



Ultrasonic Thin Wire Bonder M17

F & K DELVOTEC – the Thin Wire Bonder specialist – delivers the perfect solution for any bonding challenge in the automotive, opto-electronics, hybrid technology, COB, MCM and HF technology industries.

M17 benefits from an innovative platform strategy with a number of work areas, whereby the different wirebond technologies and transducer frequencies can be deployed on the same machine base.

Advantages

- Integrated thin wire and deep access applications in a single machine platform through fast system change-over
- Solutions for any customer requirements from prototyping to series manufacture
- Ensures repeatable bond quality through patented BPC for real-time adjustment of the bond parameters with varying material surfaces
- Ensures process transparency through seamless integration in industry 4.0/IOT procedures
- Shortens set-up times through intelligent pattern recognition with multiple structure and feature identification



NOT JUST MACHINES.
BUT BONDING SOLUTIONS.

F  **K**
DELVOTEC

MADE FOR YOU - YOUR ADVANTAGES AT A GLANCE

M17 S

- Smallest footprint on the market with maximum productivity
- Optimised scaling of your investment
- Sustainable technology through proven, exchangeable bond head principle
- Manual or automatic parts handling

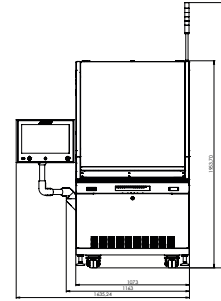
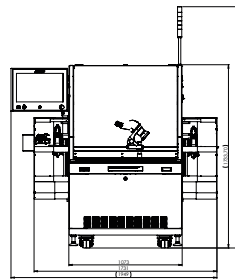
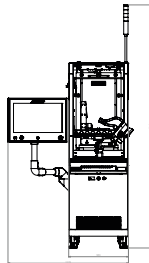
M17 D

- Smallest footprint on the market with double the output
- Perfect for high-volume production
- Best TCO through combination of thin wire and heavy wirebond technologies
- Pin or belt indexer

M17 L

- Largest work area on the market
- Flexible parts handling height, up to 500 mm
- Highest flexibility with the combination of manual and automatic parts handling:
 - Two manual work holders
 - Single track indexer with manual work holder
 - Dual track indexer with bond-off station

THIN WIRE MACHINE MODELS



M17	S	D	L
X-axis	254 mm (10")	254 mm (10")	652 mm (25")
Y-axis	152.4 mm (6")	152.4 mm (6")	350 mm (14")
Z-axis	40 mm (1.57"), optional 60 mm (2.36")	40 mm (1.57"), optional 60 mm (2.36")	100 mm (4")
Width	553 mm	1,073 mm	1,073 mm
Height with/without signal lamp	2,249 / 1,721 mm	2,283 / 1,734 mm	2,503 / 1,954 mm
Depth	1,135 mm	1,135 mm	1,237 mm
Weight	780 kg	1,165 kg	1,100 kg
Working height	SMEMA compliant 850-1,050 mm		
Power supply	120 V +/- 10 %, 230 V +/- 10 %, single phase, 50-60 Hz		
Power	0.5 kW		
Compressed air	4-8 bar		
Vacuum connection	< -0.8 bar		

THIN WIRE 30°, 45°, 60°, DEEP ACCESS 90° BOND HEAD

THIN WIRE BOND HEAD WEDGE-WEDGE 30°, 45° AND 60°

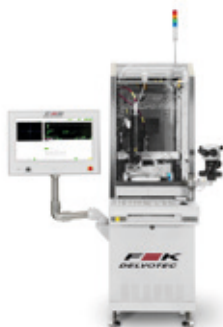
- **Wire feed angle**
30°, 45° or 60°, convertible
- **Wire diameter**
 - Standard 17.5-75 µm (0.7-3 mil)
 - Optional 12.5 µm and 100 µm
- **Wire material**
Al, Au, Cu, Pt, Pd
- **Wire spool**
 - 2" diameter
 - Wire end detection using CCD sensor
- **Cutting process**
Table tear or clamp tear, programmable
- **Bond tool**
1", all common tool manufacturers
- **Touchdown sensor**
 - Inductive sensor with linear working range
 - Anti-crash hardware sensor
- **Transducer frequencies**
 - 55 to 167 kHz
 - Largest range of transducer frequencies on the market
 - In-house F & K transducer manufacture for 25 years
- **Bond force**
 - 10 to 400 cN, programmable for each bond
 - Exact control of the bond force to 1 cN
- **Ultrasonic generator**
 - F & K, digital 30-250 kHz,
 - Resolution < 1 Hz
 - Power, max. 100 W, programmable
- **Bond head fast-change system**
Proven, fast-change system with intelligent bond head recognition, enables exchange of bond heads in less than 15 minutes
- **Speed**
 - Speed up to 7 wires/sec (application dependent)
 - Welding time: Al-wire on metallised wafer: 25 µm 20 ms, 50 µm 40 ms

DEEP ACCESS BOND HEAD WEDGE-WEDGE 90°

- **Wire feed angle**
90°
- **Wire diameter**
Standard 17.5-75 µm
- **Ribbon size**
Al, Au: 6 µm x 35 µm (0.25 mil x 1.4 mil)
up to 50 µm x 250 µm (2 mil x 10 mil)
- **Wire material**
Al, Au, Cu optional
- **Wire spool**
 - 2" diameter
 - Wire end detection using CCD sensor
- **Cutting process**
Table tear
- **Bond tool**
3/4" and 1", all common tool manufacturers
- **Touchdown sensor**
 - Inductive sensor with linear work area
 - Anti-crash hardware sensor
- **Transducer frequencies**
 - 65-145 kHz
- **Bond force**
 - 10 to 400 cN, programmable for each bond
 - Exact control of the bond force to 1 cN
- **Ultrasonic generator**
 - F & K, digital 30-250 kHz,
 - Resolution < 1 Hz
 - Power max. 100 W, programmable
- **Bond head fast-change system**
Proven, fast-change system with intelligent bond head recognition, enables exchange of bond heads in less than 15 minutes
- **Speed**
 - Speed up to 2.5 wires/sec (application dependent)
 - Welding time: Al-wire on metallised wafer: 25 µm 20 ms, 50 µm 40 ms

THIN WIRE MACHINE MODELS

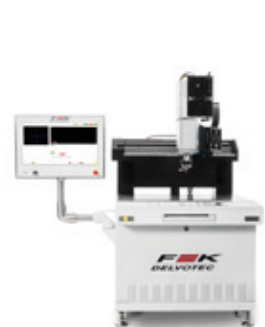
M17 S



M17 D



M17 L



MACHINE SPECIFICATION

MACHINE SPECIFICATION

X-Y-axes	Linear encoder resolution better than 0.1 µm
P-axis	+/- 200° AC servomotor with absolute encoder, resolution 0.0035°
Z-axis	Optionally 60 mm (2.36"), AC servomotor with absolute encoder, resolution 0.5 µm
Positional accuracy	< +/- 5 µm @ 3 sigma, incl. PRU/Wire/Tool/Application
Repeatability on the product	< +/- 3 µm @ 3 sigma, incl. PRU/Wire/Tool/Application
Monitor	21" flat screen
Microscope	Stereo zoom microscope, adjustable lighting
Connections	SMEMA, USB, RJ 45, Digital I/O
Operating system	Real-time, Unix®-based multi-tasking OS
Certification	SEMI S2, CE

NETWORK CONNECTIVITY

TCP/IP/FTP data exchange
SMEMA for in-line connections to other machines
SEMI communication standard SECS/GEM

PATTERN RECOGNITION

Pattern recognition unit	Cognex® 8000 Pat Max® System
Recognition time	Up to 2 ms per pattern recognition
Alignment correction	Flexsearch, single point recognition incl. phase angle, two point recognition, phase angle correction +/- 5 %
Camera	Moving CCD-camera, 640 x 480 pixel
Resolution	2-30 µm per pixel, adjustable using different optics
Image size	Standard 1.2 mm x 1 mm up to 20 mm x 18 mm

MANUAL WORKSTATIONS

4" x 4", 6" x 6", 8" x 6", 10" x 6", up to 650 mm x 350 mm (25" x 14")
Vacuum and / or mechanical clamping
Heated or unheated

AUTOMATIC PARTS HANDLING

Pin indexer	Belt indexer
Leadframes, e. g. QFN, D-PAK, PDFN and other packages	Flat substrates, e. g. ceramic substrates, PCB or workpiece carriers
Leadframe length 152-324 mm, optionally < 152 mm	Variable product length, up to 650 mm without index steps
Leadframe width 18-105 mm	Product width up to 760 mm
Downset 3 mm	Parts handling height up to 15 mm
Repeatability +/- 15 µm @ 3 sigma, linear motor accuracy 3 µm	Can be combined with manual work station, optionally heated with 2 pre-heat stations

MAGAZINE LIFT SYSTEM

F & K leadframe lifts, dual axes	Magazine width 24-115 mm	Height 94-200 mm	Length 154-244 mm, optionally 234-324 mm
F & K Substrate / boat lifts, single axis	Magazine width max. 240 mm	Height max. 300 mm	Length max. 240 mm
	Substrate width max. 160 mm	Substrate length < 150 mm or > 300 mm, Substrate widths > 160 mm are treated individually as special requirements	

NOT JUST MACHINES. BUT BONDING SOLUTIONS.

QUALITY TOOLS

BOND PROCESS CONTROL (BPC): What exactly are the advantages of the new BPC?

- Closed-loop-system for continuous monitoring and real-time control of the bonding parameters time, ultrasonic power and bond force
- Adjustment of the ultrasonic power to surface variations in the current process



LEVEL
03

Guarantee Quality by Process Perfection

A sensor tracks the wire deformation continuously and the ultrasonic energy applied is controlled in real time according to previously defined reference values.

LEVEL
02

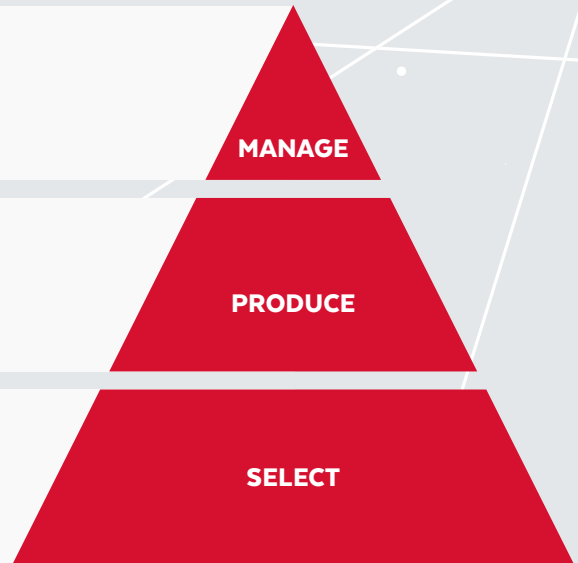
Produce Quality by Process Monitoring

The process runs reliably within defined tolerances. By means of a data base statistical evaluations from the analysis of up to 636 process parameters per wire can be made. Cpk values are determined continuously.

LEVEL
01

Select Quality by Defect Detection

The basic principle of bond process control: faulty components will be identified and can be rejected. .



Tool inspection

- Graphical display of the expected positioning of wedge and wire clamp, using the pattern recognition unit
- Minimum set-up time with maximum traceability when changing the wedge

Traceability

- Link up to standard F & K or customer specific MES
- Link to an existing host
- For manual and automatic parts handling

Load cell

- Load cell and housing for fully automatic calibration of the bond weight

DRAG and BOND panorama pattern recognition

- Innovative self-scanning-system for maximum overview
- Intuitive user interface for generation of bond programmes

Barcode & DMC-Reader

- Fully automatic part recognition, recipe and process data assignment
- Available as flexible hand-held DMC-reader or fixed-position integrated unit

Transducer

- Optimised, tuned system comprising transducer and ultrasonic generator
- Continuous in-house development for 25 years ensures constant and outstanding quality
- Measurement of every transducer using extensive test procedures properly documented by the transducer laboratory

BOND ACADEMY: your advantages?

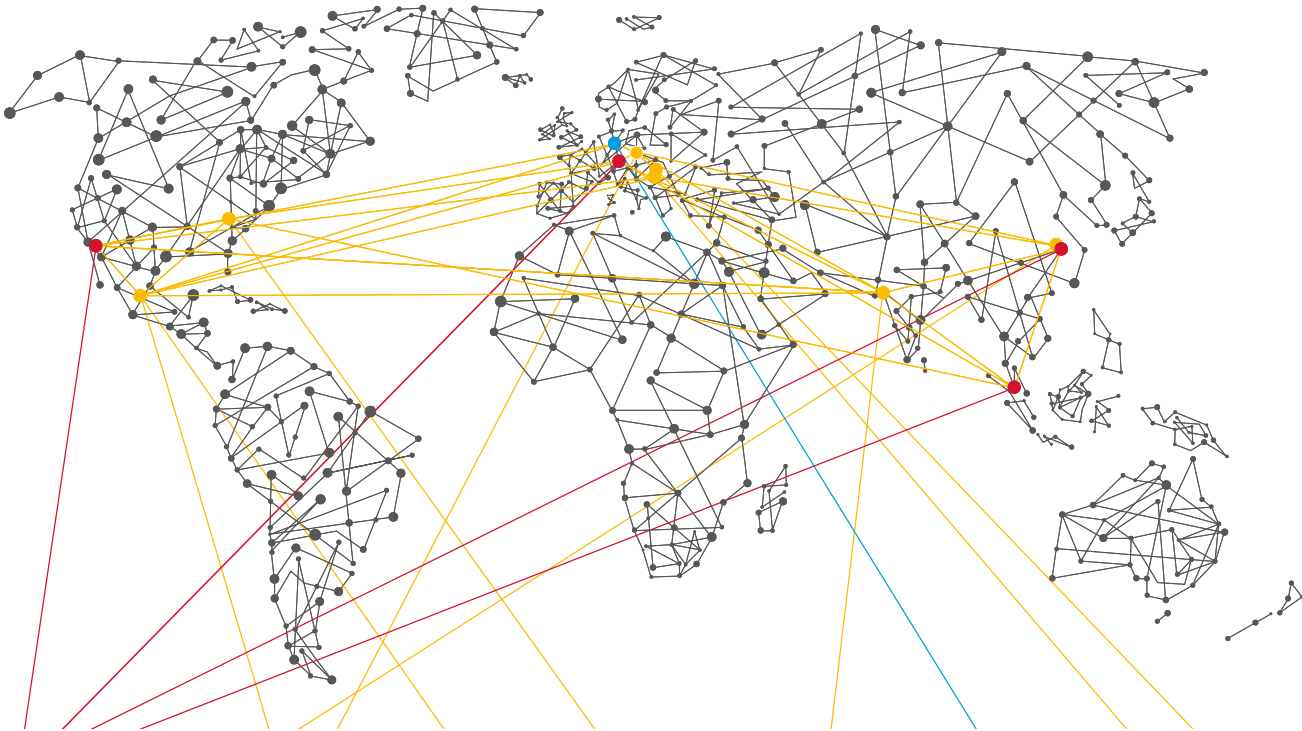
Our support for implementing your requirements and optimising your processes:

- Competent advice
- Determining the correct transducer frequency for the application
- Rapid prototyping
- Validation of product design
- Sample bond tests and pilot series manufacture
- Training your service technicians
- Ramp-up-support



POWERFUL SYNERGIES AS „MEMBER OF STRAMA GROUP“

Together with our parent company, Strama-MPS, we integrate our wirebonders into complete assembly lines with other joining, assembling and testing stations. Our customers profit from the combination of our bonding and automotive expertise, „One-stop-shopping“, and the interface free quality of the complete package.



GERMANY,
Ottobrunn
USA, Foothill Ranch
CHINA, Shanghai
SINGAPORE



GERMANY,
Straubing
CHINA, Taicang
MEXICO, Puebla



MEXICO, Puebla



USA, Greer



INDIA, Nashik



GERMANY,
Kassel



CROATIA,
Cerna
BOSNIA, Orašje

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