

Operation Instructions



microtap II

megatap II

jobtap

© copyright microtap GmbH 05.1994 - 2016

All information, know-how and illustrations contained in these operating instructions are the sole property of *microtap GmbH*.

Without expressed permission from *microtap GmbH* neither the entire operating instructions nor any parts thereof may be communicated directly or indirectly to third parties, nor may they be copied or used other than for the purpose for which they are supplied.

General information, list of contents, SAFETY INSTRUCTIONS	1
Technical data	2
Description	
Assembly, Commissioning	3
Operation machine	4
Maintenance	5
Trouble shooting	6
Spare parts	7
Integration of optional Accessories	8
Product overview	9

Date of original issue: **Version 01.94**

Date of this issue: **Version 01.16**

TABLE OF CONTENTS

1.	GENERAL INFORMATION	4
1.1.	Declaration of EC-conformity	4
1.2.	Warranty-/Operating procedure Certificate	5
1.3.	Operating conditions	6
1.4.	Definitions.....	6
1.4.1.	Viewing definitions	6
1.4.2.	Validity of the operating instructions	6
1.5.	Definition of pictograms.....	7
1.6.	Safety instructions.....	8
1.7.	Specific operating instructions for the operator	9
1.8.	Possible risks to health and safety	10
2.	TECHNICAL DATA, DESCRIPTION	11
2.1.1.	Dimensions megatap II	14
2.1.2.	Dimensions microtap II	15
2.1.3.	Dimensions base plate.....	16
2.2.	Short description of the machine.....	17
2.2.1.	The automatic thread tapping machine has the following distinguishing features:	18
2.2.2.	Rear side of machine head megatap II / microtap II	19
2.3.	Thread tapping terms	20
2.4.	Static fracture torque of taps.....	23
3.	ASSEMBLY, COMMISSIONING AND RELOCATION	24
3.1.	Off-loading and unboxing	24
3.2.	Commissioning	25
3.2.1.	Location.....	25
3.2.2.	Assembly and commissioning.....	26
3.3.	Relocating the machine.....	27
3.4.	Interfaces, pin-out.....	28
3.4.1.	Connector for lubricating system (receptacle, 4-pins female)	28
3.4.2.	Serial interface RS 232, SUB-D, 9-pin female	28
3.4.3.	I/O user interface connector (SUB-D, 15-pins)	29
3.4.4.	I/O wiring diagramm (internal wiring of the machine)	30
3.4.5.	I/O Samples (external wiring of the machine).....	32

3.5.	Link between PC and thread tapping machine	34
3.5.1.	Set of parameters forwarding to the machine.....	34
3.5.2.	Feedback messages of the thread tapping machine.....	35
3.5.3.	How to request for specific values.....	35
3.5.4.	Quality monitoring.....	36
3.5.5.	Remote control mode.....	36
4.	OPERATING THE MACHINE	37
4.1.	Changing taps.....	37
4.2.	Power Up / working menu.....	38
4.3.	System Setup.....	39
4.4.	Setting / changing the parameter.....	40
4.4.1.	Operating menu.....	40
4.4.2.	Parameter Menu.....	40
4.5.	Manual operation.....	48
4.6.	Thread tapping with option „ZAP“ via remote control.....	49
4.7.	Thread tapping with ZAP-option via RS232.....	50
5.	MAINTENANCE	51
5.1.	Periodic routine maintenance.....	51
5.1.1.	Replacing the dust filter (only megatap II, jobtap / labtap):.....	51
6.	TROUBLE SHOOTING	52
6.1.	General information.....	52
6.2.	Fault report form.....	53
6.3.	Quality, error indications.....	54
6.4.	Opening and closing the machine.....	57
6.5.	Repairs.....	58
6.5.1.	Replacing the fuse.....	58
6.5.2.	Changing the suspension wires.....	58
7.	SPARE PARTS	60
7.1.	General information.....	60
7.2.	Ordering spare parts.....	60
7.3.	Spare parts list.....	61

8.	INSTALLATION OF OPTIONAL EQUIPMENT	62
8.1.	MMS Minimum – quantity – lubricant unit	62
8.1.1.	MMS with blow out unit	64
8.1.2.	MMS with impulse control	65
8.2.	Installation / commissioning the pneumatic feed system (ZAP) to megatap II	66
8.3.	Depth stop	69
8.3.1.	Setting of the depth stop	70
8.3.2.	Working in ZAP mode with depth stop	70
8.4.	DSK double spindle head	71
8.4.1.	Installing double spindle head onto the machine	71
8.4.2.	Adjusting the hole centres	71
8.4.3.	Installing of collet and tool	72
8.4.4.	Maintenance	72
8.5.	LSM Air seal for exit of motor spindle	73
8.5.1.	Mounting of air seal	73
8.6.	Air Blast unit	75
9.	PRODUCT OVERVIEW	76
9.1.	Options and accessories for the thread tapping machine	77
9.2.	Quick change inserts	78
9.3.	Collets – Accessories	79

1. General information

1.1. Declaration of EC-conformity

in view of EC-standard machines 2006/42/EG (89/392/EWG, appendix II A)
89/392/EWG

We,	microtap GmbH Rotwandweg 4 82024 Taufkirchen / München Germany
declare that the machine, described in the following, is due to its concept and design and in the form and version distributed by us conforms to all relevant safety- and health related EC-regulations. This declaration is void if alterations are performed on the machine without prior agreement with microtap GmbH.	
machine term:	Tapping machine
machine type:	microtap II / megatap II / labtap / jobtap
machine serial No.:	xxxxxx - x
Applied EC-standards:	EC-machine regulation 2006/42/EG (89/392/EWG) EC-low voltage regulation 2006/95/EG (73/23/EWG) EC-regulation electromagnetic compatibility 2004/108/EG (89/336/EWG)
Applied harmonized standards:	EN 60 204-1; 1997 1992 DIN EN 292 T1,T2 DIN EN ISO DIN EN 294 DIN EN 349 DIN 8418
Date / signature of producer/legal representative:	January 2016
Information to the undersigner:	Company owner/president: Klaus M. Müller

microtap GmbH
Service department
Rotwandweg 4
82024 Taufkirchen
Germany

Tel.: +49-89-6128051
Fax: +49-89-6127488

1.2. Warranty-/Operating procedure Certificate

With your torque controlled thread cutting machine

and together with the operating instructions as well as our delivery- and payment-conditions you are receiving this confirmed manufacturer warranty document.

Hereby microtap GmbH, Taufkirchen, will be liable as manufacturer to grant a 12 month warranty according to the product-liability law dated 01.01.89 and in the range of our own delivery conditions provided that the copy of this warranty-certificate will be returned to us immediately after taking the a.m. machine into operation.

By sending this certificate with your signature back to us, you acknowledge the receipt of a.m. machine including operating instructions and CE-certificate in good condition.

Received goods:

Machine-type: **Serial-Nr.:**

Invoice-/Delivery Note No.: **Software Version:**

Buyer/Company name with legal form:

Name **Stamp:**

Street:

Address:

Taking a.m. machine into operation acc. to delivered instructions:

Name: **Signature:**

Date:

1.3. Operating conditions

The „microtap II“ versions G2, G5 and jobtap G5 and “megatap II” versions G8, G14, -G16, jobtap G8, -G14, -G16 and labtap G5, -G8 automatic thread tapping machine and its optional accessories are state-of-the-art design and meet all relevant safety regulations.

All versions of the thread tapping machine must be used only in the upright position unless specifically equipped for horizontal operation for the following purposes:

- for thread tapping operation in low- or high volume batches
- as a reference machine for establishing optimum tapping process parameters
- for thread inserts (ENSAT, HELICOIL)
- for torque controlled screwing

Any other utilisation is contrary to its purpose and not allowed.

The manufacturer expressly excludes all responsibility for damage or injury caused by improper use or failure to observe these operating rules; in such event the user shall bear full responsibility.

The machine must be assembled, operated, maintained and repaired only by authorised and trained personnel allocated to the task.

The safety equipment attached to the machine must not be modified or disabled.

Retrofits or modifications of the machine may be carried out only following prior agreement with and in accordance with instructions issued by *microtap GmbH*. The user shall bear full responsibility for any unauthorised retrofits or modifications.

1.4. Definitions

In these operating instructions various types of information is provided. The type of information provided is identified by the following symbols, whose purpose must be adhered to under all conditions.

1.4.1. Viewing definitions

The terms front, back, left, right, top and bottom refer to the parts of the machine as seen from the operating position. The operating lever, for instance, is on the right side of the machine.

1.4.2. Validity of the operating instructions

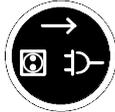
Unless otherwise stated, these operating instructions are valid for the „microtap II“ versions G2, G5 and jobtap G5 and “megatap II” versions G8, G14, -G16, jobtap G8, -G14, -G16 and labtap G5, -G8 automatic thread tapping machines and their listed optional accessories.

1.5. Definition of pictograms

The following pictograms are used in these operating instructions.



Danger! High voltage!



Disconnect mains power supply!



Wear breathing protection!



Protect the environment!



NOTE

This symbol identifies technical features which, if disregarded, can result in machine errors.



CAUTION

This symbol identifies operating instructions which must be followed exactly to avoid damage to the machine, its control system or peripheral system components.



WARNING

This symbol identifies operating instructions which must be followed exactly to avoid risks of injury to personnel; it includes the definition of **CAUTION**. Failure to observe such instructions may lead to death or severe injury.



Manufacturer's hint

This symbol identifies hints and tips offered by the manufacturer, which the operator may find useful.

1.6. Safety instructions

The thread tapping machine and its optional accessories are state-of-the-art design and conform to all relevant safety regulations.

They may however due to their nature give rise to safety risks if they are operated incorrectly by untrained personnel or not in accordance with the operating instructions.

Operating risks can only be eliminated by proper operation.

All relevant general safety regulations (in Germany VBG ...) must be observed and complied with.



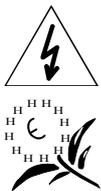
- Risk of electric shock
 - through contact with conducting components through assembly of the machine (EN 60204/VDE 0113)
 - through contact with conducting components following inexpert maintenance (VBG 4).
- Risk of thermal shock
 - by touching the tap immediately after the tapping process.
- Risk from materials of components or work materials
 - through contact with liquids, oils and greases or by inhaling gases, vapours and dusts.
 - The relevant instructions for use by manufacturers of lubricants and cleaning materials must be complied with.
 - See also the relevant safety data sheets.
- Risk due to not following operating instructions.
 - do not carry out unauthorised work on or with the machines.

1.7. Specific operating instructions for the operator

Following are some basic safety instructions, which must be observed.



- Any person who may have to deal with the automatic thread tapping machine must first read and understand these operating instructions and in particular this section.
- Never touch the spindle if the machine is plugged into an electric supply socket. Before changing a tap, switch the drive off by means of the drive selector switch.
- Always wear eye protection when operating the machine.
- Avoid any action which may impair the safety of the machine.
- Check the location of the EMERGENCY-STOP button and the main switch to ensure that you can react quickly to any emergency.
- Wear clothing which cannot catch in moving parts of the machine. Button the cuffs of your shirt or jacket, or turn them under inwards.
- If you wear long hair or a scarf, arrange them so that they stay out of the danger zone. Long hair may have to be gathered under a hairnet. Tuck in the ends of ties and scarves.
- Do not work on or with the machine if your level of attention is reduced by any drug.
- It is the user's responsibility to make sure that no unauthorized persons are working with the machine.
- Anyone operating the machine must immediately report any changes of or with the machine which may have an impact on its safety.
- The management of the user company is under the obligation to operate the machine only if it is technically sound; faults which may impair safety of operation must be rectified immediately.
- The management of the user company must ensure a proper work place environment through appropriate work regulations and inspections.
- The management of the user company must, if necessary, request operators to wear suitable protective clothing.
- Only qualified personnel may work on the electrical parts of the machine!
- Water protection!
Ensure that lubricants, cleaning compounds and other substances do not enter the waste water drain, nor ground water or soil.
- Under no circumstances must safety equipment installed to the machine be dismantled or disabled.
 - During repairs or maintenance, the following **exception** applies:
Before dismantling safety equipment for repairs or maintenance, take the machine out of operation according to the instructions.
Immediately after completion of any repair or maintenance work, reassemble the safety equipment and guards. Any faulty or broken parts must be replaced!
- When the machine is operated remotely, ensure that no one can enter the work envelope of the machine.
- Through the use of safety fences, light guards and other means of barriers, the machine has to be guarded in such a way that anyone entering this area will cause the machine to be shut down instantly.
- Worn or damaged tools must not be used. Replace them with properly functioning tools.



1.8. Possible risks to health and safety

Lubricants, safety materials and cleaning substances.

Careless use of these materials or neglect of safety and health regulations can endanger your health and especially the skin.



Safety instructions

The instructions given in the safety documentation of the manufacturers must be complied with!

- Wear protective gloves and protective clothing.
- Do not use open flames!
- Avoid skin contact to eliminate skin irritation!
- Apply barrier cream before starting work.
- If your skin comes into contact with lubricants, safety materials or cleaning fluids, immediately wash the affected part with soap and water or apply a greasy skin cream.
- Provision must be made to avoid lubricants and safety materials from getting into the waste water drains.

Safety instructions

Every container of lubricant or ancillary material (for instance cleaning solution) is supplied with safety data sheets.

These data sheets contain information about the chemical composition of the material, its safe transport, storage, handling, disposal and appropriate treatment in the event of an accident or fire.

Insert after this chapter the safety data sheets from all manufacturers whose materials are to be used with the machine.

2. Technical data, description

Type

- | | |
|--|--|
| <ul style="list-style-type: none"> • Version • Description | <p>Thread tapping machine
 microtap II-G2
 microtap II-G5/jobtap/labtap
 megatap II-G8/jobtap/labtap
 megatap II-G14/jobtap
 megatap II-G16/jobtap</p> |
|--|--|

Media supply

- | | |
|---|--|
| <ul style="list-style-type: none"> • Operating voltage, standard
version microtap II, optional • Frequency • Power consumption
Version microtap II - G2
Version microtap II - G5 / jobtap / labtap
Version megatap II / jobtap / labtap • Line fuse version microtap II 115 V
 version microtap II 230 V
 version megatap II 230 V • Dry compressed air (ZAP-mode) • Dry compressed air (drop / spray - mode) • Torque rates <ul style="list-style-type: none"> - Version microtap II-G2 - Version microtap II-G5 / jobtap / labtap - Version megatap II-G8 / jobtap / labtap - Version megatap II-G14 / jobtap - Version megatap II-G16 / jobtap • Cutting speeds <ul style="list-style-type: none"> - Version microtap II-G2 - Version microtap II-G5 / jobtap / labtap - Version megatap II-G8 / jobtap / labtap - Version megatap II-G14 / jobtap - Version megatap II-G16 / jobtap • Spindle travel microtap II / jobtap / labtap
 megatap II / jobtap / labtap • reachable thread depth
 microtap II / jobtap / labtap
 megatap II / jobtap / labtap • Reachable tolerance of measuring
(without allowance of tool holder) | <p>230 VAC ± 10 %
 115 VAC ± 10 %
 50/60 Hz</p> <p>max. 200 W
 max. 300 W
 max. 2.900 W</p> <p>6,3A / T (Circuit breaker)
 3,15A / TT (Circuit breaker)
 16 A / T (Circuit breaker)</p> <p>min. 2 bar (58 psi)
 max. 8 bar (116 psi)</p> <p>min. 4 bar (58 psi)
 max. 8 bar (116 psi)</p> <p>2 to 65 Ncm
 5 to 220 Ncm
 50 to 700 Ncm
 120 to 1.680 Ncm
 150 to 2.100 Ncm</p> <p>150 to 1.000 min⁻¹ (RPM)
 250 to 2.200 min⁻¹ (RPM)
 300 to 3.000 min⁻¹ (RPM)
 125 to 1.250 min⁻¹ (RPM)
 100 to 1.000 min⁻¹ (RPM)</p> <p>max. 65 mm
 max. 85 mm</p> <p>max. 45 mm
 max. 75 mm</p> <p>0,1 mm</p> |
|---|--|

Dimensions, weights

Dimensions over all	approx. (L x W x H in mm)
• microtap II / jobtap / labtap	
- with column 600 mm	510 x 323 x 808
- with column 750 mm	544 x 312 x 1047
• megatap II / jobtap / labtap	
- with column 750 mm	544x312x1047
- With higher column the dimensions add for the difference of the high of the column.	
• Weights	approx.: in kg
- base plate	20,5
- Column cpl. 600 mm	12,8
- Column cpl., 750 mm	14,2
- Column cpl., 1.000 mm	16,5
- Machine head, microtap II-G2	16,1
- Machine head, microtap II-G5 / jobtap / labtap	18,1
- Machine head, megatap II-G8 / jobtap / labtap	27,0
- Machine head, megatap II-G14/-G16 / jobtap	28,6

Tool attachment system

Machine type	Spindle	Tool holder
microtap II-G2	B6	Collet change system SZS0
microtap II-G5 / jobtap / labtap	B10	Quick tool change system SWS0
megatap II-G8/ jobtap / labtap	B12	Quick tool change system SWS1
• megatap II-G14 / jobtap	B12	Quick tool change system SWS2
• megatap II-G16 / jobtap	B12	Quick tool change system SWS3

ATTENTION!



The machine is delivered with the chuck heat-shrunk to the spindle; it must not be removed by the user, since this may damage the spindle bearing.

Work envelope

- Vertical envelope in Z-direction (without tool)

Type of column	microtap II	megatap II G8	megatap II G14 /16
600 mm	approx. 280 mm	approx. 250 mm	approx. 238 mm
750 mm	approx. 430 mm	approx. 400 mm	approx. 388 mm
1000 mm	approx. 680 mm	approx. 650 mm	approx. 638 mm

- Cutting capacity

- microtap II-G2 (Metric ISO-standard thread); DIN13/sheet 34	M 0,5 - M 2 (X5CrNi189) M 0.5 - M 2,5 (9SMn28) M 0.5 - M 3 (AlCuMgPb)
- microtap II-G5 / jobtap G5 / labtap (Metric ISO-standard thread); DIN 13/sheet 34)	M 1.0 - M 5 (X5CrNi189) M 1.0 - M 6 (9SMn28) M 1.0 - M 6 (AlCuMgPb)
- megatap II-G8 / jobtap / labtap (Metric ISO-standard thread); DIN 13/sheet 34)	M 2.5 - M 8 (X5CrNi189) M 2.5 - M 10 (9SMn28) M 2.5 - M 12 (AlCuMgPb)
- megatap II-G14 / jobtap (Metric ISO-standard thread); DIN 13/sheet 34)	M 3.5 - M 12 (X5CrNi189) M 3.5 - M 14 (9SMn28) M 3.5 - M 18 (AlCuMgPb)
- megatap II-G16 / jobtap (Metric ISO-standard thread); DIN 13/sheet 34)	M 4 - M 14 (X5CrNi189) M 4 - M 16 (9SMn28) M 4 - M 20 (AlCuMgPb)

Peripheral operating conditions

• Room temperature for the machine	0 to 60 °C (32 to 140 °F)
• Isolation	IP 44
• Continuous noise emittance; (measured with continuous ZAP-operation) (Reference meter: Onsoku Sand Meter SM-6)	70 dB(A)

Control system, interfaces (not for jobtap)

• PLC-compatible control	4 Bit Input, 4 Bit Output, parallel, galvanically isolated
• Interfaces	RS 232, 9600 Baud, 8 Bit, no parity, 1 stop bit, galvanically isolated
• Operation	menu driven, display 4-lines

Paint finish

• microtap II / megatap II	emerald green, RAL 6001
• jobtap	emerald green, RAL 6001
• labtap	bright ivory, RAL 1015

2.1.1. Dimensions megatap II

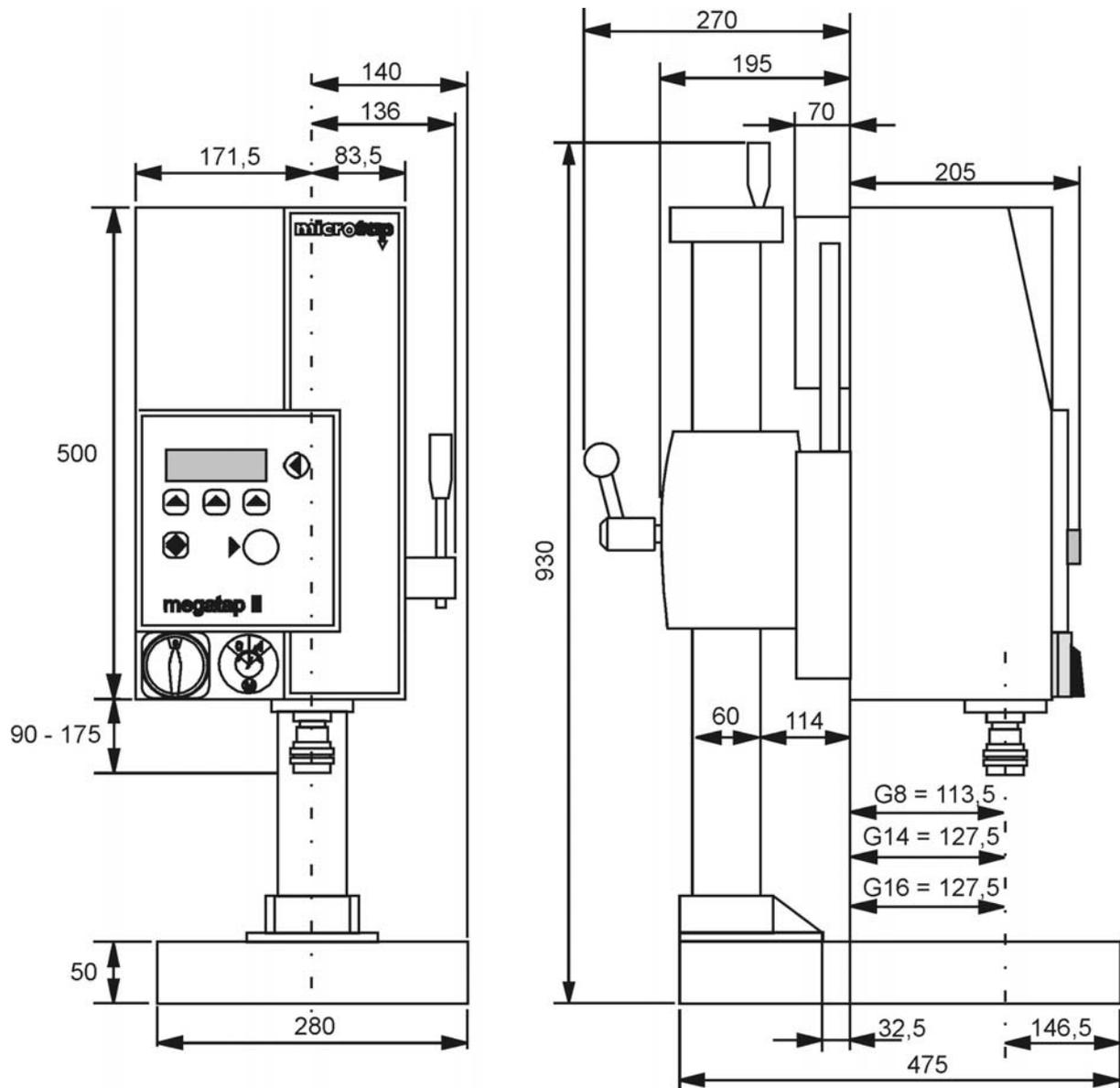


Fig 2-1 Dimensions megatap II / jobtap / labtap (unit: mm)

2.1.2. Dimensions microtap II

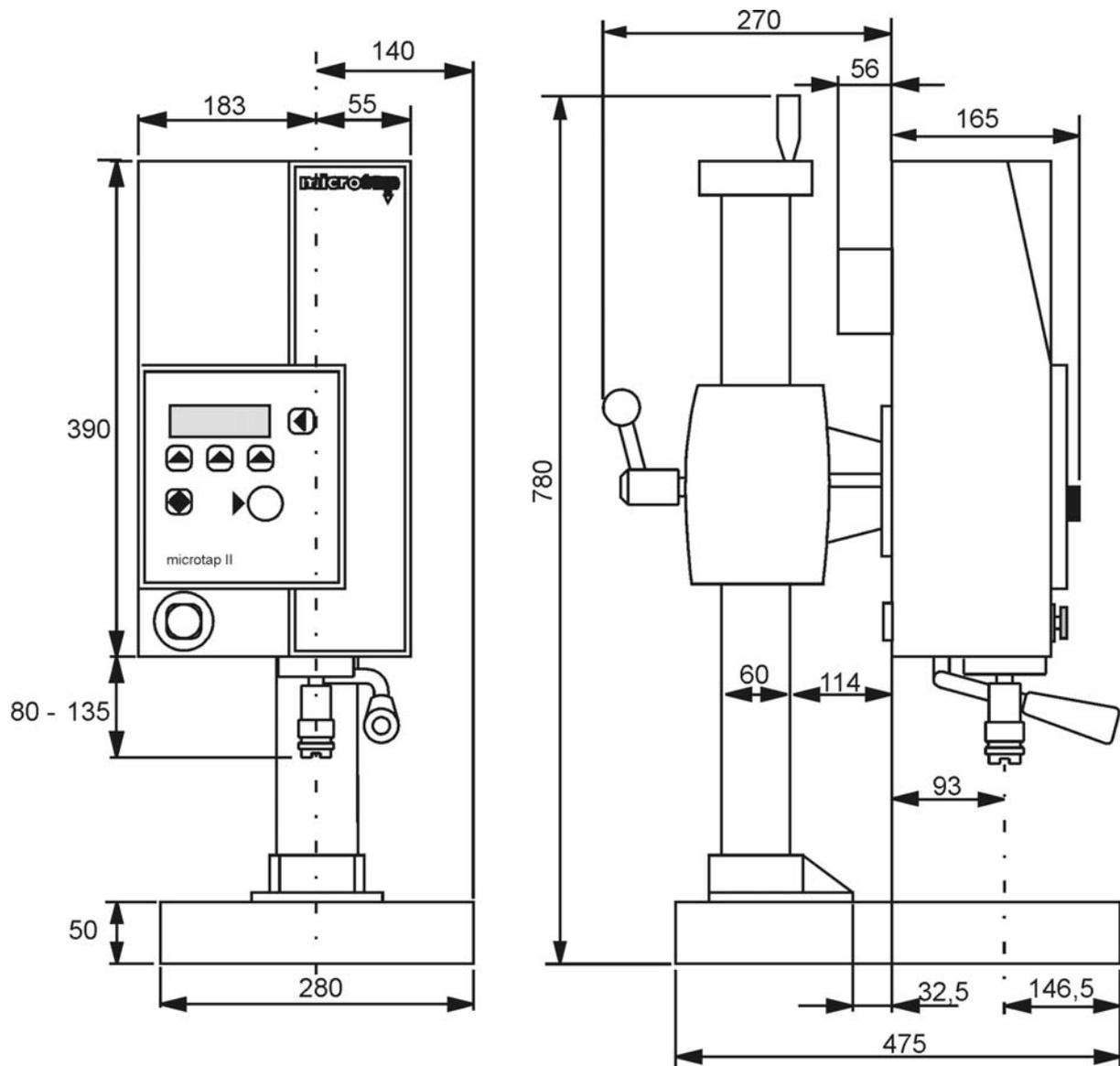


Fig. 2-2 Dimensions microtap II / jobtap-G5 / labtap-G5 (unit: mm)

2.1.3. Dimensions base plate

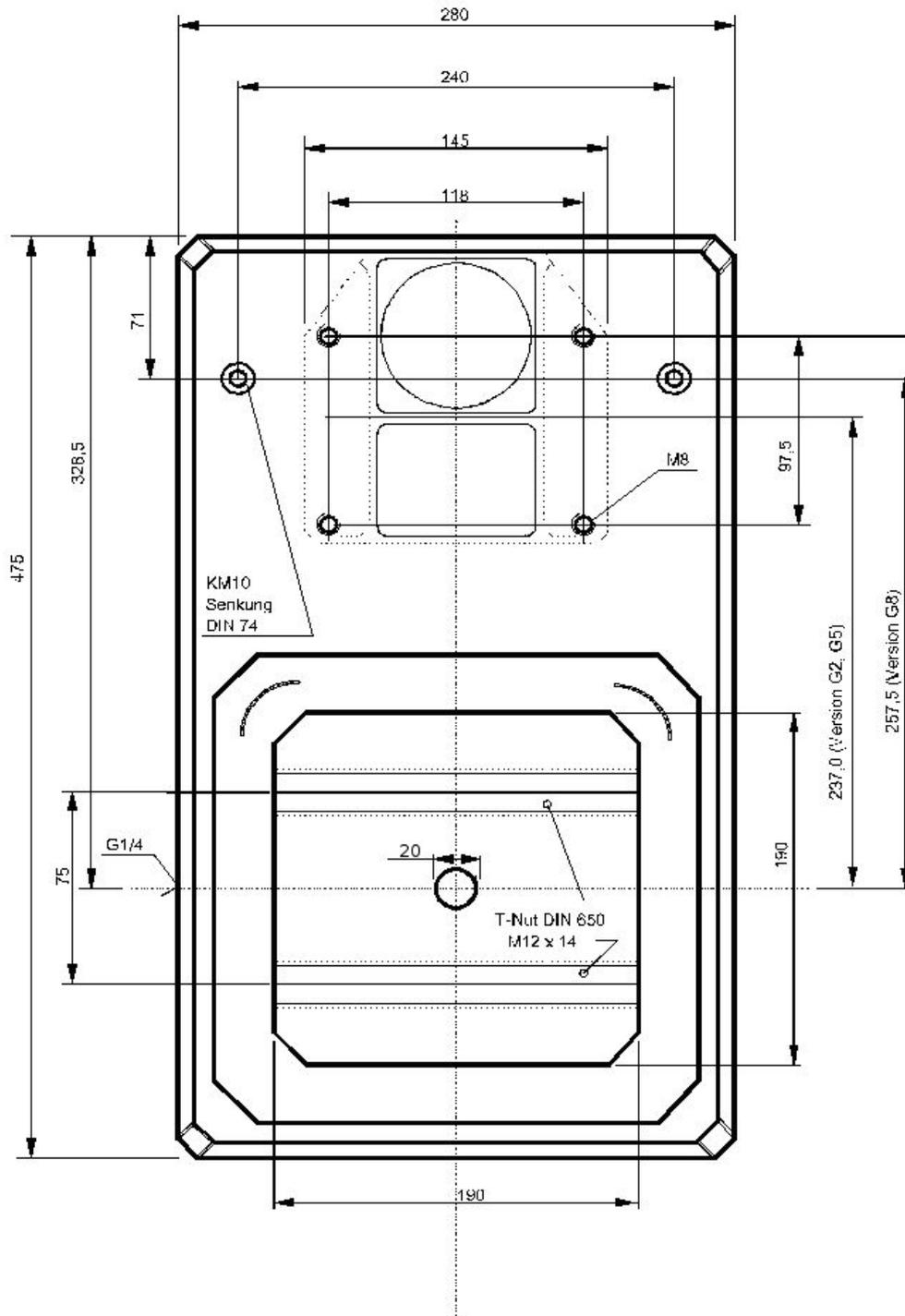


Fig 2-3 Dimensions: Standard base plate for all thread tapping machines

Threaded connection G ¼ (PG6) for reassembly of lubricants.

2.2. Short description of the machine



Fig 2-6 Front view megatap II / jobtap



Fig. 2-7 Front view microtap II-G5 / jobtap G5

- 1 Base plate
- 2 Height adjustment (column)
- 3 Thread tapping unit
- 4 Crank for height adjustment
- 5 Clamp handle for height adjustment
- 6 Operating lever with start button

- 7 Setting lever for retracting force on drive spindle (counter-balance)
- 8 Drive spindle
- 9 Quick-change collet holder
- 10 control panel and display screen
- 11 EMERGENCY STOP switch (megatap II = main switch)
- 12 Motor ON/OFF switch

2.2.1. The automatic thread tapping machine has the following distinguishing features:

- **Height adjustment (column)** 600 mm, 750 column, 1.000 mm
The machines can be equipped with different columns. Column 600 (standard microtap II,) 750 mm (standard megatap II); the height of the work head is adjusted by a hand crank after releasing the locating clamp. The work head can not be rotated horizontally.
- **Operating lever with integrated start button**, for manual operation.
The operating lever has an adjustment provision for its length. It can also be disengaged from the feed drive. This helps to prevent accidents when the machine is operated with the pneumatic feed control (ZAP).
- **Floating (weight-balanced) suspension of motor (work spindle).**
The weight of the work spindle is equally balanced over its entire travel; the spindle operation is by hand lever or pneumatic pressure. After the start of the cut, no force is applied in the feed direction; the cutting tool advances into the workpiece solely by virtue of its pitch. The return force on the operating head is adjustable.
- **The drive spindle of the motor is also the work spindle,**
which ensures a very quick reaction time to prevent tool fracture and permits an accurate measurement of the applied torque.
The megatap II-G14/-G16 / jobtap G14 /-G16 includes a gearbox between the drive motor and the work spindle.
- **Continuous monitoring of torque of drive motor;**
The torque is limited to the value preset by the operator and is continuously indicated on the operator display. The torque is monitored to prevent fracture of the tool, to provide, for instance, a measure of tool quality and tool life, or indication whether lubricant is needed or whether the selected cutting speed is correct, or whether the hole is too large or too small.
- **Quick-change collet holder** (quick tool change system SWS) (see chapter tool holder).
The machine is delivered with the chuck heat-shrunk to the spindle; it must not be removed by the user, since this may damage the spindle bearing.
The quick-change inserts are sized to suit the diameter of the cutting tools. The inserts do not retain the cutting tool rigidly but permit limited axial backlash. The cutting tool is thus self-centering in the hole and can compensate positional deviation approx. 0,1mm.
- **Control panel** (see chapter "operating machine")
The control panel incorporates-a 4-line display, a sealed keyboard with 5 selector buttons and a rotary knob
- **The ON/OFF selector switch** (only megatap II)
If the machine is in automatic mode (START AUTO Sz), the selector switch must be set to "0" before attempting to change the tapping tool.
The screen displays the message "SAFETY STOP, MOTOR DISABLED".



WARNING Risk of injury!

When the machine is in automatic mode, the spindle starts automatically when the work head is advanced towards the workpiece.

2.2.2. Rear side of machine head megatap II / microtap II

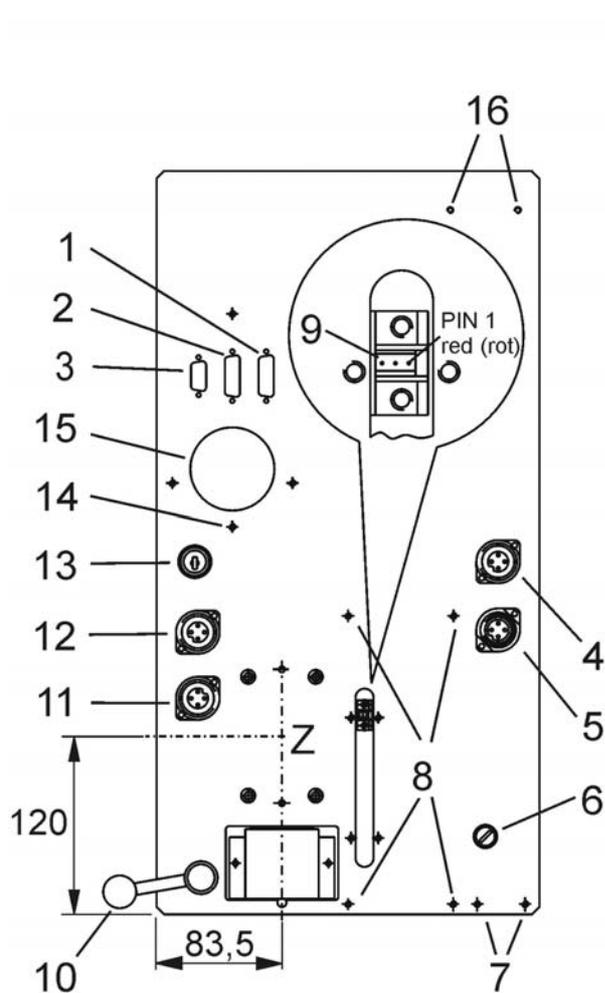


Fig. 2-4 Rear side of machine head megatap II

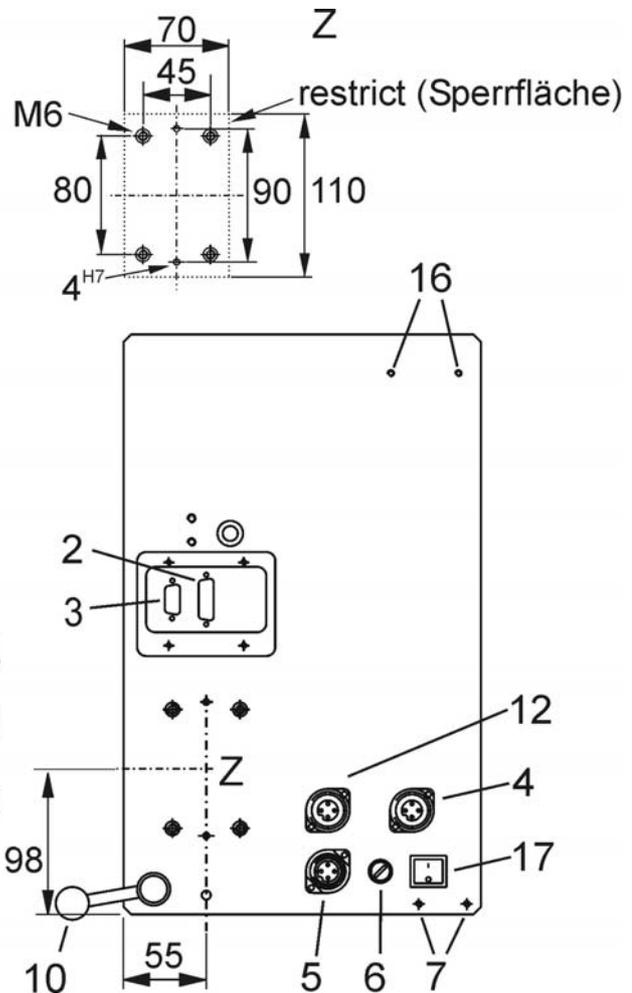


Fig. 2-5 Rear side of machine head microtap II

- | | |
|--|--|
| 1 Connection: ZAP | 9 Receptacle: press sensor ZAP
PIN1 = red |
| 2 Receptacle: I/O user interface (SPS)
(I/O) | 10 Setting lever for retracting force
(counter balance) |
| 3 Receptacle: V24 (RS 232D) serial
interface | 11 Receptacle: Operating lever |
| 4 Receptacle: lubrication unit (MMS) | 12 Receptacle: Foot switch ZAP |
| 5 Receptacle: Main connection (230VAC
/ 50Hz) | 13 Key switch (option) |
| 6 Fuse: megatapII 16A / T
microtapII 3,15A / TT | 14 cable relief |
| 7 MMS connection | 15 Air intake hole for cooling fan |
| 8 ZAP connection (ZAP) | 16 signallamp connection |
| | 17 Mainswitch |

2.3. Thread tapping terms

The following terms are used in these operating instructions:

Pos.	Term	Definition
1	Mz	Torque applied to tool
2	Fz	Feeding force in the tapping tool direction
3	Sz	Spindle advance
4	DSz	Tolerance on spindle advance
5	RPM	Spindle speed
6	Depth	Depth of the thread
7	Cutr.	Cut relief

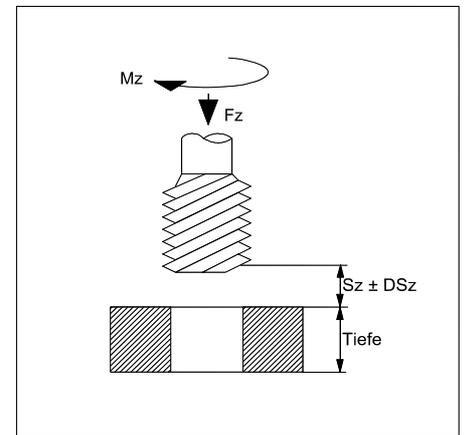


Fig. 2-9 Thread tapping terms

The thread tapping process is influenced by several interacting parameters:

- the part being tapped and the material it is made of
- the kind and type of tool used
- the spindle speed
- the thread depth
- the drill diameter of hole
- whether or not chips are removed
- the lubricant

The findings revealed the following facts:

- **it is not possible** to compile a general applicable table of values or to develop a general applicable formula for determining in advance the optimum values for any application which may arise in practice and thus to predict tapping characteristics and production figures.

1. **Mz** (torque applied to tool)

Threads within specified tolerances can be tapped only within a certain torque range which may vary between the min-Mz and max-Mz limits. Starting with the recommendations in the *microtap* brochure "Thread tapping - tables for setting the parameters" and using the thread tapping machine as a test bench, the optimum values for any application may be established.

The torque max-Mz defines the maximum torque:

- to tap the thread without raising a burr
- to recognize bluntness of the tool (monitoring of tool life)
- to recognize under-size holes
(in accordance with DIN 13, Sheet 34)
- to establish the optimum spindle speed
- to establish the best lubricant
- to eliminate tool fracture
- to confirm whether hole and tool are coaxially aligned
- to establish the best tool geometry or type of tool.

• **max-Mz** (torque to tool)

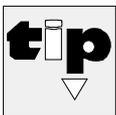
The trip-setting for Mz must not exceed 75 % of the fractural torque of the tapping tool (given by its manufacturer). To ensure that tapping tool breakage is prevented, see chapter "Static fracture torque of taps".

If during tapping the applied torque reaches the preset value, the work spindle will stop and reverse by one revolution, then automatically resume tapping in an attempt to complete the thread to the desired depth. If three attempts fail, the tool reverses completely out of the workpiece and a related error message appears on the machine display.

• **min-Mz** (torque applied to the workpiece)

The min-Mz value should be set to about 35 % of the max-Mz values (in Ncm) normally required to tap the thread. Whenever the actual operating torque fails to reach the preset min-Mz value, the control system displays the message "min-Mz not reached". This means that the pilot hole is either over-sized or that the machine declines to count again a thread which has already been tapped.

Rule of thumb: Enlargement of the hole diameter by 1% results in a drop of 15% in applied torque during the tapping process.



Manufacturer's hint:

Prepare some test pieces with over-sized holes, which you would normally regard as scrap part. Attempt to tap them and note the Min-Mz. Adjust the monitoring window accordingly.

2. **Fz** (spindle feed force)

Depending on the mode of operation, a feed force is applied either manually or automatically. When the spindle has completed two revolutions and has thus attained sufficient depth, the spindle will resume to a balanced state again; the tap advances into the work piece by virtue of its pitch.

If the "ZAP" system is installed, the balancing force can be adjusted.

3. **Sz** (spindle advance)

The term spindle advance applies to the travel of the spindle from its rest position to the contact with the pilot hole.

- 4. DSz (tolerance on spindle advance)**
This is the permissible tolerance on the advance of the tap to contact with the pilot hole (applies only if option ZAP is installed). For instance, if you enter 0.20, this means that a tolerance of 0.20 mm is acceptable on the spindle advance. If the spindle advance is longer or shorter than the set advance by more than the selected tolerance, the machine does not start.
- 5. RPM (spindle speed)**
The spindle speed must be selected accurately to permit threads to be tapped with a low applied torque.
The thread tapping machine shows the value of the applied torque continuously on its display. This feature helps you to establish the best spindle speed for any given job, by carrying out tests at different spindle speeds.
The same test method applies for finding the best lubricant and tool type.
- 6. DEPTH (depth of thread)**
This value determines the depth of the thread tapped in the workpiece.
- 7. CUTR. (cut relief)**
This menu prompt determines how often the spindle should reverse in the course of tapping operation to break the chip.
Cut relief avoids the jamming of long chips in blind holes. It permits tapping of blind holes without discernible increase in friction due to difficulties in chip removal.
Cut relief is recommended only when tapping deep blind holes (of depth greater than 1.5 times the hole diameter) with spirally fluted taps.
Through-holes are normally tapped with straight-fluted taps. Do not use the cut relief facility, because due to the large clearance angle at the tap flanks the chip tends to jam when the tap reverses.

2.4. Static fracture torque of taps

The following table shows the fracture torque in Ncm of tapping tools for three different quality grades.

Tap size/ thread type	Guide values in Ncm for static fractural torque of machines taps of		
	<u>high</u> quality	<u>standard</u> quality	<u>low</u> quality
M2			
Bottom holes	50 - 60	25 - 45	20 – 30 Ncm
Through holes	50 - 70	30 - 50	20 - 35 Ncm
M3			
Bottom holes	150 - 220	100 - 150	70 – 90 Ncm
Through-holes	150 - 250	100 - 170	70 - 100 Ncm
M4			
Bottom holes	500 - 560	400 - 500	250 – 300 Ncm
Through holes	500 - 620	400 - 550	250 - 350 Ncm
M5			
Bottom holes	800 - 1000	600 - 800	500 – 700 Ncm
Through holes	800 - 1200	600 - 800	500 - 800 Ncm
M6			
Bottom holes	1400 - 1600	1100 - 1200	800 – 1000 Ncm
Through holes	1400 - 1900	1100 - 1300	800 - 1100 Ncm
M8			
Bottom holes	3000 - 4200	2500 - 3500	2000 – 3000 Ncm
Through holes	3000 - 5000	2500 - 4000	2000 - 3400 Ncm
M10			
Bottom holes	7400	7000	6000 Ncm
Through holes	8300	7200	6400 Ncm



NOTE

The classification of thread tapping tools into high, standard and low quality is meant for general guidance and not as technical specifications.

Participation for machines with gear-reductions Type G14 / G16

By the observation with running spindle, the empty-sprint-torque must be read off. (Ad under the actual Mz-measurement in the display) This value must be added Mz to the torque maximum.

Example: "Torque for M4" 350Ncm = 200Ncm "Mz max" + 150Ncm empty- sprint-torque. With the program "fast-return" should only be worked with sufficient buffer to the empty-sprint-torque.

Switching in the reverse-run on a higher speed (100% of the settled torque - generally that maximum speed is not overstepped!) can overstep the torque maximum ==> it takes place the wished reversal with settled max. torque limit!

3. Assembly, commissioning and relocation

The machine is delivered partly dismantled, packed in three boxes as follows:

- box No. 1 contains: the base plate
- box No. 2 contains: the column (high adjustment)
- box No. 3 contains: the operating head
 - operator manuals 0,9 kg
 - quick-change inserts SWS0 0,4 kg
 - quick-change inserts SWS1/2 0,5 kg
 - quick-change inserts SWS3 2,4 kg
- box No. 4 (optional) contains:
 - lubricant system
 - machine lamp with magnetic base
 - WinPCA

3.1. Off-loading and unboxing

Article (name)	Package sizes (L x W x H) mm	Weight article	Weight packing materials	Total weight article incl. packing materials	
Operating head microtap II	585 x 355 x 360	18,1 kg	2,1 kg	21,5 kg *	(47,4 lb)
megatap II G8	700 x 400 x 410	27,0 kg	3,2 kg	31,6 kg *	(69,7 lb)
megatap II G14/16	700 x 400 x 410	28,6 kg	3,2 kg	35,1 kg *	(77,4 lb)
base plate	625 x 430 x 110	20,5 kg	3,0 kg	23,5 kg	(51,8 lb)
Column 600 mm long	960 x 255 x 335	12,8 kg	2,6 kg	15,4 kg	(34,0 lb)
Column 750 mm long	960 x 255 x 335	14,2 kg	2,6 kg	16,8 kg	(37,0 lb)
Column 1000 mm long	1.220 x 255 x 355	16,5 kg	3,2 kg	19,7 kg	(43,4 lb)
Options	depending on contents				
TTT-System kpl. :					
labtap II G8	700 x 400 x 410	27,0 kg	3,2 kg	31,6 kg *	(69,7 lb)
Column 750 mm lg	960 x 255 x 335	11,2 kg	2,6 kg	13,8 kg	(32,0 lb)
MPT new	800 x 783 x 326	35,0 kg	4,0 kg	39,0 kg	(85,9 lb)
Options	depending on contents				
Total		73,2 kg	9,8 kg	84,4 kg	(187,6 lb)

1lb (Pound) = 0,4536 kg

* Total weight incl. inserts, manual and power cable

3.2. Commissioning

Operating the machine after the machine has reached ambient temperature (condensation). Earliest after 24 hours.

Open box 1-3.

3.2.1. Location

The following requirements must be met when erecting the machine:

1. Supporting surface specifications (see Fig 3-1):
 - minimum load capacity 67 N/m² (137,23 lbf/sq ft)
 - overall volume (L x W x H) 1470 x 1320 x min.1600mm
2. Further important requirements:
 - electric mains supply 230 VAc \pm 10 %, 50/60 Hz
optional: microtap II-G2/-G5: 115VAC \pm 10 %
 - Max. allowable surface level tolerance 3 mm/m²
 - vibrationless
 - interferenceless(HF emissions)
 - free from local directional heating or cooling (from radiators, draft air etc.)
 - ambient room temperature must not exceed 30 °C
 - relative humidity must not exceed 80%
 - a supply of compressed air (for accessory ZAP)
 - water- and oil-free
 - minimum pressure 4 bar
 - maximum pressure 8 bar
 - a supply of compressed air (for accessory MMS)
 - water- and oil-free
 - min. 400 kPa (4 bar)
 - max. 800 kPa (8 bar)

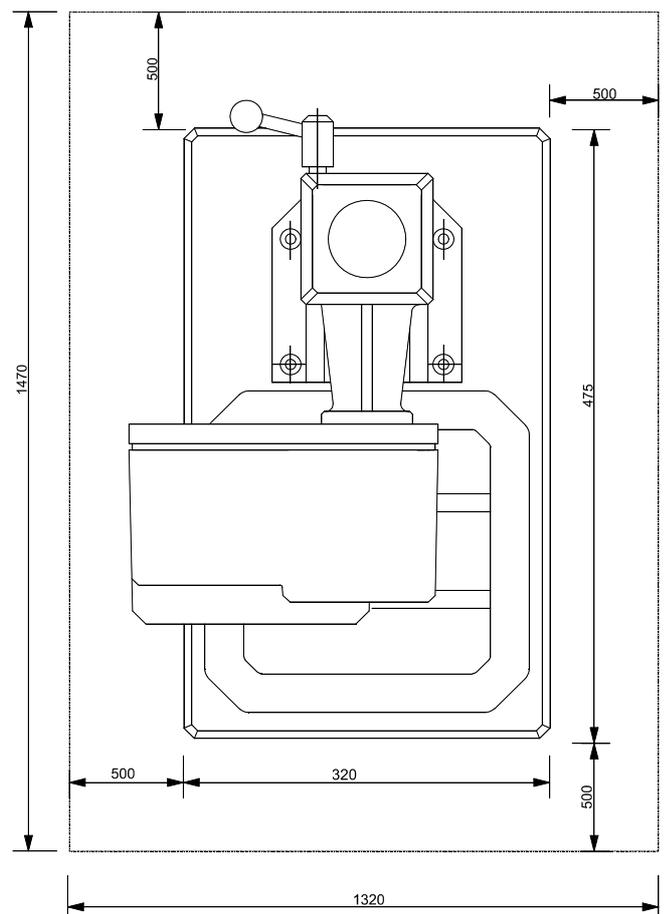


Fig 3-1 Erection plan, area required (mm)

3.2.2. Assembly and commissioning

1. Open box 1,2 and 3.



NOTE

Do not dispose of box # 3; it will be useful if you need to transport the machine.

2. Locate the base plate at the prepared area
If required, bolt the base plate to the supporting surface.
3. Mount the column on the base plate by means of four M8 hexagon socket .Tighten the hexagon socket screws with a torque of 25 Nm.
4. Mount the operating head on the height adjustment bracket using 4 screws and washers M6.
Tighten the hexagon socket screws with a torque of 10.5 Nm.
5. Connect the start button cable in the operating lever into the appropriate receptacle (only megatap II).
6. Connect the mains power cable with the appropriate receptacle



CAUTION!

The wall outlet must be protected with a 16A automatic circuit breaker!

7. Turn the key switch into the desired position
(Option only megatap II)
8. Set the drive selector switch to „1“ (only megatap II)
9. Disengage (pull outwards) the EMERGENCY STOP button (only microtap II)

The machine is now ready for operation.



NOTE

- Please fill in the warranty certificate and send it to microtap GmbH to guarantee the best service in case of repair .

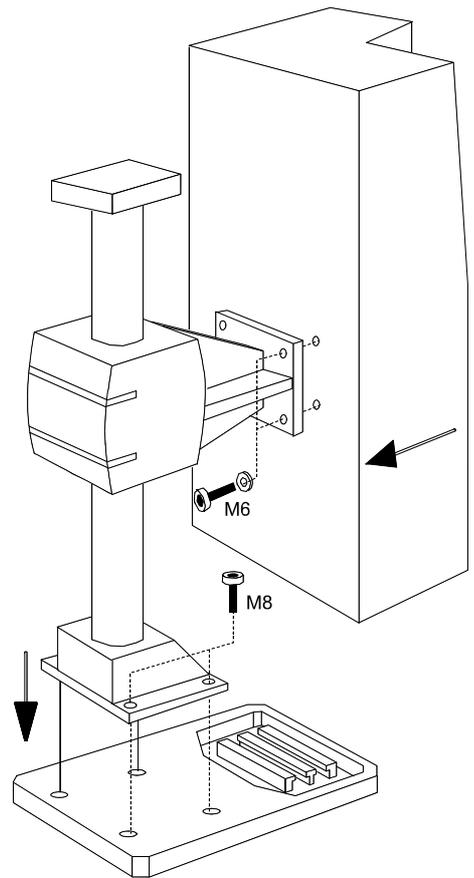


Fig 3-2 Unit installing

3.3. Relocating the machine

1. Switch the machine off
2. Prepare the new operating area in accordance with the instructions in Section "locating"
3. Unplug the mains cable
4. If installed, unplug the foot switch
5. If installed, unplug the PC connecting cable
6. The complete machine can then be lifted with appropriate resources and be moved to the new operating area.



WARNING

The weight of the machine depends on the type and the column, between 60 and 80 kg.

7. If applicable:
 - plug in the foot switch.
 - plug in the remote control cable and the PC cable
8. Plug in the mains cable.



CAUTION!

The supply socket must incorporate a 16 A, automatic circuit breaker!

9. Turn the key switch to the desired position (only megatap II)
10. Set the drive selector switch to "1" (only megatap II)
11. Disengage (pull outwards) the EMERGENCY-STOP button (only microtap II).

The machine is now ready for operation.

3.4. Interfaces, pin-out



CAUTION!

The interfacing of external equipment to the provided interface connectors is only allowed to be carried out through qualified personnel.

3.4.1. Connector for lubricating system (receptacle, 4-pins female)

(Figure please see chapter “technical data, description”)

PIN	Connection
2	open collector
3	+ 24 V / max. 0,2 A

Any 24 VDC solenoid valve of appropriate capacity can be connected between pins 2 and 3, for instance for an external lubricating system or control for compressed air, etc.

3.4.2. Serial interface RS 232, SUB-D, 9-pin female

(Figure please see chapter “technical data, description”)

(9600 baud, 8Bit, no parity, 1 stop-bit)

For further details see chapter “communication PC – thread tapping unit”.

PIN	Connection
2	232 TX
3	232 RX
5	232 GND

3.4.3. I/O user interface connector (SUB-D, 15-pins)

(Figure please see chapter “technical data, description”)



NOTE

The galvanically isolated inputs and outputs are active with respect to external ground. External inputs and relays (N/O) are rated max. 100 mA, max 48 VDC.



PIN	Connection
1	Relay 1, contact A contact closed (machine ready)
9	External input 1
2	Relay 2, contact A contact closed, (quality OK)
10	External input 2
3	Relay 3, contact A contact open
11	External input 3
4	Relay 4, contact A contact open
12	External input 4
5	Common reference for relays 1; 2; 3; 4 (all contact B)
13	input start 1 (Function like manual start)
6	Ground external
14	Input start 2 (Function like foot start)
7	+ 24 VDC, auxiliary supply max. 300 mA (7,2W)
15	Open collector Valve 3 (only microtap II Software V4.9 and higher)

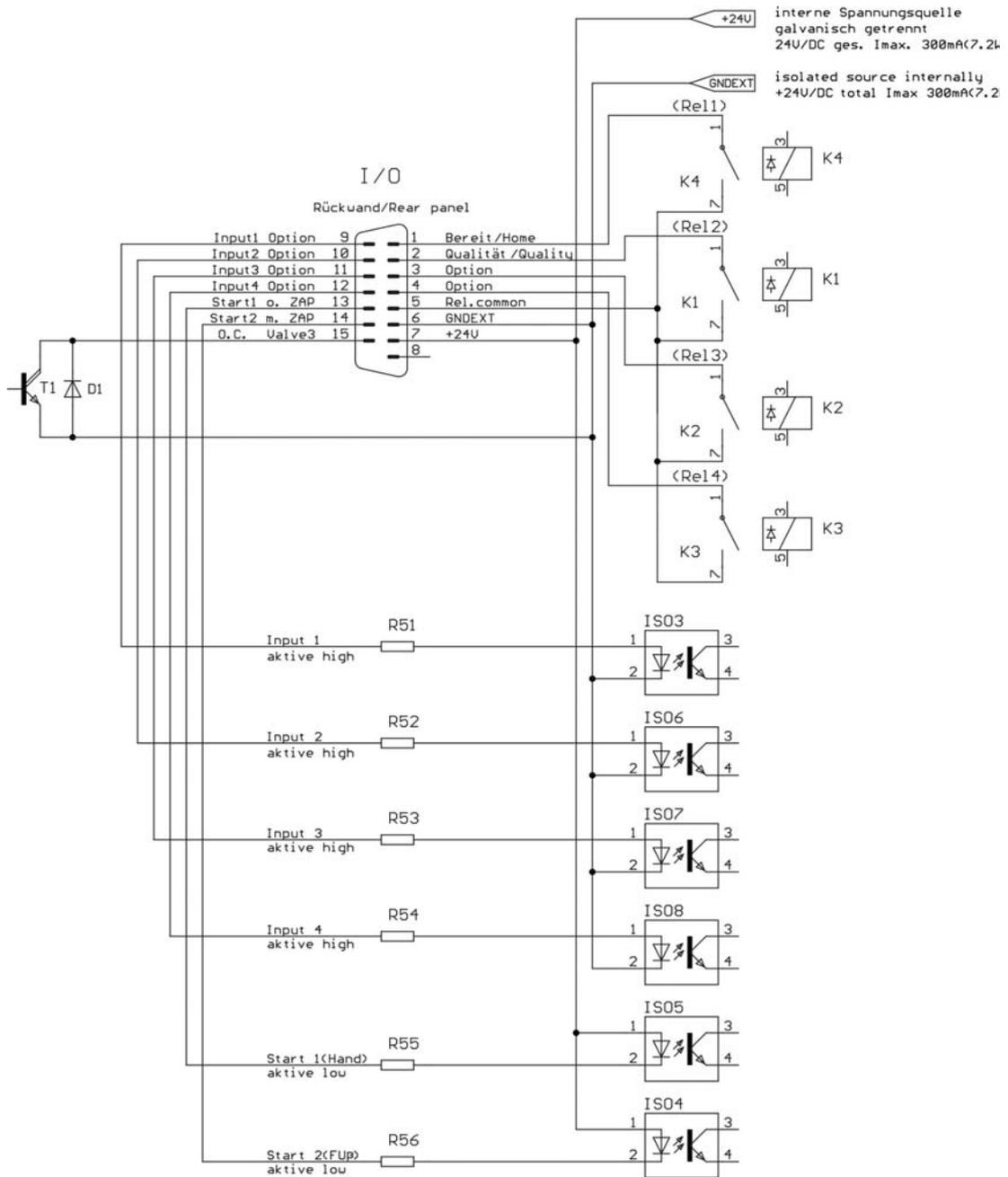
Warning

For usage of the machine via remote control

Ensure that no person can enter the operating area of the machine when it is under remote control by erecting a fence, photo-electric gate or other means of barrier.

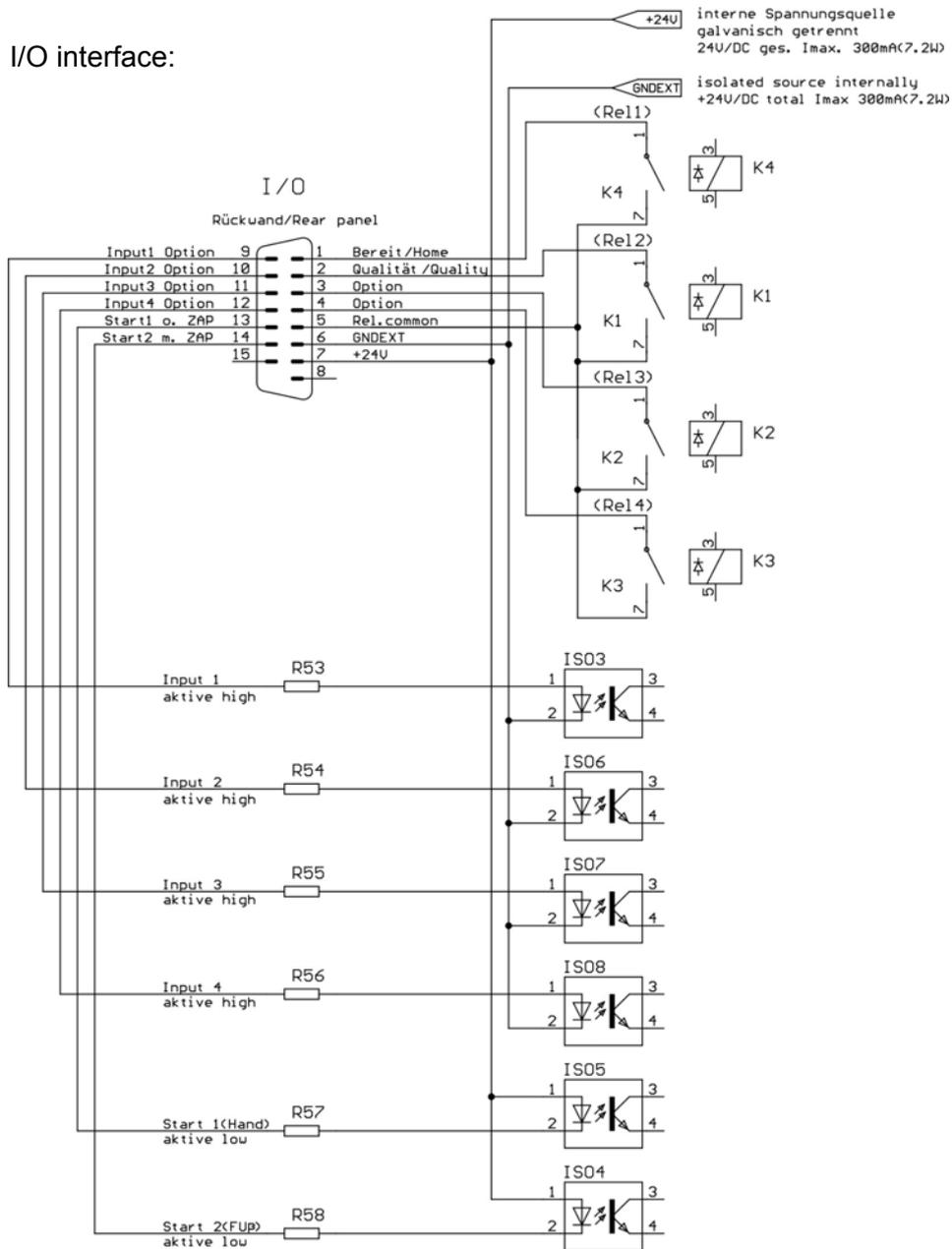
3.4.4. I/O wiring diagram (internal wiring of the machine)

Information about the internal wiring of the I/O interface
microtap II-G5 (valid for software version 4.9 and higher)

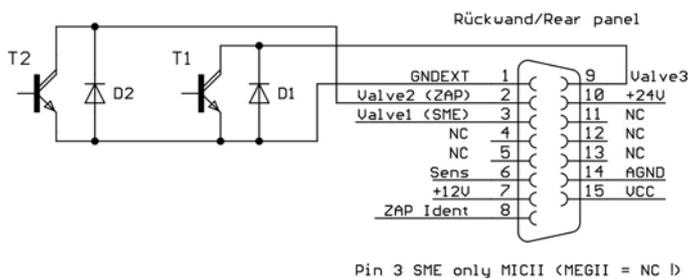


Information about the internal wiring of the I/O and ZAP interface
 - microtapII G5 (valid only for software up to version 4.0)
 - megataplI

I/O interface:



ZAP Interface:



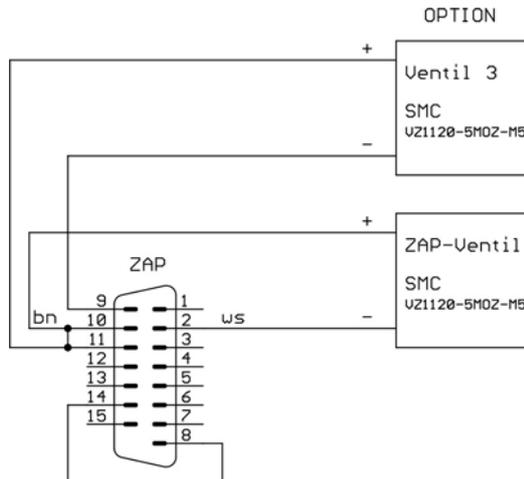
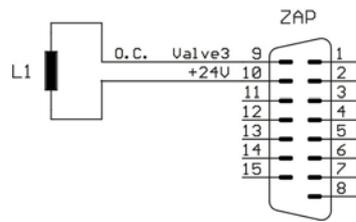
3.4.5. I/O Samples (external wiring of the machine)

3.4.5.1 Sample 1A: Magnetic valve V3 to connector ZAP (megataplII)

External wiring of the ZAP interface

- microtap II G5 (valid only for software up to version 4.0)
- megatap II

(Spule Magnetventil max. 2.1W)



- OPTION
- 1= GNEXT
 - 2= Open Collector Valve2 (ZAP)
 - 3= Open Collector Valve1 (SME)
 - 4;5;6;7;15= NC
 - 8= ZAP Ident
 - 9= Open Collector Valve3 (Option)
 - 10;11;12= +24U/500mA max (bei MEGII ist nur Pin 10 belegt, ext. verbinden)
 - 14= AGND

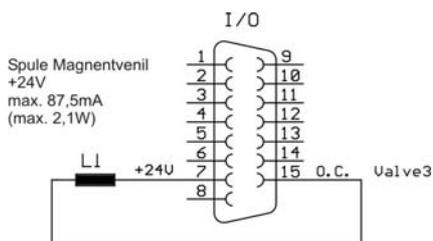
Attention for microtapII G5:

Connector for valve 3 is located at the I/O interface for software up to version 4.0 (see sample 1B)

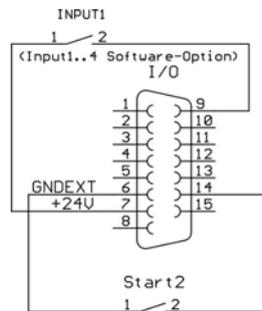
3.4.5.2 Sample 1B: magnetic valve V3 to connector I/O (microtapII)

External wiring of the I/O interface

microtapII G5 ((valid for software version 4.9 and higher)

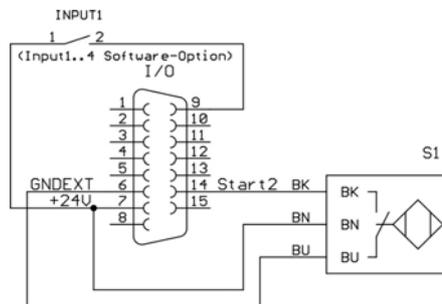


3.4.5.3 Sample 2A: Input signal Start2 by closing



3.4.5.4 Sample 2B: Input signal Start2 by switch Input1 (Option !)

It is only possible to read input 1 ... 4 with Software-Option

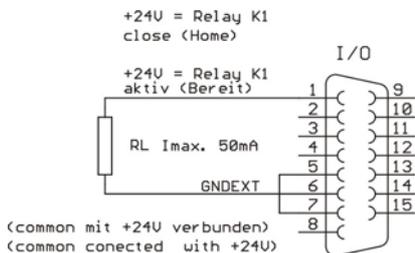


Input 1-4 = active high (The inputs 1-4 are wired against PIN 6 GND Ext.)

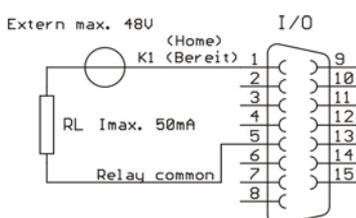
Start 1-2 = active low (The inputs Start 1-2 are wired against PIN 7 +24V)

In ZAP-Mode (Start Fz, Start Auto Sz, autostart Fz/Sz +/-) the pneumatic valve for the pneumatic Z-Axis spindle feed is actual when the closer (Start 2) is activated.

3.4.5.5 Sample 3A: Exit relay contact (K1S ready) by internal +24V power source.



3.4.5.6 Sample 3B: Exit relay contact (K1S ready) by external power resource (p.e. SPS)



3.5. Link between PC and thread tapping machine

The communications link between a PC and the thread tapping machine is realised via serial interface RS 232 and is based on ASCII code.

9600 baud, 8 data bits, 1 stop bit, no parity bit

3.5.1. Set of parameters forwarding to the machine

The set of parameter values is transferred as a block ASCII code. Each parameter has a single character code followed by the symbol "=" selected parameter value. The end of each parameter datum is coded by the characters "<CR>" (carriage return). No parity sum created.

EXAMPLE: T=105<CR> (depth = 10,5 mm)

The set of parameters includes the following parameters:

Parameter	Code	Range of values	
Depth	'T'	0 - 800	(0,0 – 80,0 mm)
Spindle speed	'N'	300 - 3000	(300 - 3000 min ⁻¹)
Fracture torque	'B'	30 - 7000	(30 - 7000 Ncm)
chip clearance	'E'	0 - 5	(0 – 5 chip clearances)
Lubricant pulse	'L'	0 - 10	(0-10)
Thread	'G'	0	(0 = right hand)
		1	(1 = left hand)
Reverse mode	'R'	0	(0 = 100%)
		1	(1 = 200 %)
		2	(2 = 50 %)
Start- mode	'A'	0 = Start manuel	(Start MAN)
		0 = Start Fz	(Start Fz) (only with ZAP)
		1 = Auto	(Autostart)
		2 = auto + Sz	(St Fz/Sz) (only with ZAP)
Sz	'S'	0 - 700	(0,0 – 70,0 mm)
DSz	'D'	0 - 100	(0,0 – 10,0 mm)
Remote control	'H'	0	(0 = Off)
		1	(1 = On)
Fz	'F'	0 - 100	(0 – 10,0 N)

3.5.2. Feedback messages of the thread tapping machine

Upon completion of an operation cycle, the machine responds in the following manner:

- 'Y' cycle ready, no error
- 'X' error

In the event of an error, code "Q?" can be used to request an indication as to the nature of the error.

3.5.3. How to request for specific values

The request is done by sending the code for a specific value followed by "?" and "CR LF".

EXAMPLE: Q?<CR>

The thread tapping machine responds then with the same code and its current value.

EXAMPLE: Q=2<CR>

The following values are monitored exactly:

Value	Code	Value range	
Mz cut (compl. cut process forerun)	'c'	values cut	(Ncm)
Mz (compl. cut process forerun and reversal)	'C'	values cut	(Ncm)
Type of machine	'W'	0 1 2	(0 = G8) (1 = G14) (2 = G16) (2 = G5)
Mz max (max. torque during cut)	'M'	30 - 7000	(30 - 7000 Ncm)
Mz max (max. torque during reverse)	'Y'	30 - 7000	(30 - 7000 Ncm)
Quality	'Q'	0-7	see under "Quality"
depth	't'	0 - 800	(0,0 – 80,0 mm)
Quantity of reverse	'r'	0-10	(0 - 10)
Sz (measured Sz)	's'	0 - 700	(0,0 – 70,0 mm)
Mz mean value cut	'U'	30 - 7000	(30 – 7000 Ncm)
Mz mean value reverse	'u'	30 - 7000	(30 – 7000 Ncm)

The status of "Mz" can be requested with "M?".

After response "Y" the tapping torque "Mz" is monitored (machine ready, no error).

3.5.4. Quality monitoring

The quality status can be requested with "Q?"

Usually, a quality status is requested following an "X" (error) response.

The numeric code provides the following information:

- 0 = OK
- 1 = command tapping depth not reached
- 2 = tapping start fault
- 3 = (not used)
- 4 = process interruption by operator
- 5 = error in reverse mode
- 6 = error Sz
- 7 = EMERGENCY STOP active

In special applications, further information can be retrieved:

Quality status	Additional requests	Code used
1	tapping depth reached	t?
5	no. of reversing attempts	r?
6	Sz	s?

3.5.5. Remote control mode

The thread tapping machine can be remote controlled.

For this mode, the option ZAP has to be installed, see chapter "integrating options".

Also, the operation via the machine control panel is then disabled.

Remote control ON: H=1<CR>

Remote control OFF: H=0<CR>



WARNING

For usage of the machine via remote control

Ensure that no person can enter the operating area of the machine when it is under remote control by installing a fence, photo-electric guard or other means of barriers.

4. Operating the machine

4.1. Changing taps

Version megatap II with selector switch

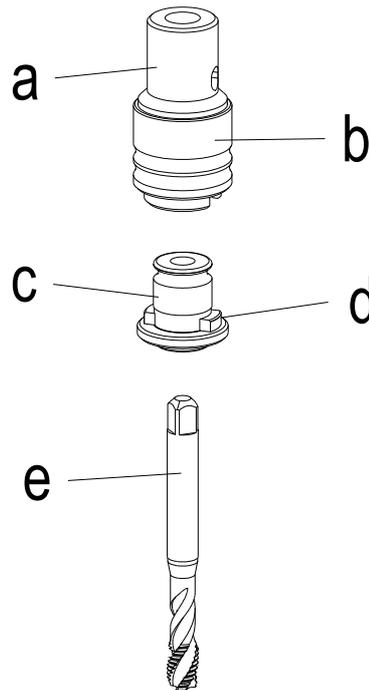
1. Set the drive selector switch to "0". The display response with the message:
„SAFETY STOP MOTOR LOCKED“



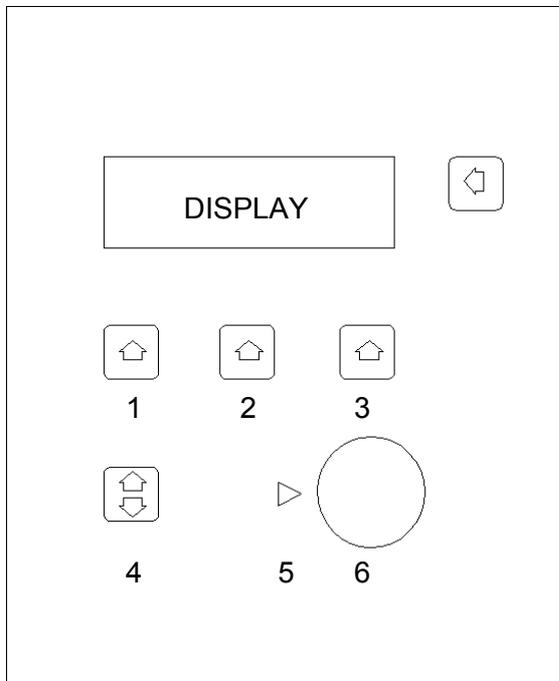
WARNING

The drive selector switch must be set to "0" before attempting the following operations, because when the machine is in automatic mode, the spindle can start automatically.

2. Change the taps as follows:
 - Push the sleeve (B) of the quick-changer collet (a) upwards and remove the quick change insert (c) and the existing tap (e).
 - Change tool (e) in the quick change insert (c)
 - Insert the new tap (e) with the quick change insert (c) so that the bar (d) on its shank engages with the groove in the collet (a), then pull the sleeve down again.
3. Set the drive selector switch to "1". The screen responds by changing the message to: „SAFETY STOP MOTOR LOCKED“.



4.2. Power Up / working menu



Button Function

- 1 – 3 Selector key
- 4 Menu choice
- 5 indicator active rotary knob
- 6 rotary knob (digital potentiometer)
- 7 BACK to working menu from every menu

Please note that only lightning buttons can be used. The rotary knob is active when the indicator (5) lights.

1. Version microtap II: Disengage the EMERGENCY-STOP button (pull it outwards).
2. Turn on the main switch at the rear side (microtap II), on front side (megatap II) of the machine.
3. Upon start, the machine performs a self-test routine.

```

MEGATAPII  G8      ZAP
VER.4.9 19.12.00
RS232 Interface O.K.
TESTING SYSTEM
    
```

Fig. 4-1 Display during self-test

4. Upon conclusion of the self-test, the basic menu is displayed

Explanation:

- Line 1
machine type and limit of capacity.
p.e. megatap II-G8 (threads M8 in stainless steel) and integrated option such as ZAP
- Line 2
software version, date of software
- Line 3 and 4
machine parameters
Selection set of parameter: NEW, LAST

5. Press the selector switch under the word "NEW" if you would like to create a new program
6. Press the selector switch under the word "LAST" if you would like to work with the last parameter setting.
7. Version megatap II: Set the drive selector switch to "1".
8. The machine is now ready for operation in the standard settings.

MEGATAP II G8	ZAP
VER.4.9.	19.12.00
PROCESS PARAMETERS	
NEW	LAST

Fig. 4-2 Basic menu

4.3. System Setup

1. Turn on the main switch of the operating head and **at the same time** press and hold the soft key (7) **RETURN** depressed during the machine self-test (about 5 seconds), The resulting display is shown in Fig 4-3.
 - Use the selector key (3) to select the measuring unit mm or inch.
 - Use the rotary knob and select the language (German, English, Francais, Netherland, Svensk, Danish, Italiano).
 - Press the selector to set.
2. The basic menu 2 will appear in the display (see Fig 4-4).
3. The machine is now ready for operation.

SETUP	
SELECT LANGUAGE	
ENGLISH	MODE
OK?	>mm<

Fig. 4-3 Setup menu

PROCESS PARAMETERS	
NEW	LAST

Fig. 4-4 Basic menu 2

4.4. Setting / changing the parameter

4.4.1. Operating menu

Selectable functions

- depth (mm or inch, see chapter "System setup")
- spindle speed min^{-1}
- torque (Mz max in Ncm) / thread range

DEPTH	RPM	M 4-5
0.10 mm	1000R	0150Ncm

Fig. 4-5 Operating menu

1. Press the selector key below the parameter you wish to set
2. Set the desired value by turning the alpha dial (rotary knob (6)).
3. To enter the selected value, press the selector key (1 - 3) below the appropriate parameter again.

Now all selector keys are lightning. It is possible to cut a thread with these settings. If you would like to form a thread or cut a left thread, you have to do like the following.



NOTE

The machine will only operate in the operating menu.

4.4.2. Parameter Menu

- Press soft key (4) menu choice
- Dial with the rotary knob (6) the desired function (the arrow shows the selected menu).
- To select the menu press the selector key (4)

→ PROGRAM MOTOR SETUP START SETUP LUBRI.CYCLE
→ CHIP CLEARANCE COUNTER DATA MEMORY PARAMETER RESET
→ OPTIONS

- By pressing the soft key (7) BACK you can return from every menu to the working menu. With soft key (4) you will get back to parameter menu.
- If you get back from the parameter menu to the working menu, the settings for start and program will be shown.

4.4.2.1 Program

With machine type jobtap only “thread cutting” and “thread forming” are working.

- Select program by rotary knob (&)
- By pressing the soft key (7) BACK you can return from every menu to the working menu.
- With soft key (4) you will get back to parameter menu.

-> THREAD CUTTING THREAD FORMING THREAD INSERT Mz THREAD INSERT Fz
-> SCREWING Mz SCREWING mm ENDURANCE RUN

THREAD CUTTING:	The spindle threads the tap to the depth which is set before. If Mz max is reached, the spindle reverses max. 3 times automatically and tries to reach the depths. If it is not possible to reach max. depth, the spindle switches into reverse and the error message "Depth not reached" appears on the display.
THREAD FORMING	The spindle forms the tap to the depth which is set before. If Mz max -10% is reached, the spindle reverses and the error message "Depth not reached" appears on the display. The reduce of 10% of the Mz prevents the tool clamp at reversal. Display in working menu: FORMING.
THREAD INSERT Mz	Spindle turns in the thread insert till Mz max. is reached and than switches into reverse. Display in working menu: NSAT Mz.
THREAD INSERT mm	Spindle turns in the thread insert till depths or Mz max. is reached and than switches into reverse. Display in working menu: NSAT mm.
SCREWING Mz	Spindle turns in the screw till Mz max. is reached and stops. Display in working menu: SCREWING Mz.
SCREWING mm	Spindle turns in the screw till depth or Mz max. is reached and stops. Display in working menu:: SCREWING mm.
ENDURANCE RUN Mz	Spindle turns in endurance run mode. Display in working menu: “ENDURANCE Run Mz”

4.4.2.2 Motor Setup

MOTOR SETUP		
THREAD	minMZ	RETURN
RIGHT	OFF	NORM

- Thread direction right / left (change by pressing selector key 1)
- Minimum torque (quality valuation). Change by pressing selector key (2), dial rotary knob (6) and confirm by pressing selector key (2).
- Reverse -> normal (like cutting speed set before), quick 200%, slow 50% (change by pressing selector key 3)

4.4.2.3 Start Setup

The Start Setup depends on the options of the machine:

Without ZAP

-> START MANUAL START AUTO Sz

with ZAP

-> START MANUAL START AUTO Sz START Fz/Sz +/-

Start Manual (without ZAP)

-> Spindle starts with start button
--

Display in the working menu:
Start MAN

Start manually

- The reference point will be set to zero by the start button in the operating lever.

Start Auto Sz

Spindle starts with feed motion: CAUTION! Cal Sz (mm) 00.0

Display in working menu:
AUTOSTART

Push selector key (2) and lower the motor with the operating lever until the tap touches the workpiece. Fix this position (Sz) and press selector key (2) to confirm.



Attention

- When you lower the spindle in the working menu, the motor starts working. The depths will be set to zero line after reaching the distance to the workpiece.
- Because of the safety this parameter will not be stored in the machine and in the data memory when the machine will be switched on next time.

- **START AUTO Sz (Option ZAP)**
The motor reaches the workpiece automatically after pressing the foot switch. When the spindle goes down, the motor starts turning. The depths will be set to zero line after reaching the distance (Sz) to the workpiece. For safety reasons this parameter will not be stored in the machine and data memory when the machine is switched on next time.
If it is not possible to cut, the pressure cylinder switches off after max. 3 seconds. The motor drives back. The error message: QUALITY CONTROL NO LEAD ANGLE appears.

Start Fz (with Option ZAP)

In manual operation the function is the same like in "Start Manual"

START after Fz-force is reached Fz 010

Display in working menu:
START Fz

Operate selector key (1) and rotary knob (6) to set the Fz - force. Confirm with selector key (1).

- After pressing the foot switch the spindle reaches the workpiece automatically. If the tool reaches the workpiece an Fz-force in Z-direction (FZ9 will be produced automatically. When the parameter preset is reached, the spindle starts and the reference point will also be set to zero automatically.
If it is not possible to cut, the pressure cylinder switches off after max. 3 seconds. The motor drives back. The error message: QUALITY CONTROL NO LEAD ANGLE appears.

Start Fz/Sz +/- (Option ZAP)

ZAP.START Sz+/- with		
Start pos. Control		
Fz	Cal	Sz+/- (mm)
XXX	XX.X	XX.X

Display in working menu:
ST Fz/Sz

Fz, Cal Sz see "START Fz", Cal Sz see "START AUTO Sz". To set the start position +/- (mm) (lead angle - tolerance) confirm selector key (3), turn rotary knob (6) to set the desired tolerance parameter and push selector key (3) to confirm.

- The working mode is the same as at "START Fz"
Additional the machine does a comparison between the preset parameter of Cal Sz and the tolerance +/- (mm). (This makes it possible to find out differences in the high, which are bigger than the preset tolerance parameter). The machine displays an error message, that the tolerance was not kept. If the spindle does not start in Sz, the pressure cylinder switches off and the spindle reverses. The spindle goes back. The error message "QUALITY CONTROL NO LEAD ANGLE" appears.

4.4.2.4 LUBRI. CYCLE

		ESCAPE->
MODE		TIMES
SME/DROP		1/1

			ESCAPE->
MODE	TIME		TIMES
SPRAY	010		1/1

Choose the lubricant unit with selector key (1). In case of a SPE set the duration of the lubricant impulse with selector key (2) and rotary knob (6). Define frequency of the lubricant cycle (every thread or every second thread etc.) with selector key (3) and rotary knob (6).

4.4.2.5 CHIP CLEARANCE

		ESCAPE->
MODE		TIMES
NORMAL		OFF

Operating of selector key (1) changes MODE NORMAL to DEPTH

To change Chip Clearance NORMAL / Depth press selector button (1)

MODE NORMAL: The input TIMES defines the number of the automatic cut reliefs. (270° turn). The machine calculates relief depths. Push selector key (3), select number with rotary knob (6) and confirm with selector key (3).

		ESCAPE->
MODE	DEPTH	TIMES
DEPTH>	01.0	OFF

MODE DEPTH: The input depth defines upper limit of tool retraction and prevents the tap disengaging with the thread. Push selector key (2), dial with rotary knob (6) the depth and confirm with selector key (2). (This function is to clear chips from deep threads).

4.4.2.6 COUNTER

ALT		ESCAPE->
00000		
PARTS	COUNTER	THREAD
XXXXX	RESET	XXXXX

Push selector key (1) and set number of parts with rotary knob (6), push selector key (3) and set the number of threads / part with rotary knob (6). To clear push selector key (2).

00000 P COUNTER	00000 G
DEPTH 1/min	M 4-5
0.10 mm 1000R	0150Ncm

Working menu with active counter.
See at the left side of the display the number of finished parts. Right side number of finished threads each part.

In the case of scrap it is possible to reset the thread counter (not the part counter) with escape key (7) to zero! Bad threads will not be counted.

After every part, the message "number of parts reached" appears. After this message it is possible to continue the work. After reaching the total number of parts this message appears again, but it is not possible to continue work. The machine needs to be unlocked by pressing soft button menu choice (4).

4.4.2.7 DATA MEMORY

DATA MEMORY	ESCAPE->
>-----<	
IDENT NR:001	
EDIT STORE	RECALL

Select data file number with rotary knob (6).

Edit	Push selector key (1) and select the first digit of the data file name with the rotary knob (6). Confirm with selector key (1). The cursor is now at the next place. The data file can be stored if all 10 digits have been edited with selector key (1) (all selector keys are shining).
Store	Press selector key (2), the storage will be confirmed with a short OK! on the display.
Recall	Push selector key (3). If a valid data file has been selected, a short "OK!" appears in the display. If the data file is empty "NO DATA!" will be displayed.



NOTE

The spindle distance travel Sz will not be stored.

4.4.2.8 PARAMETER RESET

Machine settings	
NEW	LAST

- Push selector key (1) if you will create a new programm (all parameters will be deleted)
- Push selector key (3) if you will work with the old settings

4.4.2.9 OPTIONS (not active at machine type jobtap)

→ PRINTER
AUTOMATION
STARTSIGNAL

PRINTER:

PRINTMODE
OFF PRINT

Select printmode via selector key (1):

- Off -> no print
- Auto -> Print after reaching the part number
- ALL -> Record of every cut.

Selector key (3) print actual store.

AUTOMATION: (for customer specific functions, p. e. automatic vice)

PROGRAM
OFF

Switch program on or off with selector key (1).

The program is preset with the following function: If the spindle is not in the start position, the exit V3 is active (see chapter I/O I/O wiring diagram).

STARTSIGNAL

SEND START SIGNAL
ON

Switch program on or off with selector key (1).

This parameter is needed for the use with WinPCA (Version from 3.7) with TSE Temperature-Sensor-Equipment. For the use with older versions this parameter has to be set to off.

4.5. Manual operation

1. Insert the desired tool
2. Set the retracting force with the spring balance level.
The balance system lever should be set so that the spindle returns to the back position by itself. The return force should be kept to a minimum for best tap life.
3. Turn on the machine.
4. Position the work piece underneath the tap



NOTE:

A minimum distance of approx. 5mm between tapping tool and workpiece should be maintained.

5. Enter the appropriate process parameters in the operating menu (see Fig 4-5):
 - thread depth
 - spindle speed
 - torque limit (max Mz).



WARNING!

The selected limiting torque must always be less than the fracture torque of the tool. If you fail to observe this rule, the tool may break when reaching the bottom of a ground hole! Small broken-off particles of the tapping tool can turn into dangerous bullets!



6. Wear eye protection
7. With the operating lever, lower the tool until it touches the pilot hole!
8. Apply necessary cutting-start force to the operating lever and press the green start button. This causes the depth measuring device to reset to zero. Release the start button and the operating lever.
9. The machine starts up and due to the pitch of the tap, it draws itself into the workpiece without applied force.
10. When the preset depth is reached, the spindle reverses automatically and retracts the tool from the workpiece. The balance lever has to be set so that the spindle returns to the back position.

4.6. Thread tapping with option „ZAP“ via remote control

ZAP = Z-axis pneumatic spindle feed system



NOTE

The following instructions apply only if ZAP equipment is installed.

1. Lock hand lever out (only megatap II).
2. Set retracting force with lever of the spring balance system:
The balance system lever should be set so that the spindle returns to the back position by itself. The return force should be kept to a minimum for best tap life.
3. Switch on the machine.
4. Set spindle feed velocity of the pressure cylinder.
 - Select in Motor Setup “ START Fz” (Start after Fz-force is reached or start manually with push button).
 - Press foot switch until the spindle reaches the material. The spindle starts to work if the preset Fz force is reached (the feeding speed can be set with an adjusting screw on the valve).
5. Insert desired tool.
6. If needed, set retracting force with lever of the spring balance system.
7. Mount workpiece



NOTE

Leave a distance of at least 5 mm between workpiece and tool.

8. Enter the appropriate process parameters in the operating menu:
 - thread depth
 - spindle speed
 - torque limit (max. Mz).



WARNING!

The selected limiting torque must always be less than the fracture torque of the tool! If you fail to observe this rule, the tool may break when reaching the bottom of the ground hole! Small particles can turn into dangerous bullets!

9. Select in Start Setup the operation mode and set the desired parameter.



Wear eye protection.

10. Start to work with the foot switch.

4.7. Thread tapping with ZAP-option via RS232



NOTE

The following sequence of operation applies only for use with ZAP equipment and peripheral control.

1. Deactivate the EMERGENCY-STOP button
2. Switch off the remote control (H = 0, see also chapter "Communication PC -> thread tapping unit.)
3. Install the desired tool.
4. Set retaining power with the adjusting lever.
5. Switch the machine ON.
6. Line up the workpiece.



NOTE:

Allow at least 5 mm distance between tap and workpiece.

7. Key in the desired process parameters in the operating menu:
 - thread depth
 - spindle speed
 - limiting torque (max. Mz)



WARNING!

The selected limiting torque must always be less than the fracture torque of the tool! If you fail to observe this rule, the tool may break when reaching the bottom of the ground hole! Small particles can turn into dangerous bullets!



8. Wear eye protection.
9. Carry out a tapping test with parameters keyed in under item 7 above. If the results are satisfactory, continue with item 10. If not, modify the parameters until satisfactory results are reached.
10. Turn on the remote control (H = 1, see also chapter "Communication PC -> thread tapping unit.)
11. Release the EMERGENCY-STOP button!

5. Maintenance

5.1. Periodic routine maintenance

This chapter contains instructions for periodic routine maintenance. These maintenance tasks must be performed at the end of the defined period.



WARNING

It is absolutely essential that **SAFETY REGULATIONS** are observed and obeyed!

Location	period		Task	Remarks
	half-yearly	if needed		
Dust filter	X	X	replace	only megatap II jobtap / labtap



WARNING

DO NOT USE COMPRESSED AIR or other media likely to attack the machine paint coating!

5.1.1. Replacing the dust filter (only megatap II, jobtap / labtap):

1. Finish current task and switch off the machine.
2. Remove the dust filter from the recess and replace it.



Dispose of the old filter in an environmentally orientated manner.



CAUTION

Never use the machine without dust filter.

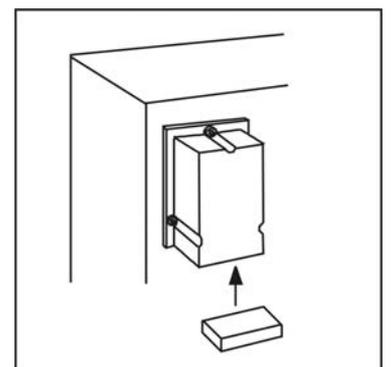


Fig. 5-2 Filter-housing

6. *Trouble shooting*

6.1. General information

Any faults or quality problems during machine operation are displayed on the screen in clear text.

For faults that cannot be analyzed and/or repaired, our customer service department will gladly assist you .

To help us assist, please report machine type, serial number and software version, when contacting us.

microtap GmbH
Customer Service
Rotwandweg 4
82024 Taufkirchen
Germany

Customer Service

Phone: <49> (89) 612 8051

Fax: <49> (89) 612 7488

Email: info@microtap.de

Return repair delivery to microtap GmbH

If you need to return the machine to *microtap GmbH* for repair, please copy the following page containing the error report form, complete it carefully and enclose it with the machine.

microtap GmbH
Customer service
Rotwandweg 4
82024 Taufkirchen
Germany

Date

6.2. Fault report form

Machine type

Machine No.

Name and address of sender:

.....

.....

Person to contact: phone Fax

email:

Contents of return shipment: Work head Mains cable

(tick as appropriate)

(send only if it doesn't work) Column 600 mm ; 750 mm ; 1000 mm ;

Foot switch Lubricant system

Which fault occurs? (Please give full detail). When, where, at what interval, ambient temperature, is the machine remotely operated, etc.).

.....
.....
.....
.....
.....
.....
.....

6.3. Quality, error indications

A Status messages

<p>EMERGENCY STOP</p> <p>UNLOCK STOP BUTTON</p> <p>SWITCH OFF UNIT</p>	<p>Meaning: Emergency-Stop button is depressed (only microtap II)</p> <p>Remedy: Unlock the Emergency-Stop button, switch off the machine and switch on again after 20 seconds.</p>
<p>SAFETY STOP</p> <p>MOTOR LOCKED</p>	<p>Meaning: Selector switch is set to „0“.</p> <p>Remedy: Set drive selector switch to „1“ (see also chapter “Changing tap”)</p>
<p>USER ABORTED</p> <p>DEPTH 1/min M 4-5 0.10mm 1000R 0150NCM</p>	<p>Meaning: User aborted thread tapping</p> <p>Remedy: Restart thread tapping after solving the problem</p>
<p>COUNTER ACHIEVED XXXX THREADS</p> <p>DEPTH 1/MIN M 4-5 0.10mm 1000R 0150NCM</p>	<p>Meaning: Preset production quantity is reached.</p> <p>Remedy: Press illuminated associated push-button.</p>
<p></p> <p>DEPTH 1/min M 4-5 0.10mm 1000R 0150NCM</p>	<p>Meaning: In AUTO MODE the motorspindle is not in final position</p> <p>Remedy: Set so the adjusting lever, the motor spindle drives herself in final position also chapter “changing parameter / start setup”.</p>

xxx = Number of reversals

B Quality messages

DEPTH NOT ACHIEVED 12.5 mm	Meaning: Preset cutting depth was not reached
	Remedy: <ol style="list-style-type: none">1. Re-drill the hole deeper2. Observe standards for tapping holes3. Use proper tool for associated material4. Replace damaged (worn) tapping tool (service life reached)5. Use lubricant6. Hole not coaxial with tool. Check thread for tolerances7. Heighten selected torque, check thread if it is o.k.
QUALITY CONTROL NO LEAD ANGLE	Meaning: Tap failed to start cutting
	Remedy: <ul style="list-style-type: none">- Check if workpiece is present- Check if hole is present- Check if hole is oversized- Check if tool is present- Check if "Sz" and "□ Sz" are correctly preset (Auto start only)
QUALITY CONTROL REVERSEMENTS xxx	Meaning: Number of working spindle reversals, (tool service life).
xxx = Number of reversals	Remedy: <ol style="list-style-type: none">1. Change damaged (worn) tool, (perhaps end of tool service life).2. Use lubricant3. Remove jammed chip4. Cause = Hard spots in work material
QUALITY CONTROL ERROR SZ 0000	Meaning: Tap failed to start cutting
	Remedy: <ul style="list-style-type: none">- Check if "△ Sz" and "□ Sz" are correctly preset.- check if „△ Sz“ is out of the preset tolerance.

QUALITY CONTROL
Mz < Mz-min 025 Ncm

Meaning: 1. min-Mz not reached.
2. pilot hole was too big
3. Thread was already cut but not counted
Remedy: drill correct size pilot holes

C Hardwaretest

HARDWARE TEST FAILED
ERROR: 002

Meaning: 1. Off / on switch interval was too short.
2. Error: Electronic defective
Remedy: 1. Switch machine off, wait 20 secs., switch on again or hardware error.
2. Machine needs to be repaired by the service of microtap GmbH.

HARDWARETEST FAILED
ERROR: 003

Meaning: Error: Electronic defective!
Remedy: Machine needs to be repaired by the service of microtap GmbH.

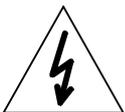
HARDWARETEST FAILED
ERROR: 004

Meaning: Error: Electronic defective!
Remedy: Machine needs to be repaired by the service of microtap GmbH.



WARNING!

If the error message „ERROR“ appears the electronic of the machine is defective. The machine is under high voltage. Only the service of microtap will open the machine!



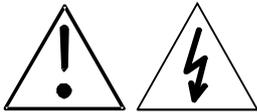
High voltage!



Note

If other error messages are displayed, please note them and call our Customer Service Department for assistance.

6.4. Opening and closing the machine



WARNING! High voltage!

Switch off the machine, disconnect main connector and wait 2 minutes
The high voltage has to be discharged!

Opening machine

1. Switch the machine off remove the mains connector and wait 2 minutes.
2. Remove the tap from the collet.
3. Disconnect the cable of the operating lever from its receptacle at the rear of the work head (see Fig 5-1).
4. Disengage the operating lever axially by pulling outwards from the machine housing (see Fig 5-1).
5. Remove the retaining screws of the spindle cover at the bottom of the work head and withdraw the cover downwards.



CAUTION

Support the cover with one hand while removing the last retaining screw. Have a look to the cables to make sure they are not broken.



CAUTION

Support the front panel while unplugging cable connections. The panel may be subject to static discharge. Do not touch the components mounting panel.

6. Remove the screws retaining the work head cover.
7. Carefully tilt the cover forward and down until the cable of the EMERGENCY-STOP button and the potentiometer cable can be unplugged from the panel.
8. Remove cover.

Closing machine



CAUTION!

When plugging in the cables, support the front panel!

1. Reinstall the work spindle cover so that you can plug in the cable.

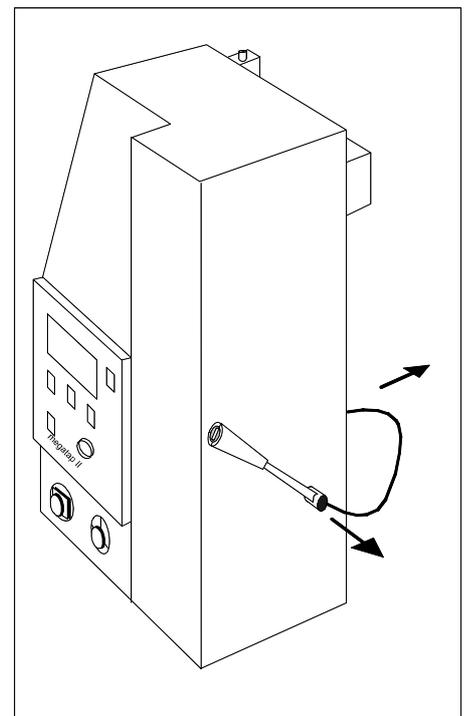


Fig. 5-1 Operating lever

2. Replace the four retaining screws of the spindle cover at the bottom of the work head.
3. Screw on the spindle cover.
4. Plug in the mains cable.

6.5. Repairs

6.5.1. Replacing the fuse

The fuse **3,15A/TT** for **microtap II /jobtap** and **16A/T** for **megatap II** is located on the rear side of the machine. The spare fuses are inside of the operator manual.



1. Switch off the machine and remove the mains connector
2. Remove the fuse cover with a screw driver
3. Remove the defective fuse
4. Insert a new fuse with the **same** type and rating and remount the cover



NOTE

A blown fuse is perhaps caused by other faults. If the replacement fuse blows, the hardware is defective and must be serviced by microtap. For continued protection against fire hazard, replace only with the same type and rating of fuse.

6.5.2. Changing the suspension wires

The floating suspension comprises a tension spring (C), three wire cables (1-3), an eccentric cam (B) and an adjusting lever (D). If any one of the cables breaks, the drive unit (A) can no longer float and will drop.

In that event, replace all three wire cables (1-3).

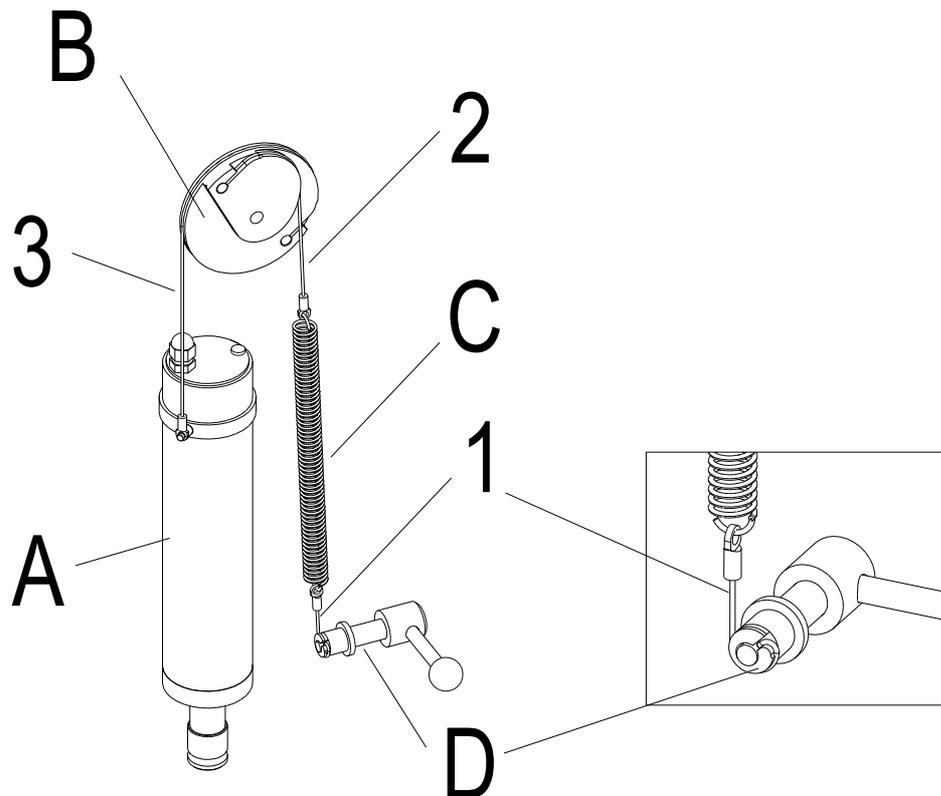
1. Raise the work spindle (A) and support it in its uppermost position by means of a suitable wooden block so that the work spindle (A) stays in the upper position.
2. Open machine see chapter "opening machine"
3. Disengage the operating lever (D) axially by pulling outwards from the machine housing
4. Disengage all three wire cables (1-3):
 - Cable 1 (adjusting lever (D) -> retaining spring (C))
 - Cable 2 (retaining spring (C) -> eccentric pulley (B))
 - Cable 3 (eccentric pulley (B) -> motor bracket (A))
5. Install new cables as follows:



ATTENTION!

Danger of injury, wear security gloves!

- Cable 2 (retaining spring (C) -> eccentric pulley (B))
 - Engage the looped end of the cable (2) with the retaining spring (2)
 - Insert the cable (2) end with the nipple and fix it in the eccentric pulley (B)
- Cable 1 (adjusting lever (D) -> retaining spring (C))
 - Insert the cable (1) end with the nipple into the radial hole of the adjusting lever (D).
 - Engage the looped end of the cable (1) with the retaining spring (C)
- Cable 3 (eccentric pulley (B) and motor bracket (A))
 - Insert the cable (3) end with the nipple and fix it in the eccentric pulley (B)
 - insert the new cable (3) end with the nipple into the hole located at the larger diameter of the eccentric pulley (B) and secure it in place by tightening the grub screw.
 - Insert the cable end with the nipple and fix it in the eccentric pulley.
6. Remove the supporting wooden block and test the floating action of the work head.
7. Close machine (see chapter “closing machine”)



7. Spare parts

7.1. General information

Included in the spare parts list are those components which, in light of current experience, may be required:

- mechanical and electronical spare parts
- parts and components required for routine maintenance.

All other parts are installed exclusively by *microtap GmbH*.

7.2. Ordering spare parts

The following information is required to order spare parts:

- machine type
- part number
- description
- required quantity

7.3. Spare parts list

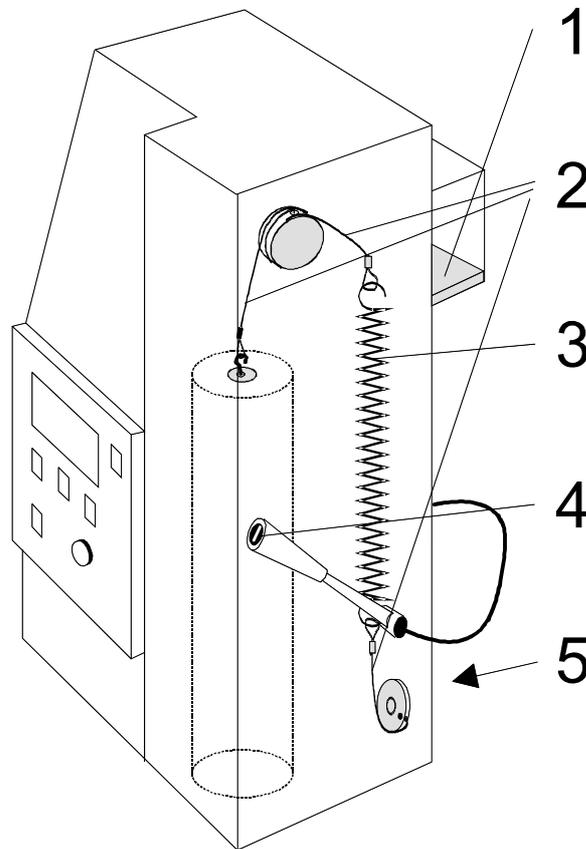
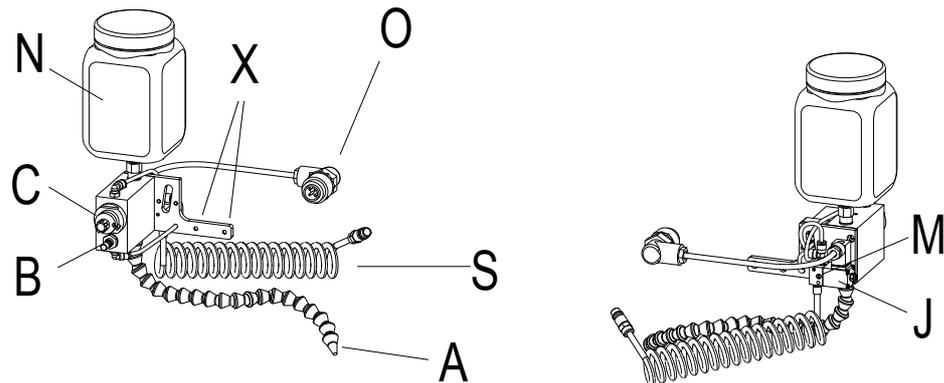


Fig. Pos.	Art. No.	Description	
1	IMX001	Dust-filter (Vlies blue/white)	
2	LTZ106	suspension wire system	mic II-G5
2	LTZ102	suspension wire system	meg II-G8/ -G14/-G16
3	JOX077	Tension spring	mic II-G5
3	JOX076	Tension spring	meg II -G8/ -G14/-G16
4	DOX005	Start button mic II & meg II	
4	DOX006	Silicon cover for Start button	
5	DOX111	Fuse	3,15A TT (mic II: 230VAC)
5	DOX113	Fuse	16A T (meg II: 230VAC)
5	DOX114	Fuse	6,3A T (mic II: 115VAC)

8. Installation of optional equipment

8.1. MMS Minimum – quantity – lubricant unit



1. Screw the lubricant unit to the rear side of the machine head with two hexagon sockets (X) (M4 x 8).
2. Plug in the electrical connection (O) at the rear side of the machine head.
3. Connect the air hose (S) to a RFL-unit and adjust the pressure to min. 4 bar, max. 8 bar.
4. Bleed all air from the MMS and adjusting block
 - Open the lubricant tank (N) and fill it with required lubricant.
 - Open the quantity regulator of the micro pump (C), approx. 2 turns (more lubricant = turn right!). Start spray pulses by manual operation (screw driver) using the valve (rear side of MMS) just until lubricant comes out.
 - Reduce quantity regulation (C) in accordance with required quantity.
 - Adjust nozzle (A) so that the lubricant cone impacts to a sheet of paper or a cloth.
 - Adjust quantity of air using the air spray regulator (B)
 - Set quantity and air as required.
5. Programme lubricant parameters - type : spray. Choose pulse time and frequency.
6. Adjust the nozzle (A) so that the lubricant is directed towards the hole to be tapped.
7. Make sure that the manual operation (M) valve is switched off, that means that the valve (J) is closed.



NOTE

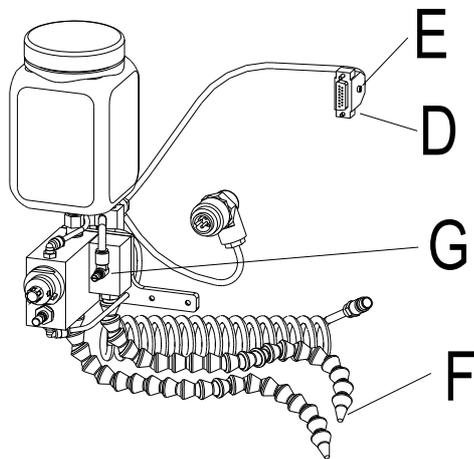
At every spray pulse the piston pump will be operated once only. The air spray regulator (B) and the time (parameter menu „lubricant pulse“) does not influence the lubricant quantity! An impulse generator is available as an accessory.



Manufacturer' hint

Always lubricate generously, so that deep threads are fully lubricated and so that there is enough lubricant for the reverse stroke. Lubrication improves the quality of the thread and extends the service life of the tap.

8.1.1. MMS with blow out unit



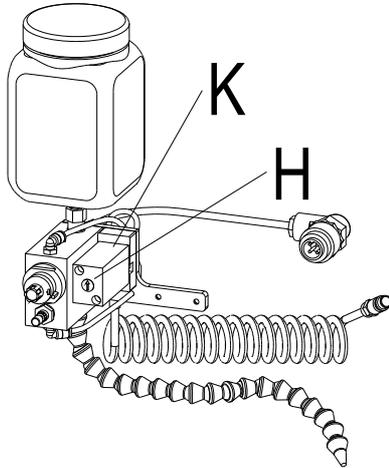
- a. Installation see „Minimum – lubricant unit (MMS)“
- b. Plug connector (D) of the electric port at the rear site of the machine head to the I/O interface.
- c. Set nozzle front (F) (yellow) that way that the air is directed to the tool in the upper position of the spindle.
- d. Wear safety glasses while operating the machine.
Chips and dirt during blow out can injure the eyes!
- e. The blow out puls starts when the spindle reaches the upper endposition (and when the machine is switched on).
- f. The time (duration of the air pules) can be set by the potentiometer (E) at the connector (D) with a slot screwdriver.
- g. The quantity of the air can be changed by the flow control (G)
- h. Install the O-ring (48mm x 4mm) that way at the spindle that there is a guard between spindle and cover at the upper position of the spindle to protect it form chips.



ATTENTION!

Set the blow out pulse that way that no chips can get into the interior of the machine.

8.1.2. MMS with impulse control



1. Installation see „Minimum – lubricant unit (MMS)“
2. General operation see chapter „Minimum – lubricant unit (MMS)“
3. Select in settings „Lubr.Cycle“ MODE: SME/DROP: Times.
4. The break time of the lubricant cycle can be set by the setting screw (H) at the pulse (K) by a slot screwdriver. The times of the lubricant cycle can be set by each process
5. The lubrication takes place only during process (not in reversal).

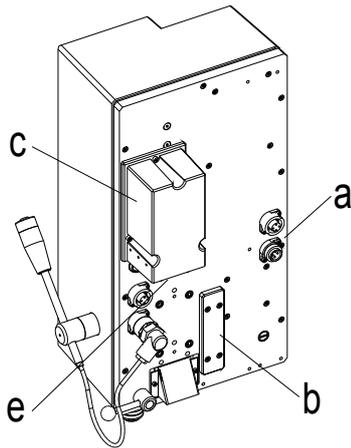


Manufacturer' hint

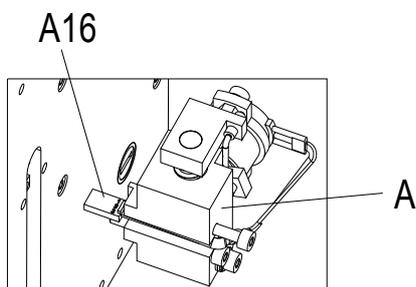
The pulse control is needed to produce depth threads and reaches good results if in the menu “CHIP CLEARANCE” the mode “DEPTH” is set.

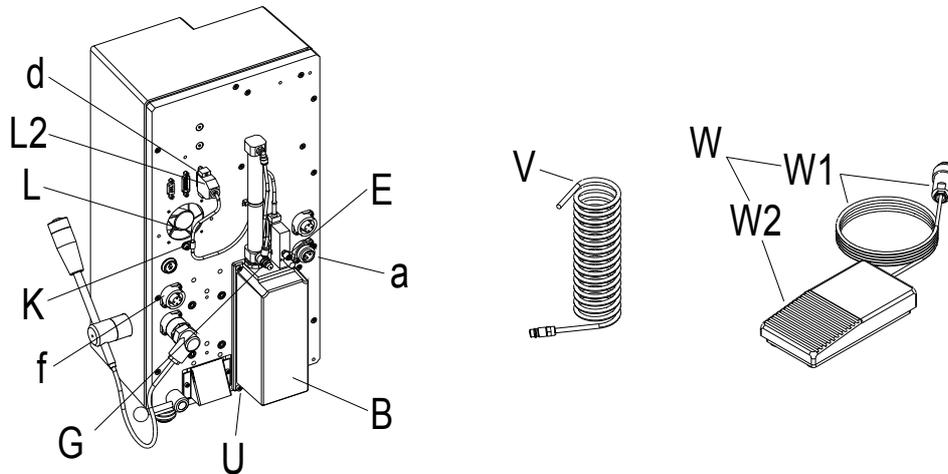
8.2. Installation / commissioning the pneumatic feed system (ZAP) to megatap II

Definition: The names left and right are defined from the rear side of the machine.

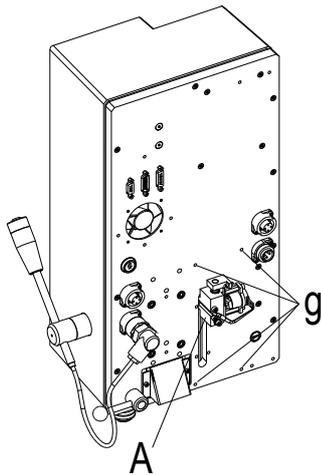


1. Switch off the machine.
2. Disengage the main connector (a).
3. Remove the cover plate (b) from the back of the machine.
4. Remove the air filter housing (c).
5. Install the cutting-start force sensor (A)
 - Insert the plug (A16), so that the lead is at the right side.
 - Secure the cutting-start force sensor (A) with two hexagon socket screws (A19) M4 x 40.





- Use four M4 x 10 hexagon socket screws (U) to install the preassembled feed unit (B) to the back of the machine (g)



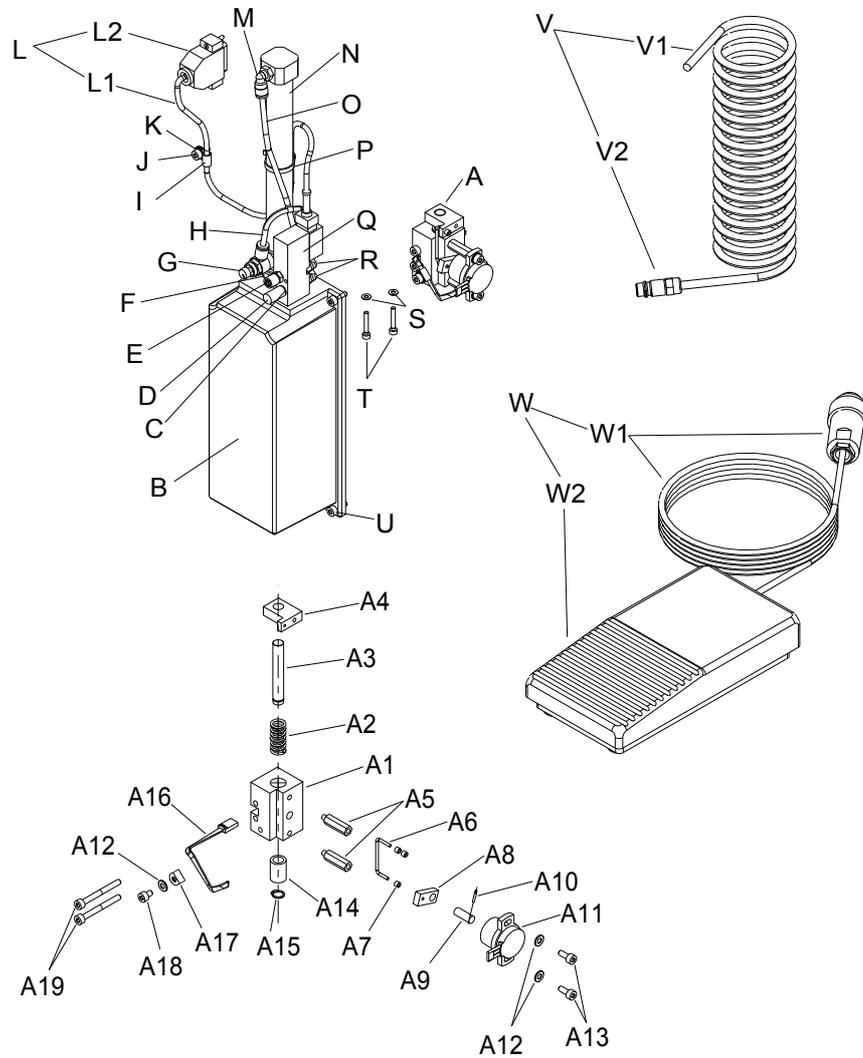
- Insert and fix the cable connector (L2) of the ZAP – control cable (L) to the I/O Port (d) of the machine.
- Fix the ZAP – control cable (L) with the cable clamp (K).
- Reinstall the air filter housing (c).



ATTENTION: The filter pad must be inserted!

- Insert the cable (W1) of the foot switch (W) to the sleeve (f).
- Connect the pipe (V) to the screw (E) and to a service unit with kondensed water; regulate pressure, min. 2 bar, max. 8 bar.
- Engage the main connector (a) and switch the machine on.
- Adjust ZAP:
(see chapter „thread tapping with option ZAP via remote control“)

Spare part overview ZAP megatap II:

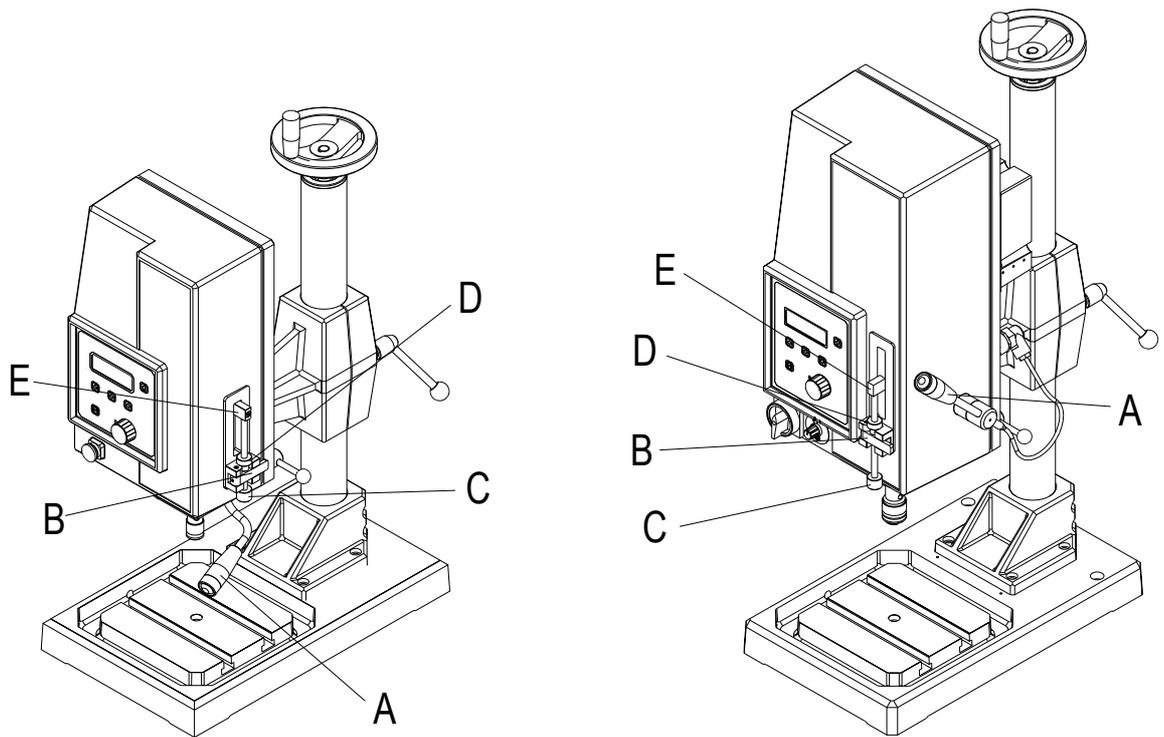


Pos.	Artikel Nr.:	Pos.	Artikel Nr.:
A	FRX001	L1	GOX060
A2	JOX051	M	GOX177
A11	BOX001	N	GOX013
A16	DMX002	O	GOX315
C	GOX306	Q	GOX053
D	GOX165	R	GOX176
E	GOX175	V	GOX312
G	GOX106	W	LTZ104
H	GOX315	W1	DMX001
L	LTZ105	W2	DOX013

8.3. Depth stop

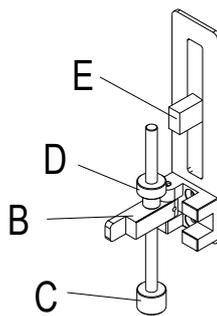
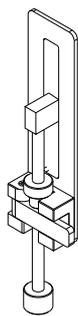
The depth stop can not be used with machine type „jobtap“.

Application-areas: restricted drill applications (drilling), counter sinking, reaming.



active

Not active



WARNING! Risk of injury!

Use the flap (B) only with the program „continuous run“. Use the depth stop only with the program „continuous run“.

Incorrect use could cause injury, damage to the tool, workpiece and machine.

8.3.1. Setting of the depth stop

1. Select program
 - Select program „CONTINUOUS RUN“ from the menu using rotary knob or keys.

THREAD CUTTING THREAD FORMING THREAD INSERT Mz THREAD INSERT Fz
SCREWING Mz SCREWING mm- -> CONTINUOUS RUN

2. Set flap (B) active.
3. loosen nut (D) and retract spindle (C).
4. Lower the tool using the hand lever (A) to the work piece. Place a gauge block between spindle (C) and stop post (E) with the desired working depth. Rotate spindle (C) just to the gauge block and secure the spindle (C) with nut (D).
5. Set desired depth, torque and speed in the working menu.



NOTE:

- When the working spindle reaches the preset torque it stops.
- If the spindle does not move for 5 - 10 seconds, the working process stops.

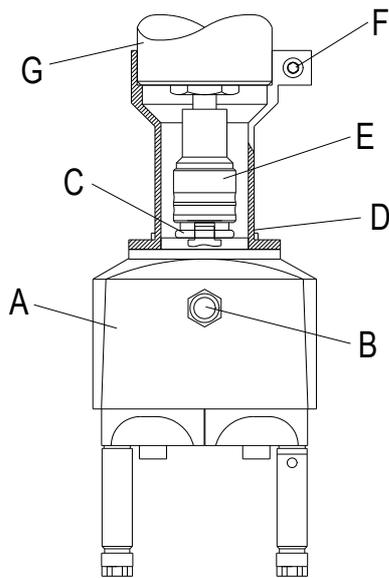
8.3.2. Working in ZAP mode with depth stop

1. In ZAP – mode the spindle runs until the preset depth is reached as set in the working menu.
2. If the spindle does not return to the start position after reaching the depth please
 - adjust the depth stop (lower) or
 - correct the depth in the working menu –0,1mm

8.4. DSK double spindle head

Installing and adjusting of double spindle head

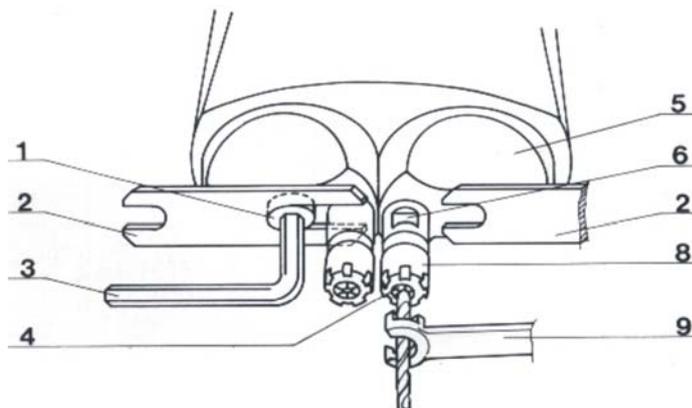
8.4.1. Installing double spindle head onto the machine



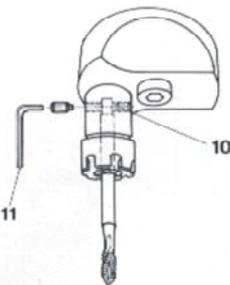
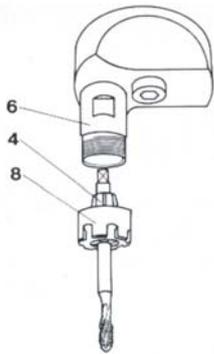
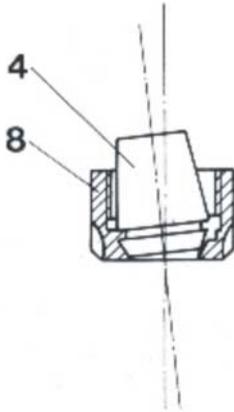
1. Fit driver insert (C) to quick change system (E)
2. Locate double spindle head (A) with flange (D) up to the motor (G), until the driver insert (C) locks in the driver slot of the double spindle head (A), rotate if necessary.
3. Clamp flange with fixing screw (F)
4. Adjust counter balance system using lever

8.4.2. Adjusting the hole centres

1. Loosen the central nut of the spindle housing (1) with hexagonal key (3).
2. Turn the spindle housing with spanner (2), until the desired centre spacing is reached.
3. Fix the central nut (1) of the spindle housing with the hexagonal key (3).



8.4.3. Installing of collet and tool



1. Select a collet with the same size of the tool.
2. Insert the collet (4) diagonally into the collet nut (8) so that the eccentric flange in the nut slots into the annular groove in the collet. The function of the eccentric flange is to extract the collet from the spindle cone.
3. Screw collet with collet nut on the spindle (6). Insert tool and clamp it with key (9) (secure spindle with key (2)). Do not over tighten!
4. To stop the tap slipping it should be fixed in the spindle (6) tighten grub screw (10) with socket key (11).



ATTENTION!

Never fit the collet nut (8) to spindle, when the collet (4) is not positioned correctly in the collet nut.

8.4.4. Maintenance

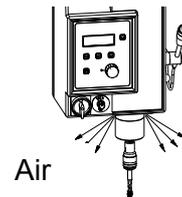
- The gear has an oil lubrication. Before installation check oil level. Hold the double spindle head vertically and control the oil level in the oil view. The oil level should be in the middle of the oil view. Removing and emptying are possible after removing the oil view. Use only acidity-free oil (ShellTellus T 37 or similar). Change oil after approx. 500 working hours.

8.5. LSM Air seal for exit of motor spindle

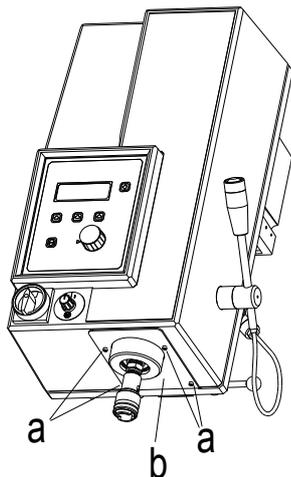
for megatap II

The air seal is to protect the interior of the machine and will be used at the following working conditions.

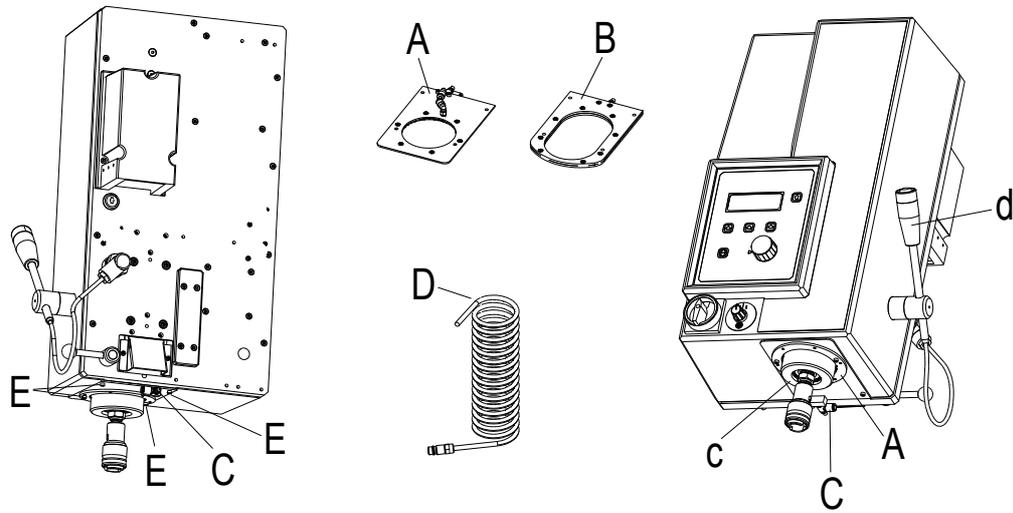
- Use of compressed air under the spindle.
- Short chip materials
- dirty contaminated air (ie. welds)
- Atomised lubricants



8.5.1. Mounting of air seal



2. Switch off the machine.
3. Disengage the main connector.
4. Unscrew the coverplate of the spindle (b) at the underside of the machine head.
(4 screws (a) M3 x 10 with hexagon socket)



5. Push air seal (A) for megatapII G8 or air seal (B) for megatapII G14 and G16 over the spindle (c) and fix it using hexagon socket screws (E) M3 x 12.
6. Adjust air seal so that there is a evenly air gap between spindle (c) and air seal (A) or (B) .
To control the air gap move the hand lever (d) up and down.
7. Fix the screws (E) (Attention: Not too tight! >aluminium cover<)
8. Install air hose (D) to throttle (C) and to a maintenance unit with condensed water separator, max. 8 bar.
9. Adjust outcoming air with throttle (C) so that there is an easy airflow.
10. Engage the main connector and switch on the machine.

8.6. Air Blast unit

- a. Installation please see chapter „MMS Minimum – quantity – lubricant unit “.
- b. Plug in connector (15 pol. SUB-D) to the I/O user interface at the back of the machine head.
- c. Position nozzle (yellow) so that the air cone meets the tool in the upper position of the spindle.
- d. Always wear eye protection when operating the machine.
Chips and contamination can cause damage to the eyes during blowing out!
- e. The air blast impulse starts when the working spindle reaches the upper - back position (and also when the machine is first switched on).
- f. The time (duration of the air impulse) can be set with the potentiometer at the 15 pol. SUB-D connector using a screw driver.
- g. Air quantity can be changed using the throttle (right beside the quantity regulation of the micropump from the MMS).
- h. Install the O-ring (48mm x 4mm) to the spindle between spindle and housing so that there is no chance for chips and contamination to get into the machine.



ATTENTION!

Set the air blast so that there is no chance for chips and contamination getting into the machine between spindle and housing.

9. Product overview

Machine Types	Stainless Steel	microtap / megatap	jobtap	labtap
G2	# 0 - 2 M0,5 - M2	•	-	-
G5	# 0 - 10 M1 - M5	•	•	•
G8	# 3 - 5/16" M2,5 - M8	•	•	•
G14	# 6 - 7/16" M3 - M14	•	•	-
G16	# 8 - 1/2" M4 - M16	•	•	-
Machine software / Functions		microtap II / megatap II	jobtap	labtap
Language selector GB/F/NL/B/DK/S/I/D		•	•	•
Metric / Inch selector for tap and depth of cut		•	•	•
Ncm Torque control setting, Mz minimum - maximum Peak torque display each cycle / Quality error functions		•	•	•
Spindle speed (stepless), depth of thread setting (0,1 mm)		•	•	•
Right or lefthand drive		•	•	•
Fast, normal and slow reverse speeds		•	•	•
Automatic start with position depth control with ZAP		•	•	•
Cutting force FZ start sensor, only with optional ZAP		•	•	•
User data storage for 40 different parameters		•	•	•
Lubricant control with pulse and with timed flow		•	•	•
Variable chip clearance function / Titanium chip function		•	•	•
Single and total thread / part counter		•	•	•
SW	Program for thread cutting and forming	•	•	•
SW	Program for thread inserts / Ensaf / Helicoil / Kato	•	-	•
SW	Program for screw setting	•	-	•
SW	Control software for one 24 Volt DC Valve (I/O)	•	-	•
QND	Quality printer / RS232	•	-	•
WinPCA	Data acquisition software / RS232	•	-	•
PCtap	PC and control software / RS232	•	-	•
I/Oport	parallele interface with 4 x I/O outputs (Option)	•	-	•
RS232	serial interface	•	-	•
RAL	Finish	6001 emerald green	6001 emerald green	1015 bright ivory
AutoSW	Control and handlings Software on request	•	-	•

• = included / - = not available

9.1. Options and accessories for the thread tapping machine

This is an overview about the usage of the accessories with the different thread tapping units.

Options and Accessories	microtap II / megatap II	jobtap	labtap
ZAP controlled pneumatic feeding system	•	•	•
MMS lubricant fluid dispenser	•	•	•
MMS2 two bottle system	•	•	•
DSK double spindle head	•	•	•
LSM air seal	•	•	•
MLM machine light	•	•	•
SHV column specials	•	•	•
HVS horizontal reach adjustment	• only microtap II	• only microtap II	• only microtap II
SSB security key	• only megatap II	• only megatap II	• only megatap II
SWS quick change tool holder systems	•	•	•
ASL audible signal light	•	-	•
Inserts inserts and screw-holder systems	•	-	•
MPT manual positioning table	•	• not controlled	•
WinPCA Data Acquisition Software for PC	•	-	•
QND ONLINE serial printer for quality reports	•	-	•
I/Oport Parallel Interface 4x I/I (Option)	•	-	•
RS232 Serial Data Communication	•	-	•
SWPro Programs for screwsetting and threaded inserts	• not for microtap II G2	-	•
AutoSW Control software for automation	•	-	•

• = included / - = not available

9.2. Quick change inserts

for microtap II / jobtap / labtap and megatap II / jobtap / labtap

Insert Size Ø / □	Tap DIN 371	Tap DIN 374/376	Quick change system / Type / Size			
			SWS0 microtap II G5 Size 00	SWS1 megatap II G8 Size 01	SWS2 megatap II G14 (G16) Size 01	SWS3 megatap II G16 (G14) Size 03
2,5/2,1	M 1 - 1,8	M 3,5	00	01*	01*	
2,8/2,1	M 2 - 2,6	M 4	00	01*	01*	
3,5/2,7	M 3	M 4,5 – 5	00	01	01	
4,0/3,0	M 3,5		00	01	01	
4,5/3,4	M 4	M 6	00	01	01	03*
5,5/4,3		M 7	00	01	01	
6,0/4,9	M 4,5 - 6	M 8	00	01	01	03
7,0/5,5	M 7	M 9-10	00	01	01	03
8,0/6,2	M 8	M 11	00*	01	01	03
9,0/7,0	M 9	M 12		01	01	03
10,0/8,0	M 10		00*	01	01	03
11,0/9,0		M 14		01	01	03
12,0/9,0		M 16		01*	01*	03
14,0/11,0		M 18				03
16,0/12,0		M 20				03
18,0/14,5		M 22 - 26				03

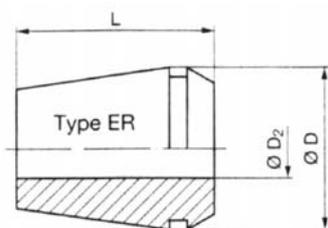
SWS p.e.: SWS 1 = Quick Change system (Type 1)
Size p.e.: 01 = Size of the inserts and holder system
***** p.e.: 01* = Special size
Bold p.e.: **01** = included in quick change system
Not bold p.e.: 01 = as accessory available

9.3. Collets – Accessories

for microtap II-G2 Collet chuck system Size ER8
 - holder with 4 collets (M0,3 - M3)

Standard SZS0

Collet / Type	L	Ø D	Size Ø D ₂	Range
ER 8	13,5	8,5	1,0 – 5,0	0,5
ER 11	18	11,5	1,0 – 7,0	0,5
ER 16	28	17	1,0 – 3,0 4,0 – 10,0	0,5 1,0
ER 20	32	21	1,0 – 3,0 4,0 – 13,0	0,5 1,0



Collet holder type	Chuck range Ø D ₂	Ø D	Ø D ₁	L ₂
00 / ER 11	0,5 – 7,0	19	13	23
01 / ER 20	0,5 – 13	34	19	38

