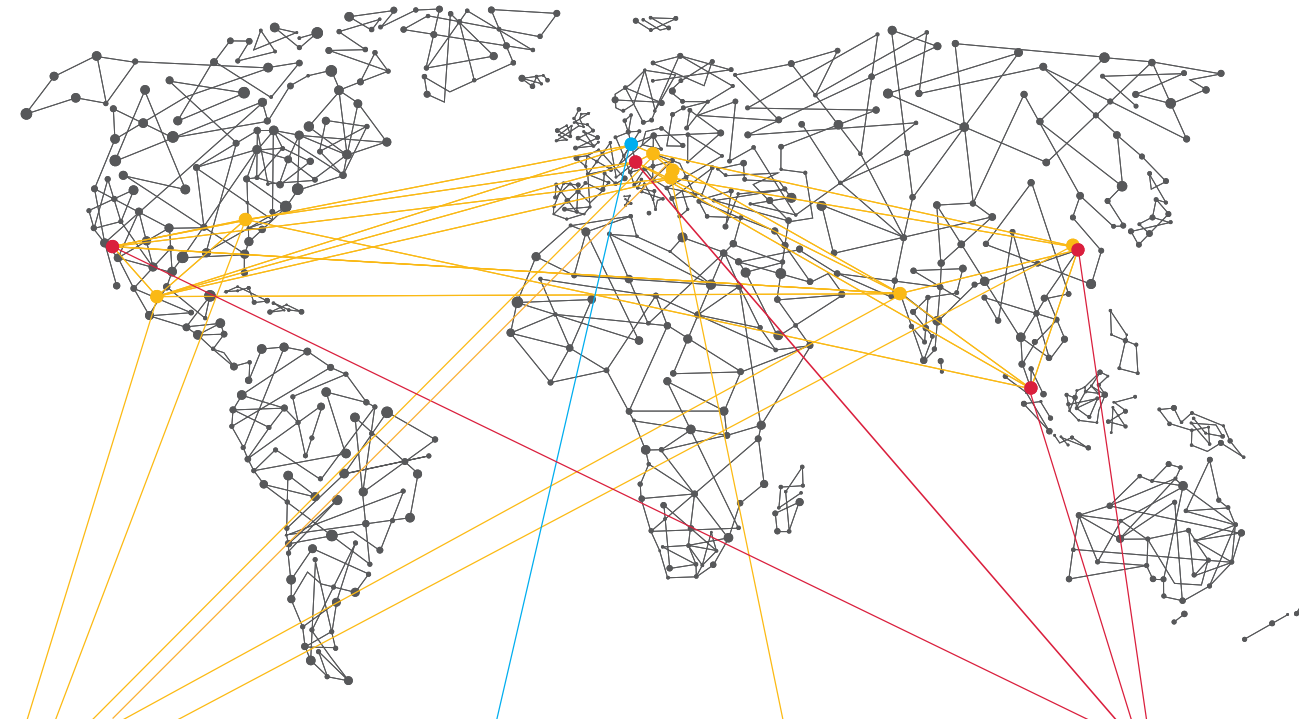


## HEAVY WIRE AND HEAVY RIBBON BOND HEAD

- Wire diameter**
  - Standard 100-600 µm (4-24 mil)
  - Ribbon up to 2000 µm x 300 µm (80 mil x 12 mil);
  - optionally laserbonding for conductors of larger cross sections
- Wire material**
  - all typical wire materials
- Wire spool**
  - Spool diameters 3", 3.5", 4" automatic wire feed
  - Wire end recognition using CCD sensor
  - 90° wire feed angle
- Cutting process**
  - Active, cut depth front and back cut option available
- Bond tool**
  - F & K standard 2", optionally 2.8", 4"
  - Development of customer specific wedges by F & K possible
- Transducer frequencies**
  - 40, 60, 85, 90, 120 kHz standard
  - Development of customer specific transducers by the F & K laboratory possible
- Ultrasonic generator**
  - F & K, digital 30-250 kHz
  - UUG 300: allround talent for thin and heavy wire applications
  - UUG 310: specialist for ball-wedge applications
  - UUG 350: specialist for Cu wire and ribbon resolution < 1 Hz
- Bond force**
  - Up to 5000 cN
- In-head pulltest**
  - NEW High-speed in-head pulltester, programmable for each bond, up to 40 % speed improvement compared to conventional in-head pulltests
- Consumables**
  - Patented F & K clip-on system for optimum wire feed and control
  - NEW Cutter with hardened surface for extra-long life
- Speed**
  - 2.5 wires per second, application dependent
- Bond head fast-change system**
  - Proven, fast-change system with intelligent bond head recognition, enables exchange of bond heads in less than 15 minutes

## 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.



**STRAMAMPS**

GERMANY, Straubing  
HUNGARY, Budapest  
CHINA, Taicang  
USA, Duncan  
MEXICO, Puebla

INDIA, Nashik **STRAMASUMMIT**

**AE**  
automotive engineering

**ULTINORM**

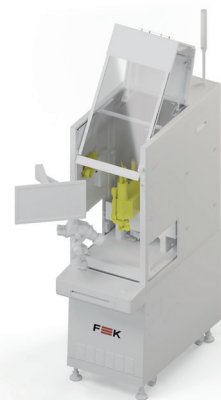
CROATIA, Cerna  
Gradište  
GERMANY, Osterhofen

**F&K DELVOTEC**

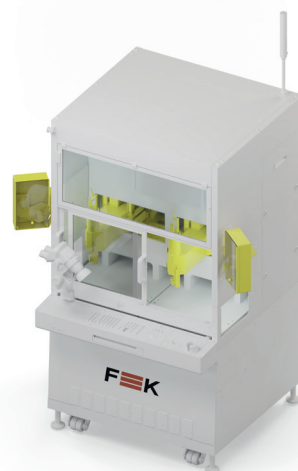
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SINGAPORE

## HEAVY WIRE MACHINE MODELS

**M17 S**



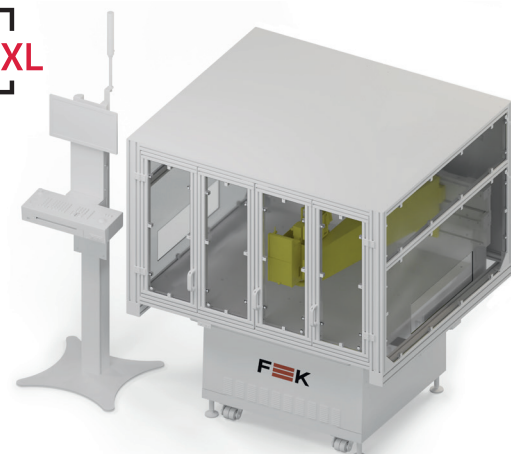
**M17 D**



**M17 L**



**M17 XL**



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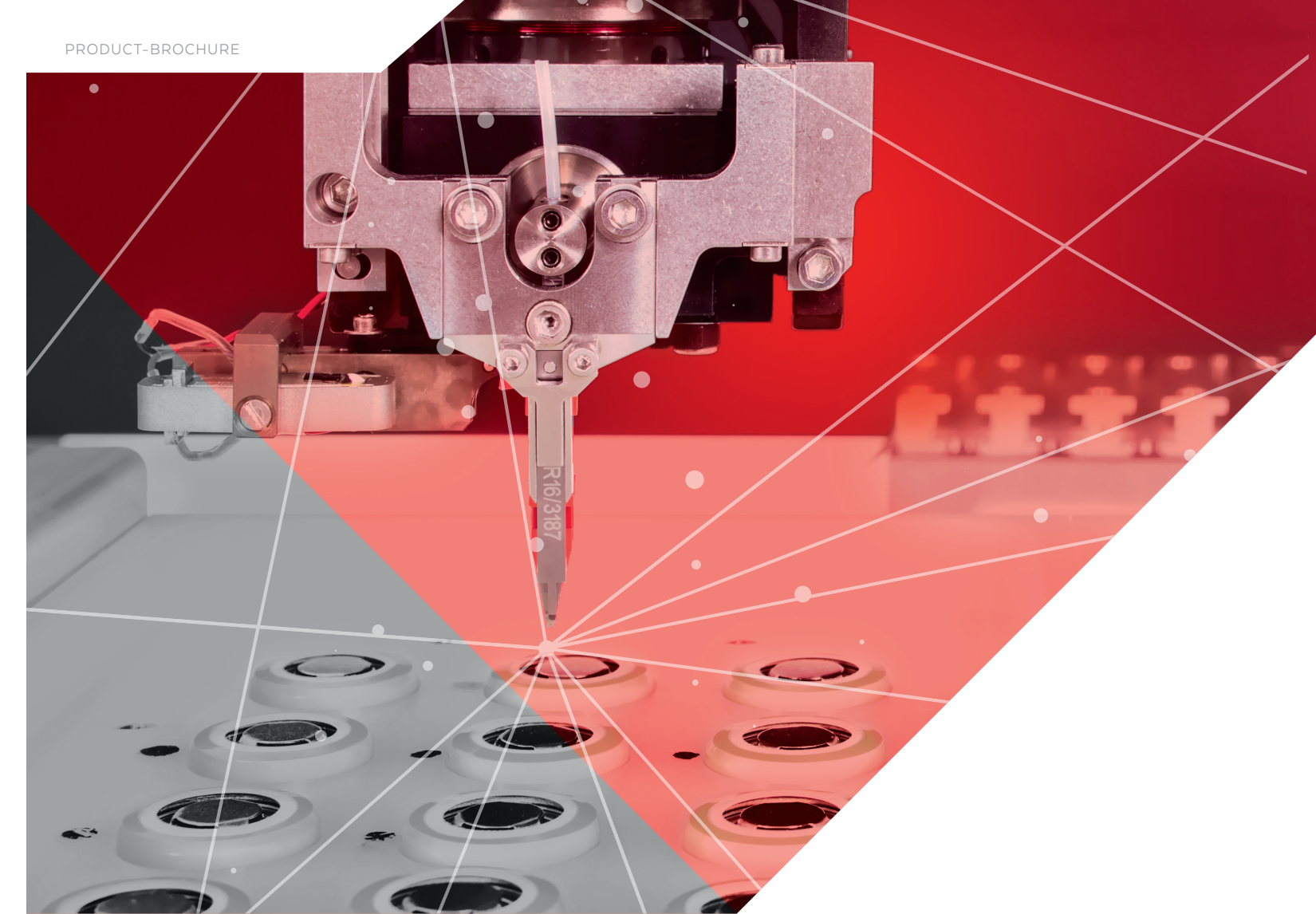
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NEXT GENERATION OF SOLUTION.  
MADE IN GERMANY. MADE FOR YOU.

**F&K DELVOTEC**  
MEMBER OF STRAMA GROUP

PRODUCT-BROCHURE



## Ultrasonic Heavy Wire Bonder M17

F & K DELVOTEC - The Heavy Wire Bonder specialist - delivers the perfect solution for any bonding challenge in the IGBT, smart power module and hybrid assemblies industries.

The innovative platform strategy, whereby the differing wirebond technologies and transducer frequencies can be deployed on the same machine base, is continued on the latest F & K Bonder generation M17. The number of different sized work areas as well as interchangeable bond heads and transducer variants ensure the highest flexibility in the packaging technology.

### Advantages

- Integrated heavy wire and heavy ribbon in one machine platform using fast system change-over
- Ensures repeatable bond quality through patented BPC for automated real-time tuning of the bond parameters with varying material surfaces
- Ensures process transparency through seamless integration in industry 4.0/AI procedures
- Offers process stability through a large choice of ultrasonic frequencies for optimum material matching
- Integrated process technology and automation solutions from a

**ULTRASONIC WIREBONDER**

NOT JUST MACHINES.  
BUT BONDING SOLUTIONS.

**F&K DELVOTEC**  
MEMBER OF STRAMA GROUP

## 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 fine wire and heavy wirebond technologies
- Pin or belt indexer with in-line pulltester

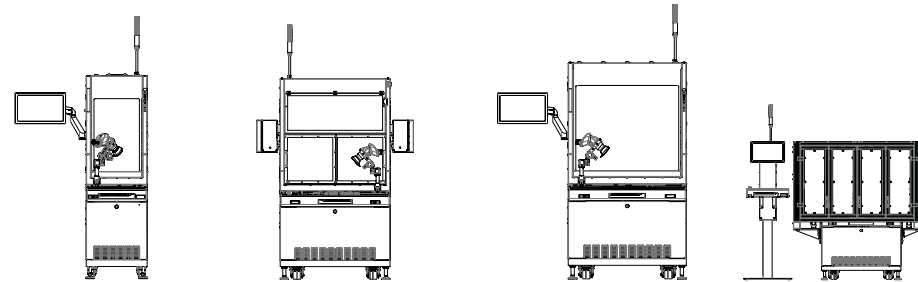
### M17 L

- 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

### M17 XL

- Largest work area on the market
- No interference from mainframe components as with gantries
- Flexible parts handling height, up to 500 mm
- Perfect for BMS and battery connections

## HEAVY WIRE MACHINE MODELS



Working area	M17S	M17D	M17L	M17XL
X	254 mm (10")	254 mm (10")	652 mm (25")	1,133 mm (44.61")
Y	152.4 mm (6")	152.4 mm (6")	350 mm (14")	702 mm (27.64")
Z	40 mm (1.57"), optional 60 mm (2.36")	40 mm (1.57"), optional 60 mm (2.36")	100 mm (4")	40 mm (1.57")
<b>Machine size</b>				
Width	553 mm	1073 mm	1073 mm	1545 mm
Height with/without signal lamp	2249 / 1721 mm	2283 / 1734 mm	2503 / 1954 mm	1850 mm / -
Depth	1135 mm	1135 mm	1237 mm	1606 mm
Weight	780 kg	1165 kg	1100 kg	1400 kg
Working height	SMEMA compliant 850-1050 mm			
Power supply	120 V +/- 10 %, 230 V +/- 10 %, single phase, 50-60 Hz			
Power	0.5 kW			

## 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	CE

### NETWORK CONNECTIVITY

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

### PATTERN RECOGNITION

Pattern recognition unit	Cognex® Pat Max® System
Alignment correction	Flexsearch, single point recognition incl. phase angle, two point recognition, phase angle correction +/- 5 %
Camera	Moving CMOS-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 45" x 30"
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 1133 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

## NOT JUST MACHINES. BUT BONDING SOLUTIONS.

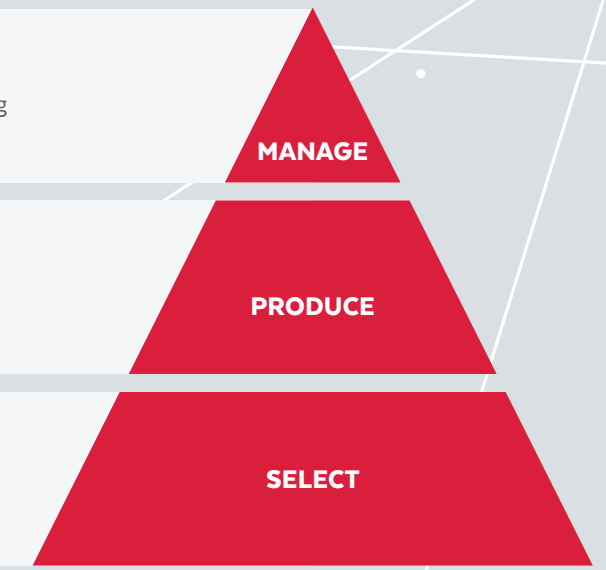
### QUALITY TOOLS

#### 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



- 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
- 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, cutter and wire guide using the pattern recognition unit
- Minimum set-up time with maximum traceability when changing wedge, cutter or wire guide

#### 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

