1,000 mm; min. 1,500 x 750 mm

Cycle time per module
- 56.5 sec. (6 strings with 10 cells each) 66.7 sec. (6 strings with 12 cells each)

Flux application method for cells
cells fluxed with adjustable, metered micro spray; top and bottom side

Breakage rate
on cell thicknesses down to 180 µm < 0.3 % (varies according to cell quality)

Ribbon sizes
width ≥ 0.6 mm, different sizes may require changeover parts

Technical availability
> 95 % (VDI 3423) Layup: > 98 % (VDI 3423)

Noise level
max. 69 dB(A) max. 75 dB(A)

Dimensions
5.80 m x 1.75 m x 2.30 m Layup: 9.1 m x 6.0 m x 3.0 m

Weight
3,500 kg Layup: 3,000 kg

Electrical power requirement
22 kVA Layup: 30 kVA

Average power consumption (p. hour)
13.3 kWh Layup: 9 kWh

Compressed air requirement
600 kPa (6 bar)

Compressed air consumption (at 1 bar)
0.4 Nm³/min Layup: 0.25 Nm³/min

Changeover time from e.g. 4 to 5 bb, 5 to 6 bb
approx. 2-3 hours per STRINGER

Operator interface (HMI)
color touch screen with German/English/Chinese and other language options

Unloading system (Layup)
flipping unit automatic with 6-axis robot

Warranty
12 months