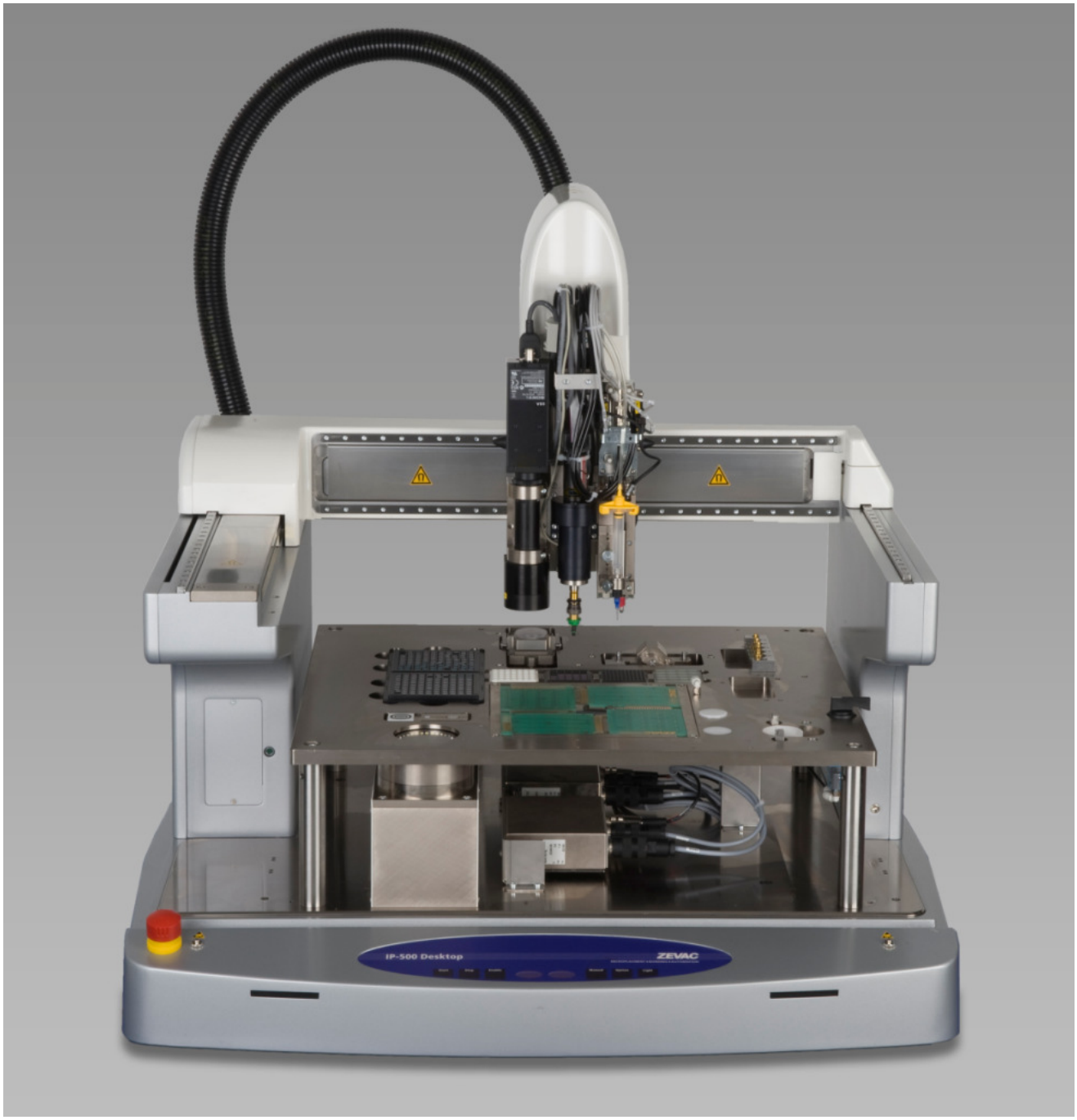
IP-500 TABLETOP

MULTIFUNCTION POSITIONING- AND ASSEMBLY PLATFORM

APPLICATION: MICRO-ASSEMBLY

ZEVAC-LINE: IP

The complete IP product line documentation is composed of the following data sheets:



GENERAL

THE IP-500 IS AN EXTREMELY FLEXIBLE MULTIFUNCTION POSITIONING AND ASSEMBLY PLATFORM.

DETECTION, PICK-UP, ALIGNMENT AND PLACING OF COMPONENTS AS WELL AS DISPENSING OR STAMPING LIQUIDS IS JUST A PART OF THE POSSIBLE RANGE OF PROCESSES.
HANDLING AND PROCESSING OF COMPONENTS IN THE FIELD OF MICROMECHANICS, MICRO-OPTICS OR MICROELECTRONICS WITH SMALLEST DIMENSIONS IS NOT A MAJOR CHALLENGE OF THE SYSTEM.

THE MAIN RANGE OF APPLICATIONS IS: PROTOTYPE PRODUCTION, SMALL TO MEDIUM VOLUME PRODUCTION WITH FOCUS ON PRECISION AND FLEXIBILITY.
THE IP-500 TABLETOP IS BASED ON A CARTESIAN POSITION SYSTEM WHICH CAN BE EQUIPPED WITH A WIDE RANGE OF STANDARD AND APPLICATION SPECIFIC OPTIONS TO OPTIMIZE YOUR APPLICATION PROCESS.

RANGES OF APPLICATION

A simple and quick configuration of the in-line capable IP-500 allows the following process steps:

- pick-up, align and place with accurate force control
- joining and bonding
- dispensing, stamping, dipping
- screwing
- measuring and inspecting
- controlling and regulating
- curing and soldering
- cognition and detection of absolute or relative positions and orientations

and lots more in technologies such as

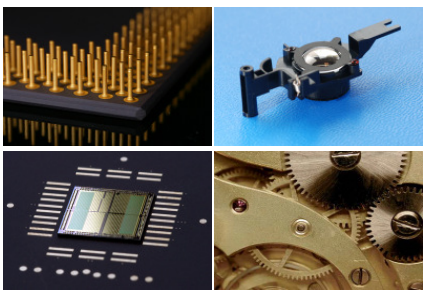
- electronics / microelectronics
- sensors
- semiconductors
- MEMS / MOEMS
- biotechnology
- optics / optronics
- photonics
- micromechanics
- mechatronics

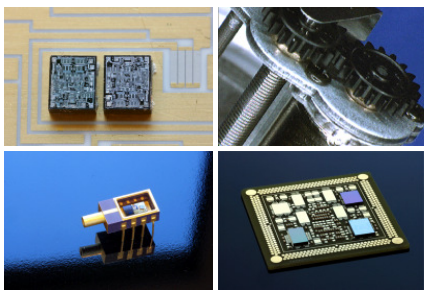
COMPONENTS

With the innovative technology of the IP-500 Tabletop components such as

- Gearwheels
- Injection moulding micro parts
- Apertures
- Lenses
- Laser diodes / VCSEL
- Flip chip
- µBGA / CSP

can be easily handled.



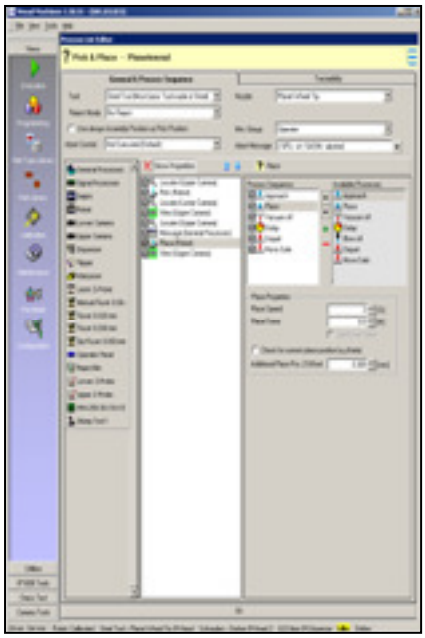


MECHANICAL STRUCTURE

The mechanical base structure is in-line capable, modular and can be equipped with application specific options and peripherals.
For flexible and precise automation processes with repeatable results, the structure consists of

- Base frame from aluminium casting
- Base plate and application plate made from nickel-plated aluminium
- Cartesian X/Y robot system with maintenance free linear motors and linear encoders. The Robot head can be supplemented with Z- and theta axis, pick&place tools, dispensers, and other modules.
- Closed loop controls for all machine components
- Aesthetic appearance

SOFTWARE AND PROGRAMMING



All parameters, functions and configuration data of the IP-500 are controlled via the user-friendly software VisualMachines™. It's a object-oriented, open and modular in-house software solution.
The single process steps are presented as small boxes which can be easily inserted in the process flow by „drag-and-drop". That way the process sequence can be comfortably developed and optimized without any knowledge of a programming language. The user gets to the detailed information and parameters by clicking on the desired process box.
Furthermore, VisualMachines™ supports working with part type libraries with that predefined process lists can be stored and linked with the component in the software database. In this manner, components or part types can be accessed in variable applications without any limitation.
VisualMachines™ includes true geometric object location vision software, which is not a variance of grey-scale correlation techniques. Freeform objects and features are handled. No frame grabber board is required.
As an option, VisualMachines™ provides interfaces to import CAD data and to export traceability data in order to support any quality management system.

IP-500 TABLETOP

Base Platform

1 Robot head with camera movable in Z
2 Robust machine base, aluminium casting structure
3 Customer specific application plate
4 Linear drives in X and Y
5 Integrated control pane
6 Emergency stop push button

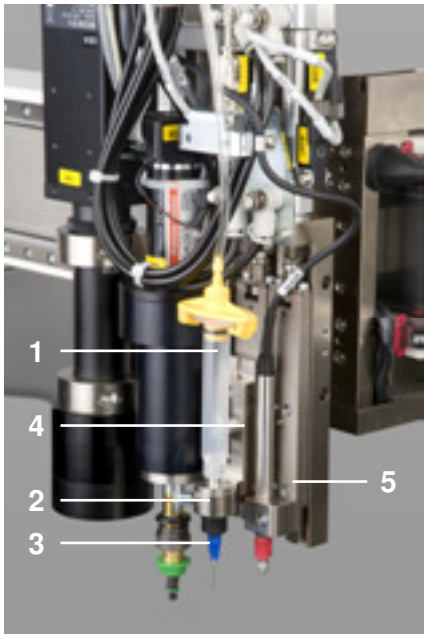
Modules

7 Z / Theta-Axes with pick&place head
8 Down-looking camera
9 Up-looking camera
10 Double-Z-slide
with dispense unit and touch probe
11 Tool changer
12 Doctor blade station

OPTIONS

LIQUIDS DISPENSER

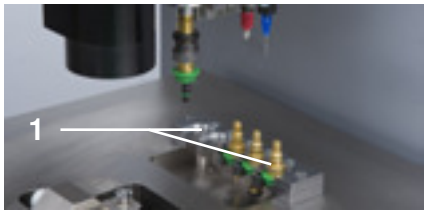
For dispensing of liquid media with various viscosity. Time/pressure, auger or piezo-electric systems are available, depending on the viscosity and the application requirements.
All dispense parameters are accessible and controllable via the machine control software. Thus, the dispense process can be fully implemented in the application's main process list.



1 Cartridge with medium to dispense
2 Cartridge holder (time/pressure)
3 Dispense needle
4 Mechanical Z-adjustment

TOOL CHANGER

For take-up of standard JUKI, Siemens or other vacuum tips, die collets, grippers. The standard tool changer has a capacity for six tools.



1 Tool pockets

COMPONENT-FLIPPER

Is primarily used for die-bonding applications. The component edge dimension can vary from 0.2 mm up to 25.4 mm.

1 Interposer
2 Flipper-lever
3 Lift and rotate mechanism
4 Standard or application specific vacuum tip

LINEAR DOCTOR BLADE STATION

The automatic linear doctor blade station is mainly used for stamping adhesives. The encapsulated liquids reservoir tops up the cavity plate with every slide movement.

1 Reservoir
2 Cavity plate
3 Slide mechanism

Tape feeder, die feeder and vibrating units as well as other application specific options on request.

TECHNICAL DATA

Cell	Dimensions	width		823 mm	
		depth		821 mm	
		height (standard, without stacklight)		702 mm	
		weight (standard)		ca. 100 kg	
	Supply	Electrical power		1 x 240 VAC 50 Hz 10 A	
				1 x 129 VAC 60 Hz 10 A	
		Compressed air		4 - 6 bar, 58 - 87 psi	
Robot		X (linear drive)	Y (linear drive)	Z (servo drive)	φ_Z (DC drive)
	Traverse path	400 mm	400 mm	66 mm	±360 °
	Axis acceleration (1)	0.75 ms^{-2}	0.75 ms^{-2}	1.5 ms^{-2}	28 $rots^{-2}$
	Axis speed (1)	0.15 ms^{-1}	0.15 ms^{-1}	0.15 ms^{-1}	2.3 $rots^{-1}$
	Axis resolution	0.001 mm	0.001 mm	0.001 mm	0.003 °
	Repeatability	± 0.004 mm	± 0.004 mm	± 0.004 mm	± 0.012 °
	Process accuracy (3)	± 0.009 mm	± 0.009 mm	± 0.020 mm	± 0.020 °
Options	Force sensor in Z	Range		0.1 – 50 N	
		Resolution		0.01 N	
	Pneumatic	Vacuum, vacuum sensor, process air, blow-off air			
Safety	Certificates	CE-certificated			
		UL-compatible			

(1) The axes speed is limed due to safety regulations, with the optional operator safety cover the axes can be optimised in speed.

(2) Values are based on the glass-flip-chip measurement method. A local accuracy of 5 µm can be obtained, depending of the machine configuration.

ZEVAC-Agent

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