

Eroding Equipment

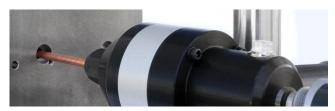


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Superior technology for removing broken-off tools

Broken-off taps cannot be completely avoided even with the most modern manufacturing process. Then the hard, sticking fragment has to be removed from the machined part without damaging the thread or the drilling.

With the **Kullick-Eroding Equipment LE** you solve this problem reliable, fast and without any special knowledge.



The eroding process is a type of electric arc erosion. Together with the outstanding KULLICK-EEC-control system a so far incomparable **ease of use**, **fast eroding**, **high efficiency** and **high operating time** compared with conventional machines is reached. The eroding voltage is always under 25 V. Therefore it is not dangerous even in case of direct contact.

Product video

The product video is useful for a quick overview. It illustrates the use and the function of the KULLICK eroding equipment LE.

Forwarding directly from the homepage: www.kullick-geraetebau.de/erodiergeraete eng.htm



Variants of configuration

The standard program provides different variants of configuration: Constructed as a modular system all variants can be realized afterwards.



Basic configuration LE16 or LE30
Includes everything needed for eroding.
Only electrodes and collets have to be chosen according to the requirements.

→ Page 4-6



Magnetic Eroding Support
For eroding on site.
→ Page 8-9



Tool Trolley GWThe classic trolley, mobile and compact
→ Page 7



Tool Trolley GG
The closed version
→ Page 7



Eroding Table TK 600
Complete eroding unit
→ Page 10

Range of use

- Removal of broken-off tools as taps, twist drills, centre drills, reamers made of HSS and hard metal, from Ø 2 to Ø 60 and larger. Procedure:
 - Erode the core out with a tubular electrode.
 - Take out the loose cutting edges.

2) Removal of broken-off screws:

- Erode an inner square.
- Unscrew by turning the screw with a square tool. Or:
- Erode the screw out completely.
- Put in a thread insert.

The eroding process takes place:

- Directly at every machine tool with sleeve.
- With the magnetic eroding support.
- With the eroding table TK 600.





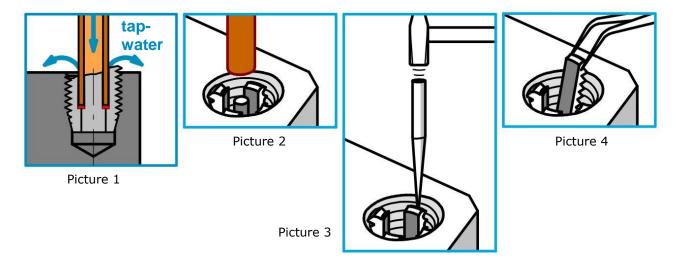


Mode of operation

To remove for example a broken-off tap-fragment, a tubular electrode with half the diameter of the tool (e.g. Ø5 for M10) is clamped into the eroding head. When lowering, electric arcs are ignited between the electrode and the tap-fragment (50 per second). Simultaneous inner cooling through the electrode with in water emulsified cooling lubricants (or tap water) effects erosion of the material [Picture 1]. The core of the tap is hollowed out by that [Picture 2]. Thereafter the cutting edges are free and can then be loosed [Picture 3] and taken out easily [Picture 4].

The removal of broken drills or reamers is similar.

Threads or bore walls are preserved undamaged.



Example of eroding

Broken-off, stuck tap: M12 x 20 deep Used electrode: Cu Ø 6 mm Eroding time: about 2 minutes

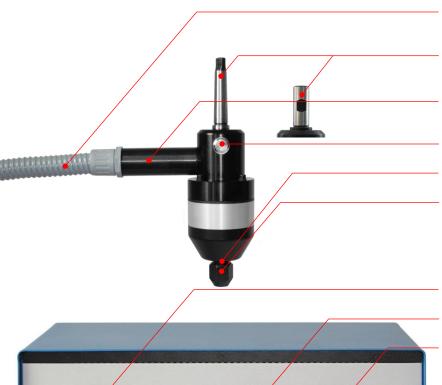
Specification

All eroding equipment LE devices are equipped with the KULLICK-EEC-control, which controls the eroding process. This has decisive advantages:

- Short-circuits, e.g. caused by high pressure or lateral contact of the electrode, are avoided.
 - Therefore the operating time of the devices increases considerably.
- Because of the short-circuit-monitoring of the EEC-control, fixedvoltage and efficient transformers can be used.
 - Eroding becomes more simple.
 - The efficiency of the device is increased.
- The operator gets information about the eroding process.
 - Therefore difficult eroding works are also feasible.
 - Eroding directly at the CNC is possible.







Solid supply hose with steel coil. Length 3,5 m (optional 5 m or 6 m).

Morse taper MT2 or parallel shank Ø20 with clamping surface.

Grab handle to tighten the clamping nut and to protect the inner connections.

Eroding power lamp, 180° readable.

Hardened clamping nut thread.

Collet system:

For collets Ø1 - Ø12.

Electrodes up to $\emptyset12$ can be inserted 130 mm deep into the eroding head. Larger electrodes with clamping pin $\emptyset10$.

Main switch

Eroding step switch

Pump and eroding head On - Off

Carry handles at the sides

Eroding step chart

Eroding power display

- Gives information about the eroding process.
- Shows the proper feed, important with eroding at the CNC. See also page 8.

Functional lamps

Backside:

Eroding head connections, pump socket, fuses, power cable with connector

KULLICK

LE 30

Two Device Sizes





Туре	LE 16	LE 30		
Application	Small to medium eroding work	Small to larger eroding work		
For removal of tools with Ø	2 - 20	2 - 60		
Erodible material	Steel / HSS / hard metal	Steel / HSS / hard metal		
Switch steps	5	6		
EEC-control	Standard	Standard		
Eroding head for collets Ø	1 - 12	1 - 12		
Controller weight	28 kg	33 kg		
Controller dimensions	B490 H225 T310	B490 H225 T310		
Electr. connected load	400V 50/60Hz 16A	400V 50/60Hz 16A		
Eroding Power Display	Accessory	Standard		
Order no.	100.160	100.300		

Standard Configuration

- Controller LE 16 or LE 30 with PU-power cable 5 m and connector plug
- **Eroding head** with supply hose 3,5 m (optional 5 m or 6 m)
- Coolant pump, self-priming, with suction hose 2 m and strainer
- Minus cable pliers with cable 3,5 m (optional 5 m or 6 m)
- Accessories: Clamping nut key, 20 splash guard bags, angle tweezers, LED-test lamp, operating instructions / technical documentation



The standard configuration contains all components which are needed for eroding. Only electrodes and suitable collets have to be chosen according to the requirements. Please have a look at page 6. You will find additional accessories on page 7 - 10.

Electrodes and collets

KULLICK electrodes are optimized for the electric arc eroding concerning alloying constituents and ratio of outside to inside diameter. So a secure evacuation of the abrasion particles is ensured, a welding up of the electrode is prevented and best results of eroding will be achieved.

KULLICK brass collets centre themselves in the eroding head. They conduct the eroding current and guarantee a firm hold of the electrodes.



The correct electrode diameter:

broken-off tool	electrode Ø			
tap	0,5 x thread Ø			
twist drill	0,5-0,7 x drill Ø			
reamer	0,5-0,7 x reamer Ø			

The correct type of electrode:

Eroding material	Type of electrode		
HSS / steel / non-ferrous metal	CU-/ WK-electrode		
Hard metal	WK-electrode		

Abrasion of the electrodes:

Cu-el. in HSS and WK-el. in hardmetal: ca. 1 \times eroding depth WK-el. in HSS: ca. 0,1 - 0,2 \times eroding depth

	COLLETS		CU-ELECTRODES			WK-ELECTRODES		
Ø	Order no.	Ø	Length	Order no.	Ø	Length	Order no.	
1	102.010	1	200	105.010	1	175	107.010	
1,5	102.015	1,5	200	105.015	1,5	175	107.015	
2	102.020	2	200 (300)	105.020 (106.020)	2	175 (360)	107.020 (108.020)	
2,5	102.025	2,5	200 (300)	105.025 (106.025)	2,5	175 (360)	107.025 (108.025)	
3	102.030	3	250 (500)	105.030 (106.030)	3	175 (360)	107.030 (108.030)	
3,5	102.035	3,5	250	105.035	3,5	175	107.035	
4	102.040	4	250 (500)	105.040 (106.040)	4	175 (410)	107.040 (108.040)	
4,5	102.045	4,5	250	105.045	4,5	175	107.045	
5	102.050	5	250 (500)	105.050 (106.050)	5	175 (410)	107.050 (108.050)	
6	102.060	6	250 (500)	105.060 (106.060)	6	175 (410)	107.060 (108.060)	
7	102.070	7	250	105.070	7	150 (390)	107.070 (108.070)	
8	102.080	8	250 (500)	105.080 (106.080)	8	150 (390)	107.080 (108.080)	
10	102.100	10	250 (500)	105.100 (106.100)	10	150 (390)	107.100 (108.100)	
12	102.120	12	250 (500)	105.120 (106.120)	12	150 (390)	107.120 (108.120)	
			250 (500)	105.140 (106.140)	Long WK-electrodes (order no. 108.xxx) consist of WK 175 or 150 mm long and Cu-extension. For more details have a look at the price-list.			
With clamping pin —		16	250 (500)	105.160 (106.160)				
		18	250 (500)	105.180 (106.180)				
		20	250 (500)	105.200 (106.200)				
Ø 10		22	250 (500)	105.220 (106.220)				
		25	250 (500)	105.250 (106.250)				
		30	250 (500)	105.300 (106.300)				

Additional Accessories

Tool Trolley GW Order No. 110.000 (Delivery without components)

- The proven classic trolley everything is completely and ergonomically placed.
- Suitable for all device sizes: LE 16 or LE 30
- Dimensions: 550 x 620 x 860 [width x depth x height]



Repository for electrodes, collets and accessories.

Deepened storage.

Controller LE and operating components are arranged protectively.

Space for the coolant reservoir.

Eroding head holder and hose holder.

Safe fastening of the pump.

Big, smooth-running rollers.



Tool Trolley GG Order No. 115.000 (Delivery without components)

- The closed version comfortable and ergonomic.
- Suitable for all device sizes: LE 16 or LE 30
- Dimensions: 600 x 780 x 1000 [width x depth x height]



Big, deepened storage. -

Stable, smooth-running drawer for electrodes, collets and accessories.

Controller LE and operating components protectively and ergonomically positioned. In the complete housing removable.

Space for the coolant pump and the coolant reservoir (on slide rails).

Also almost completely closed from behind. The deepening with hose- and eroding head holder provides space and protection for the eroding head (even with 6 m hose package), the minus-cable and the electric supply.

Big, smooth-running rollers.







Coolant Reservoir Order No. 120. 000

- 30 litres, with handle and cover.
- · Accurately fitting into the tool trolleys GW and GG.



Eroding Power Display Order No. 150.000

- Precise viewable eroding process.
- Shows the correct eroding feed therefore essential with use at the CNC.
- For controller LE 16 (for LE 30 standard configuration).



Eroding Head Hose Extension Order No. 170.000

• Extensions the 3,5 m long eroding head hose to 6,5 m total length if required.



Quick assembling without tools.

(Also deliverable permanently installed extended eroding head hoses 5 m or 6 m long, see page 5 standard configuration.)

Magnetic Eroding Support Order No. 160.000

- The magnetic eroding support is especially designed for eroding on-site.
- The eroding head can be reliably positioned, easily adjusted and precisely fed.
- Big adjusting ranges enable the use on complex workpieces too.
- The two high-performance magnets need only small base areas so that the magnetic eroding support can also be used with narrow space.



- Attachment for MT2 or parallel shank Ø20.

Fine eroding stroke 150 mm.

Spindle movement allows a sensitive feed.

Therefore also suitable for difficult eroding works.

Flexible with 3 adjusting axes:
Horizontal, vertical, longitudinal and angular adjustable.

Position easily and quickly to adjust with a clamping lever.

Robust trapezoidal spindle drive, self-locking, therefore safe hold in every position.

· High stiffness because of 2 hard-chrome-plated guide pillars.

Robust hard-chrome-plated guide pillars.

- Setting up and removing with eccentric brass wheel.

2 high-performance magnets for safe hold with each max. 1800 N. Electrical connection is not necessary. Removable, thereby the ground plate can also be mounted directly, for example at unmagnetic work pieces.

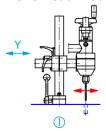


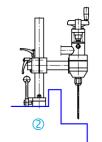


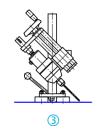


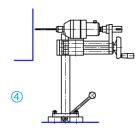
Y-axis longitudinal and angular adjustable, thereby:

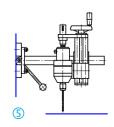
- Exact, easy positioning of the electrode (precise positioning of the magnets not necessary). ①
- Bridging of steps, edges, drill holes.
- In any angle erodible. 3 4 5
- Overhead Eroding. 6

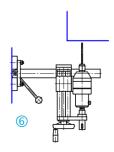






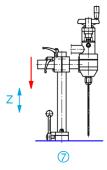


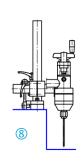


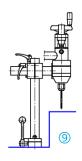


X-axis longitudinal and angular adjustable, thereby:

- Enlarged depth of eroding by readjusting. ⑦
- Eroding in deepenings and over steps. ® 9

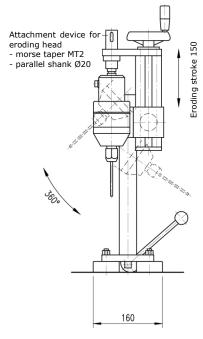


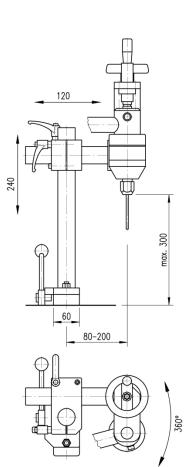




Dimensions and weight

Weight (without eroding head): 12 kg Delivery without eroding head.





Eroding Table TK 600 Order No. 180.000 (Delivery without components)

- Compact, fully integrated unit all completely and ergonomically housed.
- Suitable for all device sizes: LE 16 or LE 30



Eroding stroke 150 mm with self-locking spindle and handwheel for easy, sensitive eroding.

Height-, cross- and angular-adjustment withclamping lever.

Hard-chrome-plated pillars.

Table

- 600 x 700 mm with 4 T-slots (M8x10) and coolant drain channel.
- Return hose to the coolant reservoir.

Stable, smooth-running drawer for electrodes, collets and accessories.

Controller LE and operating components protectively and ergonomically positioned. In the complete housing removable.

Space for the coolant pump.

Coolant reservoir (on slide rails) included.

Also almost completely closed from behind. The deepening with hose- and eroding head-holder provides space and protection for the eroding head (even with 6 m hose package), the minus-cable and the electric supply.

Height adjustable feet (or with rollers).











Configuration also with mobile magnetic eroding support and rollers.

For the universal use at the eroding table, at the machine tool or at big workpieces on site.

