

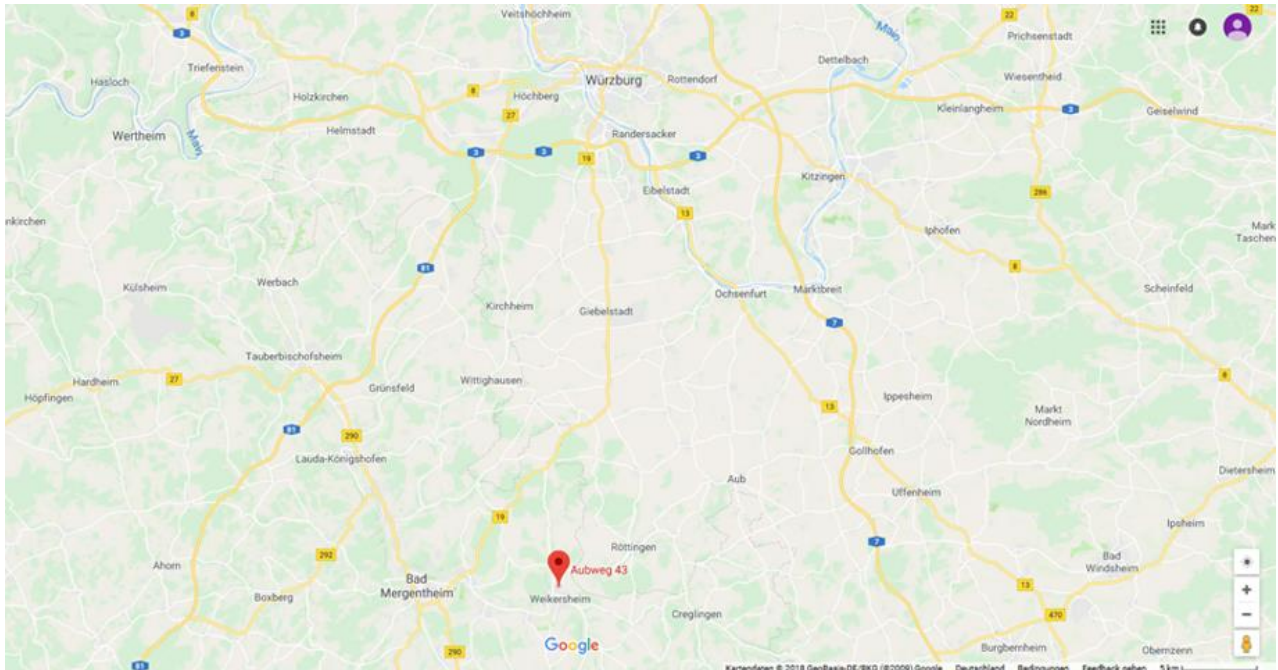
PRODUCT OVERVIEW



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Company Location



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Traffic contacts:

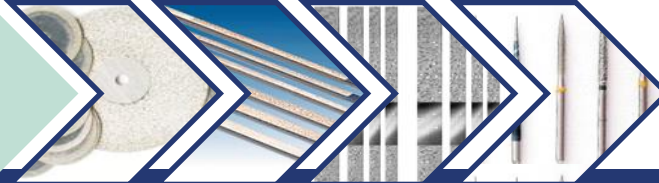
Motorway A3 from Frankfurt / Main → Exit Würzburg-Heidingsfeld

- Airport Frankfurt/Main
 - Intercity Frankfurt/Main (Airport) - Würzburg (Central Station)
- Airport Stuttgart
 - Regional train Stuttgart (Central Station) – Lauda
- Airport Nuremberg
 - Intercity Nuremberg (Central Station) – Würzburg (Central Station)
- Airport Munich
 - Intercity (Central Station) – Würzburg (Central Station)

Please ask for a detailed route description if required.
 We will be pleased to meet you at Würzburg Central Station or Lauda upon being notified of your arrival time.

Our Fields of Application

Dental Industry



Flexible Discs • Dental Burrs • Finishing Strips

Semiconductor Industry



ID Saw Blades • Diamond Band Saws • CMP Conditioner Pads

Automotive Industry



Diamond and CBN Profile Wheels • Diamond Dressing Rollers • Grinding Wheels for the Gear Industry

Glass and Plastics Industry



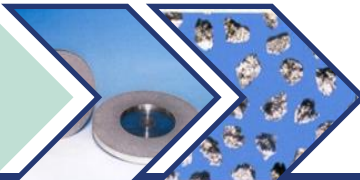
Male and Female Grinding Cones • Edge grinding Wheels • Band Saws

Stone Industry



Profile wheels • Cut-off Wheels • Milling Cutters • Wire-Saw Beads • Band Saws

Abrasives and Gem Stone Industry



Gem Stone Grinding Plates • Diamond and CBN Coating

Electro-Plated Tools of different Types for various Applications



Grinding Pins • Needle Files, Machine Files • Cut-off Wheels • Hollow Drills • Honing Tools • Cup Wheels • Abrasive Belts • Band Saws

**Pre-Treatment Plants VBA for
Steel, Brass, Copper and
Bronze Materials**

- VBA 4-453/013
- VBA 4-353/453/D23
- VBA 5-353/453/D23
- VBA 5-355/455/D45
- VBA 6-353/453/D23
- VBA 6-355/455/D45

Pre-Treatment Plant VBA 4-453/013

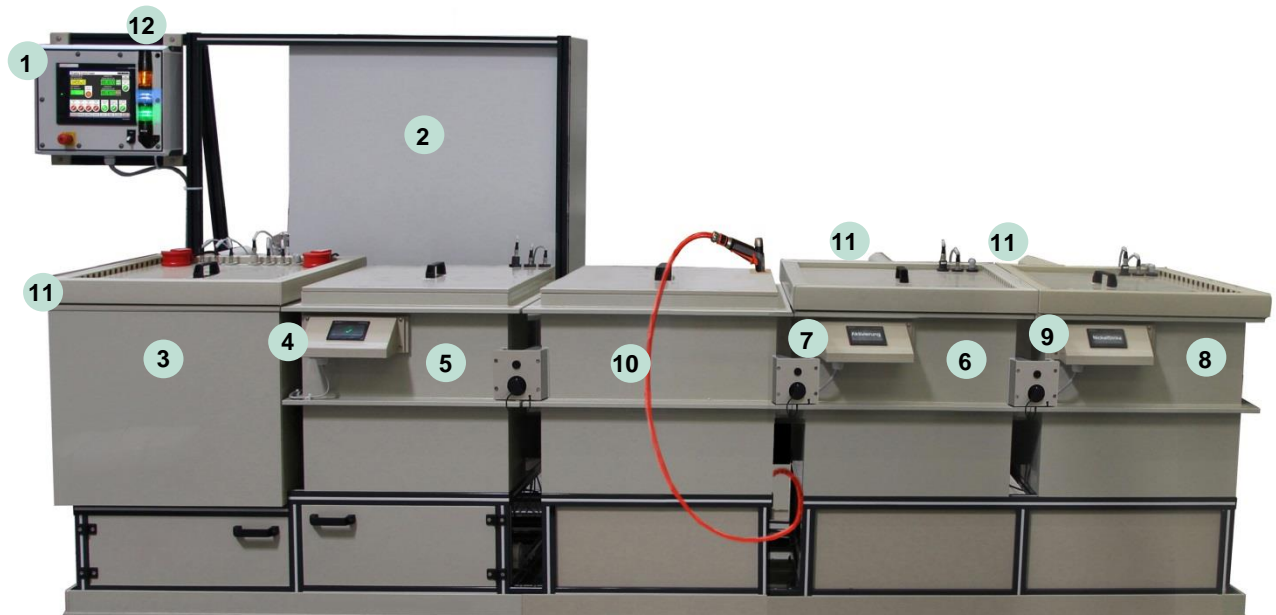
The pre-treatment plant is for cleaning and preparing the steel blanks of grinding tools for the subsequent diamond or CBN electro-plating process.

Pre-treatment comprises a warm-process bath (degreasing), 3 cold-process baths (decapation, activation and Nickelstrike) as well as a spray stream wash station.

The parts – already fitted into the corresponding contact and holding fixtures – are transported from one bath to the next in the sequence of the single process steps. Between each process step the parts are rinsed with the provided hand spray nozzle in the spray stream wash station located between the decapation and the activation baths.

Programming and pre-set of the process and bath parameters is done by means of the Touch screen operator terminal. To control the individual process steps each process bath is fitted with a corresponding control panel.

View of system



- | | |
|--|--|
| <p>1. Process-bath control PBS-845/001 including Touch screen operator terminal for process control and programming:</p> <ul style="list-style-type: none"> - Temperature - Current - Voltage - Process time - Heating cycles <p>2. Electronics cabinet (Service access on rear side)</p> | <p>3. Warm-process bath (degreasing – anodic/cathodic; polarity reversible)</p> <p>4. Process control panel for degreasing</p> <p>5. Cold-process bath (Decapation)</p> <p>6. Cold-process bath (Activation)</p> <p>7. Process control panel for activation</p> <p>8. Cold-process bath (Nickelstrike)</p> <p>9. Process control panel for Nickelstrike</p> <p>10. Spray stream wash station with hand nozzle</p> <p>11. Rim exhaustion (3 pcs)</p> <p>12. Signal lamp</p> |
|--|--|

Technical data:

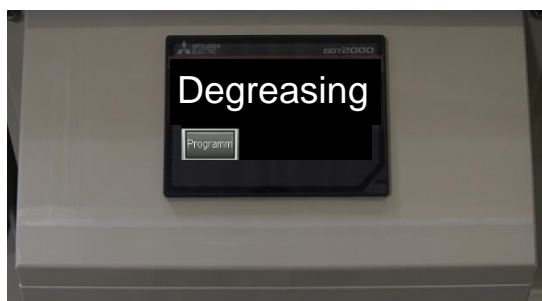
- Bath volume: Process baths: appr. 180 l each; Spray stream wash station appr. 180 l
- Bath temperature: max. 80°C (degreasing bath); room temperature (all other baths)
- System dimensions (L x W x H): appr. 4107 x 790 x 1000 mm
- Power ratings. 10 KVA, 3 x 400 V, 3 x 16 A, 50 Hz
- Warm-process bath, of PP, heat insulated,
- Cold-process baths and spray stream wash station of PP
- Pipes of PP
- 1 centrifugal pump to circulate the degreasing bath
- Rim exhaustion for process baths (connection to fan, DN 160 mm)

Optional:

- Level stabilisation of process baths
- Water de-salting cartridges for autonomous deionized water supply



Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)



Control panel for process control
(Example: degreasing)

Activation

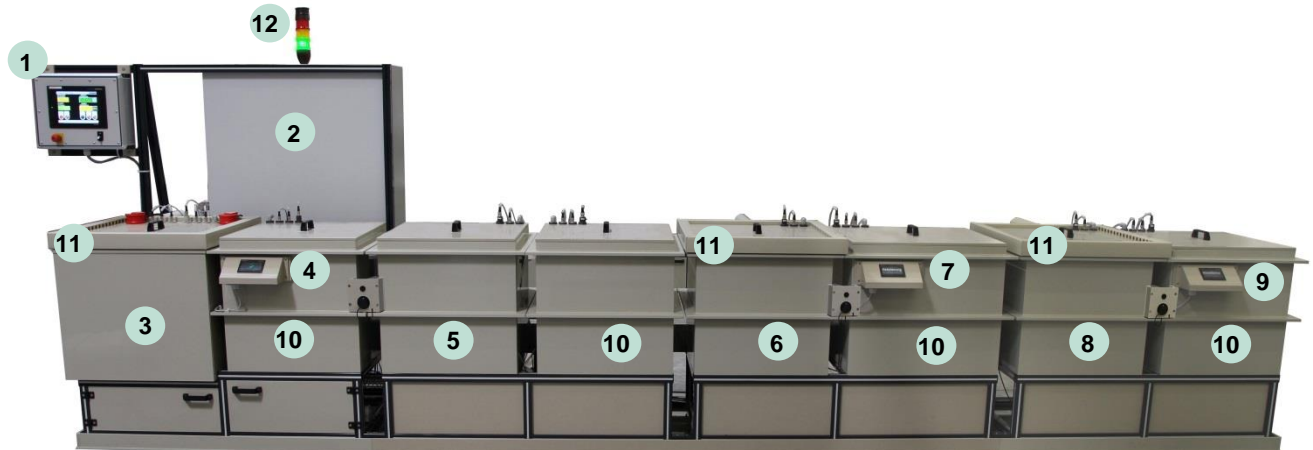
Pre-Treatment Plant VBA 4-353/453/D23

The pre-treatment plant serves to clean and prepare the steel blanks of grinding tools for the subsequent diamond or CBN electro-plating process.

Pre-treatment comprises a warm-process bath (degreasing), 3 cold-process baths (decapitation, activation and Nickelstrike) as well as the intermediary rinsing baths. The parts – already fitted into the corresponding contact and holding fixtures – are transported from one bath to the next in the sequence of the single process steps.

Programming and pre-set of the process and bath parameters is done by means of the Touch screen operator terminal. To control the individual process steps each process bath is fitted with a corresponding control panel.

Front view



- | | |
|--|--|
| <p>1. Process-bath control PBS-845/001 including Touch screen operator terminal for process control and programming:</p> <ul style="list-style-type: none"> - Temperature - Current - Voltage - Process time - Heating cycles <p>2. Electronics cabinet (Service access on rear side)</p> | <p>3. Warm-process bath (degreasing – anodic/cathodic; polarity reversible)</p> <p>4. Process control panel for degreasing</p> <p>5. Cold-process bath (Decapitation)</p> <p>6. Cold-process bath (Activation)</p> <p>7. Process control panel for activation</p> <p>8. Cold-process bath (Nickelstrike)</p> <p>9. Process control panel for Nickelstrike</p> <p>10. Rinsing bath (4 pcs)</p> <p>11. Rim exhaustion (3 pcs)</p> <p>12. Signal lamp</p> |
|--|--|

Rear view

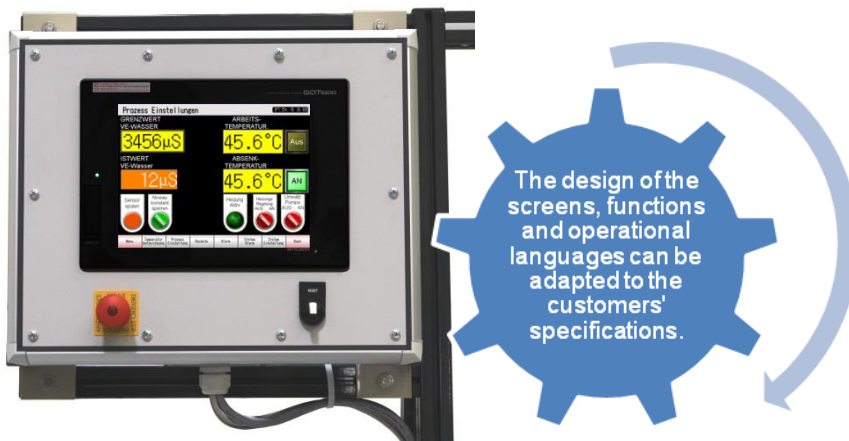


Technical data:

- Bath volume: Process baths: appr. 180 l each; rinsing baths: appr. 180 l each
- Bath temperature: max. 60°C (degreasing bath); room temperature (all other baths)
- Dimensions (L x W x H): appr. 6100 x 708 x 1000 mm
- Power ratings: appr. 10 KVA, 3 x 400 V, 3 x 16 A, 50 Hz
- Warm-process bath, of PP, heat insulated,
- Cold-process and rinsing baths of PP
- Pipes of PP
- 1 centrifugal pump to circulate the degreasing bath
- Rim exhaustion for process baths (connection to fan, DN 76 mm)

Optional:

- Level stabilisation of process baths
- Flow-standing sink technology in the rinsing baths
- Expansion possible to a semi-automatic pre-treatment plant VBA 4-355/455/D45



Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)



Control panel for process control (Example: degreasing)

Activation

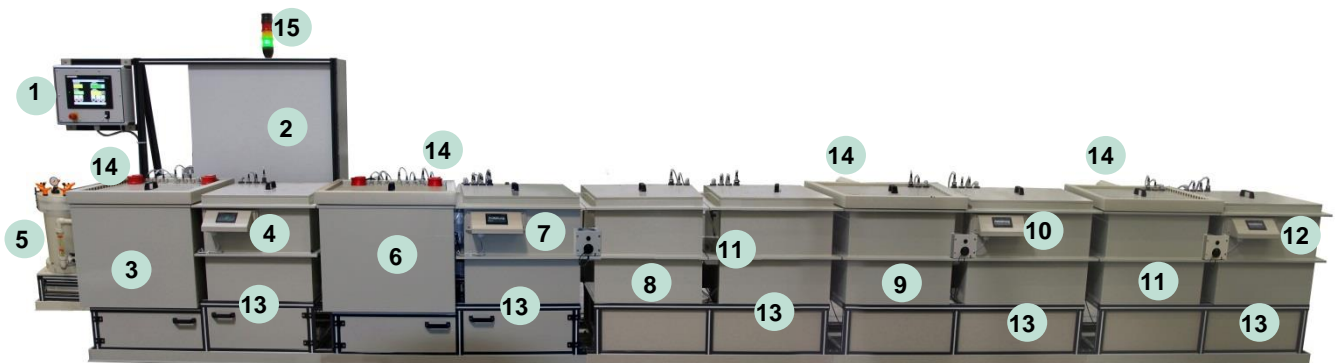
Pre-Treatment Plant VBA 5-353/453/D23

The pre-treatment plant serves to clean and prepare the steel blanks of grinding tools for the subsequent diamond or CBN electro-plating process.

Pre-treatment comprises two warm-process baths (preliminary degreasing and electrolytic degreasing), 3 cold-process baths (decapation, activation and Nickelstrike) as well as the intermediary rinsing baths, as well as an oil separator for the preliminary degreasing. The parts – already fitted into the corresponding contact and holding fixtures – are transported from one bath to the next in the sequence of the single process steps.

Programming and pre-set of the process and bath parameters is done by means of the Touch screen operator terminal. To control the individual process steps each process bath is fitted with a corresponding control panel.

Front view



- | | |
|--|---|
| 1. Process-bath control PBS-845/001 including Touch screen operator terminal for process control and programming:
- Temperature
- Current
- Voltage
- Process time
- Heating cycles | 5. Oil separator |
| 2. Electronics cabinet (Service access on rear side) | 6. Warm-process bath (electrolytic degreasing – anodic/cathodic; polarity reversible) |
| 3. Warm-process bath (preliminary degreasing) | 7. Process control panel for electrolytic degreasing |
| 4. Process control panel for preliminary degreasing | 8. Cold-process bath (Decapation) |
| | 9. Cold-process bath (Activation) |
| | 10. Process control panel for activation |
| | 11. Cold-process bath (Nickelstrike) |
| | 12. Process control panel for Nickelstrike |
| | 13. Standing sink (5 pcs) |
| | 14. Rim exhaustion (4 pcs) |
| | 15. Signal lamp |

Rear view

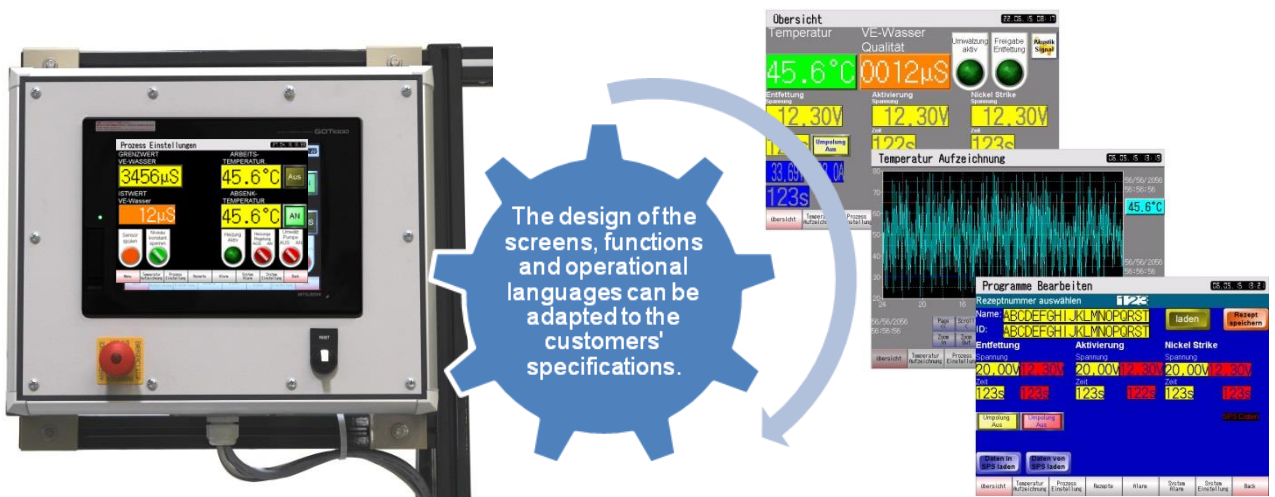


Technical data:

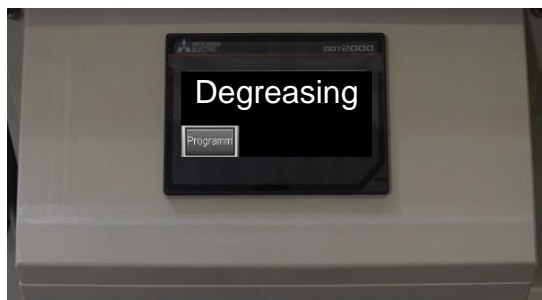
- Bath volume: Process baths: appr. 180 l each; rinsing baths: appr. 180 l each
- Bath temperature: max. 80°C (preliminary degreasing); 60°C (electrolytic degreasing bath); room temperature (all other baths)
- Dimensions (L x W x H): appr. 7200 x 708 x 1000 mm
- Power ratings: appr. 15 KVA, 3 x 400 V, 3 x 16 A, 50 Hz
- Warm-process baths of PP, heat insulated,
- Cold-process and rinsing baths of PP
- Pipes of PP
- 1 centrifugal pump each to circulate the warm-process baths
- Rim exhaustion for process baths (connection to fan, DN 76 mm)

Optional:

- Level stabilisation of process baths
- Flow-standing sink technology in the rinsing baths
- Expansion possible to a semi-automatic pre-treatment plant VBA 6-355/455/D45



Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)

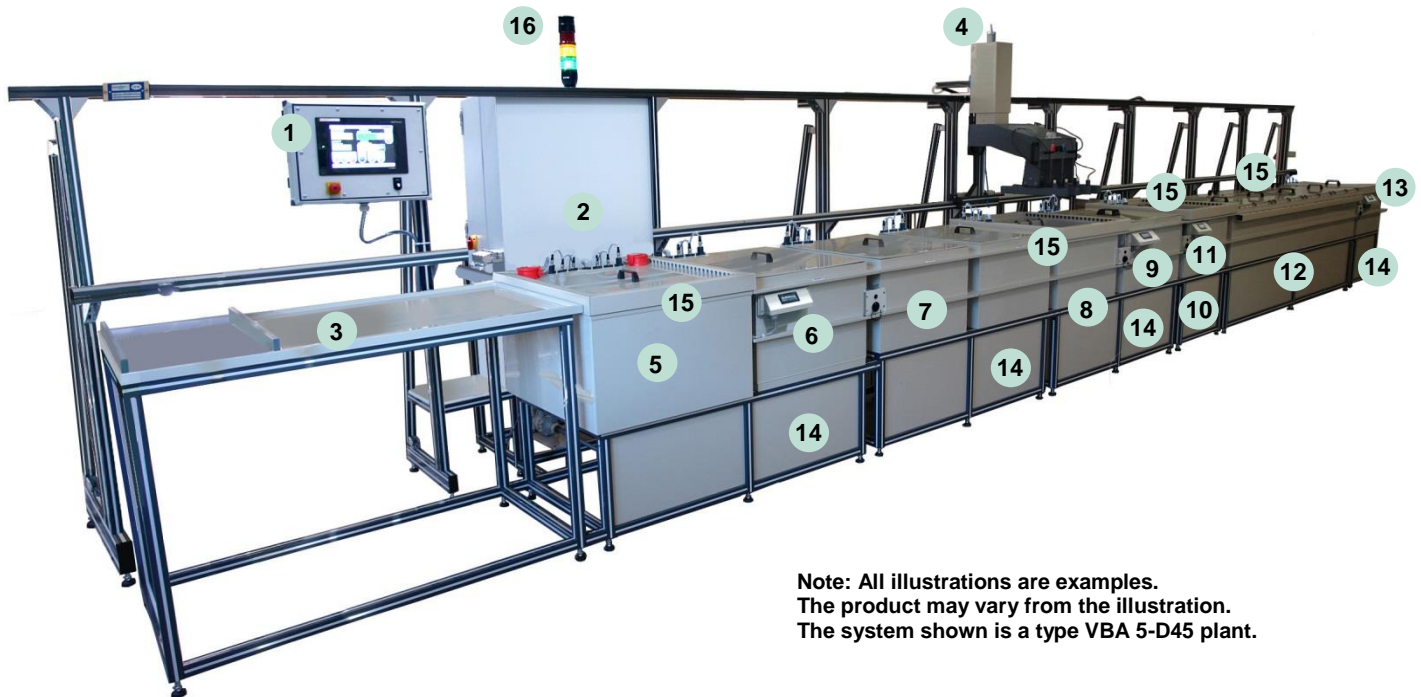


Control panel for process control (Example: degreasing)

Activation

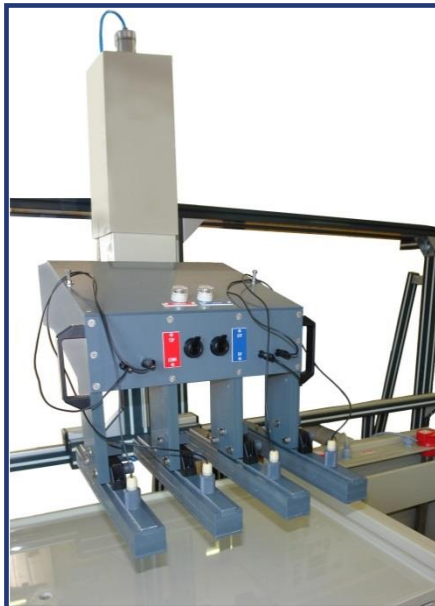
Pre-Treatment Plant VBA 5-355/455/D45

The Pre-Treatment Plant serves for cleaning and preparing the steel blanks of dental burrs, grinding pins and small tools prior to the subsequent electro-plating process. Without the appropriate pre-treatment, the parts can't be correctly electro-plated with the abrasive layer. Pre-treatment comprises 1 warm-process bath (degreasing) 3 cold-process baths (decapation, activation and Nickelstrike), an active-keeping buffer (to store the pre-treated parts which can't be immediately electro-plated) and the intermediate rinsing baths. The parts are transported – after having been mounted onto the appropriate electro-plating fixtures – from one bath to the next by means of a transport cart with a built-in lifting and lowering installation.



**Note: All illustrations are examples.
The product may vary from the illustration.
The system shown is a type VBA 5-D45 plant.**

1. Process bath control PBS-845/001
Including Touch screen operator terminal for process control and programming:
 - Temperature
 - Current
 - Voltage
 - Process time
 - Heater cycles
2. Electronics cabinet
(Service access on rear side)
3. Loading station for fixtures
4. Transport carriage for contact fixtures including lifting and lowering installation
5. Warm-process bath (Degreasing – anodic/cathodic; polarity reversible)
6. Process control panel for degreasing
7. Cold-process bath (Decapation)
8. Cold-process bath (Activation)
9. Process control panel for activation
10. Cold-process bath (Nickelstrike)
11. Process control panel for Nickelstrike
12. Cold-process bath (Active-keeping buffer)
13. Process control panel for active-keeping buffer
14. Standing sink (4 pcs)
15. Rim exhaustion (4 pcs)
16. Signal light column



Transport carriage with lifting and lowering installation with four contact fixtures in place

Technical data:

- Bath volume: Process baths: appr. 173 l each; active-keeping buffer: appr. 745 l; Standing sinks: appr. 173 l each.
- Bath temperature: max. 60°C (degreasing bath); room temperature (all other baths)
- Dimensions (L x W x H): appr. 9620 x 1320 x 3220 mm
- Power ratings: appr. 12.5 KVA, 240 V, 80 A
- 1 warm-process bath, heat insulated, of PP
- 3 cold-process baths, 4 standing sinks, 1 active-keeping buffer of PP; pipes of PP
- 1 centrifugal pump to circulate the warm-process bath
- Transport system for contact fixtures with 2 guide rails and 1 transport carriage
- Rim exhaustion for process baths (connection to fan, DN 76 mm)

Optional:

- Level stabilisation of process baths
- Flow-standing sink technology in the rinsing baths



The design of the screens, functions and operational languages can be adapted to the customers' specifications.

Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)

Pre-Treatment Plant VBA 6-353/453/D23

The pre-treatment plant serves to clean and prepare the steel blanks of grinding tools for the subsequent diamond or CBN electro-plating process.

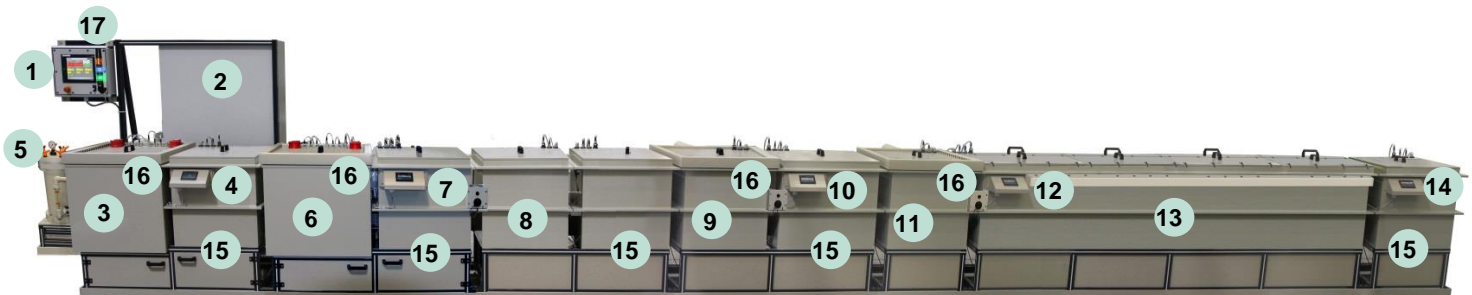
Pre-treatment comprises two warm-process baths: preliminary degreasing with oil separator and electrolytic degreasing. Furthermore it comprises 3 cold-process baths: decapation, activation and Nickelstrike as well as the intermediary rinsing baths.

The parts – already fitted into the corresponding contact and holding fixtures – are transported from one bath to the next in the sequence of the single process steps.

For temporary storage of the processed parts an active-keeping buffer is provided.

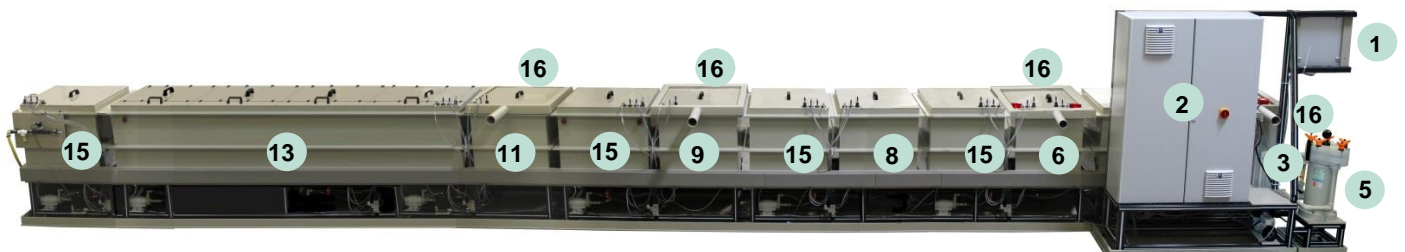
Programming and pre-set of the process and bath parameters is done by means of the Touch screen operator terminal. To control the individual process steps each process bath is fitted with a corresponding control panel.

Front view



- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Process-bath control PBS-845/001 including Touch screen operator terminal for process control and programming: <ul style="list-style-type: none"> - Temperature - Current - Voltage - Process time - Heating cycles 2. Electronics cabinet (Service access on rear side) 3. Warm-process bath (preliminary degreasing) 4. Process control panel for preliminary degreasing 5. Oil separator of preliminary degreasing | <ol style="list-style-type: none"> 6. Warm-process bath (electrolytic degreasing – anodic/cathodic; polarity reversible) 7. Process control panel for electrolytic degreasing 8. Cold-process bath (Decapation) 9. Cold-process bath (Activation) 10. Process control panel for activation 11. Cold-process bath (Nickelstrike) 12. Process control panel for Nickelstrike 13. Active-keeping buffer 14. Process control panel for active-keeping buffer 15. Standing sink (5 pcs) 16. Rim exhaustion (4 pcs) 17. Signal lamp |
|--|---|

Rear view



Technical data:

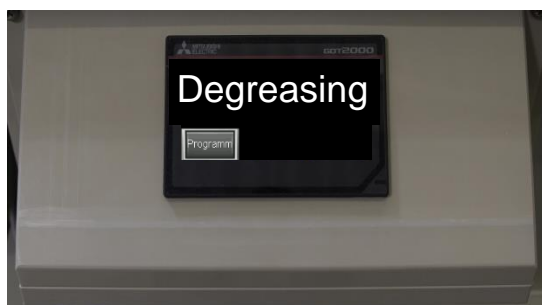
- Bath volume: Process baths: appr. 180 l each; rinsing baths: appr. 180 l each active-keeping buffer appr. 750 l.
- Bath temperature: max. 80°C (preliminary degreasing); 60°C (electrolytic degreasing bath); room temperature (all other baths)
- Dimensions (L x W x H): appr. 9100 x 708 x 1000 mm
- Power ratings: appr. 20 KVA, 3 x 400 V, 3 x 16 A, 50 Hz
- Warm-process baths of PP, heat insulated,
- Cold-process and rinsing baths of PP
- Pipes of PP
- 1 centrifugal pump each to circulate the warm-process baths
- Rim exhaustion for process baths (connection to fan, DN 76 mm)

Optional:

- Level stabilisation of process baths
- Flow-standing sink technology in the rinsing baths
- Expansion possible to a semi-automatic pre-treatment plant VBA 6-355/455/D45



Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)



Control panel for process control (Example: degreasing)



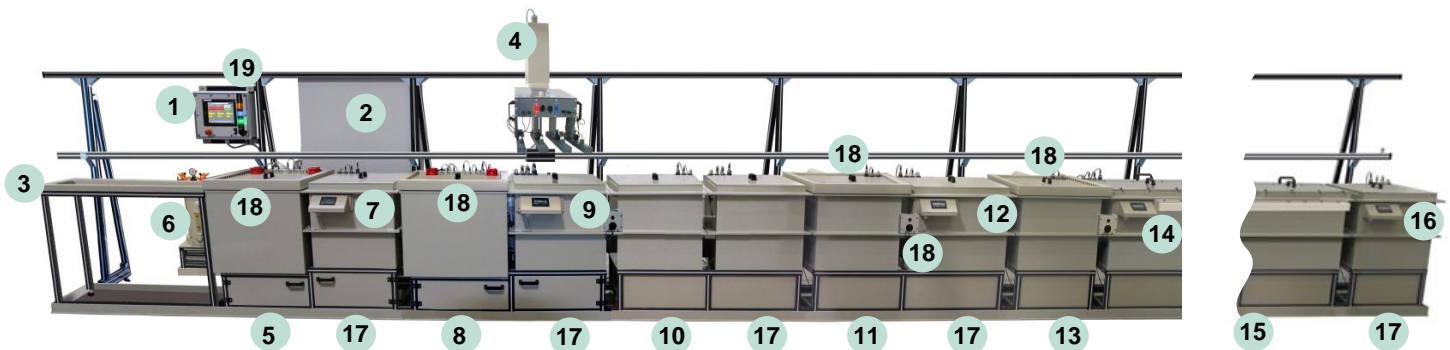
Pre-Treatment Plant VBA 6-355/455/D45

The Pre-Treatment Plant serves for cleaning and preparing the steel blanks of dental burrs, grinding pins and small tools prior to the subsequent electro-plating process. Without the appropriate pre-treatment, the parts can't be correctly electro-plated with the abrasive layer.

Pre-treatment comprises two warm-process baths: preliminary degreasing and electrolytic degreasing; 3 cold-process baths (decapation, activation and Nickelstrike), an active-keeping buffer (for temporary storage of the pre-treated parts which are not immediately electro-plated) and the intermediate rinsing baths.

The parts are transported – after having been mounted onto the appropriate electro-plating fixtures – from one bath to the next by means of a transport cart with a built-in lifting and lowering installation.

Setting of the process and bath parameters is done by means of a Touch screen operator terminal. For process control, the appropriate process control panels are provided on the individual process baths.



Note: All illustrations are examples.

The product may vary from the illustration.

The system shown is a type VBA 5-D45 plant with preliminary degreasing and electrolytic degreasing.

1. Process bath control PBS-845/001
Including Touch screen operator terminal for process control and programming:
 - Temperature
 - Current
 - Voltage
 - Process time
 - Heater cycles
2. Electronics cabinet (service access on rear side)
3. Loading station for fixtures
4. Transport carriage for contact fixtures including lifting and lowering installation
5. Warm-process bath (Preliminary degreasing)
6. Oil separator for preliminary degreasing
7. Process control panel for preliminary degreasing
8. Warm-process bath (Electrolytic degreasing – anodic/cathodic; polarity reversible)
9. Process control panel for electrolytic degreasing
10. Cold-process bath (Decapation)
11. Cold-process bath (Activation)
12. Process control panel for activation
13. Cold-process bath (Nickelstrike)
14. Process control panel for Nickelstrike
15. Cold-process bath (Active-keeping buffer)
16. Process control panel for active-keeping buffer
17. Standing sink (5 pcs)
18. Rim exhaustion (4 pcs)
19. Signal light column



Transport carriage with lifting and lowering installation with four contact fixtures in place

Technical data:

- Bath volume: appr. 173 l each; active-keeping buffer: appr. 745 l; Standing sinks: appr. 173 l each.
- Bath temperature: max. 80 °C (preliminary degreasing); max. 60°C (electrolytic degreasing bath); room temperature (all other baths)
- Dimensions (L x W x H): appr. 12620 x 1320 x 3220 mm
- Power ratings: appr. 15 KVA, 240 V, 80 A
- 2 warm-process baths, of PP, heat insulated
- 3 cold-process baths, 5 standing sinks, 1 active-keeping buffer of PP; pipes of PP
- 2 centrifugal pumps to circulate the degreasing baths
- Transport system for contact fixtures with 2 guide rails and 1 transport carriage
- Rim exhaustion for process baths (connection to fan, DN 75 mm)

Optional:

- Level stabilisation of process baths
- Flow-standing sink technology in the rinsing baths



The design of the screens, functions and operational languages can be adapted to the customers' specifications.

Pre-set and monitoring of the process and bath parameters by means of the Touch screen operator terminal (PBS-845/001 control)

**Diamond Electro_Plating Plants DBA
- Electrolytic Process**



- DBA 1-355/455 - 010
- DBA 1-355/455 - 015
- DBA 1-808/809
- DBA 1-455/013
- DBA 1-DFS/010
- DBA XX-355/455
- DBA XX-D23

Diamond Electro-Plating Plant DBA 1-355/455 - 010

Single-Tank Diamond Electro-Plating Plant

for the production of diamond or CBN electro-plated grinding tools of steel with a max. diameter of 400 or 500 mm.

Equipped with a Touch screen operator terminal for process control and for pre-set, programming and monitoring the process and bath parameters.



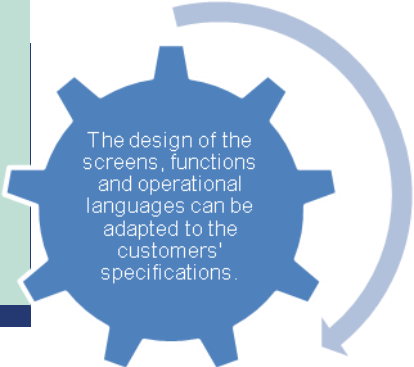
Please note: All illustrations are examples. The product may vary from the illustrations.

Touch screen operator terminal
Examples of process control and programming screens.

1. Touch screen operator terminal for process control, programming, pre-set and monitoring of:

Process parameters:	Bath parameters
- Current	- Temperature
- Voltage	- pH value
- Leak current	- Level
- Time count	- Electrolyte constancy
- Lifting/lowering/rotation	- Safety sensors
	- Amin counter

 including signal lamp for operational status
2. Process regulation and control unit (PRS) in electronics cabinet
3. Electro-plating tank (heat insulated)
4. Bath lighting
5. Three-cascade standing sink unit
6. Rim exhaustion
7. Raised work platform with non-skid floor grating



The design of the screens, functions and operational languages can be adapted to the customers' specifications.

Technical data:	DBA 1-355/010	DBA 1-455/010
max. applicable outer tool Ø	350 (400) mm	450 (500) mm
Bath volume:	350 l	540 l
Bath temperature:	max. 60°C	max. 60°C
Dimensions (L x W x H):	appr. 3854 x 2180 x 2028 mm	appr. 3954 x 2280 x 2028 mm
Power ratings:	appr. 2.5KVA, 240V, 16A, 50 Hz	appr. 4.5 KVA, 400 V, 32 A, 50 Hz

Diamond Electro-Plating Plant DBA 1-355/455 - 015

Single-Tank Diamond Electro-Plating Plant

for single parts, prototype and small mass production with electrolyte compensation tank to raise and lower the electrolyte level in the plating tank.

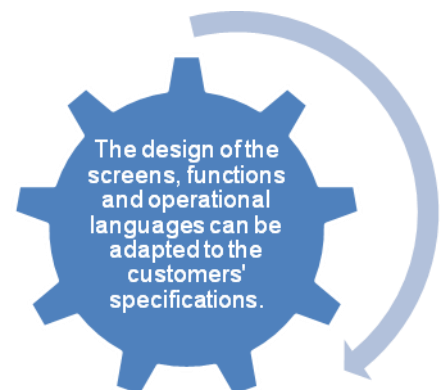
Touch screen operator terminal for process control and adjustment, programming and monitoring the process and bath parameters.



Please note: All illustrations are examples. The product may vary from the illustrations.

Touch screen operator terminal
Examples of process control and programming screens..

1. Touch screen operator terminal for process control, programming, pre-set and monitoring of:
 Process parameters: Bath parameters
 - Current - Temperature
 - Voltage - pH value
 - Leak current - Level
 - Time count - Electrolyte constancy
 - Safety sensors
 - Amin counter
2. Process regulation and control unit (PRS) in electronics cabinet
3. Electro-plating tank (heat insulated)
4. Electrolyte compensation tank
5. Three-cascade standing sink unit
6. Raised work platform with non-skid floor grating



Technical data:	DBA 1-355 / 015	DBA 1-455 / 015
max. applicable outer tool Ø	350 (400) mm	450 (500) mm
Bath volume:	273 l	420 l
Capacity of the electrolyte compensation tank	max. 406 l	max. 406 l
Bath temperature:	max. 80°C	max. 80°C
Dimensions (L x W x H):	approx. 3570 x 2200 x 1200 / 2575 mm	approx. 3670 x 2300 x 1200 / 2575 mm
Power ratings:	approx. 2.5KVA, 240V, 16A	approx. 2.5KVA, 400V, 16A

Diamond Electro-Plating Plant DBA 1-808/809

For manufacturing diamond and CBN electro-plated grinding wheels with a maximum outer diameter of 800 mm.



1. Swivel and rotation unit for grinding wheel
 - Movement of the work piece along the horizontal and vertical axis
 - Swiveling and rotation of the work piece during electro-plating
2. Touch screen-operator's terminal for:
 - Control of all axis movements
 - Level regulation of the electro-plating tub and control of the rinsing pumps
 - Input of the operation parameters of the diamond electro-plating control (DBS)
 - Control of the electro-plating process:
 - * Current
 - * Voltage
 - * Leak current
 - * Timing
3. Diamond electro-plating tank

	Type of system		Max. load capacity of swivel and rotation unit
	DBA 1-808	DBA 1-809	
Max. wheel dimensions	Ø 500 x 250 mm	Ø 500 x 350 mm	320 kg
	Ø 600 x 200 mm	Ø 600 x 300 mm	
	Ø 700 x 150 mm	Ø 700 x 250 mm	

	Ø 800 x 120 mm	Ø 800 x 220 mm	
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Technical data:

- Swivel area 90° (± 45°) continuous
- Rotation permanent and continuously adjustable from min. 1 turn/240, max. 5 rpm
- Rotation: permanent or interval controlled
- Movement speed of axes adjustable through frequency inverter
- Pneumatic crash protection
- Selectable rotation direction
- Raising and lowering of electrolyte level in the plating tank possible with electrolyte compensation tank
- Pre-nickel, diamond tackdown and finish nickel plating are done in one tank.



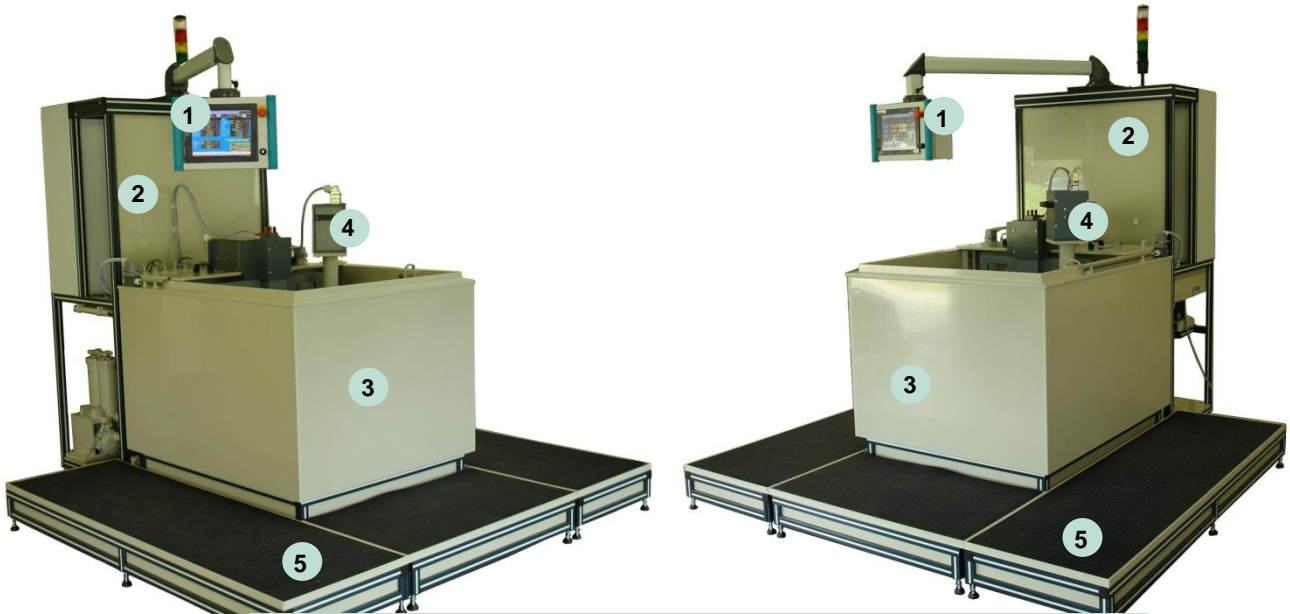
Grinding wheel mounted to swivel and rotation unit



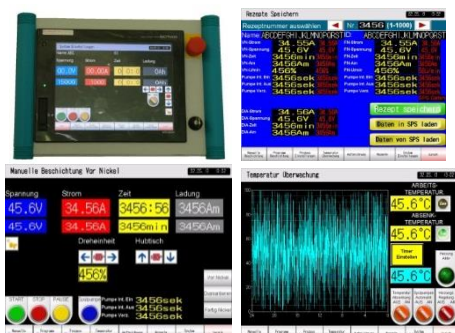
Display examples of Touch screen operators' terminal. The displays and operating functions may be individually programmed according to the customer's specifications and in various languages.

Diamond Electro-Plating Plant DBA 1-455/013

For manufacturing of diamond band saw blades and tools with a max. insertable diameter of 600 mm with lifting/lowering and rotation installation.



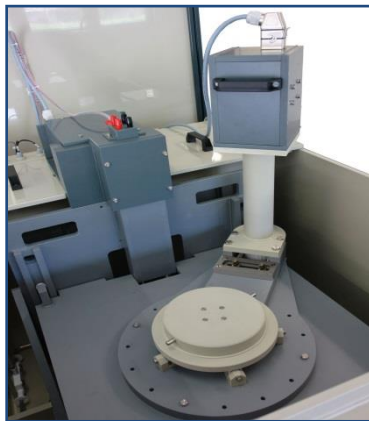
1. Touch screen operators' terminal for:
 - Bath parameters
 - Process parameters
 - Programming
 - Process control
 - * Current
 - * Voltage
 - * Leak current
 - * Timing
2. Process control and regulation unit (PRS)
 - Temperature
 - pH value
 - Level stabilisation
 - Safety sensors
 - Amin counter
3. Diamond electro-plating unit (DBE 1/100x120x80) with lifting/lowering installation
4. Horizontal rotation installation
5. Raised work platform with non-skid floor grille



Display examples of Touch screen operators' terminal. The displays and operating functions may be individually programmed according to the customer's specifications and in various languages.



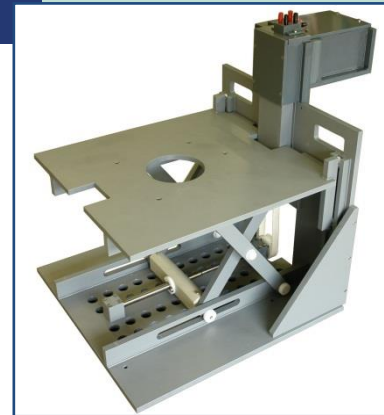
Contact and diamond electro-plating fixture for band saw blades



Horizontal rotation installation



Electro-plating station of the DBE-1/100x120x80 with electro-plating cassette, rotation unit, lifting/lowering installation and Touchscreen operators' terminal



Lifting/lowering installation

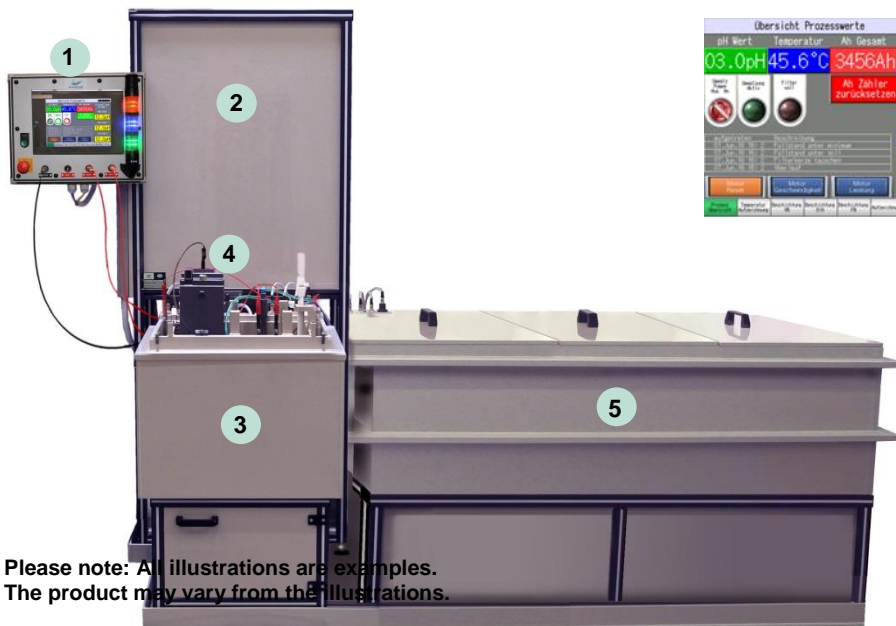
Contact fixture with band saw blade blank and rake to equalise the diamond grits (top) and with shielding disc (bottom)

Diamond Electro-Plating Plant DBA 1-DFS / 010

Single-Tank Diamond Electro-Plating Plant

for the production of diamond flexible discs for dental applications with max. diameter between 6 and 45 mm.

Equipped with a Touch screen operator terminal for process control and adjustment, programming and monitoring the process and bath parameters, as well as a motor unit to rotate the contact fixture for a more consistent electro-plating.

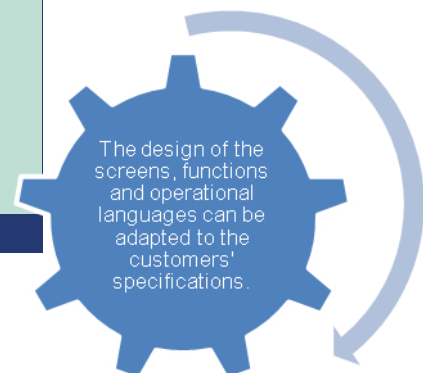


Please note: All illustrations are examples. The product may vary from the illustrations.



1. Touch screen operator terminal for process control programming, pre-set and monitoring of:
 Process parameters:
 - Current
 - Voltage
 - Leak current
 - Time count
 - Lifting/lowering/rotation
 Bath parameters:
 - Temperature
 - pH value
 - Level
 - Electrolyte constancy
 - Safety sensors
 - Amin counter
 including signal lamp for operational status
2. Process regulation and control unit (PRS) in electronics cabinet
3. Electro-plating tank (heat insulated)
4. Motor unit / lifting and lowering installation
5. Three-cascade standing sink unit

Touch screen operator terminal
Examples of process control and programming screens.



The design of the screens, functions and operational languages can be adapted to the customers' specifications.

Technical data:	DBA 1-DFS/010
max. applicable outer tool Ø	6 to 45 mm (20 or 15 pcs.)
Bath volume:	approx. 120 l
Bath temperature:	max. 60°C
Dimensions (L x W x H):	approx. 3650 x 1345 x 2028 mm
Power ratings:	approx. 2.5KVA, 240V, 16A, 50 Hz

Diamond electro-plating plant DBA XX-355/455

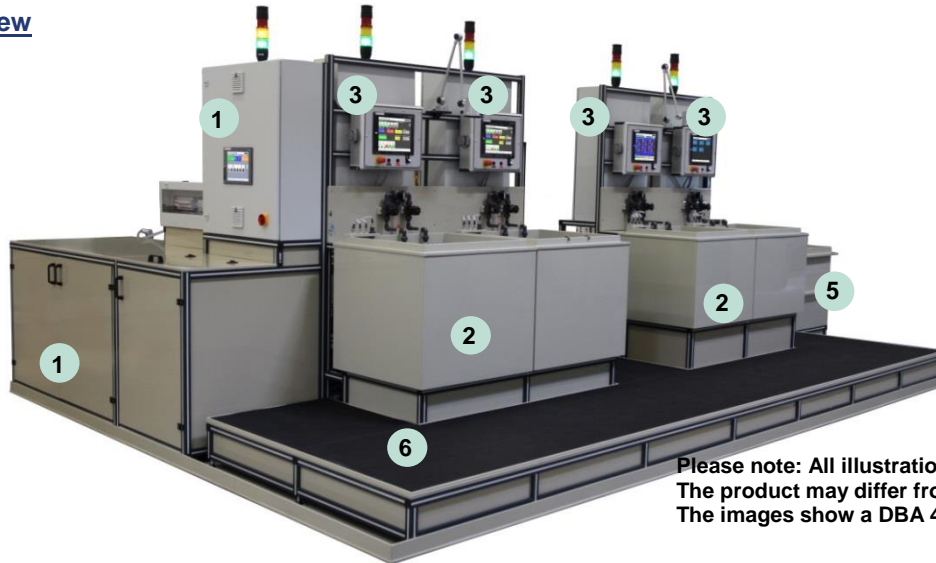
For the production of diamond or CBN electro-plated tools with steel blanks.

The blanks are electro-plated with the abrasive grits using the appropriate fixtures. All three process steps (pre-nickel, diamond tackdown and finish nickel) are carried out in the same tank. Several electro-plating stations allow for simultaneous processing of different tool types.

The system can comprise up to 10 electro-plating stations according to customers' specifications.

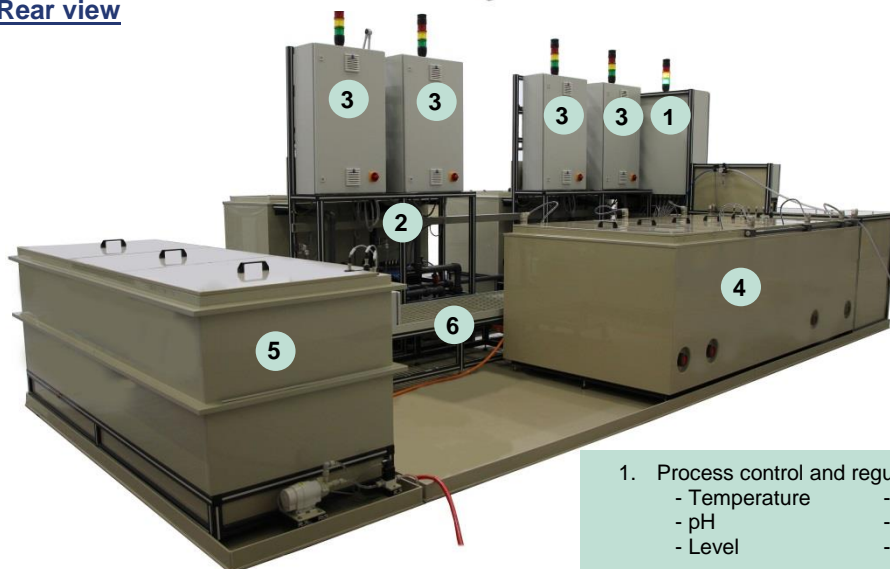
The PRS unit is for stabilisation and consistency of the process parameters. Electro-plating is carried out and monitored from the electro-plating control panels (DBS). All control panels are equipped with a Touch screen operator terminal; these can be adapted for language and customer-specific functions.

Front view



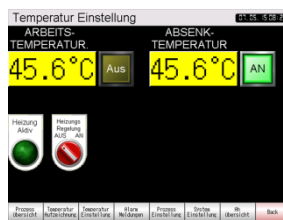
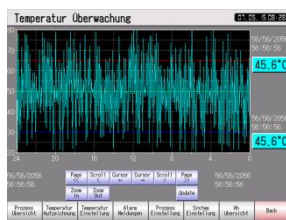
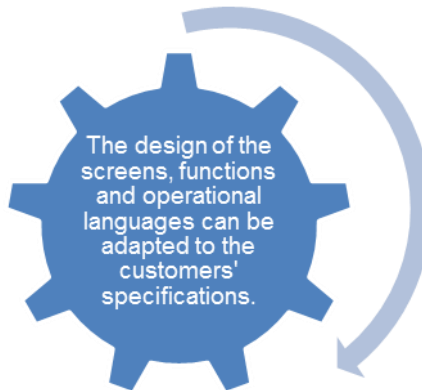
Please note: All illustrations are examples. The product may differ from the illustrations. The images show a DBA 4-455/002.

Rear view

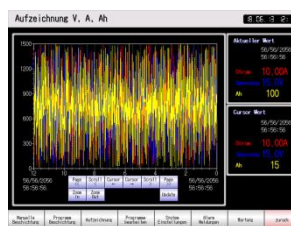
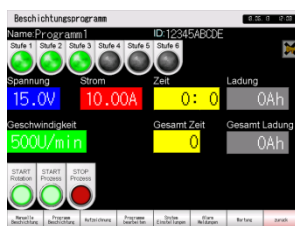
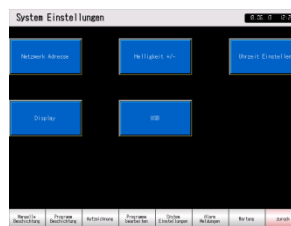


1. Process control and regulation unit (PRS)
 - Temperature
 - pH
 - Level
 - Electrolyte stabilisation
 - Safety sensors
 - Amin counter
2. Diamond electro-plating unit (DBE) with 2 work stations
(2 pcs, can be expanded to 4 pcs, → 8 work stations)
3. Diamond electro-plating controls DBS (4pcs)
 - Current
 - Voltage
 - Leak current
 - Time count
4. Electrolyte storage tank (EVB)
5. 3- cascade standing sink unit (KSP)
6. Raised work platform with non-skid floor grille

Please note: All illustrations are examples.
The product may differ from the illustrations.



Touchscreen operator terminal of the PRS (Electrolyte constancy)
Display examples of bath parameters, temperature recording, Temperature setting, AH-counter.



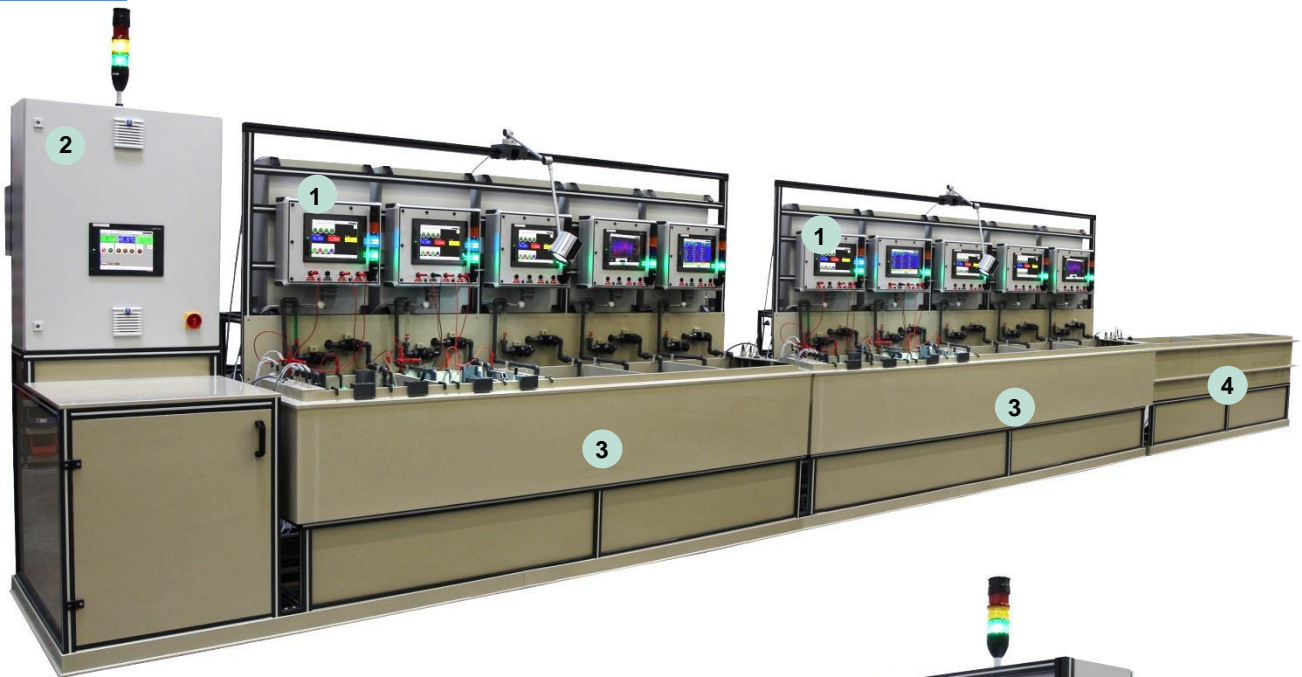
Touchscreen operator terminal of the DBS (Process parameters, process control, programming)
Display examples of control and programming screens.

Technical data:	DBA 8-455/002 (example)
Bath capacity:	Electrolyte storage tank: approx. 2352 l; electro-plating tanks: approx. 293 l each
Bath temperature:	max. 60°C
Dimensions (L x W x H):	approx. 7037 x 4064 x 2441 mm
Power ratings	approx. 13.0 KVA, 400 V, 32 A, 50 Hz
Connection for rim exhaustion	DN 75 mm (optional)
- Electrolyte storage tank (EVB), heat insulated, of PP	
- Automatic electrolyte stabilisation and dry-run protection	
- 4 heat insulated electro-plating tanks and pipes of PP; system can be expanded to 8 electro-plating tanks	
- Touchscreen operator terminals for bath parameters and process control	
- 1 circulation pump M100; 4 rinsing pumps M25, 3 dosing pumps for additives	

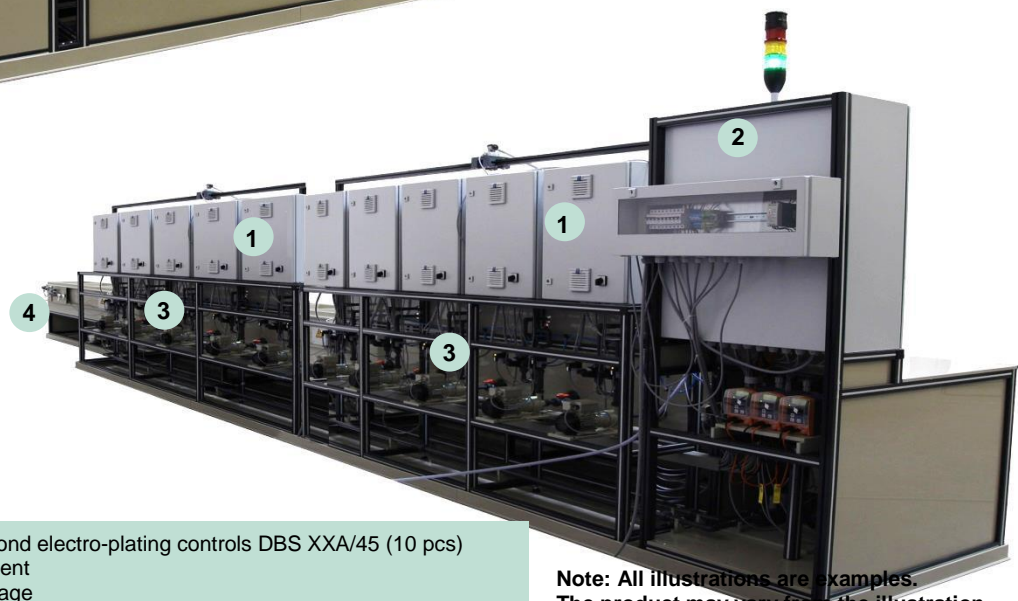
Diamond Electro-Plating Plant DBA XX-D23

For the manufacturing of diamond electro-plated dental burrs, grinding pins, Smartphone display cutters and grinding wheels with an outer diameter of up to 150 mm; with 2 to 10 electro-plating stations.

Front view



Rear view

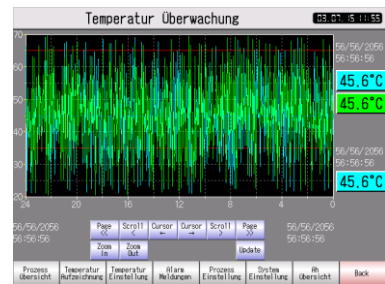
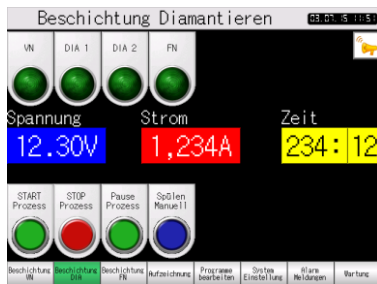


1. Diamond electro-plating controls DBS XXA/45 (10 pcs)
 - Current
 - Voltage
 - Leak current
 - Timing
2. Process control and regulation unit (PRS 745)
 - Temperature
 - pH
 - Level
 - Electrolyte stabilisation
 - Safety sensors
 - Ampère-hour counter
3. Diamond electro-plating unit (DBE, 2 pcs) with 5 electro-plating stations
4. Three-cascade standing sink unit (KSP)

**Note: All illustrations are examples.
The product may vary from the illustration.
The system shown is a type DBA 10-D23 plant.**



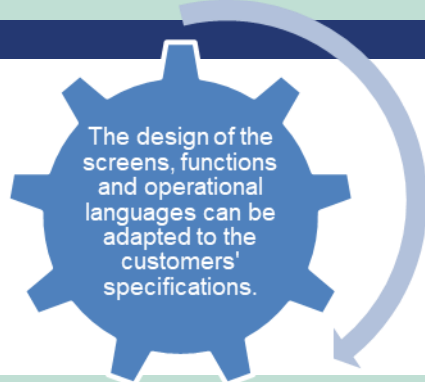
Inside view of the PRS with reservoirs for electrolyte stabilization and pH regulation, dosing pumps, circulation pump M50, filter cartridge unit 2 x 10", flow meter and flow adjustment valve



Examples of Touch screen operator surfaces (PRS /DBS)

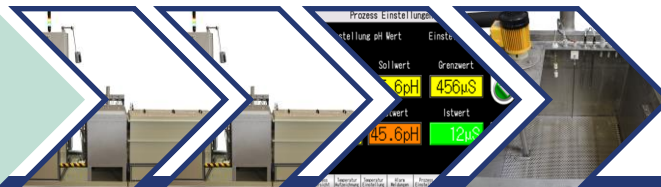


Adjustment and monitoring of the bath parameters by the Touch screen operators' terminal (PRS control)



3-stage automatic process-run control and preset of the electro-plating parameters by the Touch screen operators' terminal (DBS XXA-45 control).

**Electroless Nickel Plating
Plant CBA
- Electroless Process**



➤ CBA 1-455/001

Electroless-Nickel Plating Plant CBA 1-455/001

For manufacturing high-precision diamond and CBN grinding pieces and similar tools, as well as for protective and decorative nickel plating and dispersion plating of electro-plated diamond tools.

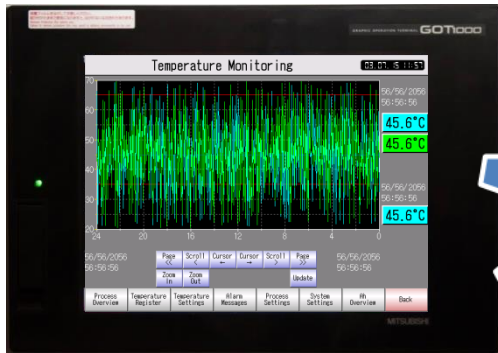


**Please note: All illustrations are examples.
The product may differ from the illustrations.**

1. Process control and regulation unit (PRS)
 - Temperature
 - pH regulation
 - Nickel regulator
 - 4-stage timing
 - Bath level
 - Stabilisation of bath parameters
 - Starting and protection current
 - Anodic tank protection
2. Stainless steel plating tank
 - Heat insulated
 - Immersed centrifugal pump for bath circulation
 - Filter bag unit with replaceable filter element
 - Built-in bath heaters
 - Integrated rim exhaustion
3. Three-cascade standing sink unit (KSP)

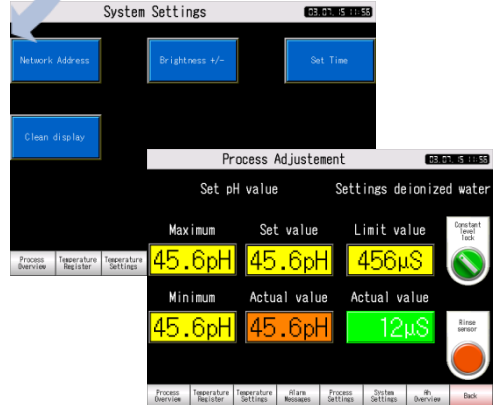
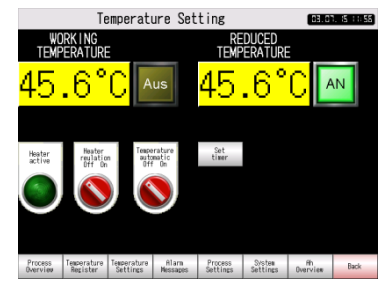


Inside view of plating tank



The design of the screens, functions and operational languages can be adapted to the customers' specifications.

- Process control
- Setting, monitoring and constancy of bath parameters
- Temperature register
- Release of starting / protection current
- Control of anodic tank protection
- Pump control
- System settings
- Status report



Operation panel for anodic tank protection (Protectostat)



Nickel regulator for monitoring and stabilization of plating bath



Inner view of PRS: Dosing pumps and reservoirs for regulation chemicals for plating bath



Filter bag unit and sensors for monitoring the plating bath

Rotational Reverse-Plating Plants RNB



- RNB 3-250/1-2-XXX
- RNB 7-250/1-6-001

Rotational Reverse Plating Plant RNB 3-250/1-2-XXX



- Automatic electrolyte stabilization
- Permanent selective cleaning
- Expansion to max. 6 stations (2 rotational reverse-plating and 4 thick-nickel plating stations) possible.

1. Process control and regulation unit (PRS)
2. Rotational reverse-plating unit (RBE)
3. Thick-nickel plating unit (DVE) with 2 electro-plating stations
4. Electrolyte storage tank (EVB) for 1400 l nickel sulfamate electrolyte



Touchscreen operators' terminals for adjustment and pre-set of the bath and process parameters, process sequence control and process programming

Screen layouts, functions and operational languages to customers' specifications possible.



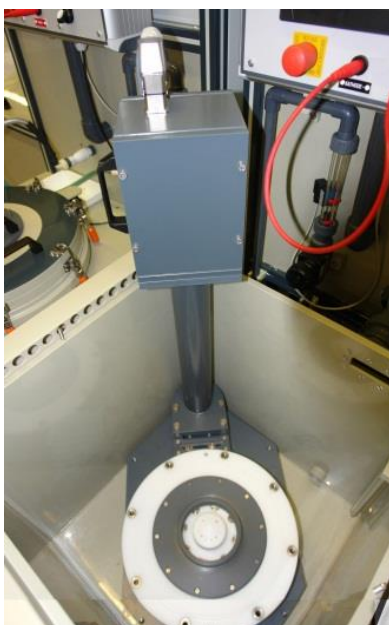
Rotational reverse-plating unit RBE 1/45-49/001

- 1 rotational plating vessel with lid
- Flow meter and diaphragm valve for electrolyte flow regulation
- Rotation max. 500 rpm
- 1 rotational reverse-plating control RBS 10A-45/001

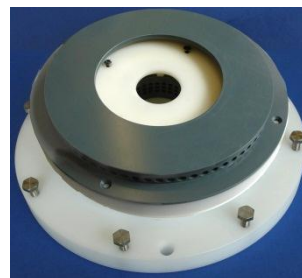


Thick-nickel plating unit DVE 2/56-56-50/001

- 2 electro-plating tanks with rim exhaustion
- 2 horizontal rotation units
- 2 thick-nickel plating controls DVS 10A-45/001 with built-in motor control



Horizontal rotation unit fitted into electro-plating tank



Rotational reverse-plating fixture containing reverse mould, mounted onto holding platter



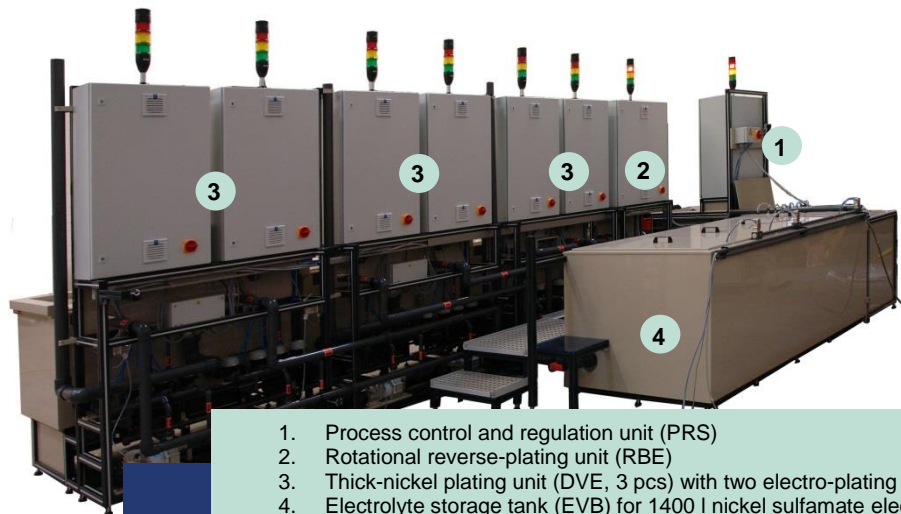
Diamond profile dressing roller

Rotational Reverse Plating Plant RNB 7-250/1-6-001

Front view



Rear view



1. Process control and regulation unit (PRS)
2. Rotational reverse-plating unit (RBE)
3. Thick-nickel plating unit (DVE, 3 pcs) with two electro-plating stations each
4. Electrolyte storage tank (EVB) for 1400 l nickel sulfamate electrolyte



Touchscreen operators' terminals for adjustment and pre-set of the bath and process parameters, process sequence control and process programming

Screen layouts, functions and operational languages to customers' specifications possible.



Rotational reverse-plating unit RBE

- 1 rotational plating vessel with lid
- Flow meter and diaphragm valve for electrolyte flow regulation
- Rotation max. 500 rpm
- 1 rotational reverse-plating control RBS 10A-45/001



Thick-nickel plating unit DVE 2/56-56-50/001

- 2 electro-plating tanks with rim exhaustion
- 2 horizontal rotation units
- 2 thick-nickel plating controls DVS 10A-45/001 with built-in motor control



Rotational reverse-plating fixture
With reverse-plating mould
(max mould outer Ø 250 mm)



Anode rod system
(components)



Diamond profile dressing roller

Nickel-Stripping Plants DRA



- DRA-1 (PP)
- DRA-3 (Stainless steel)

Nickel-Stripping Plants DRA-1 (PP)

The nickel stripping plant, DRA, is used for the reclamation of abrasive and basic ferrous and non-ferrous blanks of electroplated diamond and CBN tools. The tools are put into a special container for the stripping process. During this process the nickel is removed from the blanks while allowing the copper based alloy and steel body not to be affected. An integrated compressed air diaphragm circulating pump is used to ensure a uniform temperature distribution allowing grits to be filtered out and into a special filter bag. After 8 to 24 hours, depending on the grit size, the stripped blanks can be taken out, cleaned, and re-coated. The diamond or CBN grits can be taken from the filter bag and be cleaned if required then sorted and used again.



1. DRS control
 - Temperature
 - Pump
 - Level control
2. Filter
3. Rim exhaustion
4. Stripping-off tank (heat insulated)
5. Circulation pump

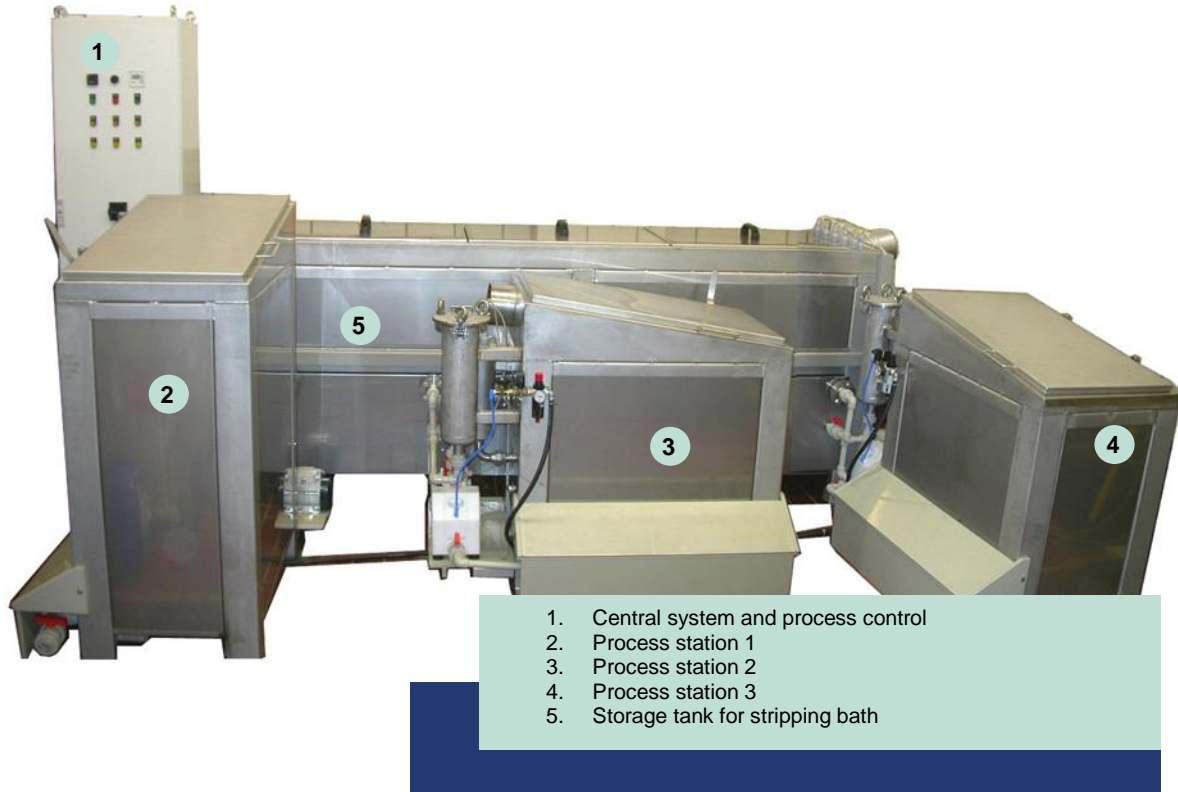
Recommended stripping-off chemical for electroplated nickel layers:

Stripping-off chemical AKE, part 1 to 5
 Stripping-off rate: max. 30 µm Ni/h (50-60°C)
 max. metal loading: appr. 30g Ni/l

Technical data:	DRA 1-300	DRA 1-500
- max. tool diameter:	300 mm	500 mm
- max. tool weight:	appr. 20 kg	appr. 30 kg
- Tank volume:	appr. 115 l	appr. 330 l
- Bath temperature:	max. 75°C	max. 75°C
- Dimensions (L x W x H):	appr. 570 x 1000 x 1300 mm	appr. 770 x 1200 x 1300 mm
- Power ratings:	appr. 2,5 KVA, 230V, 16A	appr. 5 KVA, 400V, 16A
Connection for rim exhaustion:	DN75	DN75
- Heat-insulated stripping-off tank and pipes made of PP		
- Automatic level control and dry-run protection		
- Filter bag device with cleanable filter inserts		
- Compressed air diaphragm pump		

Nickel-Stripping Plant DRA-3 (Stainless steel)

3-Station Nickel-Stripping Plant DRA 3-702/50-XXX



- Stripping bath storage tank of stainless steel for quick level compensation
- Automatic level stabilisation
- Central control for all process stations
- 3 process stations, each equipped with:
 - Stripping tub of stainless steel
 - Compressed-air operated membrane pump
 - Filter bag container of stainless steel with interchangeable filter element
- Total bath capacity 1200 l
- Max. applicable tool weight 350 kg / stripping bath
- Max. tool diameter 700 mm

**Semi- and Fully
Automatic Varnishing
and Colour-Ring coding
systems TLA+FCA**

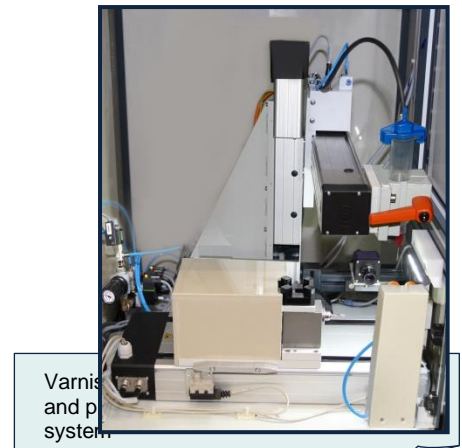


- TLA 1-D23/101
- TLA 1-D23/202
- TLA/FCA 1-D23/102
- TLA/FCA 1-D45/312
- TLA/FCA 1-D45/XXX-XXX
- SMART-LINE FCA 1-D23/702 - 802
- FCA 1-D23/XXX

Semi-Automatic Varnishing System

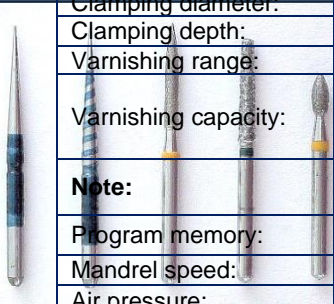
TLA 1-D23/101

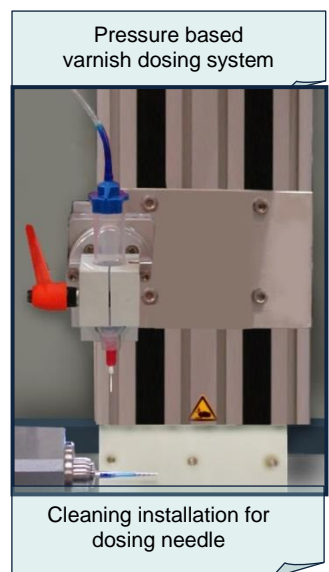
The semiautomatic varnishing system serves for varnishing or masking prior to the electro-plating process as well as for marking with colour rings of diamond dental burrs (types FG, H and RA) and grinding pins. It is equipped with a three-axis linear guide, a camera and monitor for visual control of varnishing, a PLC controller and a Touch screen operators' terminal for programming and backup of programs.



**Note: All illustrations are examples.
The product may vary from the illustrations.**

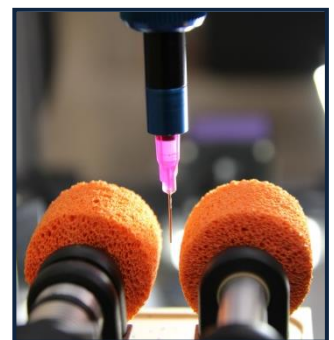
Technical Data

	Clamping diameter:	1,6 / 2,35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
	Clamping depth:	Depending on length of work piece
	Varnishing range:	With three freely programmable varnishing zones according to program
	Varnishing capacity:	For masking: appr. 8 - 10 pcs/min. (Blank: FG: varnishing zone 10 mm, dosing needle Ø 0.25mm) Colour-ring coding: appr. 12 - 15 pcs/min (2-component varnish)
	Note:	All information given depends on operator and quality and precision of blank, and may therefore vary.
	Program memory:	appr. 2000 dental burr types depending on varnishing range and hard disk capacity
	Mandrel speed:	max. 1000 rpm
	Air pressure:	5 ... 7 bar, oil-free, dry
	Power connection:	230 V, 50 Hz
	System dimensions:	L x W x H appr. 1450 x 740 x 1450 mm



Basic equipment

- Holding frame welded of aluminium profiles and baking enamelled
- Table surface for varnishing unit made of aluminium, baking enamelled
- Headstock with collet holding fixture and pneumatic tension unit
- Freely programmable carriage
- Carriage guide for x-y-z-axes with step motor
- Driving motor for headstock, continuously speed controlled by PLC.
- Main control with switch box
- PLC-controller
 - Version: CPU-module Q-series
 - Input/output addresses: 4096/8192
 - Storage media: Program memory 120 kByte
 - Interfaces: USB 100BASE-TX
- Graphics Display: with touch operation 8,4" 65536 colours
- LCD type: TFT Colour-LCD, resolution : 640 x 480
- Optical control of varnishing by camera and 19" monitor
- Safety housing incl. light barrier for machine safety
- Varnish dosing incl. pressure-regulation valve for varnish cartridges 5,10, 30 and 55 cc
- Cleaning installation for dosing needle



Optional expansions TLA 1-D23/101

- Electronic hand wheel in connection to on-board PC for easier programming
- Laser-assisted precision zero-setting for better reproducible varnishing results
- Prearrangement of the TLA for integrating a robot for automation incl. servomotors for axes, motion controller and servo amplifier
- Volumetric dosing system for precision-dosing
- 6-axes varnishing robot for grinding points with vertical surfaces
- Enlargement of head stock fixture up to collet Ø 32 mm
- Change of power ratings to 120 V, 60 Hz

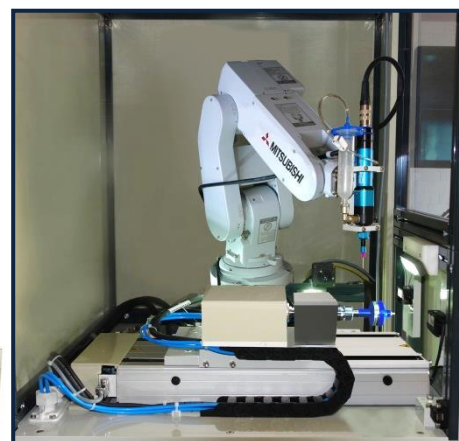
Semi-Automatic Varnishing System

TLA 1-D23/202

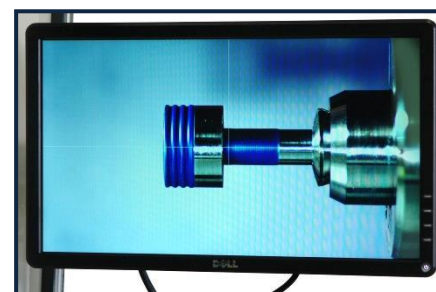
The semiautomatic varnishing system TLA is for varnishing or masking prior to the electro-plating process of milling cutters for processing Smartphone displays, grinding pins and grinding wheels. It is equipped with a PLC controller, a Touch screen operator terminal for programming and program backup, as well as a camera and monitor for visual control of the varnishing. The volumetric paint dosing guided by a 6-axes robot enables the system to apply masking also to work pieces with complex shapes.



Note: All illustrations are examples.
The product may vary from the illustrations.



Varnishing unit with 6-axes robot and volumetric dosing system

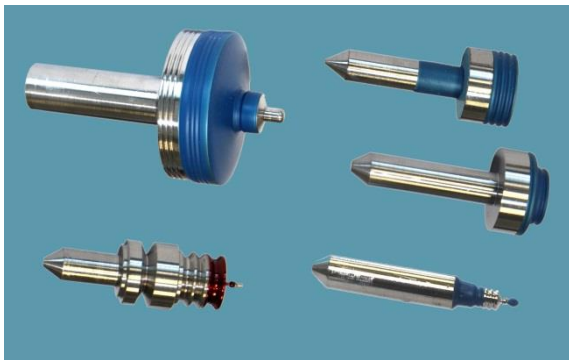


Monitor for visual check of varnishing

Technical Data

Clamping diameter:	1,6 / 2,35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
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Clamping depth:	Depending on length of work piece
Varnishing range:	Corresponding to freely programmable multi-axes robot: x = 40 mm, y = 30 mm, z = 50 mm
Varnishing capacity:	40-60 sec/ varnishing sector
Varnish types:	Masking varnish for electrolytic and electroless nickel plating
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary.
Masking varnished milling cutter	
Programs for Smartphone displays	2000 tool types depending on varnishing range and hard disk capacity
Mandrel speed:	max. 1000 rpm., continuously adjustable
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	230 V, 50 Hz
System dimensions:	L x W x H appr. 1450 x 900 x 1570 mm



Basic equipment

- Holding frame welded of aluminium profiles and baking enamelled
- Table surface for varnishing unit made of aluminium, baking enamelled
- Headstock with collet holding fixture and pneumatic tension unit
- 6-axes varnishing robot for varnishing also on vertical surfaces
- Carriage guide for x-axis with step motor
- Motor for headstock, rotation speed continuously adjustable by PLC.
- Volumetric dosing system for precision application of varnish
- Main control with switch box
- PLC-controller
 - Version: CPU-module Q-series
 - Input/output addresses: 4096/8192
 - Storage media: Program memory 120 kByte
 - Interfaces: USB 100BASE-TX
- Graphics Display: with touch operation 8,4" 65536 colours
- LCD type: TFT Colour-LCD Resolution : 640 x 480
- Visual control of varnishing by camera and 19" monitor
- Safety housing incl. light barrier for machine safety

Volumetric varnish dosing system



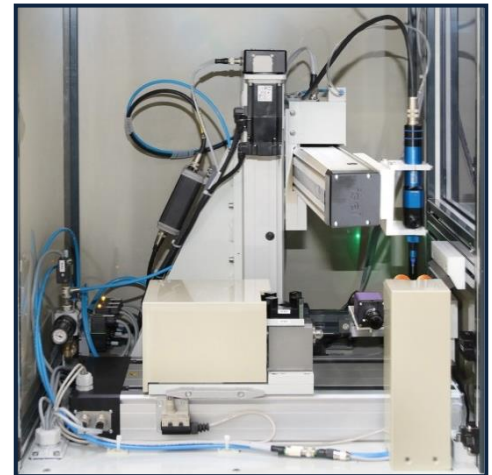
Optional expansions TLA 1-D23/202

- Electronic hand wheel in connection to on-board PC for easier programming
- Laser-assisted precision zero-setting for better reproducible varnishing results
- Enlargement of head stock fixture up to collet Ø 32 mm
- Change of power ratings to 120 V, 60 Hz
- Varnish dosing incl. pressure-regulation valve for varnish cartridges 5,10, 30 and 55 cc
- Masking of grinding wheels:
 - a. Up to max. Ø 100 mm
 - b. Up to max. Ø 250 mm
 - c. Up to max. Ø 350 mm

Semi-Automatic Varnishing System

TLA/FCA 1-D23/102

For coding with colour rings of diamond dental burrs (types FG, H, HP and RA), implant drills, milling cutters, grinding pins, spiral drills, taps and similar with a shank \varnothing 1.0 – 10.0 mm



Varnishing unit with four-axes linear guide and volumetric paint dosing system VDS-145

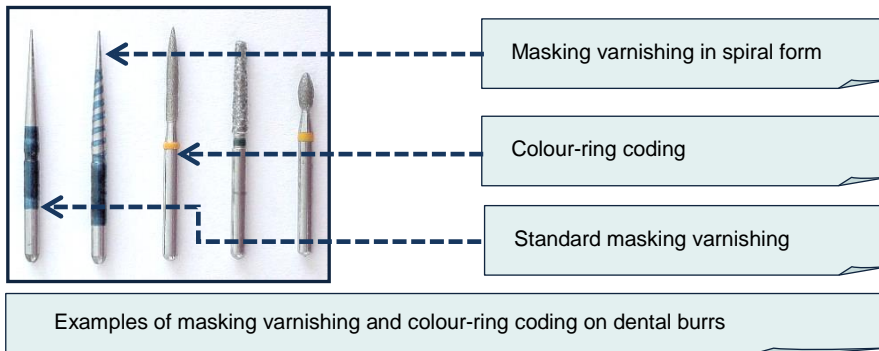


Monitor to check varnishing

Note: All illustrations are examples.
The product may vary from the illustrations.

Technical Data	
Clamping diameter:	1.6 / 2.35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
Clamping depth:	Depending on length of work piece
Varnishing range:	With four freely programmable axes: varnishing zone according to program
Varnishing capacity:	For masking: appr. 6 - 10 pcs/min. (Blank: FG; varnishing zone 10 mm, dosing needle \varnothing 0.25mm) Colour-ring coding: appr. 8 - 12 pcs/min (2-component varnish)
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary .
Program memory:	appr. 2000 dental burr types depending on varnishing range and hard disk capacity
Mandrel speed:	max. 1000 rpm
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	230 V, 50 Hz

System dimensions: L x W x H appr. 1450 x 740 x 1640 mm



Volumetric paint dosing system VDS-145

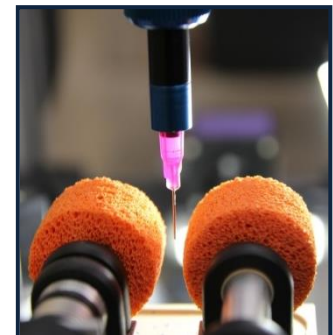


Examples of colour-ring coding on implant drills

Basic equipment

- Holding frame welded of aluminium profiles and baking enamelled
- Table surface for varnishing unit made of aluminium, baking enamelled
- Headstock with collet holding fixture and clamping by spring and pneumatic release with footswitch
- Freely programmable carriage
- Carriage guide for x-y-z-axes with servo motors
- Drive motor for headstock, continuously speed controlled by PLC.
- Main control with switch box
- PLC-controller

Version:	Mitsubishi CPU module
Input/output addresses:	4096/8192
Storage media:	Program memory 120 kByte
Interfaces:	USB 100BASE-TX
- Graphics Display: with touch operation 8,4" 65536 colours
- LCD type: TFT Colour-LCD, resolution : 640 x 480
- Optical control of varnishing by camera and 19" monitor
- Safety housing incl. light barrier for machine safety
- Volumetric dosing system for precision application of varnish
- Laser-assisted precision zero-setting for improved reproducible varnishing results
- Electronic hand wheel in connection with on-board PC for easier programming



Cleaning device for dosing needle

Optional expansions TLA/FCA 1-D23/102

- Prearrangement of the TLA/FCA for integrating a robot for automation incl. servomotors for axes, motion controller and servo amplifier

- 6-axes varnishing robot for grinding points with vertical surfaces
- Enlargement of head stock fixture up to collet Ø 32 mm

Automatic Varnishing System

FCA 1-D45/312

For colour-ring coding of implant drills, milling cutters, grinding pins and / or diamond dental burrs (Types FG, H and RA).



Note: All illustrations are examples. The product may vary from the illustrations.

Basic equipment

- Fully automatic colour-ring coding unit with 6-axes bent-arm robot
- Parts supply by pallets / manual loading and unloading station (different pallet sizes available on request)
- Single axis linear guide
- PLC controller
- Storage media: Program memory 120 kByte, interface: USB
- Touch screen operator's terminal 8,4"
- Varnish dosing by pressure or volumetric dosing system
- Holding frame welded of aluminium profiles and baking enamelled
- Headstock with collet holding fixture and pneumatic tension unit
- Motor for headstock, rotation speed continuously adjustable by PLC.
- Main control with switch box
- Safety housing incl. safety interrupter

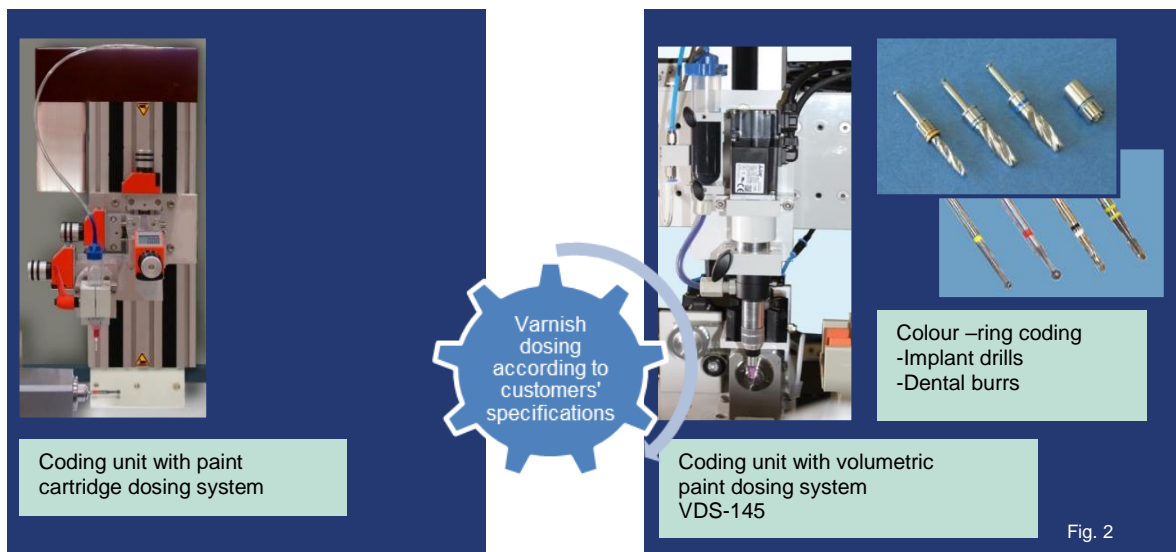
Technical Data

Clamping diameter:	1.6 / 2.35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
Clamping depth:	Depending on length of work piece
Varnishing range:	With one freely programmable axis: varnishing zone according to program
Varnishing capacity:	Colour-ring coding approx.10 - 15 pcs/min (one or two-component varnish)

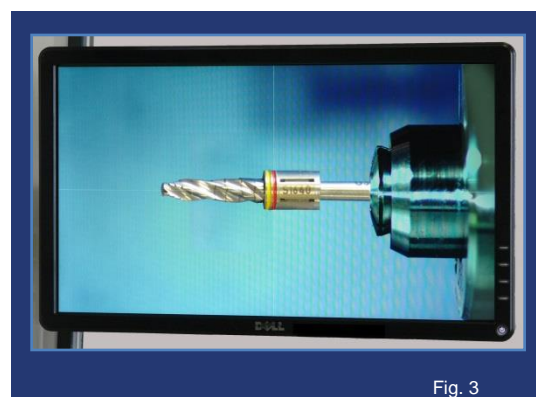
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary.
Mandrel speed:	max. 1000 rpm.
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	230 V, 50 Hz
System dimensions:	L x W x H approx. 2100 x 1450 x 1800 mm

Optional expansions FCA 1-D45/312

- Varnish dosing incl. pressure-regulation valve for varnish cartridges 5, 10, 30 and 55 cc. (Fig. 1)
- Volumetric dosing system for precision application of varnish. (Fig. 2)



- Change of power ratings to 120 V, 60 Hz
- Camera and monitor for visual check of varnishing (Fig. 3)



- Enlargement of head stock fixture up to collet Ø- 32mm and increase of robot support capacity

Automatic Varnishing System

TLA/FCA 1-D45/XXX-XXX

For application of colour-ring coding and/or masking varnishing on dental burrs (types FG, H, HP and RA), implant drills, milling cutters, grinding pins, spiral bits, screw taps and similar with shank \varnothing 1.0 – 10.0 mm.

Front view



Figure 1



Examples of colour-ring coding, laser engraving and laser blackening on implant drills

Please note: All illustrations are examples. Depending on the customers' configuration, the product may vary from the illustrations. The product shown is a type TLA/FCA 1-D45/322-001 plant.

Rear view



Examples of masking varnishing and colour-ring coding of dental burrs



Basic equipment

- Fully automatic clamping and varnishing unit (Figure 2)
- Parts feed by holding pallets / active accumulation line (different pallet sizes available on demand)
- Holding frame welded of aluminium profiles and baking enamelled
- Table surface for varnishing unit made of aluminium, baking enamelled
- Headstock with holding fixture for collet; clamping of parts by spring force and pneumatic release
- Freely programmable carriage
- Carriage guide for x-y-z-axes with servo motors
- Drive motor for headstock, continuously speed controlled by PLC
- Main control with PLC and electronics cabinet
- Visual control of masking varnishing / colour-ring coding by camera and monitor
- 6-axes bent-arm robot with motorized double grip for handling of parts
- Robot control including teach box with colour/touch display
- Touch screen operator terminal (Figure 3)
- Electronic hand wheel in connection with on-board PC for easier programming
- Laser-assisted precision zero-setting for improved reproducible varnishing results
- Automatic calibration of dosing needle by cross-laser
- Loading and unloading areas with safety light barrier
- Safety housing including safety interrupters
- 6-station linear transport unit for holding pallets (Figure 5)
- Volumetric paint dosing system VDS-145 for precision dosing (Figure 6)



Varnishing unit with four-axes guidance and volumetric dosing system VDS-145

Figure 2



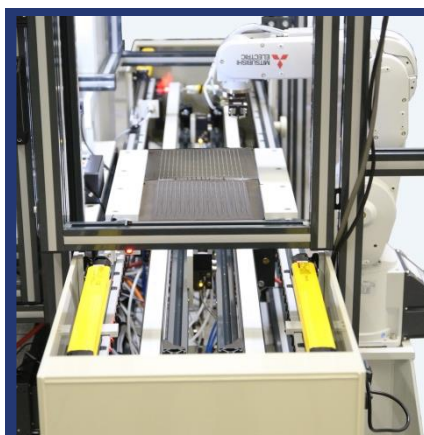
Monitor and Touch screen-operators terminal for process surveillance and control

Figure 3



Cleaning device for dosing needle

Figure 4



6-station linear transport unit
for holding pallets

Figure 5



Volumetric paint dosing system
VDS-145

Figure 6

Technical data	
Clamping diameter:	0,5-7 mm; 8-90 mm with additional top-mounted collet
Clamping depth:	Depending on work piece length
Varnishing range:	With four freely programmable axes: varnishing zone according to program
Varnishing capacity:	Masking varnishing approx. 11 - 15 pcs/min. (Blank: FG; Varnishing zone 10 mm, Ø of dosing needle 0,25mm,) Colour-ring coding approx. 14 - 17 pcs/min (1- or 2-component varnish)
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary .
Program memory:	approx. 2000 tool types depending on varnishing range, may be expanded
Mandrel speed:	max. 4000 rpm.
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	400 V, 50 Hz
System dimensions:	L x W x H approx. 2392 x 2947 x 2690 mm

Optional expansions TLA/FCA 1-D45/002

- Module for remote maintenance, remote diagnosis, malfunction report and transmission of files by "Remote Access" for PLC controller through Web server
- GSM module to report malfunctions to an external cell phone (SIM carte of a cell phone network additionally required)
- Enlargement of head stock fixture up to collet Ø- 32mm
- Change of power ratings to 120 V, 60 Hz
- Operation mode from pallet to pallet, fully automatic with two-sided pallet handling unit
- Operation mode from pallet to pallet, fully automatic with circulating conveyor
- Convection drying station with integrated convection heating system
- Infrared drying station with timer controlled infrared radiant heater
- Expansion of the 6-station linear transport unit by a further 6 pallets (Length: appr. 1500mm)
- Docking station for storage stack
- Storage stack for supply of pallets for blanks / uncoded tools (displaceable)
- Supply of blanks (bulk material) with parts recognition and parts singling
- Laser engraving and blackening module (Fibre laser or ultra-short pulse laser)

SMART-LINE

Colour-Ring Coding System

FCA 1-D23/702 - 802



For colour-ring coding of implant drills, milling cutters, grinding pins and diamond dental burrs (Types FG, H and RA).



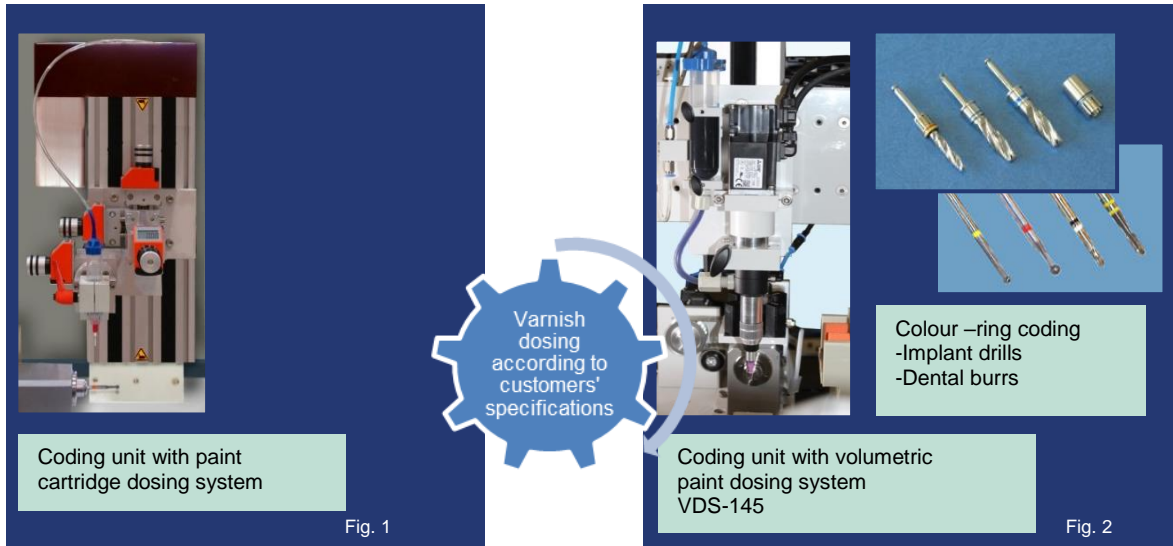
Note: All illustrations are examples. The product may vary from the illustrations.

Basic equipment

- Holding frame welded of aluminium profiles and baking enamelled
- Table surface for varnishing unit made of aluminium, baking enamelled
- Headstock with collet holding fixture; clamping by spring force and pneumatic release through footswitch
- Freely programmable carriage
- Carriage guide for Z axis by pneumatic force
- Carriage guide for X axis by servo motor
- Manually adjustable Y axis
- Motor for headstock, rotation speed continuously adjustable by PLC
- Main control with PLC and electronics cabinet
- Volumetric paint dosing system VDS-145 for precision application of varnish.

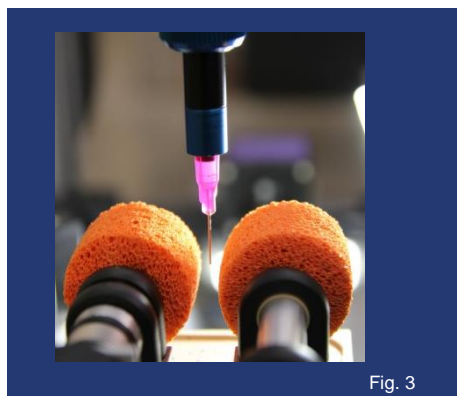
Technical Data	
Clamping diameter:	1.6 / 2.35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
Clamping depth:	Depending on length of work piece
Varnishing range:	With one freely programmable axis: varnishing zone according to program
Varnishing capacity:	Colour-ring coding: approx. 10 - 15 pcs/min (one or two-component varnish)
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary.
Mandrel speed:	max. 1000 rpm
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	230 V, 50 Hz
System dimensions:	L x W x H approx. 1150 x 630 x 1640 mm

Paint dosing systems



Optional expansions FCA 1-D23/702 - 802

- Change of power ratings to 120 V, 60 Hz
- Cleaning installation with sponge rubber rollers for dosing needle (Fig. 3)



- Connection for exhaustion of solvent vapours including shut-off valve (NW 76), fan not included.
- Angled adapter for inclination of dosing needle
- Enlargement of head stock fixture up to collet Ø 32 mm

Semiautomatic Colour-Ring Coding System

Semiautomatic Colour-Ring Coding System FCA 1-D23/XXX

For colour-ring coding of implant drills, milling cutters, grinding pins and / or diamond dental burrs (Types FG, H and RA).



Note: All illustrations are examples. The product may vary from the illustrations.

Basic equipment

- Single axis linear guide
- PLC controller
- Storage media: Program memory 120 kByte, interface: USB
- Touch screen operator's terminal 8,4"
- Varnish dosing by pressure or volumetric dosing system
- Holding frame welded of aluminium profiles and baking enamelled
- Headstock with collet holding fixture and pneumatic tension unit
- Motor for headstock, rotation speed continuously adjustable by PLC.
- Main control with switch box
- Safety housing incl. safety interrupter

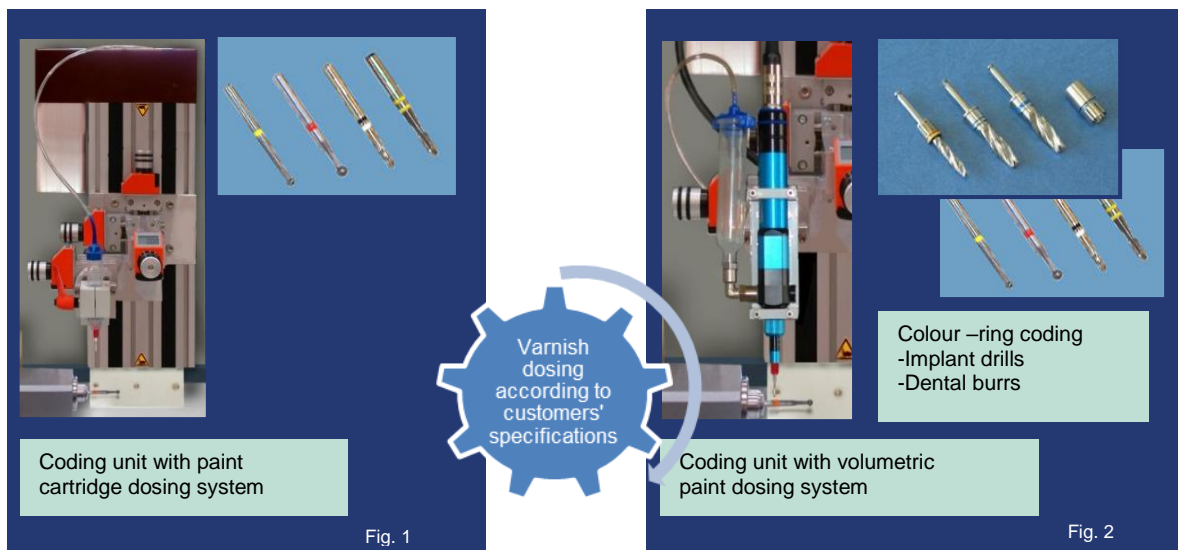
Technical Data

Clamping diameter:	1.6 / 2.35 / 3 / 4 / 5 / 6 / 8 / 10 mm (other diameters available on request)
Clamping depth:	Depending on length of work piece

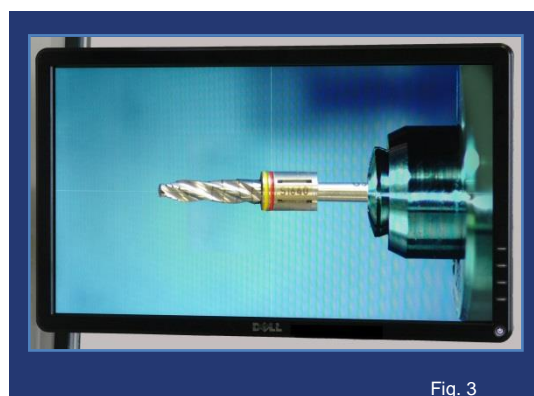
Varnishing range:	With one freely programmable axis: varnishing zone according to program
Varnishing capacity:	Colour-ring coding: approx.10 - 15 pcs/min (one or two-component varnish)
Note:	All information given depends on operator and quality and precision of blank, and may therefore vary.
Mandrel speed:	max. 1000 rpm
Air pressure:	5 ... 7 bar, oil-free, dry
Power connection:	230 V, 50 Hz
System dimensions:	L x W x H approx. 1065 x 740 x 1450 mm

Optional expansions FCA 1-D23/XXX

- Varnish dosing incl. pressure-regulation valve for varnish cartridges 5, 10, 30 and 55 cc. (Fig. 1)
- Volumetric dosing system for precision application of varnish. (Fig. 2)



- Change of power ratings to 120 V, 60 Hz
- Camera and monitor for visual check of varnishing (Fig. 3)



Special Equipment - General

- Lifting/Lowering Tables
- Rotation Units
- Grinding Wheel Fixtures
- Band Saws
- Milling Cutters

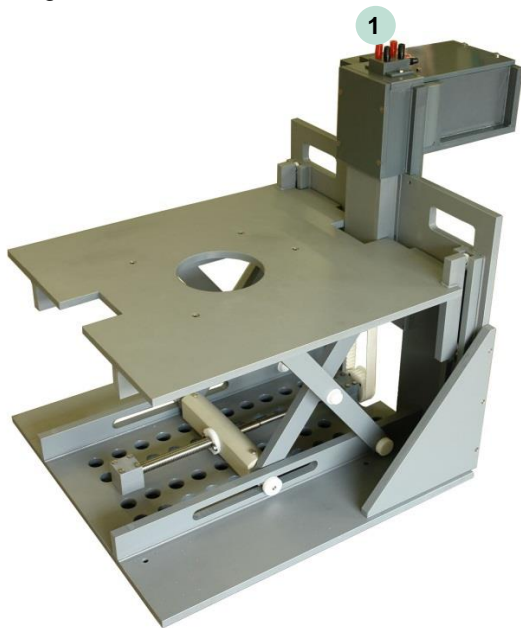
Special-purpose lifting/lowering table

The lifting/lowering system with electric drive serves to facilitate the movement of the work pieces and special fixtures during the diamond electro-plating process.

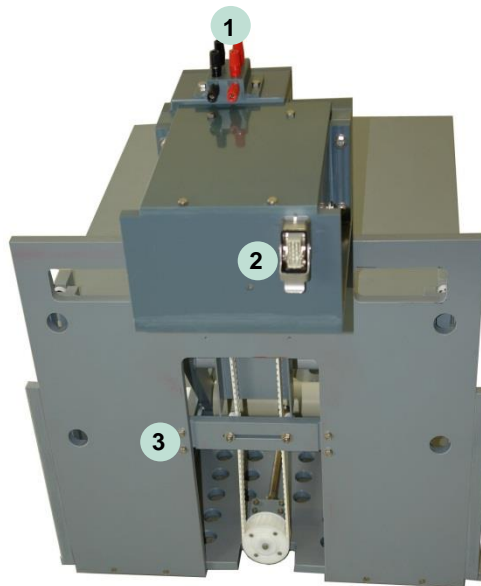
The system allows the flexible mounting of various diamond electro-plating fixtures or rotation devices. For an easier spread-over of diamond grits or for mounting or removal of the parts, the whole mechanism can be lifted or lowered to a defined position by means of the electric motor.

The motor control can be integrated into the corresponding electro-plating or process control according to the customers' specification.

The lifting and lowering tables are available in different sizes and can be customized to fit the existing electro-plating tank dimensions.



Front view of lifting/lowering table.
Flexible mounting of a bayonet catch or a rotation unit to hold various types of electro-plating cassettes.



Rear view of lifting/lowering table.

1. Anode/cathode connections
2. Motor control connector
3. Tension adjuster for timing belt



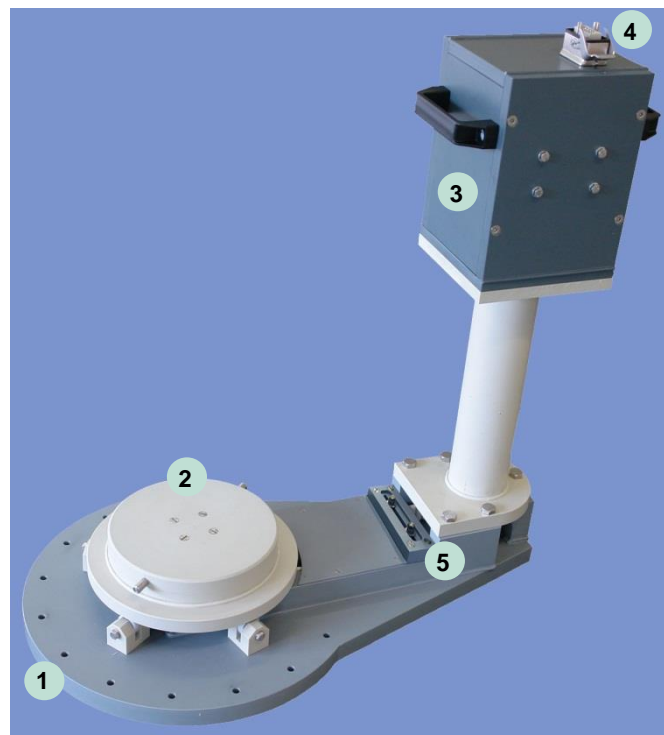
Lifting/lowering table with mounted rotation unit and bayonet catch fitted into electro-plating tank.

Special-purpose rotary unit HSR / F - horizontal

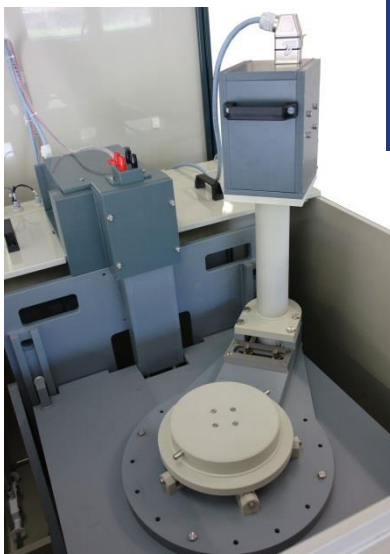
The horizontal rotary unit carries out a reversing, horizontal motion and allows a more uniform electro-plating of diamond or CBN grinding wheels and band saws. The rotary unit is typically mounted onto a lifting/lowering table; its flexible drilling pattern for the fixing lugs however allows it to be mounted directly into the plating tank.

The reversing speed is adjusted by the motor control unit which is integrated into the corresponding electro-plating control regulates. Diamond plating cassettes or other devices can be clamped to the holding platter by means of the bayonet catch.

The rotary units are available in different sizes and can be customized to your specific tank dimensions.



1. Base plate with perforations for mounting lugs
2. Rotating holding platter with bayonet catch
3. Motor / case
4. Connector for control
5. Tension adjuster for timing belt



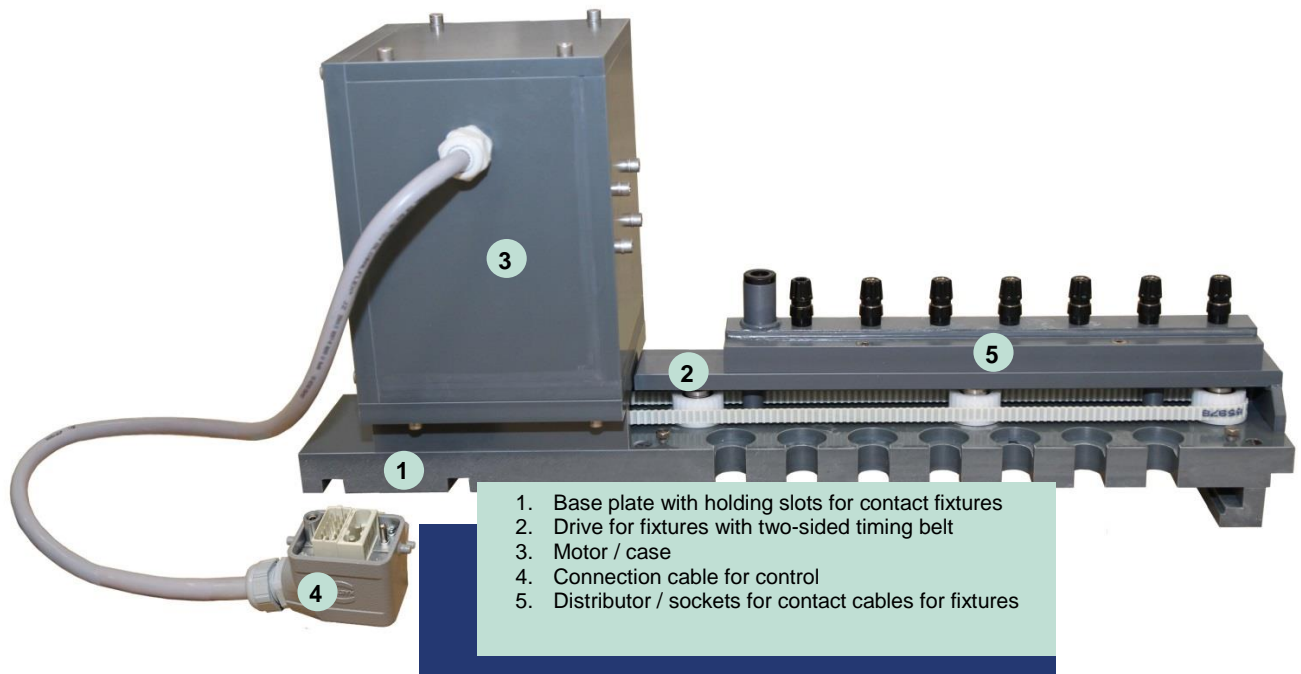
Horizontal rotation unit mounted onto lifting/lowering table

Special-purpose rotary unit HSR / G for grinding wheels, wire-saw beads, grinding rollers and similar up to Ø 130 mm

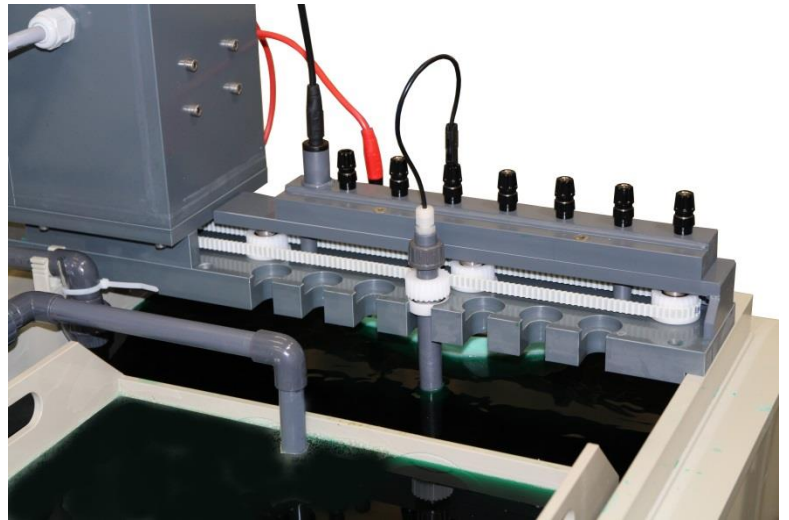
The horizontal rotary unit carries out a reversing, horizontal motion of approx. 359° and allows a more uniform electro-plating of diamond or CBN grinding wheels and dressing rollers. The rotary unit is typically mounted directly onto the electro-plating tank. The contact fixtures with the work pieces are placed into the provided holding slots. Depending on the diameter of the work pieces, 2 to 7 contact fixtures can be processed simultaneously.

Reversing speed is adjusted by the motor control unit which is integrated into the corresponding electro-plating control.

The rotary units are available in different sizes and can be customized to your specific tank dimensions. The number of holding slots can be adjusted according to the dimensions of the work pieces.



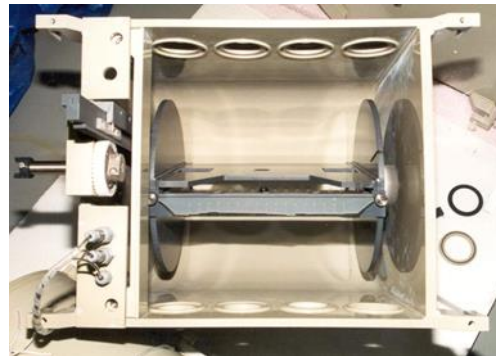
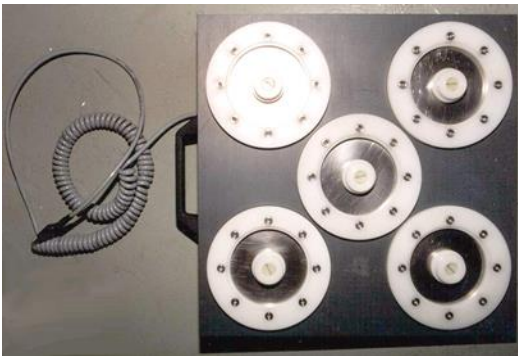
Rotary unit fitted into electro-plating station
with one contact fixture for grinding rollers



Fixture Systems for CBN and Diamond Electro-Plating of Grinding Wheels and Grinding Drums



- Fixture system for piston-ring grinding wheels
- Single production or set production (1 set = 3 pcs)
 - Quick and fast assembly
 - Masking varnishing not required



- Fixture system for diamond-penetrated precision cut-off wheels
- Micro-diamond 4-25 μm
 - Fixture for 4 or 5 wheels
 - Wheel dimensions
O.D. 2.4" – 4.7"
I.D. 1.0" – 3.5"



- Fixture system for large grinding wheels and grinding drums
- Stable design of fixture; transport with lifting device
 - Easily adapted to different wheel types by means of various spacers
 - Separate current contact for high pre-treatment currents
 - No or only partial masking required.

Fixture System to Manufacture Diamond Band Saw Blades

For diamond electro-plating of one band saw blade at a time, with straight or toothed edge.

The holding and contact fixture (contact fixture) guarantees a uniform electro-plating of the cutting edge by means of the supplied square-section silicone cord.

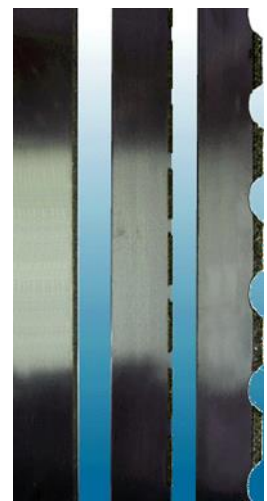
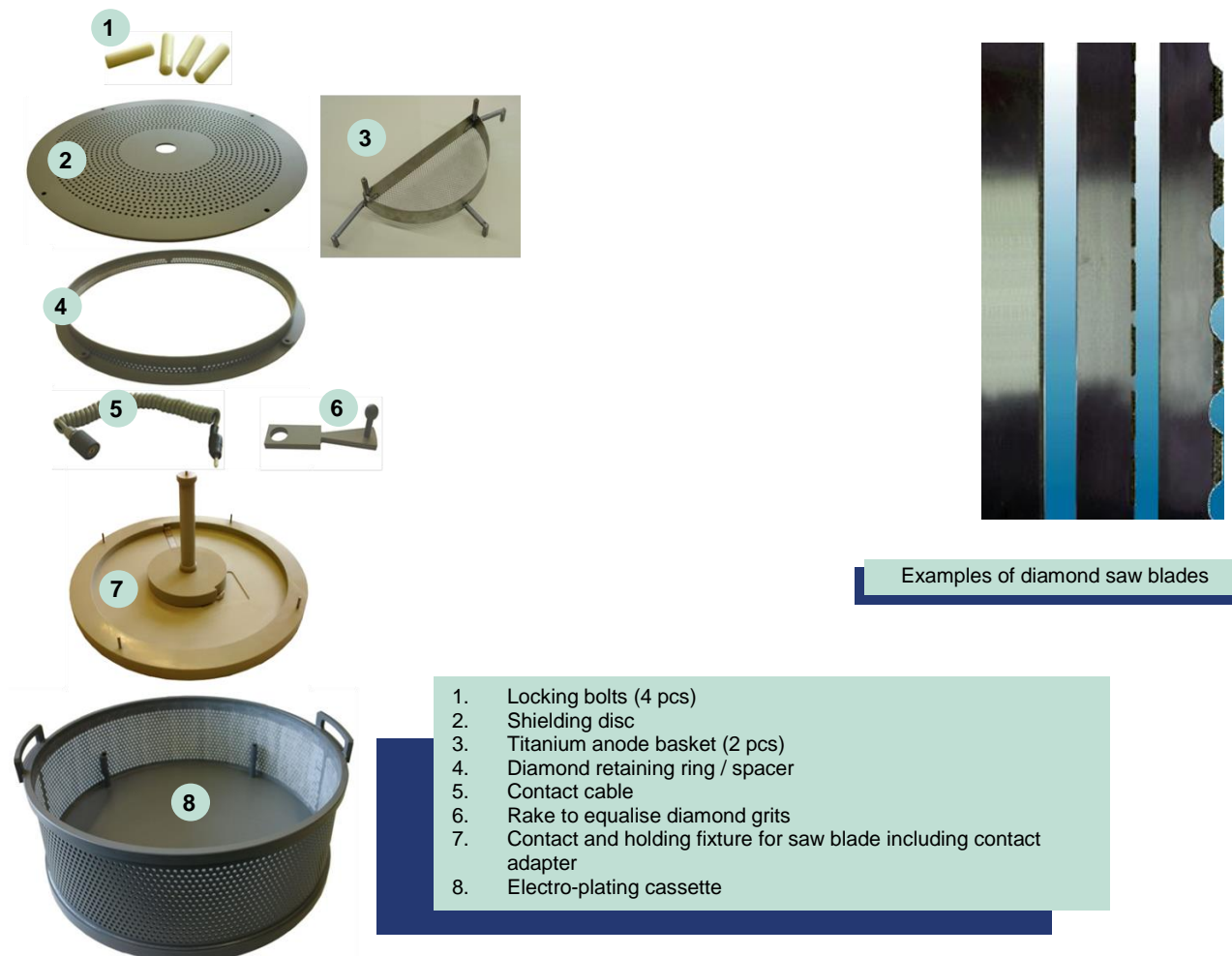
Masking of the band saw blade is not required.

The arrangement of the band saw blade is compact and space-saving.

The fixture is used for the required pre-treatment and the subsequent diamond electro-plating process without a need to remove the band saw blade.

The fixture system is designed so that only the surface areas to be electro-plated come into contact with the process baths.

Components of fixture



Examples of diamond saw blades

1. Locking bolts (4 pcs)
2. Shielding disc
3. Titanium anode basket (2 pcs)
4. Diamond retaining ring / spacer
5. Contact cable
6. Rake to equalise diamond grits
7. Contact and holding fixture for saw blade including contact adapter
8. Electro-plating cassette

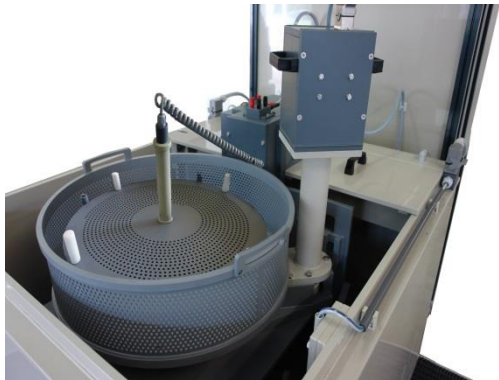
Fixture assembly



Saw blade mounted into contact fixture with square-section silicone cord

Contact fixture with rake to equalise diamond grits distribution

Contact fixture with titanium anode baskets (not shown) and shielding disc mounted into electro-plating cassette



Complete fixture system installed in the electro-plating tank.

Fixture System to manufacture Diamond Cutters for Processing Smartphone Displays

View of contact fixture



Single-row contact fixture for electroless nickel plating (bath temperature max. 100 °C)

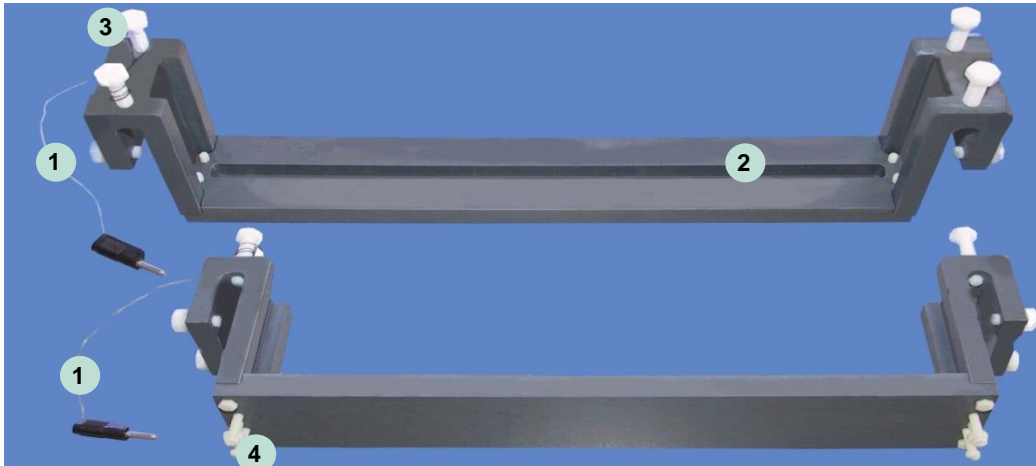


Single and double-row contact fixtures for nickel electro-plating (bath temperature max. 60 °C)

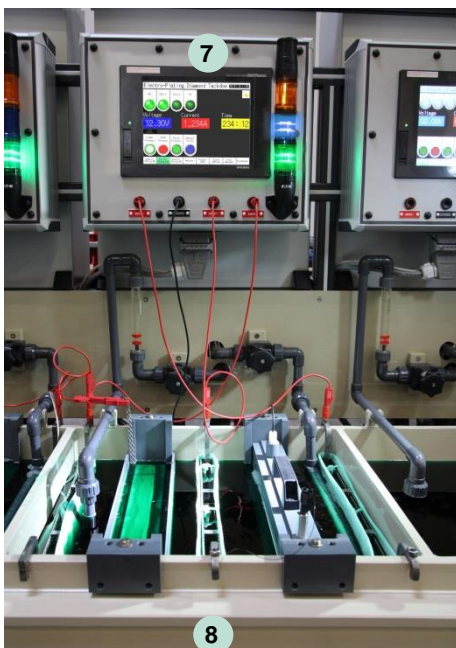
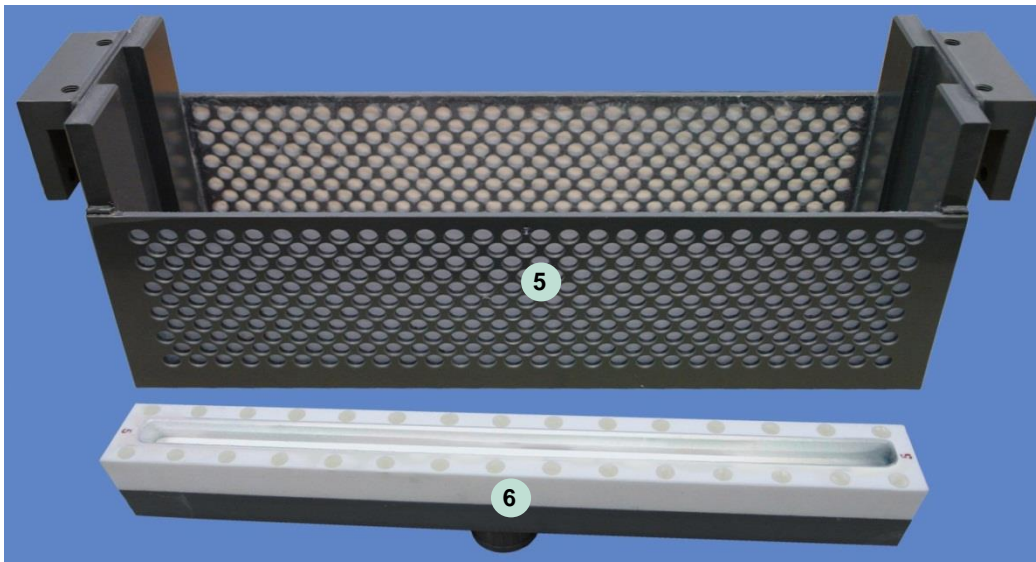


1. Contact fixture
2. Contact cable with plug
3. Contact part to connect the blind cathode

Pre- and finish nickel fixture



Diamond tackdown fixture



1. Blind- cathode wire and plug
2. Groove to hold blind-cathode wire
3. Mounting and adjustment screws for pre- and finish nickel fixture
4. Height adjustment screws for contact fixture
5. Diamond tackdown cassette diamond-retaining tissue
6. Diamond tackdown insert for single-row fixture (grit size 5 μm)
7. Diamond electro-plating control DBS 3A-45
8. Diamond electro-plating station

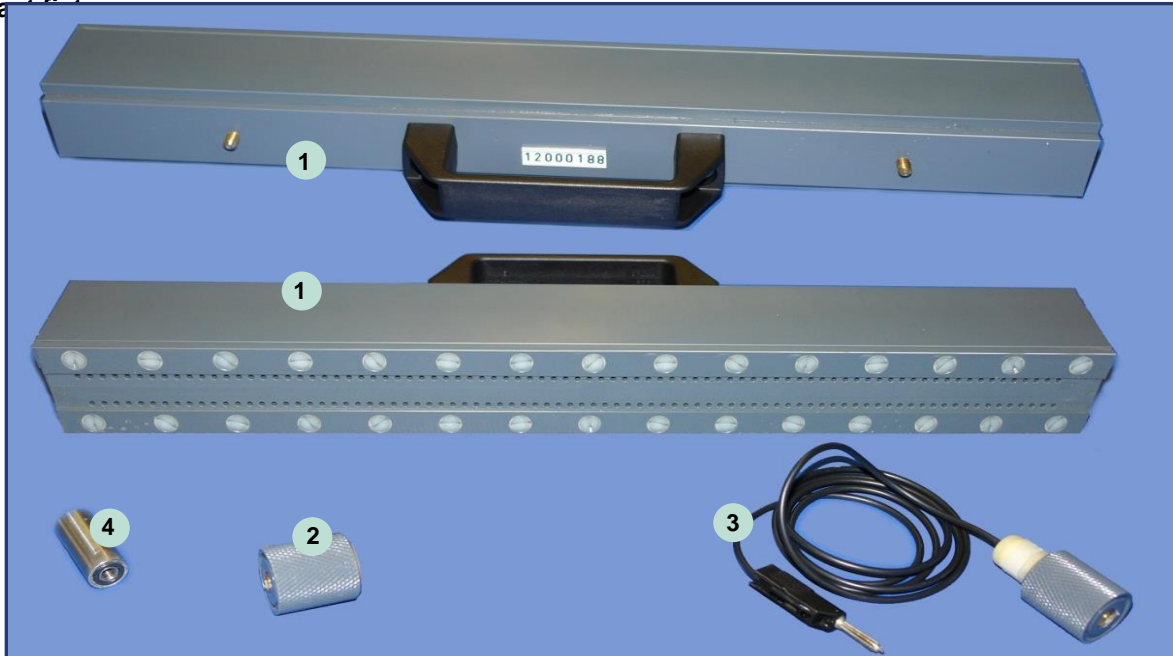
Electro-plating station with diamond tackdown fixture (left) and pre- and finish nickel fixture (right)

Special Equipment - Dental

- Dental Burrs
- Flexible Discs
- Finishing Strips

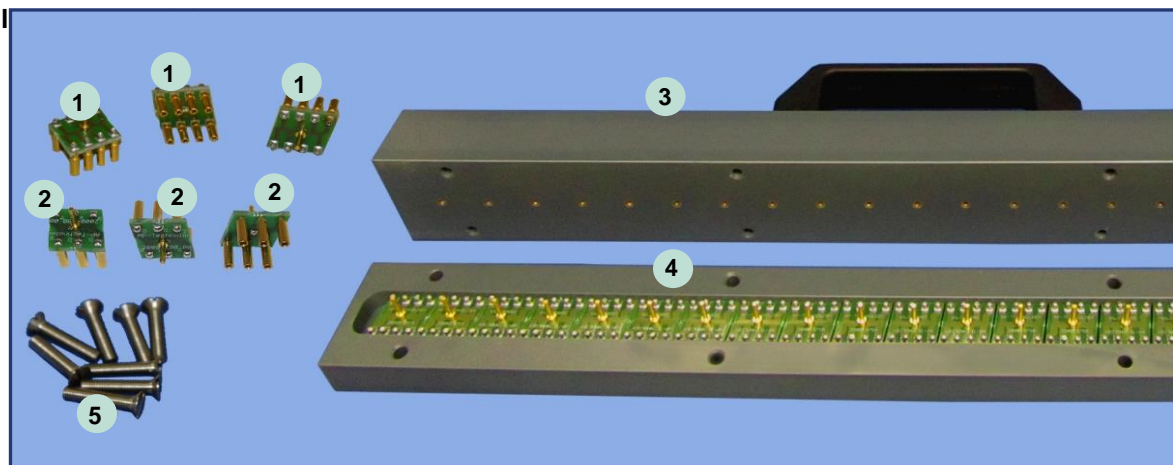
Fixture System for the Manufacturing of Dental Burrs FG, H, HP and RA 460-2/002

Contact fixture



1. Contact strip
2. PVC blind plug for blind-cathode connection for pre-treatment
3. Contact cable with contact plug
4. Blind cathode connection piece for contact fixture

Detail

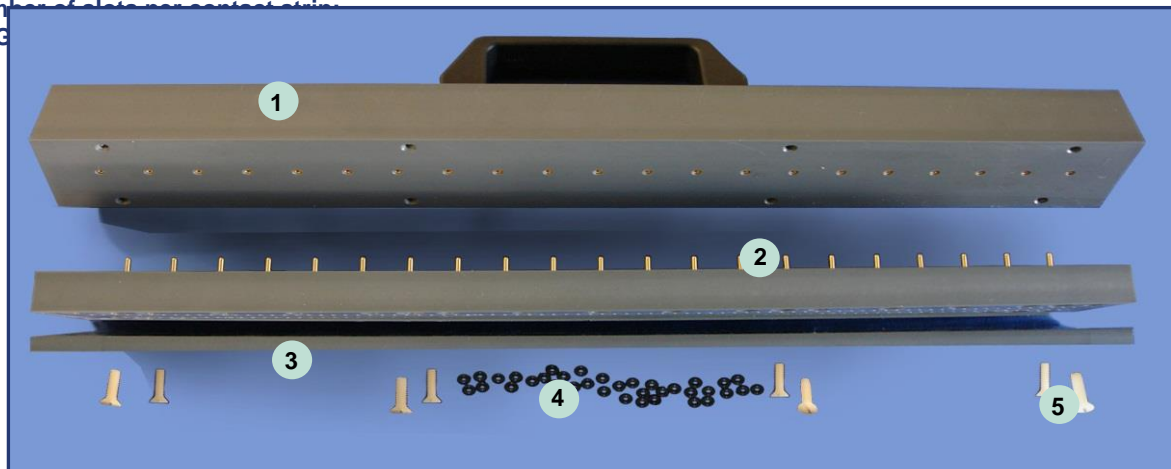


1. Contact modules FG with 8 slots each (21 pcs/fixture)
2. Contact modules H, HP, RA with 6 slots each (20 pcs/fixture)
3. Contact strip – top part
4. Contact strip – bottom part
5. Titanium bolts (8 pcs)

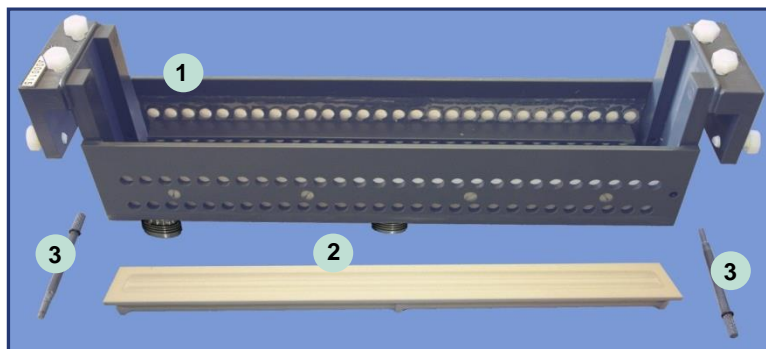
Assembly of contact fixture:

Number of slots per contact strip:

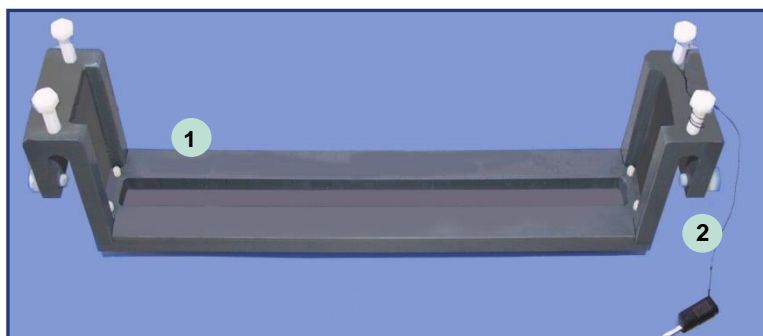
◆FG



1. Contact strip – top part
2. Contact strip – bottom part with contact modules
3. Contact strip – bottom cover
4. O-rings for contact sockets
5. PP screws (30 pcs)

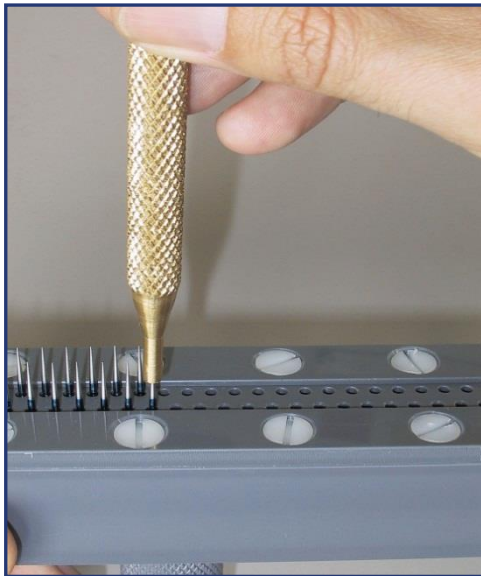


1. Holder for diamond tack-down insert with diamond retaining sieve
2. Diamond tack-down insert (trough)
3. Locking pins for diamond tack-down insert (2 pcs)

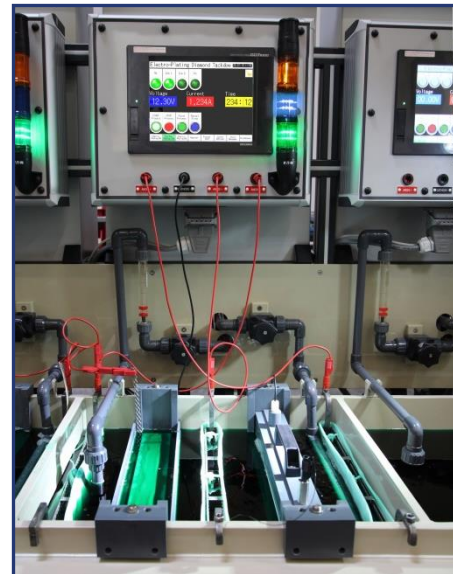


1. Pre- and finish nickel fixture
2. Blind cathode wire with plug





Push-in tool for dental burr blanks



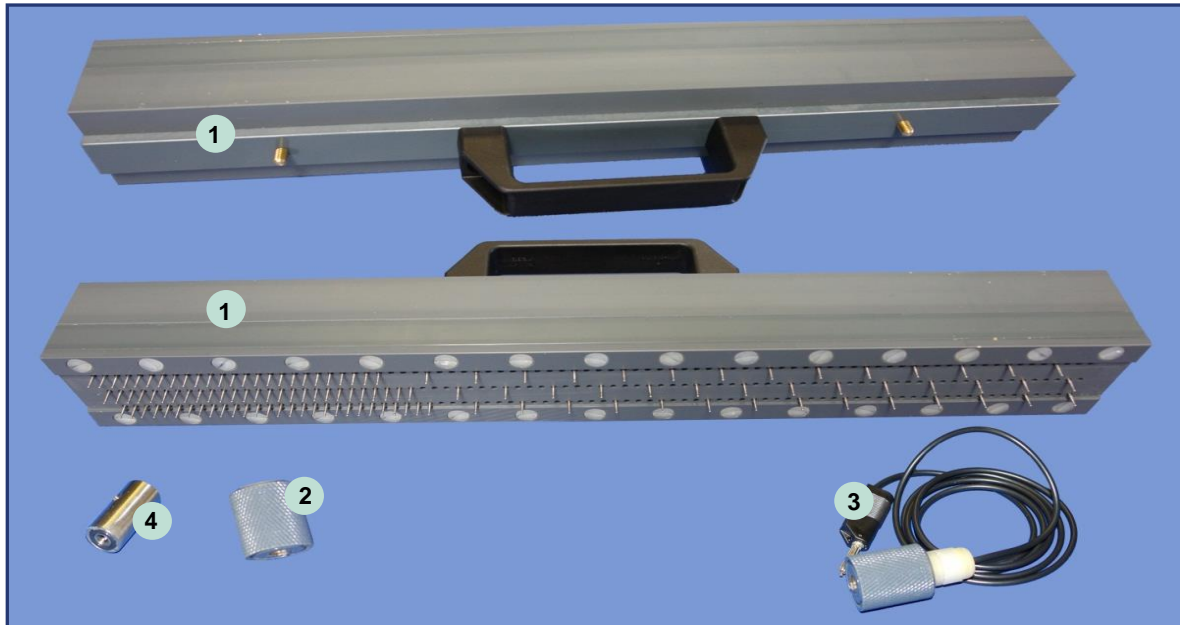
Electro-plating station with pre- and finish nickel fixture (right) and diamond tack-down fixture (left)

Production capacity per electro-plating station:

Grit size FEPA (US mesh)	Process time (min)	Production rate (pieces)			
		FG type		H, HP, RA types	
		Single shift (8 h)	Two shifts (16 h)	Single shift (8 h)	Two shifts (16 h)
D151 (100/120)	195	336	672	240	480
D107 (140/170)	120-135	504-672	1176-1344	360-480	840-960
D20 (~800)	50	1512	3192	1080	2280

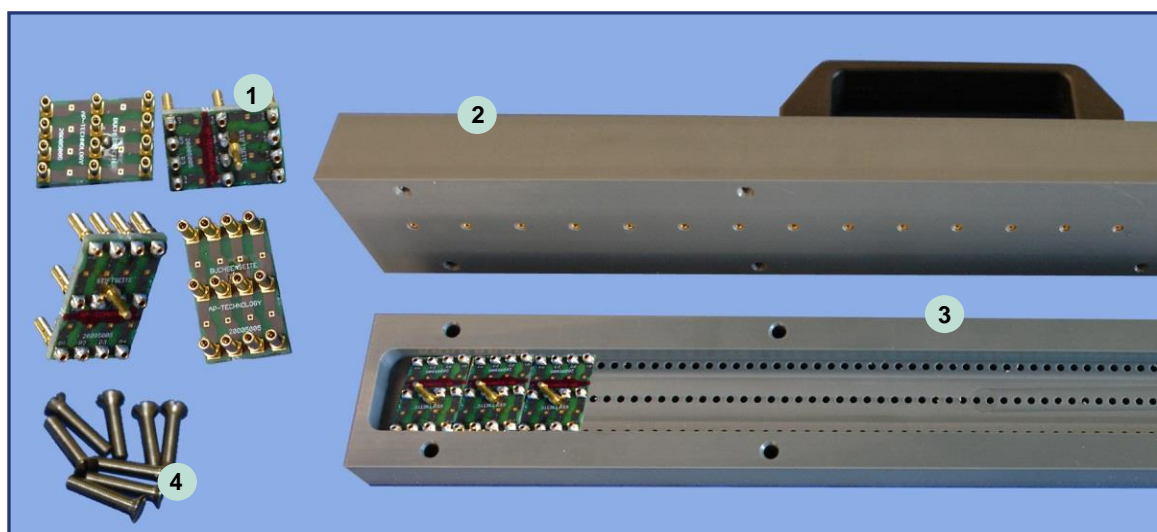
Fixture System for the Manufacturing of Dental Burrs FG, H, HP, RA 460-3/002

Contact fixture



1. Contact strip
2. PVC blind plug for blind-cathode connection for pre-treatment
3. Contact cable with contact plug
4. Blind cathode connection piece for contact fixture

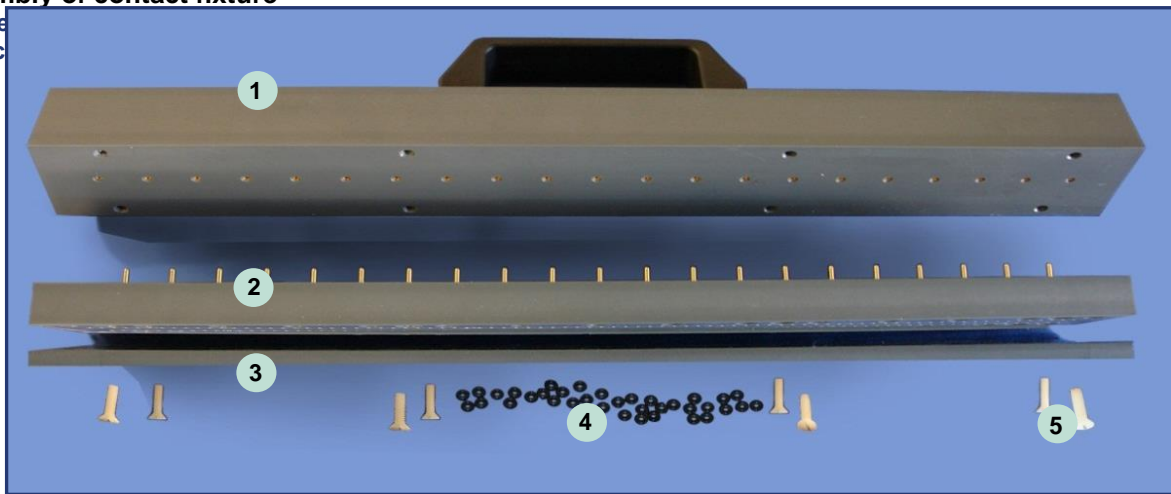
Detail contact modules



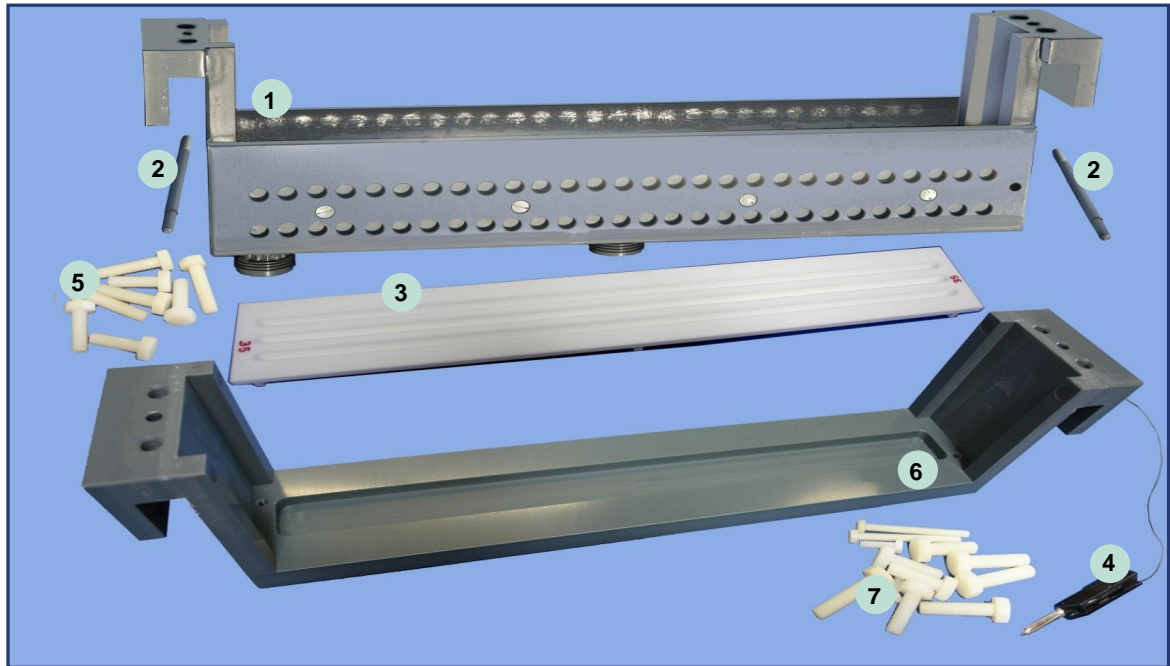
1. Contact modules FG with 12 slots each (21 pcs/fixture)
2. Contact strip – top part
3. Contact strip – bottom part
4. Titanium bolts (8 pcs)

Assembly of contact fixture

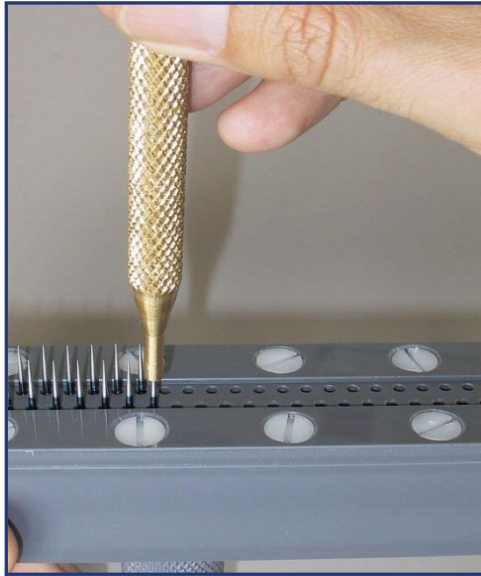
Number
◆ FG c



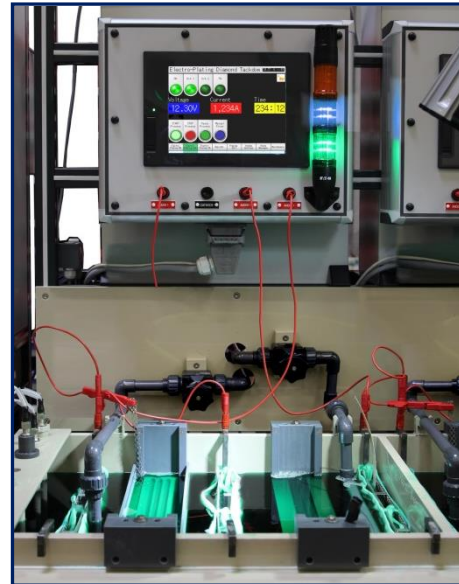
1. Contact strip – top part
2. Contact strip – bottom part with contact modules
3. Contact strip – bottom cover
4. O-rings for contact sockets
5. PP screws (30 pcs)



1. Holder for diamond tack-down insert with diamond retaining sieve
2. Locking pins for diamond tack-down insert (2 pcs)
3. Diamond tack-down insert (trough; for 35 µm grit size)
4. Blind cathode wire with plug
5. Holding and set screws for diamond tack-down fixture
6. Pre- and finish nickel fixture
7. Holding and set screws for pre-and finish nickel fixture



Push-in tool for dental burr blanks



Electro-plating station with diamond tack-down fixture (left) and pre- and finish nickel fixture (right)

Production capacity per electro-plating station:

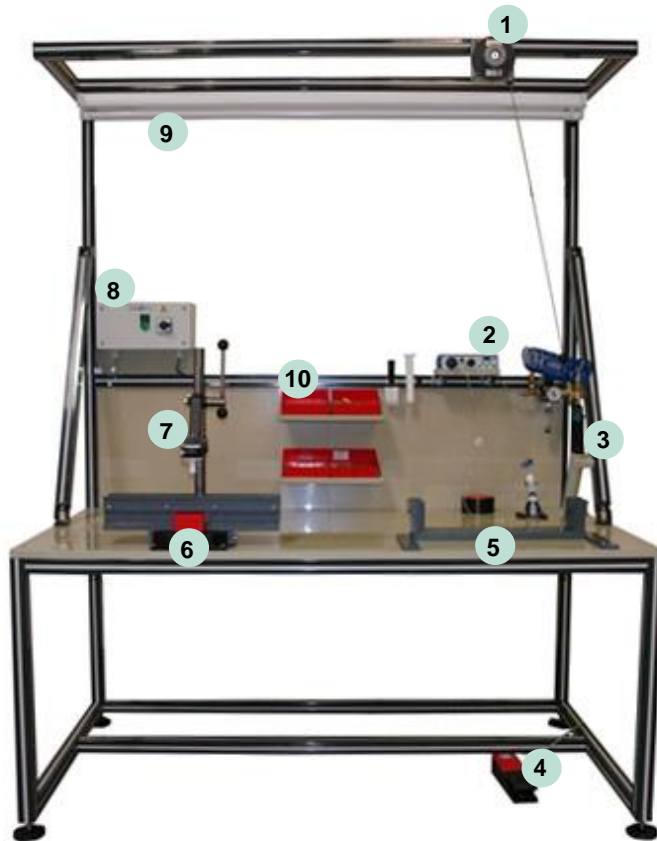
Grit size FEPA (US mesh)	Process time (min)	Production rate (pieces)			
		FG type		H, HP, RA types	
		Single shift (8 h)	Two shifts (16 h)	Single shift (8 h)	Two shifts (16 h)
D151 (100/120)	195	504	1008	360	720
D107 (140/170)	120-135	756-1008	1512-2016	540-720	1080-1440
D20 (~800)	55	2000	4000	1620	3240



Maintenance Unit for Contact Fixtures Dental FG, H, HP, RA 460-2/3-002

Maintenance unit to ease the disassembly and assembly of the contact fixtures for dental burrs FG, H, HP and RA.

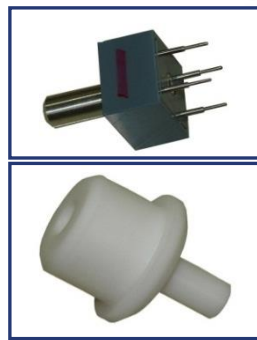
The corresponding tools and installations allow for quick and correct disassembly and assembly of the contact fixtures to preserve their function, ensure reproducible electro-plating results and prolong their service life.



1. Spring-loaded cable spool for compressed-air hose
2. Liquid-rubber dosing unit
3. Compressed-air torque screwdriver
4. Footswitch for liquid-rubber dispensing for disassembly / assembly of contact fixture
5. Position for removal of contact modules
6. Punch-out press for contact modules
7. Switch box
8. Lighting
9. Storage trays for small parts



Punch-out press for contact modules



Tool and holding adapter to punch out contact modules



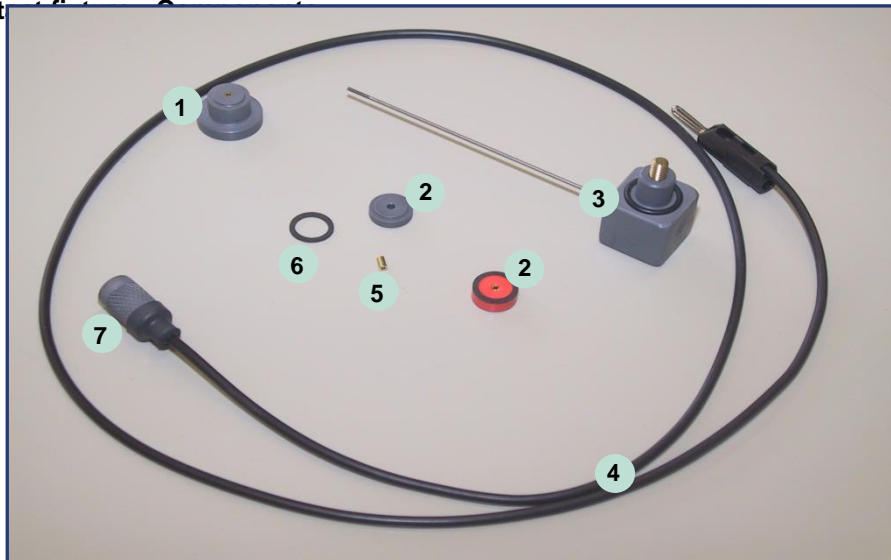
Dispenser unit for liquid rubber



Tools for disassembly of fixtures

Fixture system for flexible diamond discs (Dental) - N

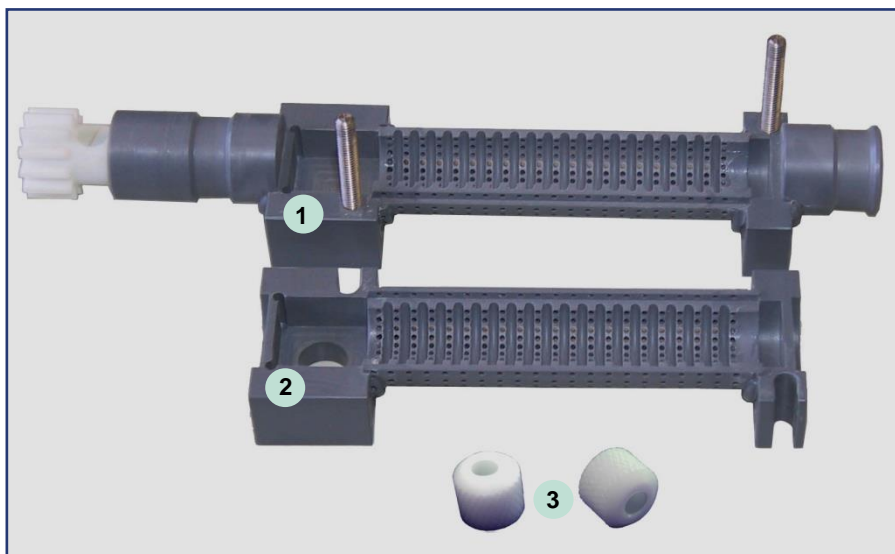
Content



1. Locking piece
2. PVC spacer
3. Contact block
4. Contact cable
5. Brass contact piece
6. Seal
7. Contact plug



Plating and shielding fixture - components

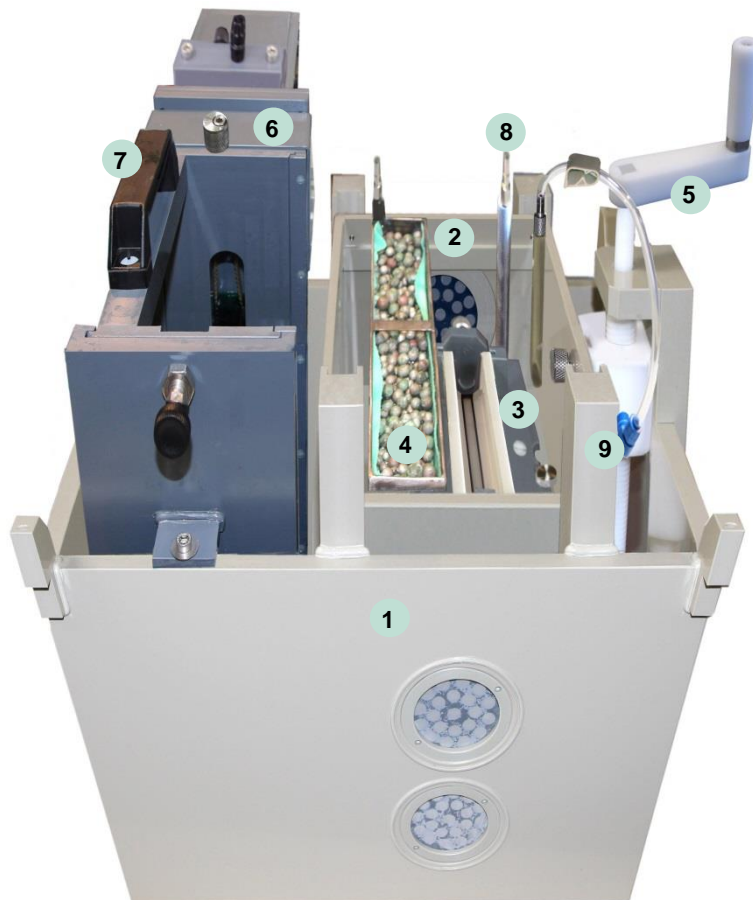


1. Electro-plating fixture – bottom part
2. Electro-plating fixture – top part
3. Quick-release nuts (2 pcs)

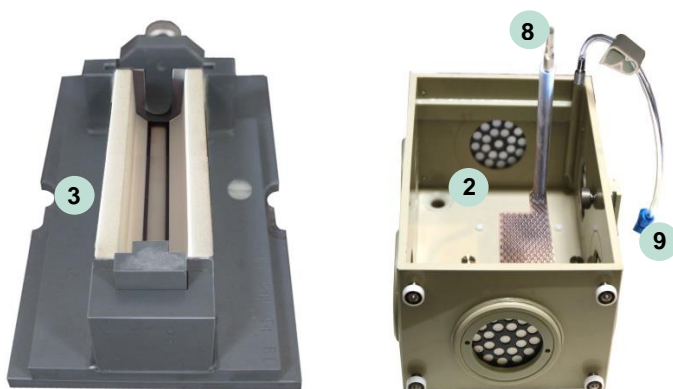


Note: All illustrations are examples. The product may vary from the illustrations.

Flexible discs electro-plating cassette with diamond tack-down fixture



1. Electro-plating cassette BKA 941
2. Diamond tackdown cassette DKA 951
3. Diamond tackdown fixture
4. Titanium anode basket box
5. Lifting and lowering installation for pre-nickel / diamond tackdown
6. Horizontal motor unit HAE
7. Holder for finish nickel fixture
8. Auxiliary anode for pre-nickel / diamond tackdown
9. Rinsing hose for electrolyte



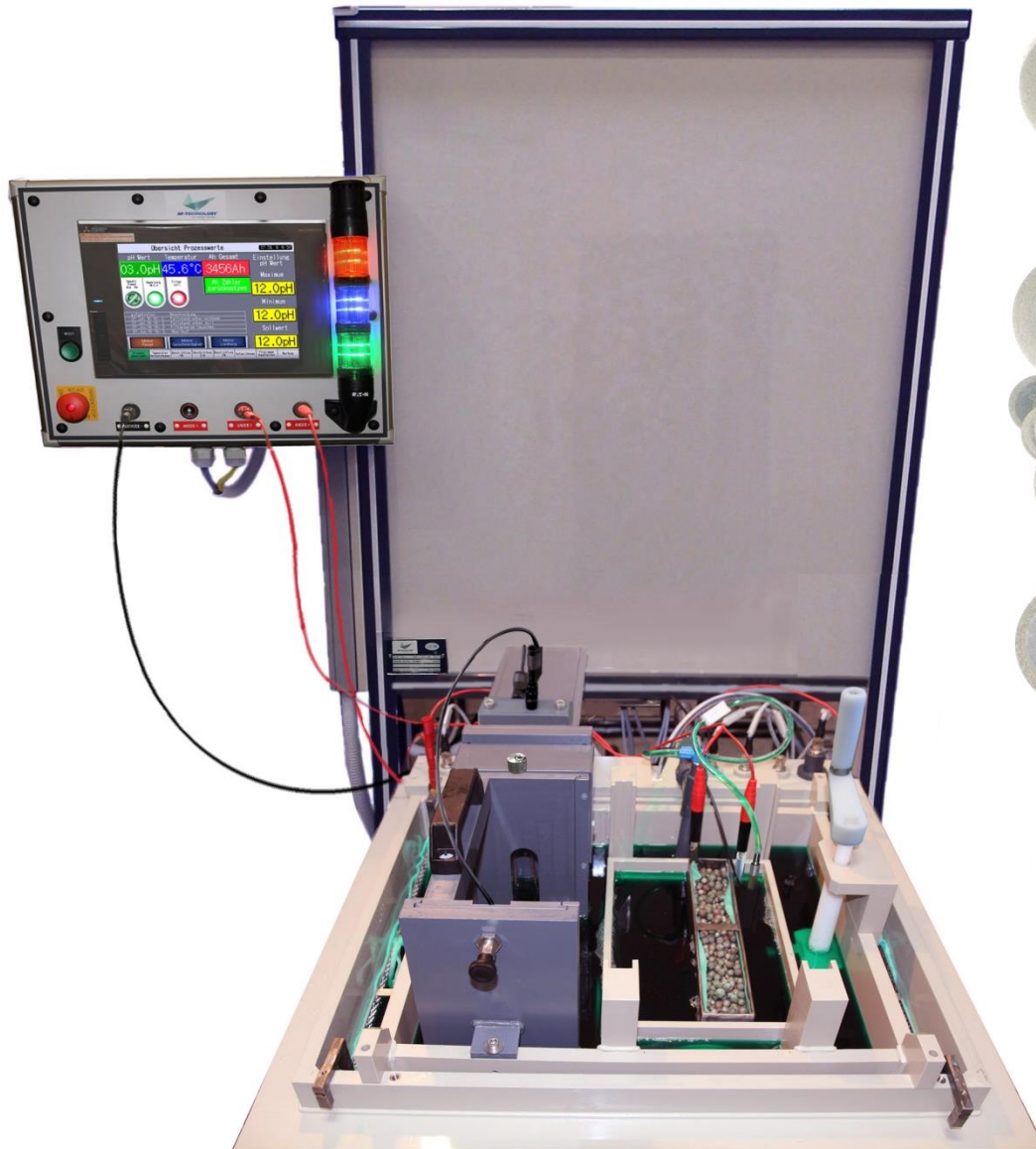
The discs are produced in sets of 10, 15 or 20 pieces.
The fixture is adapted to the respective disc type..

Possible dimensions of the flexible discs:



Outer diameter: 6 mm – 45 mm
Thickness of blank: 0,05 – 0,3 mm

Diamond Electro-Plating Control DBS XX A-45 with PLC and Touch screen
Flexible discs electro-plating cassette inserted into electro-plating station



Production capacity per electro-plating station:
(Example)

Grit size FEPA (US mesh)	Process time (min.)	Production rate (pieces)			
		19 x 0,05 mm (20 pcs.)		22 x 0,1 mm (20 pcs.)	
		Single shift (8h)	Double shift (16 h)	Single shift (8h)	Double shift (16 h)
D107 (140/170)	165	60	120	60	120
D46 (325/400)	106	80	180	80	180

Rotation System for the Manufacturing of Diamond Foils and Finishing Strips

Diamond Electro-Plating Control DBS 50 A/45

- Power ratings: 230 V, optional 110 V
- Rated current: 50A /18V DC
- Visualization and sequence control (current, voltage, leak current, timer [time run], constant voltage, pumps, motors, valves, rotation of fixture, etc.) by touch screen operator terminal
- Interfaces for connection to Intranet
- Individual adaptation of the touch screen functions possible.

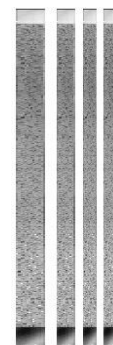
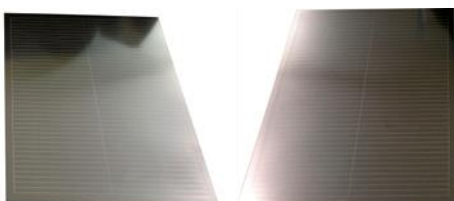


Electro-plating cassette BKA 942/002

- for holding and rotation of the contact fixture during the electro-plating process
- Horizontal motor unit HAE 971/003 with reversing rotation
- Diamond retaining filters to prevent spillage of diamond grits into the electrolyte circuit

Rotation and contact fixture RKW-001

- To hold the stainless-steel foil for electro-plating. The stainless-steel foil may be pre-etched or smooth, in which case it is cut by laser to the appropriate dimensions of the finishing strips.



Production capacity/electro-plating station (pieces):

Grit size FEPA (US mesh)	Process time	Foil dimensions: 295 x 380 mm (2 pieces)	
		Strip width	1-shift (8 h)
D54 (270/325)	145 min	4 mm	1008 pcs
		6 mm	684 pcs
		8 mm	516 pcs
D30 (400/500)	90 min	4 mm	1680 pcs
		6 mm	1140 pcs
		8 mm	860 pcs

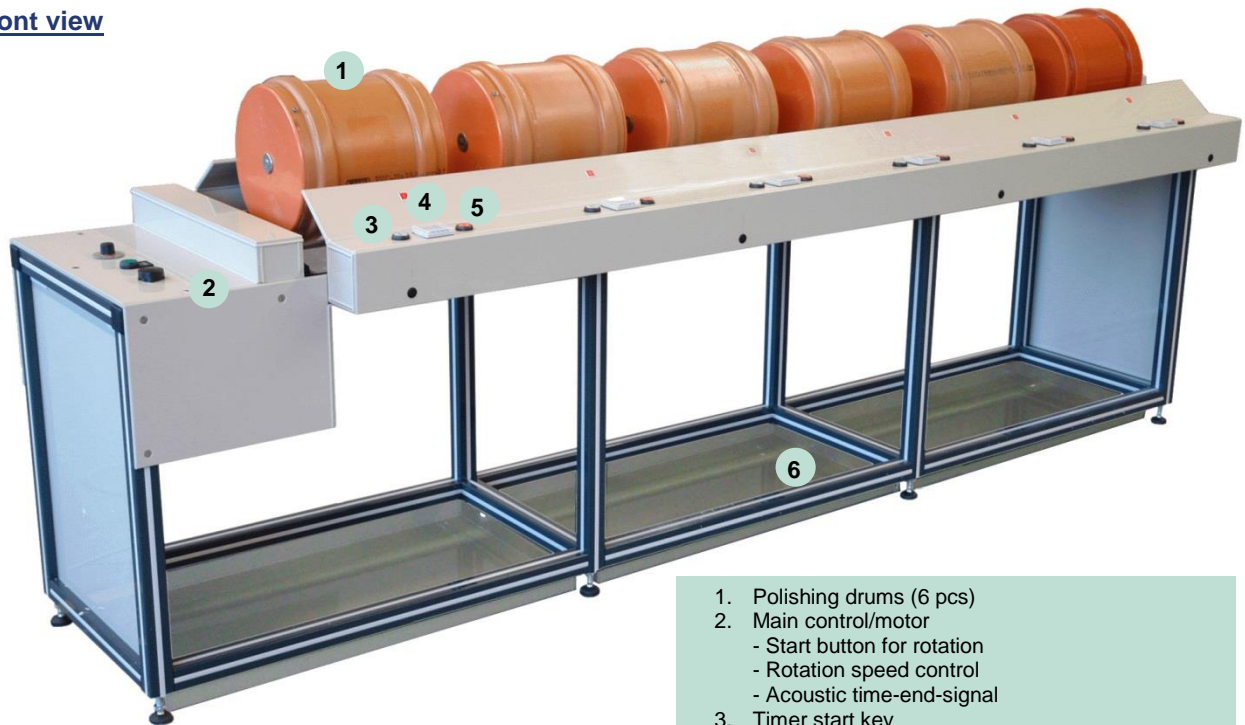
Special Systems

- Drum Polishing System TPA 6-250
- Etching System EDB 4-DPW/AL-XXX
- Displaceable Diamond Rinsing Unit DSH 1-ABR/001

Drum polishing system TPA 6-250

For polishing dental burrs, grinding pins and similar parts.

Front view



1. Polishing drums (6 pcs)
2. Main control/motor
 - Start button for rotation
 - Rotation speed control
 - Acoustic time-end-signal
3. Timer start key
4. Timer for polishing process 01 min - 99 h 59 min
5. Timer Stop key
6. Drip collection pans (3 pcs)

- Simultaneous polishing of up to 6 different tool types
- Individual pre-set of the different polishing time intervals
- Continuous speed adjustment 3 – 20 1/min
- Polishing drums can be inserted/removed individually
- Removable drip-collection pans

Polishing drum Type 1: Ø 250 mm, Volume 14 litres Type 2: Ø 200 mm, Volume 7.5 litres

Etching system EDB 4-DPW / AL-XXX for Dicing Blades with Aluminium Hub

For the final processing of high-precision diamond-penetrated cut-off wheels (dicing blades) with aluminium hub after electro-plating.

The cutting edge is revealed by the etching process.

The etching system comprises:

- An etching station with a heater control HS 501-01, a process-time control PZS 510-001 with five programmable timers with visual and acoustic time-end signal; a circulation pump and a two-cascade standing sink;
- A clarifying bath including a rim exhaustion as well as a two-cascade standing sink;
- A hot-rinsing (de-watering) station to eliminate all and any water residues from the blades and thus preventing the formation of spots on the surface; including a heater control HS 501-002;
- A drying station including a hot-air blower control HGS 520-001 and a process-time control PZS 510-001.

The etching station allows the insertion of 5 etching fixtures with 27 pcs. dicing blades each, and thus the simultaneous processing of 135 parts. The drying station can accordingly hold 5 fixtures and thus 135 parts.

Front view



Holding fixture for the etching of dicing blades with AL-hub for 27 pcs each; assembled (left); components (right)



Displaceable Diamond Rinsing Unit DSH 1-ABR/001

With the mobile diamond rinsing unit, an easy, flexible cleansing of the diamond tackdown or reverse-plating fixtures and rotation installations on location is possible and the need to displace large and heavy parts such as e.g. electro-plating cassettes over longer distances is obviated.

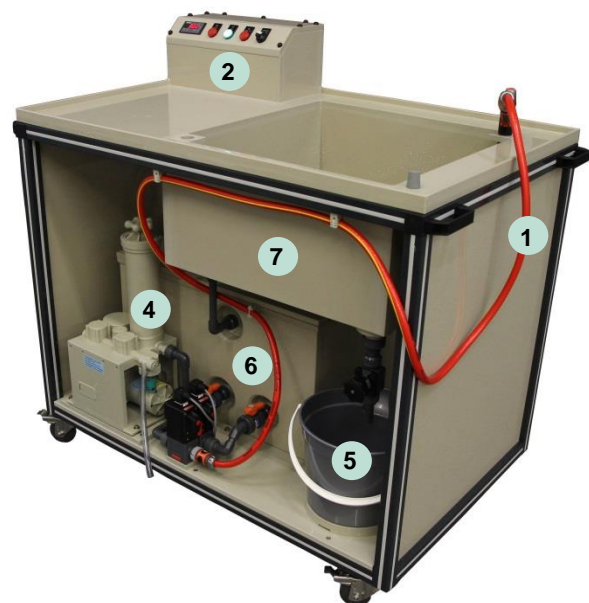
The rinsing unit has a 68 l reservoir for the rinsing solution, a feed pump and a hand spray head.

The rinsing solution is led in a closed circuit back to the reservoir. In order to maintain the service temperature, or it is pumped out through the spray head to rinse the parts. It can be then emptied through the drain into the collection bucket (to filter out the diamond grits) or be pumped back into the reservoir through the filter.

The reservoir is equipped level and temperature sensors. The diamond grits which have been rinsed out can be recovered by filtering, cleaned and re-used.



Front view



Rear view



Inside view of rinsing tank

1. Rinsing hose with spray head
2. Control panel
3. Power cord with main switch
4. Feed pump / Filter
5. Collecting bucket for rinsing solution / diamond grits
6. Reservoir for rinsing solution (68 l) with level sensor
7. Rinsing tank

Product and Furnishing Range

Pre-treatment plants for

- Steel, brass, copper, bronze etc.
- Aluminium
- Diamond, CBN

Plants for avoidance and treatment of waste water

- Recirculation of rinsing waters
- Reverse osmosis systems
- Vacuum evaporators

Diamond electro-plating plants for manufacturing

- Dental instruments
- Tools for machining marble, granite, gem stones, tungsten carbide, steel, glass, ceramics, silicon, plastics, special materials
- Pieces for wear resistance
- Sharpening steels etc.

Electroless nickel plants for

- High-precision grinding tools
- Diamond and CBN coating

Special equipment to optimize the plating process

- Contact fixtures
- Diamond tackdown fixtures
- Masking fixtures
- Lifting and lowering tables
- Rotation units
- Rivet system for flexible discs

Rotational reverse-plating plants for the production of

- Diamond dressing rollers
- Internal plating

Special plants such as e.g.

- Varnishing systems for dental burr blanks

Stripping plants for

- Electro-plated nickel
- Electroless nickel

Engineering and consulting

Systems according to customers' specification

Accessories and chemicals