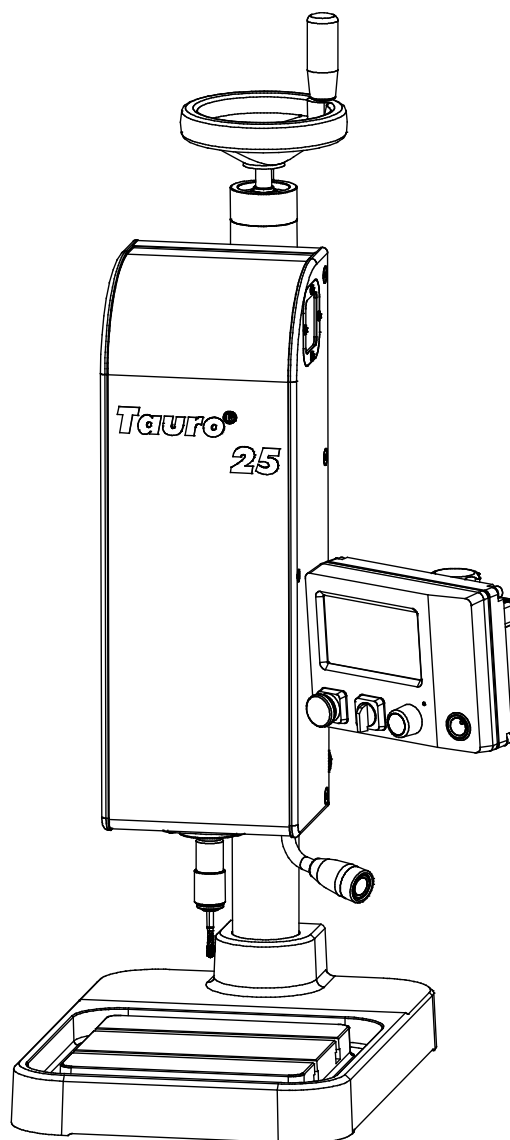


User Manual

Thread Tapping Machine

Tauro[®] 8 / 25 / 83



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This user manual is an integral part of the

Typ **Tauro®**: _____

Serial No: _____

Year of manufacture: _____



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EC Declaration of Conformity

Name and address of the manufacturer:

Taurox e. K.

Am Viechtberg 6
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Germany

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user. The declaration is no more valid, if the product is modified without agreement.

Herewith we declare, that the machinery described below

product denomination: Thread tapping machine
model / type: **Tauro® 8 / 25 / 83**

is complying with all essential requirements of the Machinery Directive 2006/42/EC.
In addition the partly completed machinery is in conformity either the EC Directives 2014/30/EC relating to electromagnetic compatibility.

Harmonised Standards used

DIN EN ISO 12100:2011-03	Safety of Machinery
EN 60204-1 :2007	Electrical equipment of machines
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments
EN 55011:2009 + A1:2010, section 6.2.2	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 61000-6-2 :2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-3-2:2006 + A1:2009 + A2:2009	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

The person authorised to compile the relevant technical documentation (must be established within EU)

Taurox e. K.

Mr. Janich
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Wiesenfelden, 30.08.2022

Janich Martin, owner of a firm

Place, Date

surname, first name and function of signatory

Signature

Significance of this operator's manual

This operator's manual is an integral part of the thread tapping machine **Tauro® 8 /25/83**.

- Must be kept in a way that it is always at hand until the thread tapping machine will be disposed of.
- Pass this manual on if the thread tapping machine is sold or loaned/leased out.

Read this manual before installation and operation.
This protects you and avoids damages at the machine.

In any case you encounter difficulties to clearly understand the manual, please contact the manufacturer.

Only persons with adequate technical knowledge and knowledge of this machine are allowed to install and operate the machine.

Missing or inadequate knowledge of the manual results in the loss of any claim of liability on part of **Taurox e. K.**

Taurox e. K. reserves the right to make alterations to its products in the interest of technical progress. These alterations need not be documented in every single case.

Disclaimer

This manual and the information contained herein have been compiled with due diligence. **Taurox e. K.** shall not be liable for errors contained herein or for incidental or consequential damage in connection with the furnishing, performance, or use of this material.

Description of symbols

General description of symbols



Danger

Indicates dangers which can be followed by death, heavy personal injury or substantial property damage.



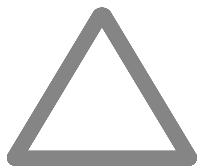
Warning

Indicates a possible risk which can be followed by death, heavy personal injury or substantial property damage.



Caution

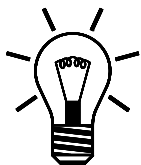
Indicates a possible risk which can be followed by minor personal injury or property damage.



Attention

Indicates a possible impending situation, which can be followed by damages at the product or in the environment.

It communicates requirements which have to be absolutely considered for an accurate operation.

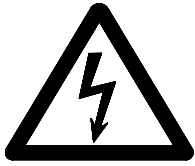


Note

Indicates applications and other useful information. It shows hints and advices for an efficient use of the machine and operation, to prevent additional work.

Additional symbol explanation

The additional symbols include always a “general symbol”.

**Warning of dangerous high voltage:**

Indicates danger of life through high operating voltage and electrical shock, which can be followed by death.
This symbol includes also „**Danger**“.

**Warning of cutting damage:**

Indicates a danger of sharp objects which can be followed by cuts.
This symbol includes also „**Warning**“.

**Warning of automatically running:**

Indicates a possible risk which can be followed by injuries.
This symbol includes „**Warning**“.

**Warning of hot surface:**

Indicates a possible risk which can be followed by burnings.
This symbol includes „**Caution**“.

**Warning of hand injuries:**

Indicates a possible risk, which can be followed by hand injuries and crush injuries.
This symbol includes „**Warning**“.

**Use eye protection:**

Always wear eye protection! Indicates a possible risk which can be followed by heavy injuries at the eyes or can be followed by blindness.
This symbol includes „**Warning**“.

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1 Safety instructions

1.1 General information

The device complies with the applicable safety regulations and standards. Special attention has been paid to the safety of the user.

For the user are additional valid the:

- Relevant accident prevention regulations,
- General accepted safety related norms,
- EG-norms or other country specific regulations.

1.1.1 Usage as agreed upon

The intended use includes the procedure according to these operating instructions. The device may only be operated within the limits of the specified data.
(see chapter: "Technical Data").

1.1.2 Usage other than agreed upon

To use the machine in different ambient conditions as mentioned in the chapter "Operation conditions" ask the manufacturer.

1.1.3 Modifications and alterations

Based on security reasons it is not allowed to do alterations and changes at the machine and its functions.

Changings at the machine which are not allowed by the manufacturer are followed by the exclusion of liability to the company **Taurox e. K.**

1.1.4 Repairs and servicing

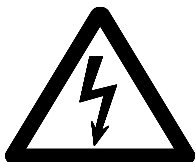
It is not allowed to repair the machine by the user. The machine has no parts which can be repaired by the user.

The machine has to be send to **Taurox e. K.** for repair.

1.1.5 Decommissioning and disposing

For the decommissioning and the disposal, the environment regulations are valid of the country the user company is placed.

1.2 Ensure your own safety / emergency stop



- Disconnect the machine of the power supply system before starting maintenance work. This avoids accidents based on electrical voltage and movable parts.

Please see chapter „Residual dangers“



Danger

- It is not allowed to override or avoid protection- and safety devices like protection cover and machine cover parts or thermic protection switches, emergency stop switch and motor switch.
- Dismantled protections like i.e. machine cover, fuses, emergency stop switch, motor protection switch, have to be reinstalled and to be checked for a proper function.
- The Operating panel with emergency stop switch and motor switch has to be installed in a convenient distance of the user!

1.2.1 Malfunctions



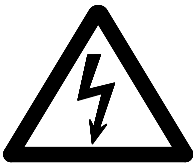
Danger

- In case of troubles or other damages immediately disconnect the machine of the power supply system.
Pay attention to chapter „Residual dangers“
- Report troubles or other damages immediately to a responsible person or to the company **Taurox e. K.**
- Secure the device against misuse or accidental use.

1.2.2 Information signs and labels

- Obligatory intent letterings, signs and labels and let them be readable.
- Renew damaged or not any longer readable signs and label

1.2.3 Housing grounding (Earthing procedure)



The protective conductor must be connected to the protective contact plug (at least 1.5mm²) and the bolt of the housing grounding (at least 10mm²) of the control unit.

High leakage current! The leakage current is higher than 3.5mA.

It is not possible to use a fault Residual Current Device (RCD) to the power supply.

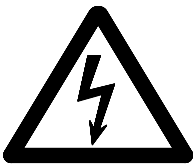
Nevertheless a residual current protective device was installed, it switches the machine off despite there is no malfunction.

If it is required to use the machine with a leakage current protector an isolation transformer has to be used.

1.3 Residual dangers

1.3.1 Hazards during operation

Danger caused of high operation voltage!



Voltages up to DC 325 V appearing which are causing danger of life! These voltages lead to muscular cramps, burnings, unconsciousness, breathing arrest and death.

- During operation hold all parts of the machine closed.
- Do not open the machine.

Danger caused of hot surface!



During operation surfaces in the machine and tools can get hot. The internal parts can reach a temperature up to 90°C.

- Never touch internal parts in the cool down phase after switch off.
- Never touch tools directly after operation in the cool down phase.

Danger in explosive substances areas!



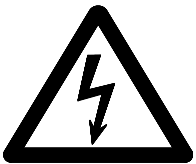
Danger

- Do not use the machine in explosive substances areas.

**Danger****Danger by mechanical force influence!**

The machine has a circulating spindle and movable parts.

- Depending on application fix additional protection cover.
- Secure that in case of unwantedly moving of the spindle no personell hazard can happen.
- Do not remove neccessary protection covers.
- Do not wear gloves or loose clothing because of danger to hang in the rotating working spindle.
- In case of too long hears wear a suitable headgear (hairnet).
- Always wear protective goggles.
- Never touch the rotating spindle.
- Before changing the tool switch off the drive spindle by the motor switch off.

1.3.2 Hazards after power is turned off**Danger by electric shock!**

Capacitors in the device carry dangerous residual voltages up to 5 minutes after switching off the operating voltage.

- Always wait min. 5 minutes after switch of the machine before disconnecting the machine of the power supply system.
- To open the machine wait min. 10 min. after switch off the machine before disconnecting the machine of the power supper. (Only personal with electro technical qualification are allowed to do).

1.4 Instructions on EMI

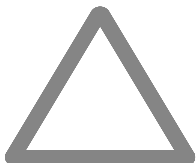
The machine is designed for use in industrial.

**Note**

2 Technical data

2.1 Electrical specification

- | | |
|-------------------------------------|--|
| • Voltage of the rated power supply | ~ $U_{\text{eff}} = 230 \text{ V}$ |
| • Power supply tolerance | $U_{\text{eff}} = 207 \text{ V} \dots 253 \text{ V} (-10\% \dots +10\%)$ |
| • Frequency | 48 – 62 Hz |
| • Overload protection | Fuse 5 A T (time-lag)
Type: (G-fuse 5x20) |
| • Leakage current | >3,5 mA
(See chapter: "Earthing procedure") |
| • Power input permanent load | max. 615 W |
| • Power input non-operated | < 40 W |
| • Digital inputs | 3 pcs 24 V |
| • Digital outputs | 10 pcs 24 V / 3,6 W (short-circuit proof) |



Attention

Attention: Time between switch off and on of the main supply:
If the driving unit was used with motor power (torque and engine speed of the motor) the starting current limitation has to cool down 2 - 3 minutes after switching off the machine. The part which causes the starting current limitation can be ruined if the a.m. was not cared about.

2.2 Mechanical specification

- | | |
|-------------------------------------|---|
| • Spindle travel Tauro 8 max. | 65 mm |
| • Spindle travel Tauro 25 / 83 max. | 90 mm |
| • Thread depth Tauro 8 max. | 55 mm |
| • Thread depth Tauro 25 / 83 max. | 80 mm |
| • Depth accuracy | 0,1 mm |
| • Finish | RAL 7035 / light grey
RAL 5005 / signal blue |
| • Travel | +/- 30° |

2.2.1 Mechanical specification Tauro 8

- Thread capacity Thread cutting
AlMg4,5Mn / 3.3547 M0.5 – M4; blind hole 2,0 x D
X6CrNiMoTi17-12-2 / 1.4571 M0.5 – M3; blind hole 1,5 x D
- Torque range 0.030 – 0.800 Nm
- Rpm range 50 – 3000 rpm
- Travel height adjustment 0 – 323 mm (Column 650 mm)
- Spindle / tool holder Collet holder ER11

2.2.2 Mechanical specification Tauro 25

- Thread capacity Thread cutting
AlMg4,5Mn / 3.3547 M1 – M6; blind hole 2,0 x D
X6CrNiMoTi17-12-2 / 1.4571 M1 – M5; blind hole 1,5 x D
- Torque range 0.1 – 2.50 Nm
- Rpm range 50 – 3000 rpm
- Travel height adjustment 0 – 330 mm (Column 650 mm)
- Spindle / tool holder quick change holder 0

2.2.3 Mechanical specification Tauro 83

- Thread capacity Thread cutting
AlMg4,5Mn / 3.3547 M2 – M10; blind hole 2,0 x D
X6CrNiMoTi17-12-2 / 1.4571 M2 – M8; blind hole 1,5 x D
- Torque range 0.30 – 8.30 Nm
- Rpm range 50 – 2400 rpm
max. 2000 rpm from 6,80 Nm
- Travel height adjustment 70 – 415 mm (Column 750 mm)
- Spindle / tool holder quick change holder 1

2.2.4 Weight

- Machine pedestal approx. 14,3 kg
- Column 650 mm with column flange approx. 8.6 kg
- Column 750 mm with column flange approx. 9.2 kg
- Control unit approx. 8.2 kg
- Operating panel approx. 1.2 kg
- Tauro 8 (Drive unit without spindle feed system) approx. 9.2 kg
- Tauro 25 (Drive unit without spindle feed system) approx. 9.8 kg
- Tauro 83 (Drive unit without spindle feed system) approx. 13.9 kg
- Spindle feed system approx. 0.4 kg

2.3 Physical dimensions

2.3.1 Physical dimensions of the control unit

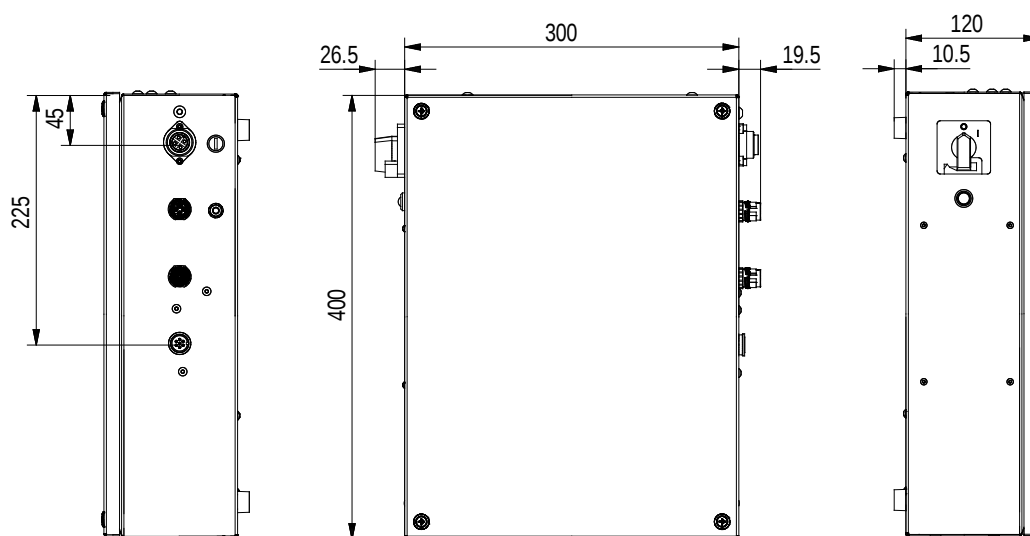


Fig.: 2.1 View of the control unit

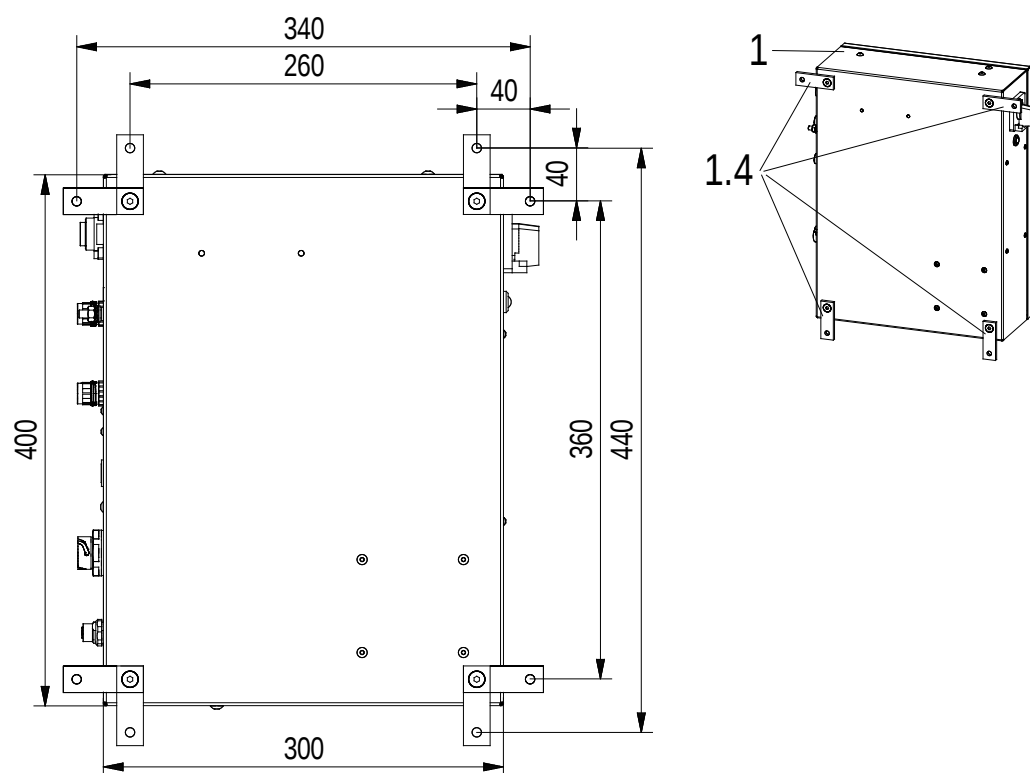


Fig.: 2.2 Rear view of the control unit with fixation to the wall (1.4) (Accessories)

2.3.2 Physical dimensions of the machine pedestal

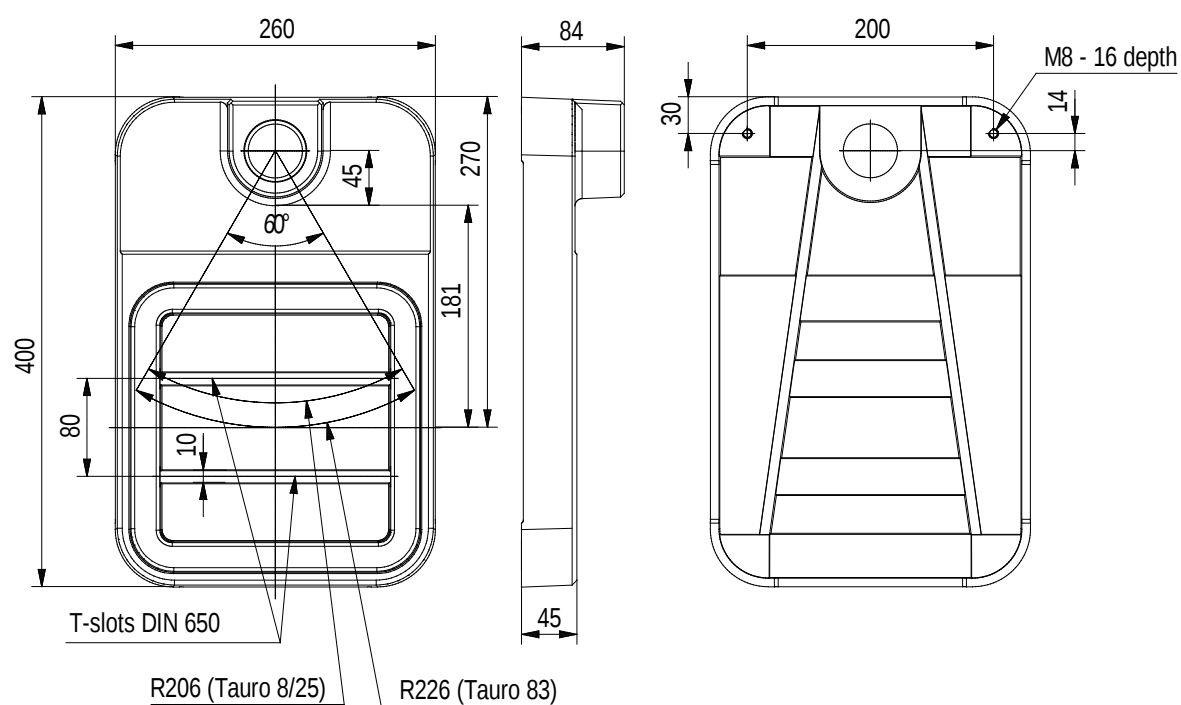


Fig.: 2.3 View of the machine pedestal

2.3.3 Physical dimensions of the Tauro 8

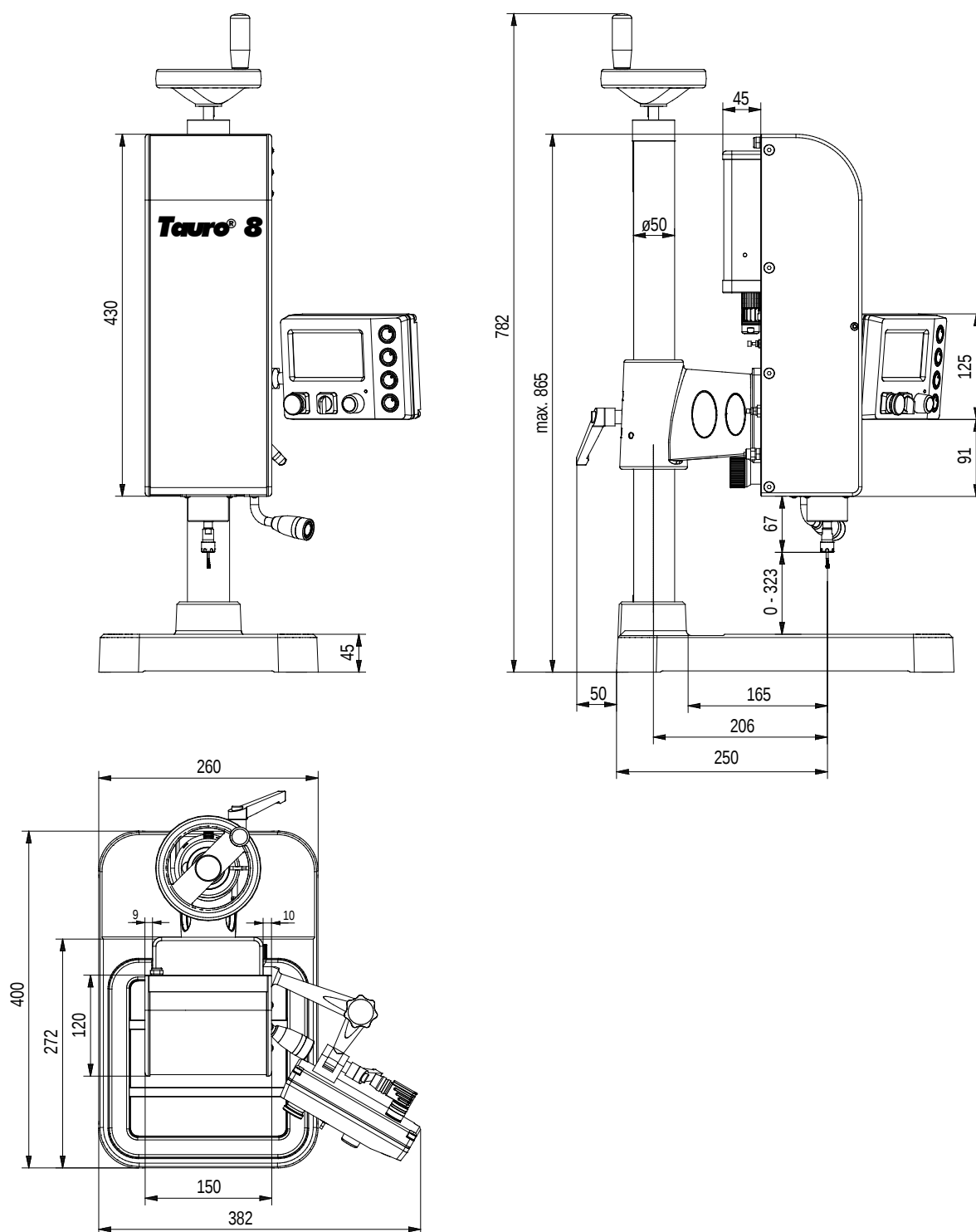


Fig.: 2.4 View of the thread tapping machine Tauro 8

2.3.4 Physical dimensions of the Tauro 25

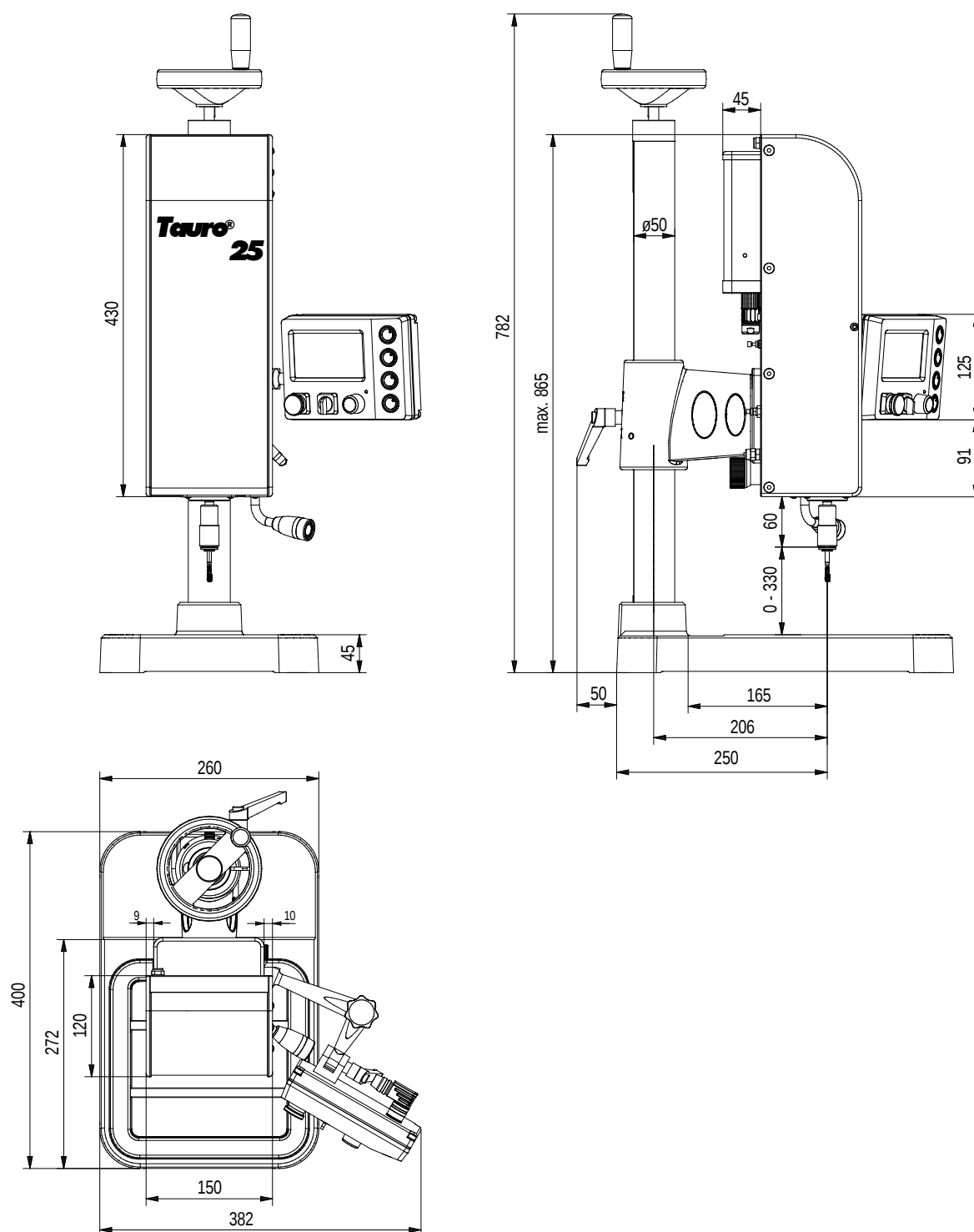


Fig.: 2.5 View of the thread tapping machine Tauro 25

2.3.5 Physical dimensions of the Tauro 83

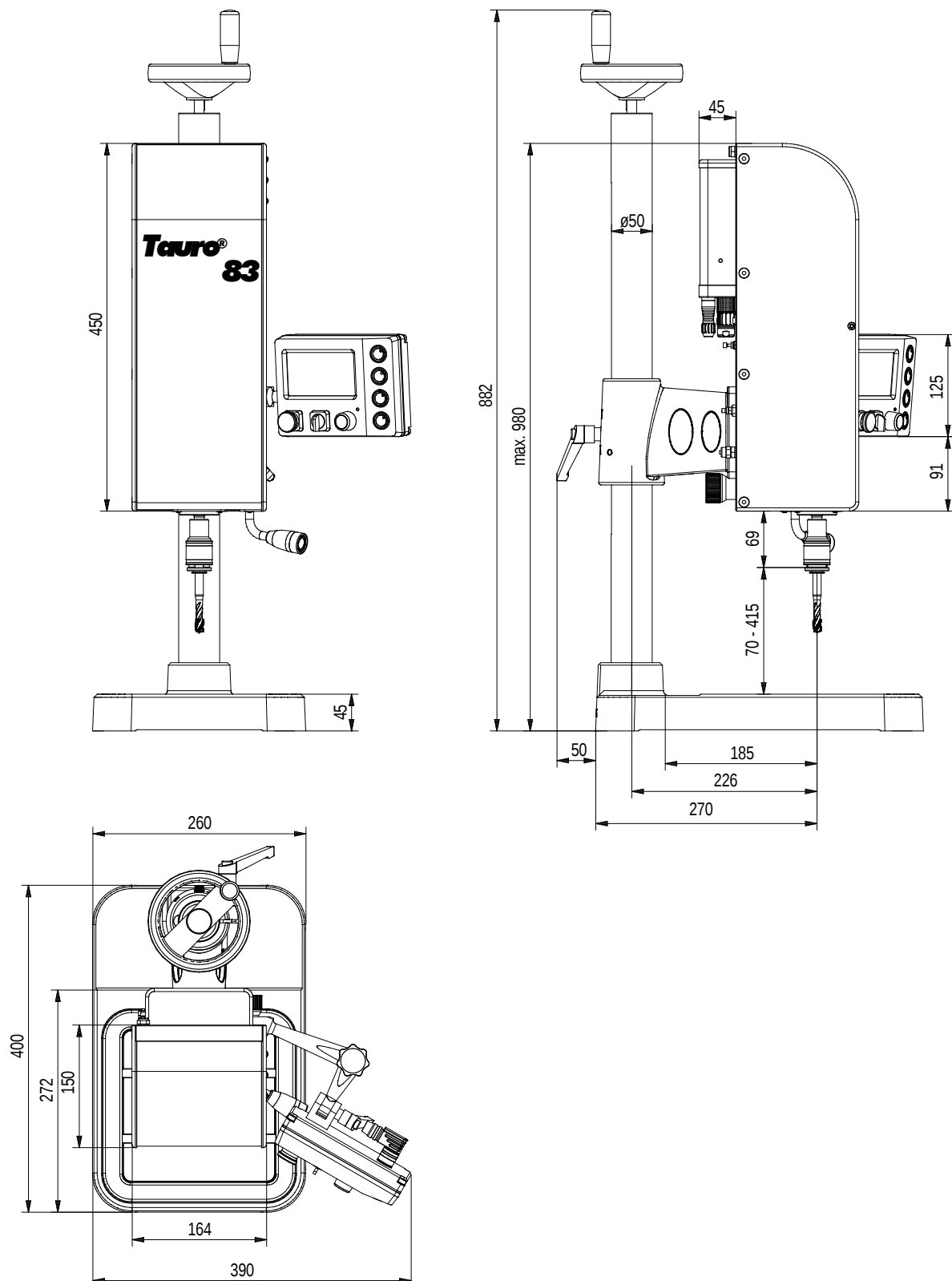


Fig.: 2.6 View of the thread tapping machine Tauro 83

2.4 Operating conditions

- Transport conditions
Temperature: -25°C - 70°C
Air humidity: 5% - 95% (non-condensing)
- Storage conditions
Temperature: -25°C - 70°C
Air humidity: 5% - 95% (non-condensing)
Maximum storage period: < 1 year without restrictions
- Ambient temperature
5 - 45°C
- Atmospheric moisture
5% - 80% (non-condensing)
- Operating altitude
1000 m max. above sea level from 1000 to 2500 m
above sea level; derating 1.5 % per 100 m increase
in altitude.
- Degree of protection
IP 54
- Protection class
I
- Corrosion immunity /
Chemical resistance
No special protection against corrosion.
Ambient air must be free from higher concentrations
of acids, alkaline solutions, corrosive agents, salts,
metal vapours, or other corrosive or electro
conductive contaminants.
- Compressed-air (unoiled)
Spindle feed system
58 – 116 psi (4 – 8 bar)
Minimum lubricant unit
58 – 87 psi (4 – 6 bar)

3 Installation / Commissioning

3.1 Scope of Delivery

- (1) Control Unit (CU)
- (2) Operating Panel with hinged bracket (OP)
- (3) Drive Unit Tauro 8 / 25 / 83 (DU)
- (4) Column with travel height adjustment
- (5) Machine pedestal
 - Mains cable (2 m)
 - Motor power cable CU-DU (2 m)
 - Data cable CU-DU (2 m)
 - Data cable CU-OP (2,2 m)
 - Attachment: screw 3 pcs. M6x22; Washer 3 pcs. Ø 6,4; 2 pcs. M5x16
 - User manual

3.2 Mechanical installation

- Verify if all parts of the delivery are available complete.
- Before installing the machine verify if the machine or the accessories have transport damages.
- Verify if the installation underground is plane (installation surface).
- Verify the minimum load capacity. (See chapter: „weight“)
- Verify the operation conditions. (See chapter: „Operation conditions“)
- Verify the electrical specification. (See chapter: „Electrical specification“)
- Fix the machine pedestal (5) with two pieces screws M8 on the installation surface. (Dimensions see chapter: „Mechanical dimensions “machine pedestal“)
- Push the column (4.1) into the machine pedestal (5) just until it reaches the ground. The nut of the column has to show backwards.
- Fix the screws (A) with a torque of 20 Nm.

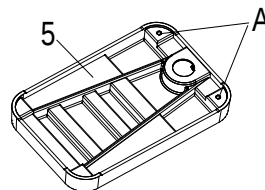


Fig.: 3.1

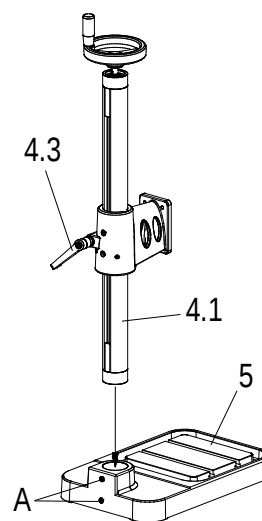
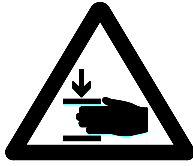


Fig.: 3.2

- Clamp the clamping lever (4.3).



- To avoid damages position a foam (B) or something similar on the machine pedestal (5). Take care that the distance between foam (B) and quick change holder (3.1) is not too large.
- Put the three peaces screws DIN912 M6x22 with washer (A) through the drilling of the column flange (4.2).
- Push the drive unit (3) onto the dowel pin of the column flange (4.2) and screw one screw down light.
- Screw down the screws (A) with a torque of 10 Nm.
- Remove the foam.

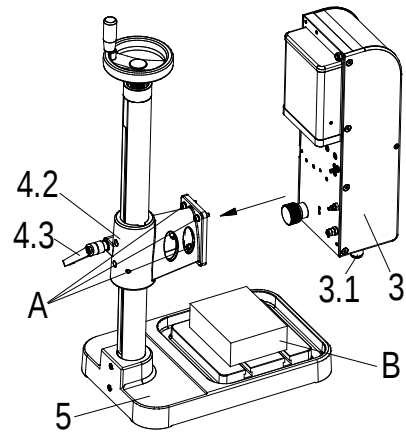


Fig.: 3.3

- Position or install the control unit at a suitable position that way that the cables are not exposed soilings directly. By the assembly kit fixation to the wall (1.4) (accessory) you are able to fix the control unit beside the work bench. (Dimension see chapter: „Mechanical dimensions control unit“)

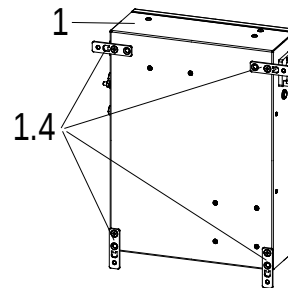


Fig.: 3.4

- Fix the articulated bracket (2.16) of the control unit (2) at the rear side of the drive unit (3) with two pieces screws DIN912 M5x16 (A).
- Screw down the screws (A) with a torque of 6 Nm.

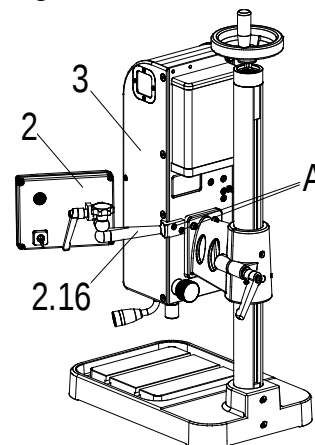


Fig.: 3.5

3.3 Electrical installation

- Connect the motor power connector X161 of the control unit (1) with the motor power cable CU-DU (4 pol) with the motor power connector X361 of the drive unit (3).
- Connect the data connector CU X162 of the control unit (1) with the data cable CU-DU (17 pol.) with the data connector DU X362 of the drive unit (3).
- Connect the data connector CU X163 of the control unit (1) with the data cable CU-OP (7 pol.) with the data connector OP X363 of the drive unit (3).

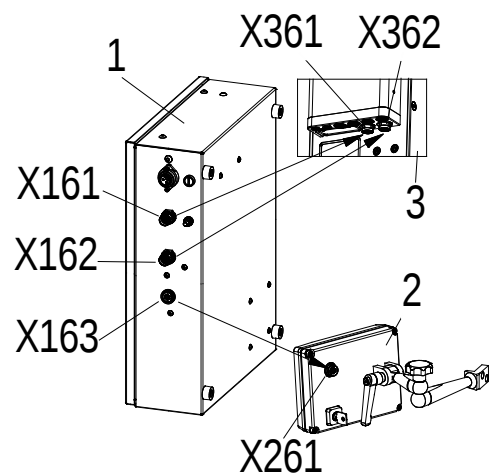
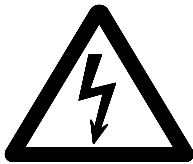


Fig.: 3.6



- The thread tapping unit has a discharge current more than 3,5mA. To avoid electrical electromagnetic interference and electric shock an installation of a second earth wire is necessary (see chapter: „Housing grounding“)
- Connect the grounding screw M6 of the cover grounding X164 of the control unit (1) with an earth wire with the earth connection (min. 10 mm², cable length 2 m).
- Connect the power cable with the connector X160 of the control unit (1).
- Do **not** plug in the safety plug of the power cable! (see chapter: „Installation“)

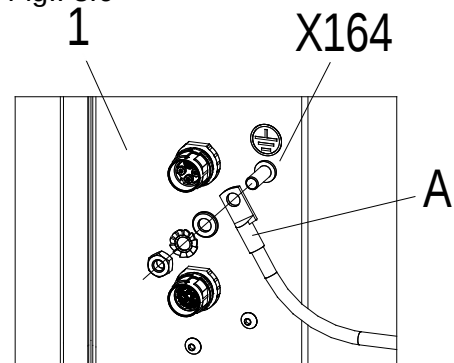


Fig.: 3.7

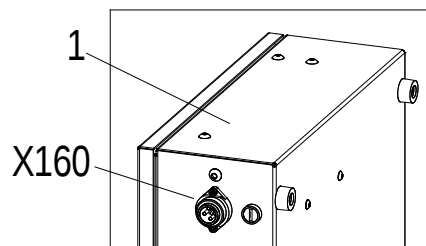
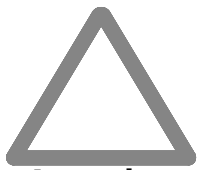


Fig.: 3.8

3.4 Commissioning



Attention

- **Important!** In case of immediate deviation of the operation conditions before installation take care that the temperature and the humidity have to be harmonised for 24 hours!

3.4.1 Brief description of components

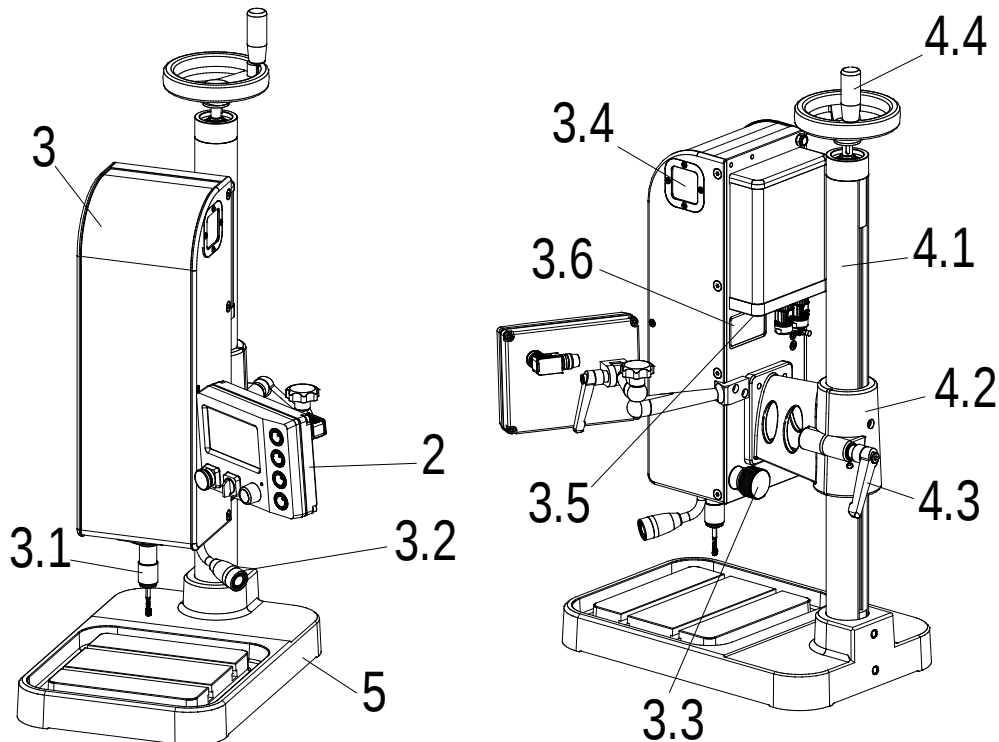


Fig.: 3.9 Rear and front view of the thread tapping machine with operating panel

- (2) Operating panel (See chapter: "Operation")
- (3) Drive unit Tauro 8 / 25 / 83
- (3.1) Quick change holder
- (3.2) Operating lever with start button
- (3.3) Adjustment wheel for the spindle counter balance system
- (3.4) Air cleaner for cooling system (in)
- (3.5) Air cleaner for cooling system (out)
- (3.5) Type plate
- (4.1) Column
- (4.2) Column flange
- (4.3) Clamp lever for column flange
- (4.4) Handwheel for column
- (5) Machine pedestal

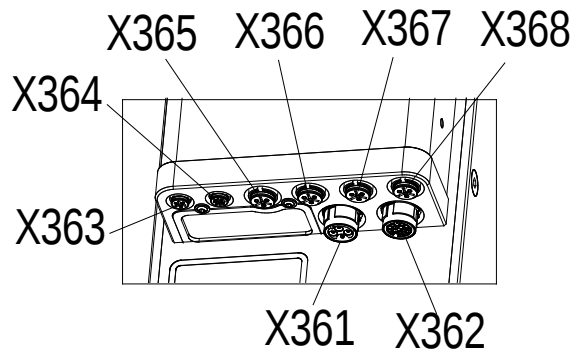


Fig.: 3.10 Connector (Rear view) of the drive unit

- (X361) Motor power connector
- (X362) Data connector DU
- (X363) Input foot switch (black)
- (X364) Input automation (black)
- (X365) Output signal column (black)
- (X366) Output automation (red)
- (X367) Output air cleaning unit (blue)
- (X368) Output lubricant unit (green)

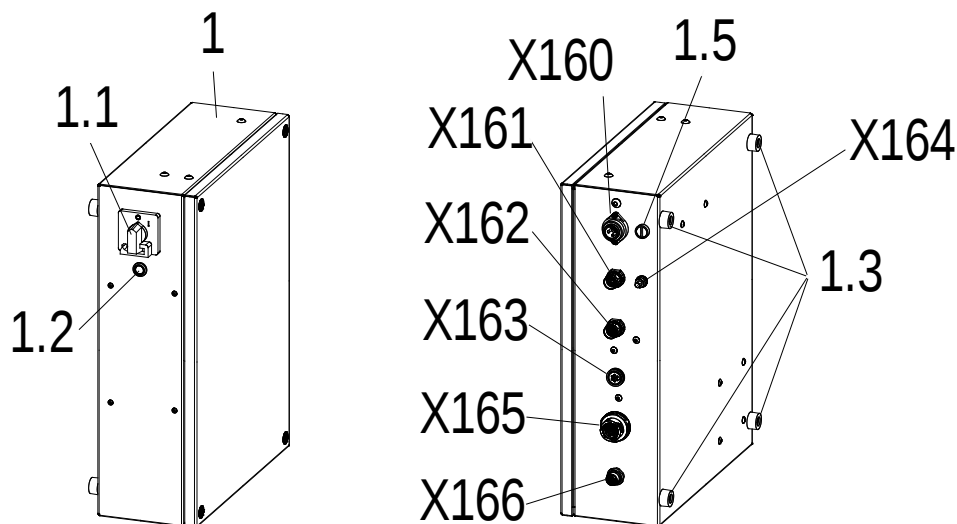


Fig.: 3.11 Rear and front view of the control unit

- (1) Control unit
- (1.1) Main switch
- (1.2) Control lamp for main switch
- (1.3) Mounting foot
- (1.5) Fuse 5 A T (time-lag); Type: (G-fuse 5x20)
- (X160) Main connector
- (X161) Motor power connector
- (X162) Data connector DU
- (X163) Data connector OP
- (X164) Earthing screw of the earthing of the housing
- (X165) Connector RJ45 ethernet (accessories)
- (X166) Connector Emergency stop and spindle lock external (accessories)

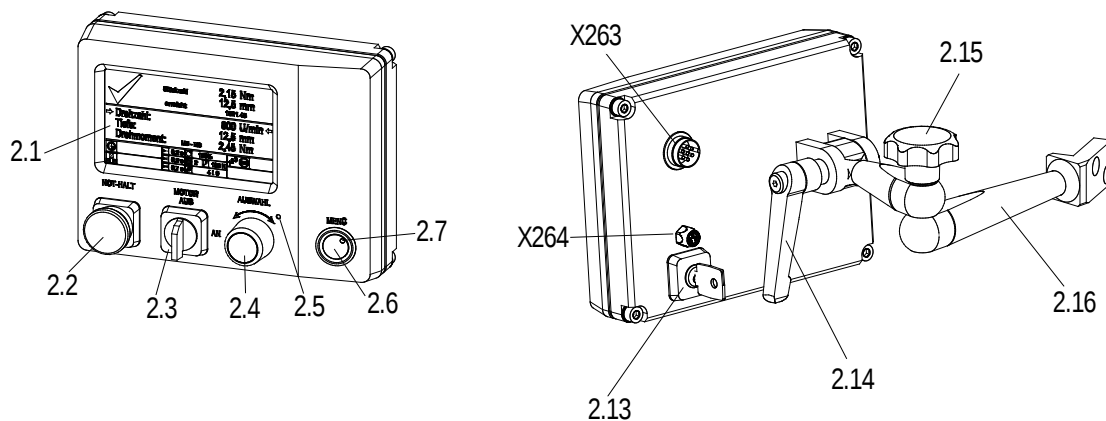


Fig.: 3.12 Rear and front view of the operating panel

- | | |
|--------|--|
| (2) | Operating panel |
| (2.1) | Display |
| (2.2) | Emergency stop |
| (2.3) | Motor switch |
| (2.4) | Rotary knob with button |
| (2.5) | Rotary knob LED |
| (2.6) | Menu button |
| (2.7) | Menu button LED |
| (2.13) | Key switch (accessories) |
| (2.14) | Clamp lever for vertical adjustment |
| (2.15) | Star grip for clamping the horizontal adjustment |
| (2.16) | Hinged bracket |
| (X263) | Data connector OP |
| (X264) | Operation lock external / 3 pol connector M8x1 (accessories) |

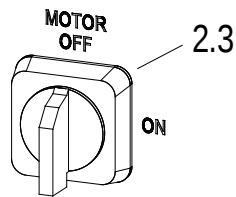
3.4.2 Turn main switch on

Secure that the machine is not damaged and the mechanical and electrical installation was realised in a workmanlike manner.

- Switch on the main switch (1.1). The control lamp (1.2) starts burning.
- A start screen appears just until the start process is finished. (approx. 13 seconds).
- The display changes to the working menu. (See chapter: „Operation“)
- The machine is ready to work now.

3.4.3 Tool change

1. Switch the motor switch (2.3) to position OFF.



The message „Motor Off“ appears in the display.

Warning: The motor switch (2.3) has to be on position OFF because the drive spindle can start running.

Warning: Tools are sharp and can cause injuries.

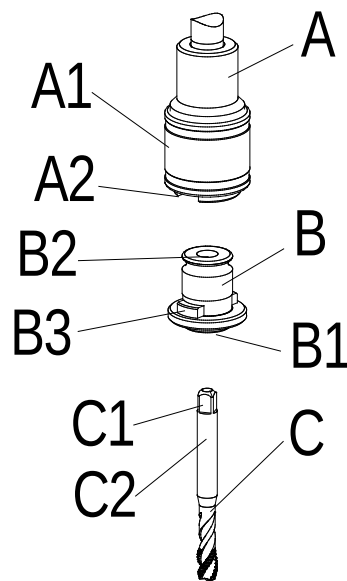
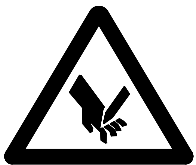
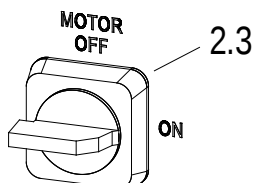


Fig.: 3.13

2. Unclamp tool (C)
 - Hold the quick change insert (B) with one hand and pull up the pressure cover (A1). The quick change insert will be unclamped in this way.
 - Press the spring dowel pin (B1) of the quick change insert (B) and remove the thread tool (C).
3. Insert tool (C)
 - Insert the thread tool (C) into the quick change insert (B). The square (C1) of the thread tool has to snap in the square (B2) of the quick change insert (B).
 - Plug the quick change insert (B) in the quick change holder (A). The nose (B3) has to snap in the nut (A2). By doing this the pressure cover slips down and clamps the quick change insert (B).
4. Switch back the motor switch (2.3) to the position ON.



3.4.4 Adjust the counter balance

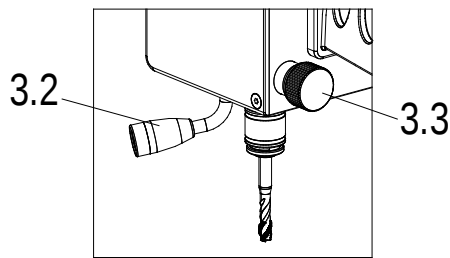
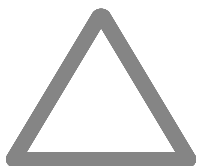


Fig.: 3.14

The retraction force of the drive spindle can be set by the adjustment wheel (3.3). Pull down the drive spindle by the operating lever (3.2). If you release the operating lever (3.2) the drive spindle should be brought back in the end position by its own because of the balance system. Take care that the retraction force is not set to high!



Attention

Attention!

A too powerful retraction force reduces the lifetime of the thread tool and can affect the quality of the working process.

By turning the adjustment wheel to the right side the retraction force of the drive unit becomes stronger.

3.4.5 Adjust the workpart and height adjustment

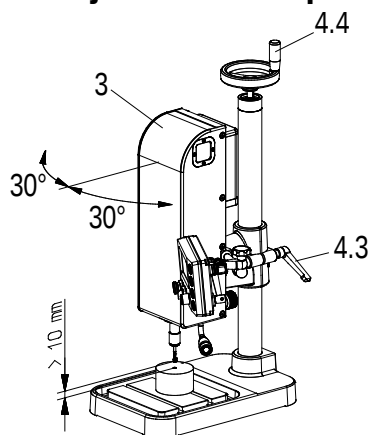


Fig.: 3.15

- Open the clamping lever (4.3).
- Position the distance between spindle and workpiece higher than 10mm with the hand crank (4.4).
- It is possible to swivel the drive unit (3) around 30° to the left and to the right at a time.
- Clamp the clamping lever (4.2).
- Secure the workpiece against torsional stiffness and unwanted moving. Use only suitable clamping devices.

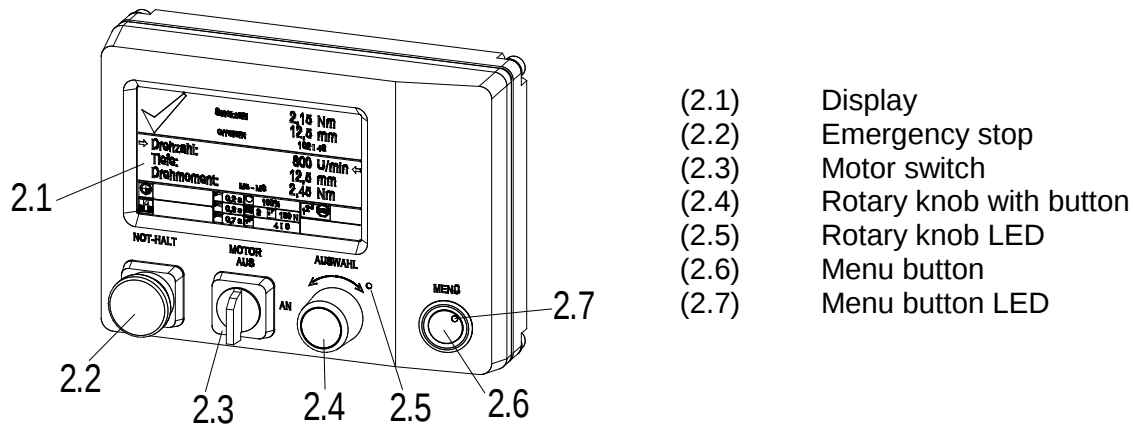


Danger

Danger: Workpieces can turn with the tool and threaten peoples and machines.

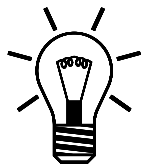
4 Operation

4.1 Functions of buttons



(2.1) The full color 4.3 "TFT display shows operating parameters, processing results, error and fault messages.

(2.2) The **emergency stop button** stops the machine after activating (push) in the function safe stop (stop category 0 to EN 60204). The message is "STOP EMERGENCY STOP". (See chapter: "error / status message")
Unlock (pull) the emergency stop button. The machine can immediately be used again.



Note

Note: The tool can be reversed from the workpiece if the emergency stop button is activated during processing. Therefore unlock the emergency stop button, press the start button and select safety reverse. (Tauro 8 / 25 / 83)

(2.3) The **motor switch** is used to lock the spindle (eg: tool change).



Note

Note: The tool can be reversed from the workpiece if the motor switch is activated during processing. Therefore unlock the motor switch, push the start button and select safety reverse. (Tauro 8 / 25 / 83)

(2.4) The **rotary knob** with button is used to select, to adjust parameters and to confirm the measures and commands.

(2.5) The **rotary knob LED** shows the current function of rotary knob with button (2.4).
Rotary knob LED on (2.4) shows activation of rotary knob.

(2.6) By pushing the **menu button** you enter the main menu and go back to the task menu.

(2.7) **Menu button LED** on displays activation of menu button (2.6).

4.2 Task menu

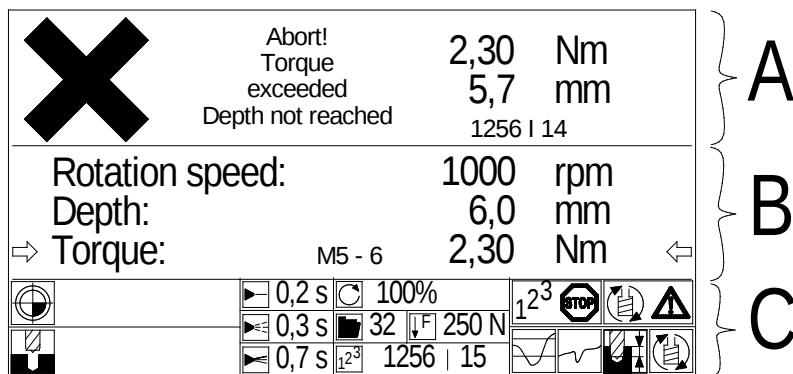
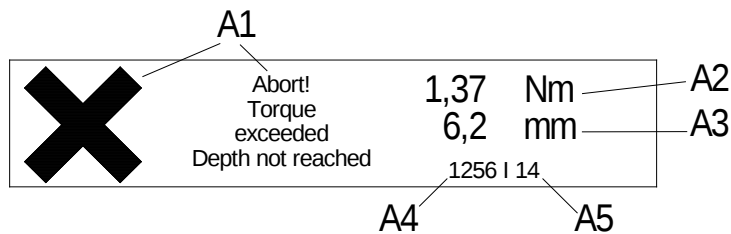


Fig.: 4.1

A Message and quality level



A1 messages (See chapter: "messages")

A2 torque reached

A3 depth reached

A4 day counter i. O. (green)

A5 day counter n. i. O. (red)

B Adjustment level

Rotation speed working speed

Depth working depth

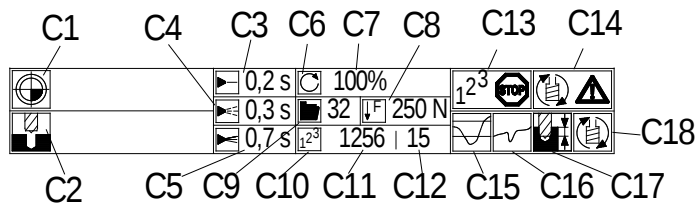
Torque maximum torque for the working process.

The mentioned thread size is only reference value!

The torque has to be under the breakage data of the tool.

C Parameter level

The parameter area is used to display set parameters and additional messages.



- C1 Start settings / Start with start button
- Start settings / Start at workpiece zero point
- Start settings / Start at torque detection
- C2 Processing type / Threading blind hole
 - Processing type / Threading blind hole / Chip breaking
 - Processing type / Threading through hole
 - Processing type / Thread recutting
 - Processing type / Thread forming
 - Insert threaded bushing
 - Stop parameter: Torque
 - Stop parameter: Depth
 - Processing type / Insert bolt
 - Stop parameter: Torque
 - Stop parameter: Depth
 - Processing type / Thread gauging
- C3 Lubricant settings Lubricant pulse active / time
- C4 Lubricant settings Air pulse active / time
- C5 Lubricant settings Air cleaning pulse active / time
- C6 Rotating direction right Rotating direction left
- C7 Reverse speed at %
- C8 Feed force in N (only with feed for spindle infeed)
- C9 Data set number 0 - 99
- C10 Workpiece counter
- C11 Workpiece counter (Number of pieces)
- C12 threads counter per pro workpieces (Number of pieces)
- C13 Message counter STOP
- C14 Message Tool wear Warning Tool wear reached
- C15 Quality parameter /Torque window active
- C16 Quality parameter / Blowhole detection active
- C17 Quality parameter / Depth tolerance active
- C18 Quality parameter / Tool wear active

4.3 Main menu, quick reference / standard parameters

The main menu is divided into several levels.

The levels can also be represented by a path in the instructions. The last information can also be a setting.

(eg: main menu/engine settings/direction/*right*)

Task menu

Main menu

Level 1

Level 2

Level 3

Level 4

Task menu

Rotation speed: *1000* rpm (Value range see technical data)

Depth: *6,0* mm (Value range see technical data)

Torque: *1,00* Nm (Value range see technical data)

Main menu

Start settings

Start with start button: *on*

Start at workpiece zero point: *on*

10,0 mm Set tool to zero point and confirm value

Start at torque detection: *on*

0,50 – 2,50 Nm

Processing types

Threading blind hole: *on*

Chip breaking: *off / on*

1,0 – 50,5 mm first chip breaking

0,5 – 25,0 mm interval

45° / 90° / 180° / 270° / 0,5 – 12,5 mm chip clearance- (depth)

Reversions: *off / on*

3 – 15 per cut

Threading through hole: *on*

Thread recutting: *on*

10 – 90% torque reduction

0,2 – 80,0 mm stop depth

Thread forming: *on*

Insert threaded bushing: *on*

Stop parameter: *Torque / Depth*

Insert bolt: *on*

Stop parameter: *Torque / Depth*

Thread gauging: *on*

10 – 4000% torque elevation

Lubricant settings

Lubricant pulse: *off / on*

0,1 – 3,0 seconds

test continuous puls

Air pulse: *off / on*

0,2 – 3,0 seconds

Air cleaning pulse: *off / on*

0,3 – 3,0 seconds

Motor settingsRotating direction: *right / left*Reverse speed: *20 - 1000%*Release height: *off / on**2,0 – 80,0 mm above workpiece surface*Brake depth: *off / automatic / manuel**0,0 – 6,0 mm (manuel)*Depth progress: *0 – 10* responsivity (0 = off, 10 = very sensitive)Feed system: *0,5 – 99,9* proof rotation**Quality parameter**Torque window: *off / on**0,03 – max. Nm (Torque)**0,1 – max. Tiefe mm start depth**0,2 – max. Tiefe mm stop depth*Minimal torque: *off / on**0,03 – max. Nm (Torque)*Blowhole detection: *off / on**5 – 95% torque decay**1,0 – max. Tiefe mm stop depth*Counter: *Day counter / Workpiece counter*Day counter: *reset*Workpiece counter: *off / on*Abbruch nach *confirmation / a faulty thread / a faulty workpiece**1 – 32000 workpieces**1 – 250 threads per workpiece**reset*Depth tolerance: *off / on**0,0 – 3,5 mm*Tool wear: *off / on**5 – 99% Wear limit***Parameter database**Default parameters: *load*

User defined parameters

*0 – 99 data set**Load**overwrite***System settings and system information**Measuring unit: *mm / inch*Language: *german / english / spanish*

Display brightness: (without function)

System temperatures: (without function)

System information: (Display)

1: *software release: Control Unit*2: *software release: Operating Panel*3: *software release: Display*4: *software release: Drive Unit*12: *piece counter Machine*

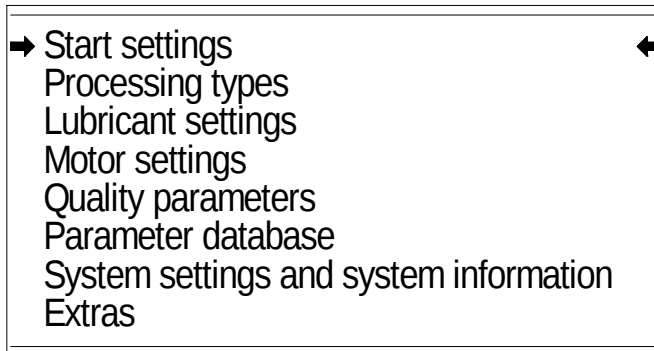
Last error: (Display of processing message)

1: *first error*2: *second error*3: *third error*4: *fourth error*

Unlock code: (without function)

Extras: (without function)

4.4 Main menu



4.4.1 Start settings

The start settings can only be set to „on“. The previous startup setting is set to „off“ by selecting a different startup setting to „on“.

4.4.1.1 Start with start button

Option: *on*

4.4.1.2 Start at workpiece zero point

Option: *on* and enter *parameter*

Enter parameter. Run the tool with the control handle in the bore. The value is saved after 2 seconds (without movement). You can also save the value via the rotary knob button (2.4) or via the start button (3.2). The display automatically changes to the task menu.



Hinweis

You can also reach this function via the quick selection if the function is already active. To do this, press and hold the menu button for one second in the work menu.

4.4.1.3 Start at torque detection

Option: *on*

You can set the *starting torque* for torque detection.

Start with torque detection only works in the machining modes:

- Threading blind hole
- Threading through hole
- Thread forming

4.4.2 Processing types

The types of processing can only be set to „on“. The previous setting is set to „off“ by selecting a different startup setting to „on“.

4.4.2.1 Threading blind hole

Option: *on*

You can set chip breaker settings and reversions.

4.4.2.1.1 Chip breaking

Option: *off / on*

You can set the following values after power on:

- *first chip breaking* (first chip breaking depth in mm)
- *interval* (interval depth in mm)
- *chip clearance depth* (chip break angle or depth to the workpiece zero point, which should be turned back by chip breaking.)

4.4.2.1.2 Reversions

Option: *on / off*

Option: *3 – 15* (maximum number of reversing)

4.4.2.2 Threading through hole

Option: *on*

The brake depth function is automatically set to off. (Can be activated.)

4.4.2.3 Thread recutting

Option: *on*

You can adjust the torque reduction during the lead-in chamfer.

(*10 – 90%*).

A *stop depth* is used to determine the point at which the torque reduction is switched off.

4.4.2.4 Thread forming

Option: *on*

4.4.2.5 Insert threaded bushing

Option: *on*

You can select the shutdown parameters:

Option: *torque stop parameter / depth stop parameter*

4.4.2.6 Insert bolt

Option: *on*

You can select the shutdown parameters:

Option: *torque stop parameter / depth stop parameter*

4.4.2.7 Thread gauging

Option: *on*

You can set a torque elevation for the return stroke.

(*10 – 4000%*)

4.4.3 Lubricant settings

4.4.3.1 Lubricant pulse

Option: *on / off*

You can set the time from *0,1 to 3,0 seconds*.

Option: *test continuous puls*

When selected, the lubrication pulse is clocked. If the air pulse is active, it is also clocked.

This function is used to test and vent the lubrication system.

4.4.3.2 Air pulse

Option: *on / off*

You can set the time from *0,2 to 3,0 seconds*. Air pulse starts with the lubrication pulse.

4.4.3.3 Air cleaning pulse

Option: *on / off*

You can set the time from *0,3 to 3,0 seconds*. The impulse start takes place when the processing is finished.

4.4.4 Motor settings

4.4.4.1 Rotating direction

Option: *right / left* (right / left hand thread)

4.4.4.2 Reverse speed

Option: *20% to 1000%*

rpm is always limited to the minimum or maximum rpm.

4.4.4.3 Release height

Option: *on / off*

You can set a height (of *5 mm to maximal travel*) above the workpiece zero point. The release height is a virtual end position at which the machine can already be restarted.

(When the enabling height is reached, output X367/3 is set to high).

4.4.4.4 Brake depth

Option: *off / automatic / manual*

Machine calculates brake depth during processing. This is necessary for careful processing. Due unfavorable processing parameters (eg, low torque, high speed, high pitch), depth can be exceeded. Avoid this by changing the processing parameters, or adjusting the brake depth.

- *off* brake depth is off (eg for applications with high processing sequences of through threads).
- *automatic* brake depth is automatically calculated by the machine during processing.
- *manual* brake depth can be adjusted manually in low processing parameters.

4.4.4.5 Depth progress

Responsivity: *0 – 10*

0 = off

10 = very sensitive

The depth advance compares the rotary movement with the feed movement during machining. If the feed movement is not sufficient, the drive stops immediately.

4.4.4.6 Feed system

Proof rotation: *0,5 – 99,9*

You can set after how many revolutions the feed should decouple (after gate). This means that there is no pressure on the thread.

At 99,9, the feed presses until the end of the thread.

4.4.5 Quality parameter

4.4.5.1 Torque window

Option: *off / on*

It is possible, if confirmed, to set *torque tolerance* starting *from 0.1 Nm*.

Torque used during processing must not exceed maximum torque in the task menu and the maximum torque, less torque tolerance.

Measuring range is set between *start depth* and *stop depth*.

(stop depth e.g. for tap clearance hole)

(See chapter: "Quality Notifications")

For higher speeds or short threads, the "minimal torque" function is better!

4.4.5.2 Minimal torque

Option: *on / off*

You can set a minimal torque from 0.03 Nm.

The used torque during machining must have reached the minimum torque once.

(e.g. for threads with through hole, short threads, fast speeds).

(See chapter: "Quality Notifications")

4.4.5.3 Blowhole detection

Option: *on / off*

You can set the *torque decrease in %* (5 - 95%).

End of the measuring range is set by stop depth.

(stop depth e.g. for tap clearance hole)

(See chapter: "new messages")

4.4.5.4 Counter

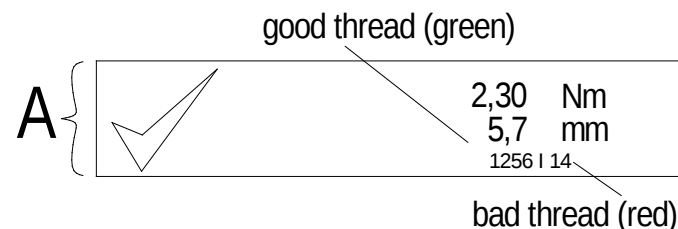
4.4.5.4.1 Day counter

Option: *on*

You can *reset* the day counter.

The day counter is **not** reset when the machine is switched on.

Display while processing:



4.4.5.4.2 Workpiece counter

Option: *off / on*

You can set different counter variants and values.

Option:

Abort after confirmation - The last part **can** be reset in case of an error by confirming the start button.

Abort after a faulty thread - Last thread **must** be reset by confirming the start button in case of an error. The next processing is blocked. The display shows the following message in parameter area C13



Abort after a faulty workpiece - The last part **must** be reset by confirming the start button in case of an error after finishing the machining of the part.

The machining is blocked after the last thread of the part.

The display shows the following message in parameter area C13



workpieces -set quantity (1 – 32000)

threads per workpiece – set (1 – 250)

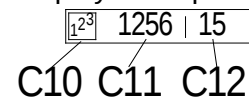
reset of counted workpieces

When the number of parts has been reached, the display shows



. This message must be reset by confirming the start button.

Display while processing:



C10 Workpiece counter active
C11 Workpiece counter (number of pieces)
C12 Thread counter per part (number of pieces)

4.4.5.5 Depth tolerance

Option: *off / on*

You can set the depth tolerance from *0 mm – 6 mm*.

(See chapter: "Quality messages")

4.4.5.6 Tool wear

Option: *off / on*

You can set the wear limit from 5% - 99%.

The machine internally makes a statistical evaluation of the torque values reached.

When a number of exceedances is reached, the message



"Tool wear warning" is displayed.

When the wear limit is reached, the message



"Tool wear reached" is displayed and the next machining operation is blocked.

This message must be reset by confirming the start button in the end position.

(See chapter: "Quality messages")

4.4.6 Parameter database

4.4.6.1 Default parameters

Option: *load*

It is possible, if confirmed, to reset the entire parameters to default parameters. (See chapter: "default parameters")

During the charging process LED 2.7 of the menu key is off and operation is blocked.

The record number "0" is displayed in parameter area C9 in the operating menu.

4.4.6.2 User defined parameters

Option: *data set*

After selecting the data set number it is possible to *load* or to *overwrite* this data set.

During the charging process LED 2.7 of the menu key is off and operation is blocked.

In the operating menu the record number is displayed in parameter area C9.

4.4.7 System settings and system information

4.4.7.1 Measurement unit

Option: *mm / inch*

4.4.7.2 Language

Option: *german / english / spanish*

4.4.7.3 Display brightness

(without function)

4.4.7.4 System temperatures

(without function)

4.4.7.5 System information

- 1: *software release: Control Unit*
- 2: *software release: Operating Panel*
- 3: *software release: Display*
- 4: *software release: Drive Unit*
- 12: *piece counter Machine*

4.4.7.6 Last error

Display: last error of processing message (number for service)

- 1: *first error*
- 2: *second error*
- 3: *third error*
- 4: *fourth error*

4.4.7.7 Unlock code

(without function)

4.4.8 Extras

No extras installed

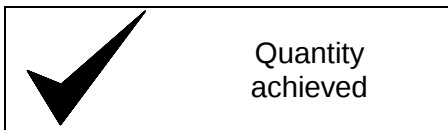
5 Messages

5.1 Quality notifications

Quality notifications „ Good “

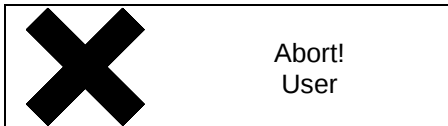


Quality good.

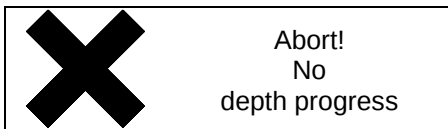


Quality good,
Quantity has been achieved.

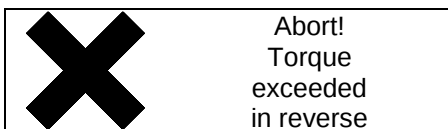
Quality notifications „Abort“



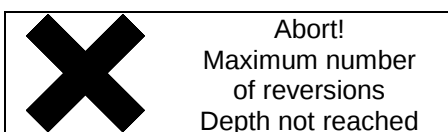
Processing canceled by user using manual start button or foot switch.



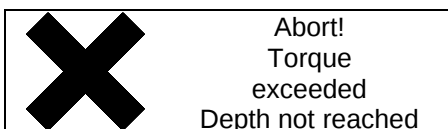
Spindle has not progressed at processing start during certain period of time.



Torque has been exceeded in reverse.
Drive spindle stops.
Drive spindle can be reversed in safety reverse mode with 50 rpm by using start button.

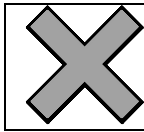


Threading blind holes:
The set number of reversions has been exceeded.
e.g. tool wear, grounding, improper cutting speed
Path: Main Menu/Engine Settings/Reversions



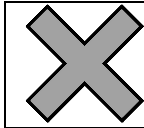
Threading canceled!
Threading through hole: Processing will be stopped immediately after exceeded torque.
Threading blind holes: Tool has reversed 3 times without progress in depth.
e.g.: grounding

Quality notifications „Error “



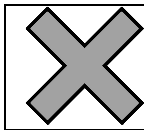
Error!
Gating

The infeed of drive spindle was moved in positive direction after setting the zero point. (in direction up)



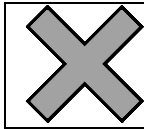
Error!
Below
torque range

The torque has slightly dropped during processing.
e.g.: pipe cavities or air pockets in cast material
Path: Main menu/Quality Parameters/Pipe Cavities



Error!
Blowhole
detected

The torque has slightly dropped during processing.
e.g.: pipe cavities or air pockets in cast material
Path: Main menu/Quality Parameters/Pipe Cavities



Error!
Depth tolerance
exceeded

Adjusted depth tolerance was exceeded.
Thread with large pitch, high speed and low torque is being processed,.
Change depth tolerance, correct the speed or set the brake depth manually (See chapter "Operation")
Path: Main Menu/Quality Parameters/Depth tolerance

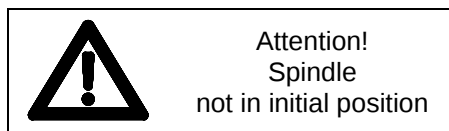
5.2 Error message / status message



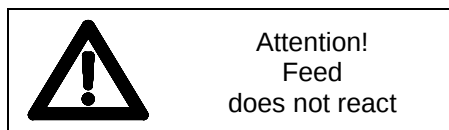
Emergency stop button (2.2) has been operated.
Check and correct malfunction.
Unlock (pull) emergency stop button



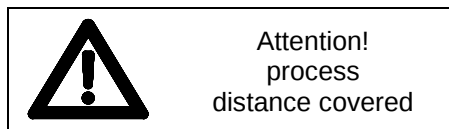
Engine switch has been operated.
Drive spindle is locked!
Machine ready again for processing by turning the motor switch (2.3).



Spindle is not in initial position after power or exiting a menu position.
Run back spindle into initial position.



The feed does not react after starting the foot switch.
Check the air supply.



The maximum travel range of the drive unit was reached.
Correct the infeed travel.

5.3 Error code



An hardware error has arrived.
(See chapter " Troubleshooting / Error
code")

6 Digital inputs and outputs

6.1 Technical data of inputs and outputs

- **Digital inputs 3 pcs:**

Type of Inputs	digital isolator
Rated voltage	24V DC +/- 10%
Voltage range	0...30 V
Input current	approx. 0,5mA
Signal voltage on	min. 15 V
Signal voltage off	max. 5 V
Delay input	> 10 ms (0 to 1 and 1 to 0)
Potential separation	none
Protective circuit	short-circuit proof, thermal cut-out, inverse-polarity protection
Connection	circular connector Ø 11,5 / IP67 cable bushing 3 - 5mm terminal cross-section max. AWG 24 / 0,25 mm ²



Note: A digital exit of a PLC control can be layed directly (without additional load) to a digital input.
Proximity switches (e.g. inductive proximity switches PNP) can be connected to a digital input directly.

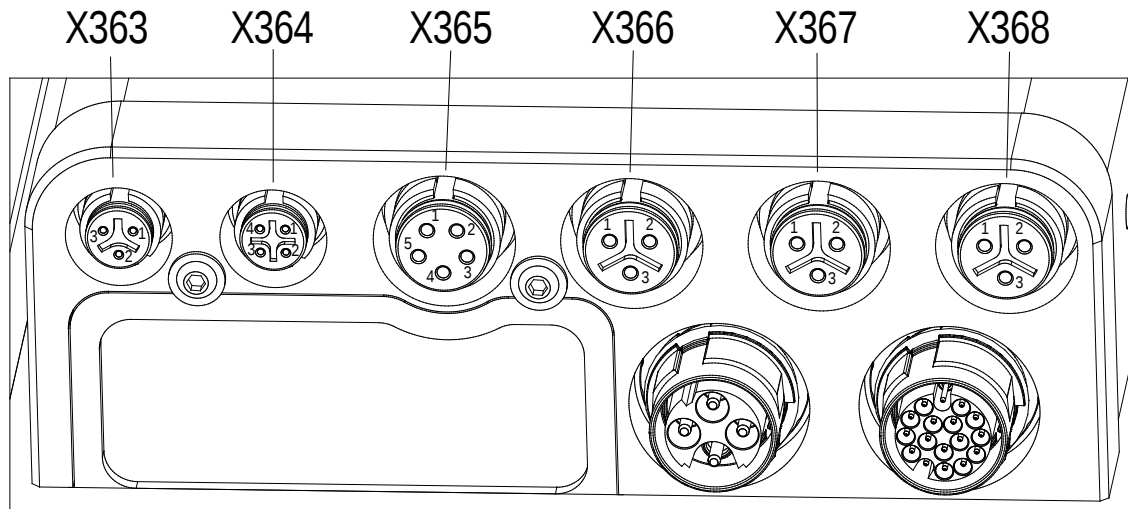
- **Digital outputs 10 pcs:**

Digital outputs	24 VDC / 3,6 W (short-circuit proof)
Type of outputs	transistor
Rated voltage	24 VDC +/- 10%
Rated current	150 mA per output
Rated burden	3,6 W per output
Potential separation	none
Protective circuit	short-circuit proof, thermal cut-out, inverse-polarity protection
Connection	circular connector Ø 16 / IP67 cable bushing 4 - 6mm (2,5 - 4 / 6 - 8 optional) terminal cross-section max. AWG 20 / 0,75 mm ²



Note: A digital exit can be layed directly (without additional load) to a digital input of a PLC control.
Valves can be connected to a digital exit directly.

6.2 Terminal connection of inputs and outputs



connector	description	Rated current	max current (<3 sec.)
<u>X363 /</u> 1 2 3	<u>Input foot switch (black) *¹</u> GND 24V Input start 1 (foot switch)	75 mA	90 mA
<u>X364 /</u> 1 2 3 4	<u>Input automation (black) *¹</u> GND 24V Input start 2 Input start button 2	75 mA	90 mA
<u>X365 /</u> 1 2 3 4 5	<u>Output quality / QA (black) *²</u> GND Output signal horn Output process NOK (red) Output processing ongoing (orange) Output process OK (green)	150 mA 150 mA 150 mA 150 mA	180 mA 180 mA 180 mA 180 mA
<u>X366 /</u> 1 2 3	<u>Output automation (red) *³</u> GND Output clamp thread Output clamp workpiece	150 mA 150 mA	180 mA 180 mA
<u>X367 /</u> 1 2 3	<u>Output air cleaning unit (blue) *⁴</u> GND Output air cleaning pulse Output ready signal	150 mA 150 mA	180 mA 180 mA
<u>X368 /</u> 1 2 3	<u>Output lubricant unit (green)</u> GND Output lubricant unit air Output lubricant unit pulse	150 mA 150 mA	180 mA 180 mA

*¹ Only with accessories feed system for the spindle.

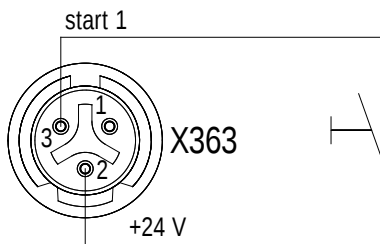
*² Only with accessories signal column, signalbar or additional accessories.

*³ Accessories.

*⁴ Only with accessories Minimum lubricant unit with air cleaning pulse or additional accessories.

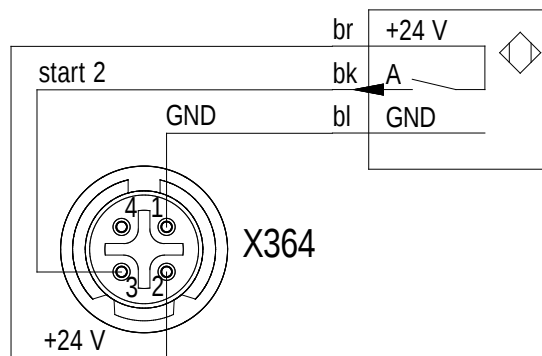
6.3 Wiring examples of the inputs and outputs

- Requirements input:** The external start pulse of the thread tapping unit should happen by an external manual button. (Only with feed system for the spindle)
 Attention: By operating „Stop! User“ during the operation the operation can be cancelled.
 This function is no **Emergency Stop** function!

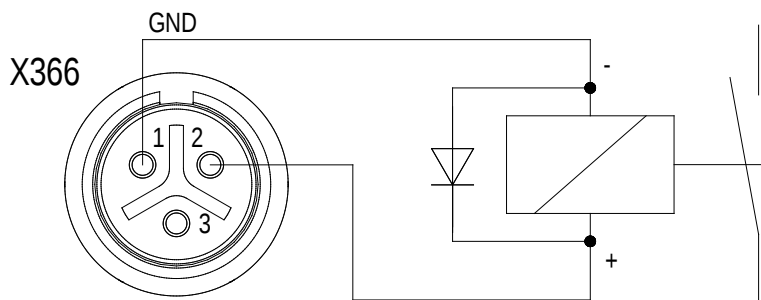


- Requirement input:** The external start puls of the thread tapping unit should happen by an inductive proximity switch.
 (Only with feed system for the spindle)

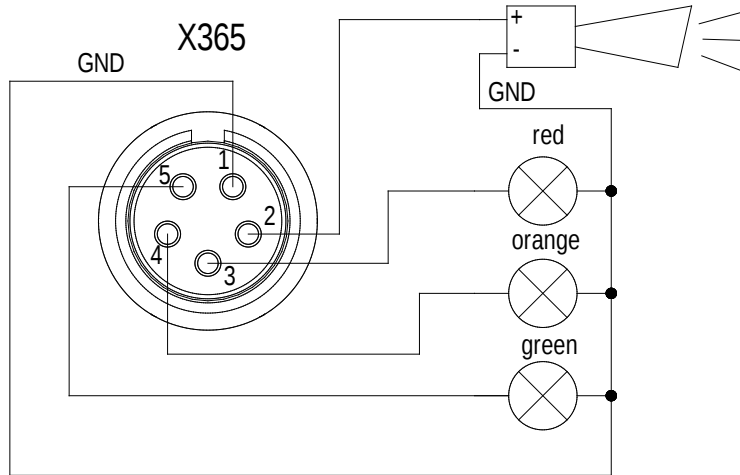
Wire the input automation (X364/3 Start 2) with an inductive proximity switch PNP.



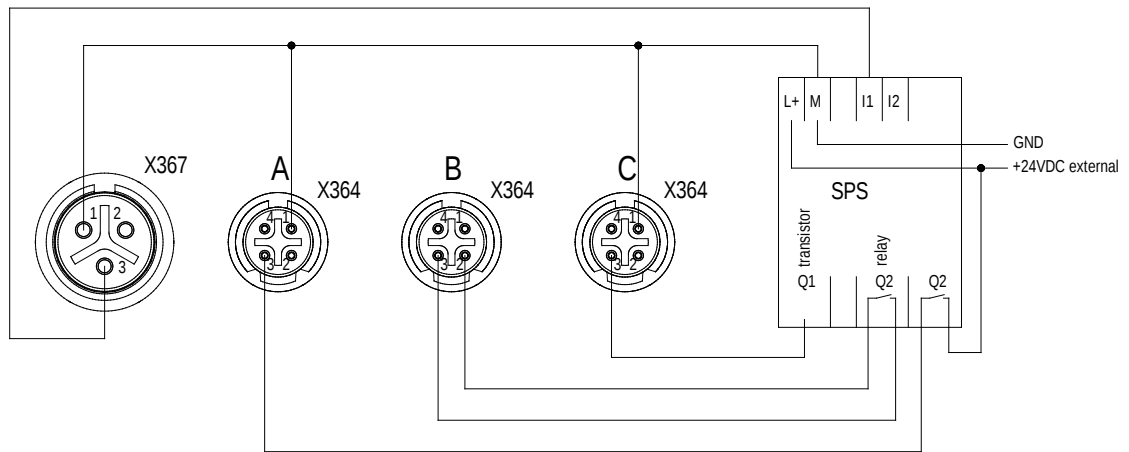
- Requirement exit:** A relais or a valve for a clamping unit should be connected.
 Wire the exit automation (X366) with a relais or a valve.
 Respect the direction of the freerunning diode if present. (A freerunning diode is not necessary)



- Requirement exit:** A warning lamp with horn should be installed for quality control.
 Wire the exit signal column (X365) with various lamps and horn.
 (You can order a signal column with horn as accessory)



- **Requirement input and exit (PLC):** The thread tapping unit should be integrated in automation by a PLC control.
Wire the exit of X367/3 ready and the input X364/3 Start 2 to a PLC – unit.



Option A:

The input of the thread tapping unit is connected to a relais exit of a PLC control.
(external power supply)

Option B:

The input of the thread tapping unit is connected to a relais exit of a PLC control.
(internal power supply)

Option C:

The input of the thread tapping unit is connected to a transistor - exit of a PLC control.

7 Diagnostics / Troubleshooting

7.1 Troubleshooting / Error code

Display on the screen (2.1)



An hardware error occurred.
Based on the following list check the error code numbers and proceed as follows.

Problem / Error code	Reason	Retification
The control lamp (1.2) doesn't shine	- No power supply - Hardware error	- Check the voltage supply - Check the safety fuse (1.5)
No display in the screen (2.1)	- No power supply - Cable defective - Hardware error	- Check if the control lamp (1.2) is shining - Check the data cable OP between the connectors X163 and X261
1001 1002	- Hardware error	- Check the data cable OP between the connectors X163 and X261
1003	- Hardware error	- Check the data cable DU between the connectors X162 and X362
1004 1050	- Hardware error	- Inform the technical service
1060	- Temperature of the drive unit is exceeded	- Switch off the machine and let it cool down
1061	- Temperature of the drive unit is undershoot	- Switch off the machine and regard chapter: "Operating conditions"
1070-1072	- short time power interruption	- Press and unlock the emergency Stopp button
1080-1083	- Hardware error	- Inform the technical service
1084	- motor switch has been activated during processing	- Switch off the machine, wait approx. 2 - 3 minutes and switch it on again
1300	- Hardware error	- Inform the technical service
1301	- Error in voltage supply - Hardware error	- Check the voltage supply
1303	- motor power cable - Hardware error	Check the motor power cable between connectors X161 and X361
1305	- Hardware error	- Inform the technical service
1306	- Hardware error	- Switch off the machine, wait approx. 20 minutes and switch it on again
1307	- Temperature of the control unit is exceeded	- Switch off the machine and let it cool down

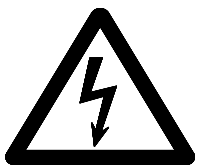
Problem / Error code	Reason	Retification
1308	- Motor temperature - Hardware error	- Switch off the machine and let it cool down
1309	- Hardware error	- Check the data cable DU between the connectors X162 and X362
1310-1342	- Hardware error	- Inform the technical service



To switch off the error message: Switch off the machine by the main switch (1.1).



If the error messages still appear again after switching off and on the machine by the main switch (1.1) please inform the technical service.



Attention! Repair of electric devices are only allowed by qualified personnel. Based on not qualified repairs substantial risks can happen

Please inform the technical service in case of defective or a sending back.

In every case state the serial number and the cause of the error or the error code.

7.2 Contact Service

Taurox e. K.

Service
Am Viechtberg 6
94344 Wiesenfelden
Germany

Phone: +49 9966 9020248
Phone: +49 9966 9020245
Fax: +49 9966 9020249
E-Mail: service@gewindebearbeitung.de



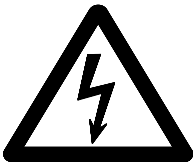
Note

Note!

To avoid transport damages send the machine back in the original packaging.

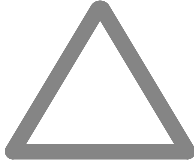
Transport damages caused of improper packing the company **Taurox e. K.** is not liable for.

8 Servicing



Danger: Switch off the machine and cut it from the power supply before doing maintenance work.

8.1 General maintenance work



Attention

- Keep the machine and the cables free of permanent contamination.
 - Do not clean the machine with aggressive cleaning compounds.
- Attention:** Do not use compressed-air to clean the machine.

8.2 Change air filter

- Check the air filter every 6 months to contamination and change it if necessary.
- Replace the air filter every 2 years.
Air filter: Air incoming (3.5) article no.: K056A
Air filter: Air output (3.4) article no.: K124A

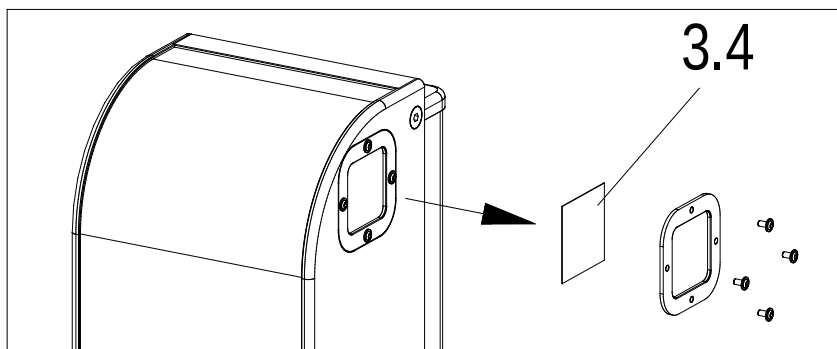


Fig.: 8.1 Air filter changing air output (3.4)

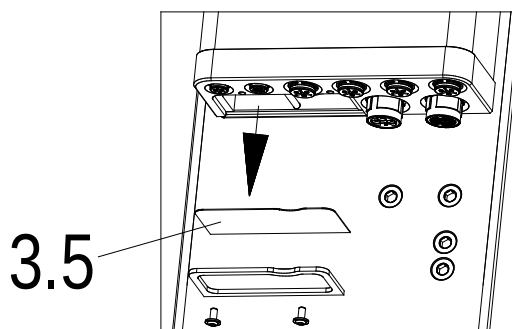


Fig.: 8.2 Air filter changing air incoming (3.5)

9 Wiring diagramn

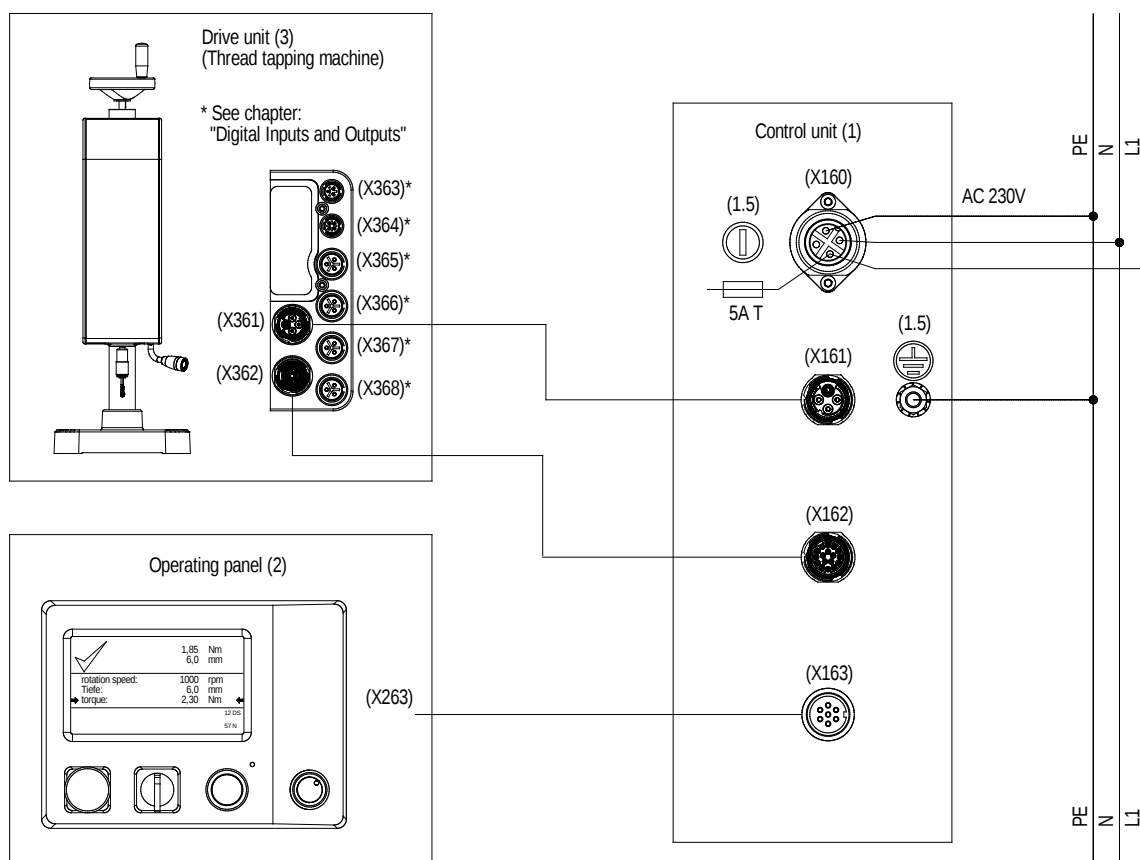


Fig.: 9.1: Connection diagram **Tauro 8 / 25 / 83**

(See chapter: "Electrical Installation")

10 Appendix A: Accessories

- Collet inserts ER11 (**Tauro 8**)
- Collet inserts ER20 (**Tauro 83 / 120** with Axial compensation)
- Quick change inserts size 0 (**Tauro 25**)
- Quick change inserts size 1 (**Tauro 83 / 120 / Taurox 300**)
- Quick change inserts size 2 (**Taurox 400 / 900**)
- Quick change holder size 1 for Taurox 400 / 900
- Quick change holder size 2 for Taurox 300
- Collet holder ER11 for Tauro 25
- Collet holder ER25 for Tauro 83 / 120
- Collet holder ER20 with Axial compensation +/- 0,7 mm for Tauro 83 / 120
- Spindle feed system
- Height adjustment (column) with longer travel
- Minimum lubricant unit 2V with lubricant pulse and air pulse
- Minimum lubricant unit 3V with lubricant pulse, air pulse and air cleaning pulse
- Signalbar green, yellow and red for optical quality evaluation in the field of view of processing
- Signal light column green, yellow, red and horn for quality evaluation
- Additional push buttons selection for parameter data base
- Key switch with locking of the user interface
- External operating lock (input 24 V DC)
- Connection for external emergency stop and motor lock on control unit
- Automation connection via digital inputs and outputs
- Ethernet interface for control unit
- TauroView software for PC to visualize the required torque and optimize the processing parameters
- Customized machine software
- Custom Modbus for automation
- Customized cable lengths
- Adjustable Multi-Spindle Heads for two threads
- Wall mounting kit for control unit

11 Appendix A1: Quick change inserts

Insert Size Ø / □	tap DIN 371	tap DIN 374/376	Quick change system		
			Tauro® 25 Size 0	Tauro® 83/120 Taurox® 300 Size 1	Taurox® 400/900 Size 2
2,5/2,1	M 1 - 1,8	M 3,5	X	X	
2,8/2,1	M 2 - 2,6	M 4	X	X	
3,15/2,5			X	X	
3,5/2,7	M 3	M 4,5 - 5	X	X	
3,55/2,8			X	X	
4,0/3,0	M 3,5		X	X	
4,0/3,15			X	X	
4,5/3,4	M 4	M 6	X	X	
5,0/4,0			X	X	
6,0/4,9	M 4,5 - 6	M 8	X	X	X
6,3/5,0			X	X	X
7,0/5,5	M 7	M 9-10	X	X	X
8,0/6,2	M 8	M 11	X	X	X
9,0/7,0	M 9	M 12		X	X
10,0/8,0	M 10			X	X
11,0/9,0		M 14		X	X
11,2/9,0				X	X
12,0/9,0		M 16		X	X
12,5/10,0				X	X
14,0/11,0		M18			X
14,0/11,2					X
16,0/12,0		M20			X
16,0/12,5					X
18,0/14,0					X
18,0/14,5		M22-M24			X

- Adaptor to reduce Size 1 auf Size 0
- Adaptor to reduce Size 2 auf Size 0
- Adaptor to reduce Size 2 auf Size 1

12 Appendix A2: Minimum lubricant unit

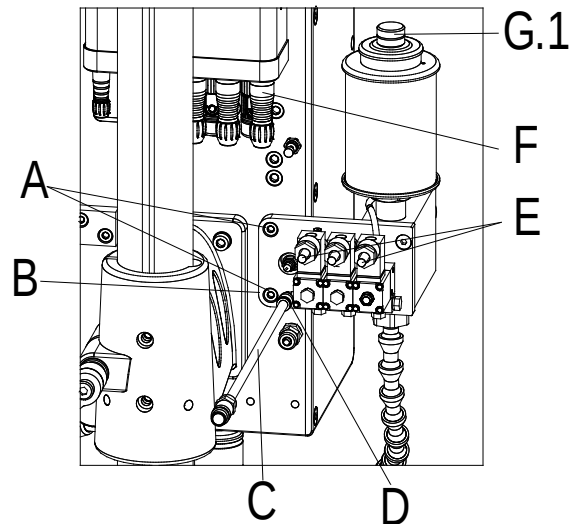
lubricant pulse, air pulse, air cleaning pulse

Scope of delivery

- Minimum lubricant unit (B)
- Attachment screw (A)
- Air tube with quick fitting coupling (C)

Installation

- Mount the lubricant unit (B) with the screws (A) at the rear side of the machine.
- Connect the electrical connection line (E) with the connector (F) with the machine.
- Connect the compressed-air hose (C) with the fitting (D).
- Connect the compressed-air hose (C) to the compressed-air.
- Compressed-air (58 - 87psi / 4 - 6bar) cleaned with steam trap!

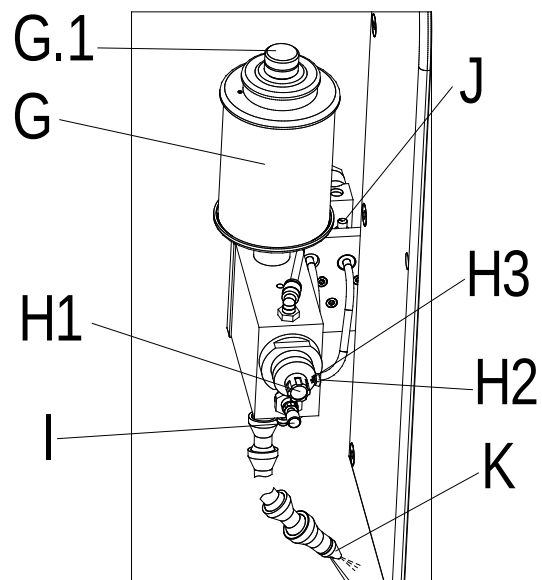


Commissioning

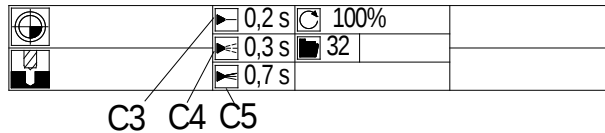
- (G) Lubricant tank
- (G1) Cover for lubricant tank
- (H1) Flow controller for dosing pump
- (H2) Clamp lever for quantity controller
- (H3) Indicator dose quantity
- (I) Adjusting screw for lubricant air
- (J) Adjusting screw for air output
- (K) Nozzle for lubricant and air



Wearing eye protection is obligatory!

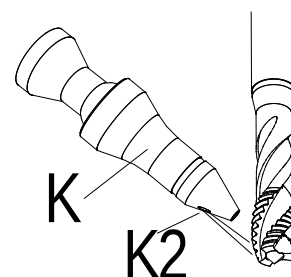


- Set in the main menu/lubricant settings of the operation unit (2) the desired parameters:
 - **Lubricant pulse:** Time of lubricant pulse. (delay after start)
 - **Air pulse:** Time for the air which takes the forwarded lubricant by the air pulse. The lubricant will be sprayed by this.
 - **Blow out pulse:** Time for the blow out pulse after operation or chip clearance with chip clearance throw out depth.



Display in the parameter area::
 C3 Lubricant pulse
 C4 Air pulse
 C5 Blow out pulse

- Open the cover (G1) of the lubricant tank and fill in the lubricant. Close cover (G1).
- Bleeding:** Open the clamp lever (H2) and set the quantity control (H1) approx the value 4 to advance enough lubricant.
 Turn on the following function:
 Main menu/Lubricant settings/Lubricating pulse/Test continuous pulse. When the lubricant is delivered from the nozzle (K), turn the flow control knob (H1) to the desired value and clamp it with the clamping lever (H2).
- Lubricant pulse:** The lubricating impulse delivers a small amount of lubricant through a dosing pump. This function forms a drop dosage.
 Function:
 The piston pump is charged with lubricant in the idle state (machine off).
 The piston pump is not charged with lubricant when the machine is at rest (machine on).
 When a lubricating impulse is given, the piston pump returns and is charged with lubricant. After the set time, the piston pump triggers the lubrication.
 Therefore the set time is a delay of the lubrication.
 This method prevents gassing of the lubricant and a continuous function with small quantities. For quantities below 1 a time of 0.1 seconds should be set. If the time is too short, it will not be sufficient for the charging process.
- Air pulse:** For small quantities (flow regulator (H1) below 0.5) the function main menu/lubricant settings/air impulse on is required, because the drop becomes too small to detach from the nozzle (K) (adhesion force).
 You can regulate the air volume with the adjustment screw for lubricating air (I). The adjustment screw (I) should not be more than 2 turns (spray mist formation).
 This function in connection with the lubricating impulse forms a spray dosage.
- Air pulse without lubricant pulse:** This function can be used with lubricating materials or for dry processing for cooling.
- Outblow pulse:** The outblow pulse is used to clean the tool or to remove chips (Setting: Main menu/Lubricant settings/Blowout pulse).
 The quantity of air is controllable by the adjusting screw (J).
- Adjusting of the nozzle:** Align the nozzle (K) with the blow out drilling (K2) to the bottom.
 Adjust the nozzle to the tap hole to ensure a lubrication during the whole working process.



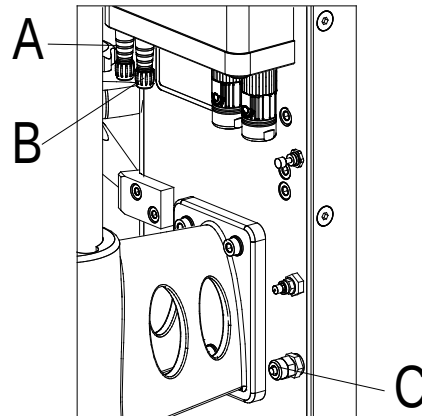
13 Appendix A3: Spindle feed system

Scope of delivery

- Air tube with quick fitting coupling
- Foot switch
- Feed is integrated in the thread tapping unit

Installation

- Connect the connector (A) of the foot switch with the machine.
- For sensors you can connect the connector (B) with the machine alternatively.
- Connect the compressed-air hose to the fitting (C) and to the compressed-air. compressed-air (58 - 116psi / 4 - 8bar) cleaned with steam trap!

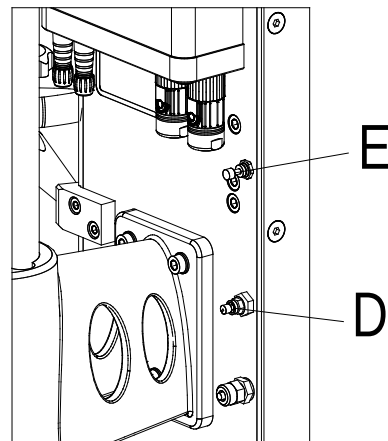


Commissioning

- (D) Flow control for the speed operation control
- (E) Pressure control for the setting of the feed force



Hand injury warnings respectively contusives!



- Set at the pressure control (E) the desired feed force. The feed force (C8) is shown in the display.

		2,30	Nm
		5,7	mm
		1256 l 14	
Rotation speed:		1000	rpm
Depth:		5,7	mm
Torque:		2,30	Nm
		M5 - 6	
		 100%	
		 32	250 N

C8

If the value (C8) is out of the range it becomes red.

- If needed set at the nozzle (D) the desired feed force speed.
- Set in the main menu/start setting the desired start function.
(See chapter: „Operation“)

start with the start button The spindle start by positioning the tool at the workpiece doing this the start depth will be set to 0,0 mm.

start at
workpiece zero point The spindle starts after leaving the end position.
The start depth can be set in the main menu/startup
settings/start at work part surface zero.

start at torque rise The spindle starts after leaving the end position.
The torque identification can be set in the main menu/start
settings/start. If the start torque is exceeded the start depth
will be set to 0,0 mm.

- Secure the workpiece against torsional stiffness and unwanted moving.
Use only suitable clamping devices.



Danger

Danger: Workpieces can turn with the tool and threaten peoples and machines.

- Start the feed by the foot switch or by a sensor.



Warning of automatically running!



Note

The start process can be cancelled by a repeated pressing of the foot switch or the start button.

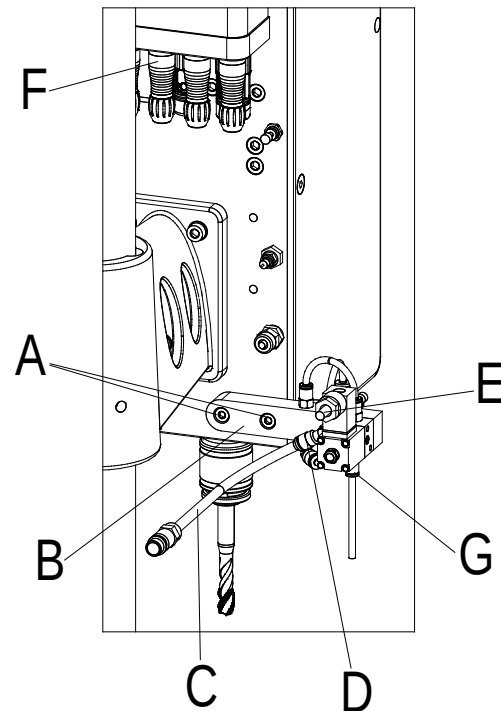
14 Appendix A4: Pneumatic vice

Scope of delivery

- Air tube with quick fitting coupling or air distribution
- Mounting lever with valve and pressure control

Installation

- Fix the mounting lever (B) with the two screw (A) at the rear side of the machine.
 - Connect the electrical connection cable (E) with the connector (F) of the machine.
 - Connect the compressed-air hose (C) with the connection (D).
 - Connect the compressed-air hose (C) to the compressed air.
 - Connect the compressed-air hose of the clamp unit to the air connection (G).
- Compressed air (58 – 116 psi / 4 - 8bar)
cleaned with steam trap!

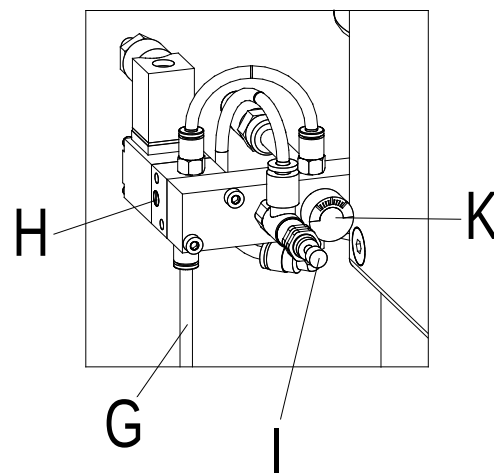


Commissioning

- (G) Air connection clamp unit
- (H) Manual action
- (I) Pressure control to set the clamping force
- (K) Pressure display



**Hand injury warnings respectively
contusives!**



- Set at the pressure control (I) the desired clamp force.
With a slot screwdriver you can operate the valve manually.
- The machine sends the signal to clamp after leaving the end position automatically.

15 Appendix C: Breakage of thread tools

This breakage data are for chipping production of thread tools.

The core diameter of a through whole thread tool is higher than a ground whole thread tool. Thereby the fraction of through whole thread tools are approx. 10% higher.

Breakage list for ground whole thread tools

Thred size	Breakage in Nm
M0,5	0,02 - 0,07Nm
M0,8	0,07 - 0,10Nm
M1	0,10 - 0,15Nm
M2	0,2 - 0,5 Nm
M3	0,7 - 1,5 Nm
M4	1,3 - 2,2 Nm
M5	3,5 - 8,0 Nm
M6	7,5 - 14 Nm
M8	18 - 35 Nm
M10	50 - 75 Nm

These data are empirical values of tools with different qualities.

At high engine speeds it is recommended to select a low breakage as set value for the breakage.

If you need detailed breakage- and cut data of the thread tools, please ask the producer of the thread tools.

Based on the diversity of the different tools it is not possible to state the values in a list.

Thread tools for non-cutting production (thread former) have are much more stable state because of their construction and missing chip nuts.

16 Appendix D: Processing of small threads (M1)

Setting recommendation for small threads under 0,29 Nm:

- Activate startsettings/start with workpiece zero point.
- Speed smaller than 300 rpm. (M1 smaller 100 rpm)
- Torque smaller than 0,3 Nm. (M1 approx. 0,09 Nm)

Additional the following parameter can be set.

- At operation thread cutting ground hole switch off the reversals.
(The operation will be cancelled after exceedance the torque)
- Turn on chip clearance and chip throw out depth

Procedure of the program function:

Under a torque of 0,29 Nm a longer acceleration ramp and a stop time will be activated by turning.

Under a speed of 300 rpm and a torque of 0,29 Nm the internal brake depth will be deactivated to avoid an hitch.