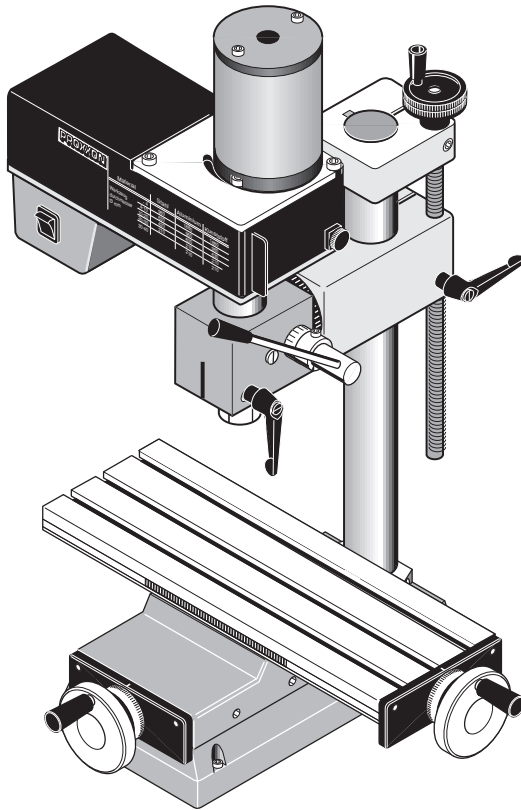


PROXXON

FF 230



Manual

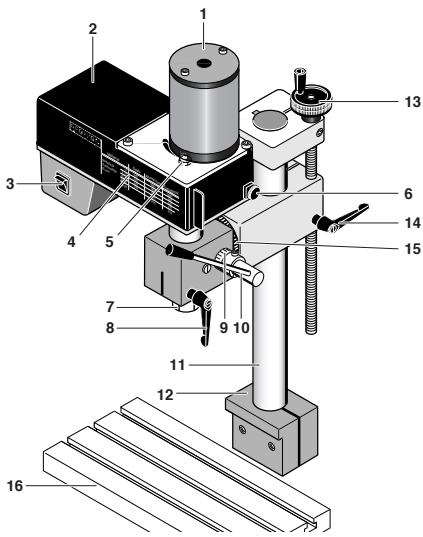


Fig. 1

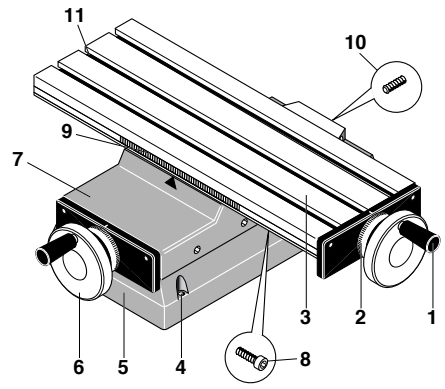


Fig. 2

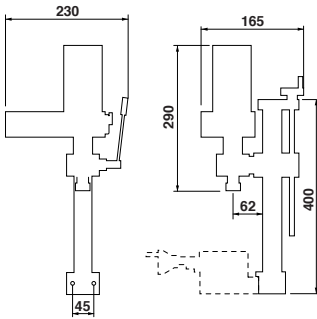


Fig. 3

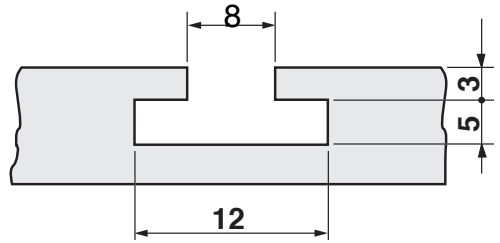


Fig. 4

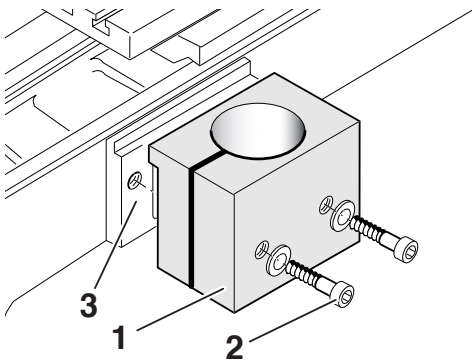


Fig. 5

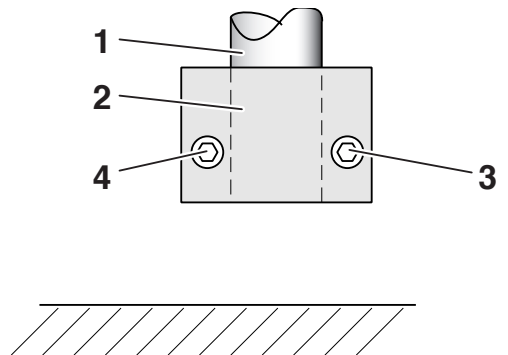


Fig. 6



Translation of the Original Operating Instructions

PF 230 milling machine / KT 230 compound-type table / FF 230 milling machine with compound-type table

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Foreword

Dear Customer,

This instruction manual deals with the PF 230 and the compound-type table KT 230 to be used with it. It addresses those of our customers having purchased the compound-type table, the milling machine, or both as the type FF 230 machine. No matter what your preference was: Read this manual carefully before using your machine and observe the instructions. Please pay particular attention to the safety instructions and always work with due care.

Only for operation in closed rooms.



Please do not dispose off the machine!



For your safety, always wear hearing protection while working!



Risk of injury!

Never work without dust protection mask and safety glasses. Some dusts have a hazardous effect! Materials containing asbestos may not be machined!



WARNING!

Read all safety warnings and instructions. Failure to follow all safety warnings and instructions listed below may result in electric shock, fire and/or serious injury.

KEEP ALL SAFETY WARNINGS AND INSTRUCTIONS FOR THE FUTURE !



Description of the machine

We offer you the following options for the 230 fine milling system:

KT 230:

1. Compound-type table
2. Operating instructions and safety regulations

PF 230:

1. Milling head, complete
2. Column
3. Lathe fixing block, including fixing components
4. Collets, Ø 6, 8 and 10 mm, including clamp nuts
5. Milling table with T slots for mounting on the PD 230/400/E, including fixing components
6. Operating tool
7. Operating manual and safety instructions

FF 230:

1. Milling head, complete
2. Column
3. Collets, Ø 6, 8 and 10 mm, including clamp nuts
4. Compound table KT 230
5. Operating tool
6. Operating manual and safety instructions

General view, PF 230 milling machine (Fig. 1)

1. Motor
2. Cover
3. On / Off switch
4. Table
5. Motor mounting screw
6. Knurled screw for cover
7. Union nut for collet chuck
8. Clamp screw for sleeve
9. Scale for depth adjustment
10. Drill lever
11. Pillar
12. Mounting block for lathe
13. Handwheel for height adjustment using fine tolerance feed
14. Clamping screw for height adjustment
15. Scale for angle adjustment
16. Milling table for lathe
(Not included with FF 230 milling machine, but only with PF 230)

General view, KT 230 compound-type table (Fig. 2)

1. Handwheel for X direction (170 mm travel)
2. Scale ring
3. Work table (270 mm x 80 mm)
4. Table mounting hole
5. Pedestal
6. Handwheel for Y direction (60 mm travel)
7. Support

8. Clamping screw
9. Scale
10. Pillar clamping screw
11. T-grooves

The PROXXON PF 230 milling machine may be used in conjunction with a compound-type table or the PROXXON PD 230/400/E lathe (in the latter case, the lathe support is used in place of the compound-type table).

PF 230 milling machine technical data

Voltage:	230 V, 50/60 Hz
Power rating:	140 watt
Short-term operation	10 min.

6 spindle speeds by shifting the V-belt:
280, 550, 870, 1200, 1500 and 2200 rpm

Sleeve stroke	30 mm
Vertical adjustment travel	200 mm
Noise emission	≤ 70 dB(A)
Vibration	≤ 2.5 m/s ²
Dimensions	refer to Fig. 3
Weight	approx. 9 kg

KT 230 compound-type table technical data

Work area:	270 mm x 80 mm
Adjustment travel in X direction:	170 mm
Adjustment travel in Y direction:	60 mm
Weight:	9.5 kg
Dimensions of T-grooves:	refer to Fig. 4
Groove spacing:	25 mm
Feed per rotation:	1.5 mm
Feed per graduation line:	0.05 mm

Noise/vibration information

The information on vibration and noise emission has been determined in compliance with the prescribed standardised and normative measuring methods and can be used to compare electrical devices and tools with each other.

These values also allow a preliminary evaluation of the loads caused by vibration and noise emissions.

Warning!

Depending on the operating conditions while operating the device, the actually occurring emissions could differ from the values specified above!

Please bear in mind that the vibration and noise emission can deviate from the values given in these instructions, depending on the conditions of use of the tool. Poorly maintained tools, inappropriate working methods, different work pieces, too high a feed or unsuitable work pieces or materials or unsuitable bits and cutters can significantly increase the vibration load and noise emission across the entire work period.

To more accurately estimate the actual vibration and noise load, also take the times into consideration where the device is switched off, or is running but is not actually in use. This can

clearly reduce the vibration and noise load across the entire work period.

Warning:

- Ensure regular and proper maintenance of your tool
- Stop operation of the tool immediately if excessive vibration occurs!
- Unsuitable bits and cutters can cause excessive vibration and noises. Only use suitable bits and cutters!
- Take breaks if necessary when working with the device!

Assembly of the milling machine

Mounting on lathe

1. Mounting lathe on a firm base.
2. Attach the mounting block **1** (Fig. 5) to the lathe **3** using screws **2** (Do not tighten screws yet!)
3. Tighten screw **3** (Fig. 6) and insert in pillar **1**.
4. Tighten screw **4** to clamp the pillar.
5. Attach the milling table **3** (Fig. 7) to the lathe support using screws **2** and square nuts **1**.

Mounting of milling machine on KT 230 compound-type table

Note:

Safe and precise operation is only possible if the machine is properly fastened to a stable work surface.

1. Attach compound-type table to work surface using 4 screws **1** (M4, not included) (Fig. 8).
2. When working in conjunction with the PROXXON PF 230 milling machine, insert pillar in flange and clamp using screws **2**.

The middle screw (between the two locking screws) is a spreader screw. By tightening this screw, the opening can be widened slightly, making it easier to insert the column. Before clamping the column, do not forget to loosen this screw again!

Working with the milling device

Important!

Disconnect the mains plug before making any adjustments on the milling machine!

The milling spindle on the PF 230 may be adjusted in height in 2 ways (Fig. 9):

1. Using the fine tolerance feed **1**
2. Using the drill lever **2**

Height adjustment via fine tolerance feed

1. Loosen screw **3** (Fig. 9).
2. Adjust to the desired height using the hand wheel **1** (1 rotation corresponds to 1 mm feed).
3. Screw **3** must always be tightened again.

Working with the drilling lever (Fig. 9)

Caution!

Before carrying out any adjustment work, switch off the device and disconnect the plug to prevent inadvertent starting up!

The drilling lever is not only useful for drilling holes, it can also be used with a defined infeed adjustment such as with a limit stop.

Easy drilling with the drilling lever:

1. Ensure that the Allen screw 6 at scale ring 5 is loosened.
5. Release toggle screw 4
6. Swivel the drilling lever 2 to place the quill in the required position. The quill is spring-loaded and returns automatically to its top position after machining.

To read the machining depth at the scale of scale ring 5 while machining, you must set it to zero first. This is quite easy:

1. Release the Allen screw 6 at the scale ring.
2. Press down the drilling lever 2 until the bits and cutters lightly touch the surface of the work piece.
3. Set the scale of the scale ring 5 to "0" and tighten the Allen screw 6.

When operating the drilling lever, the machining depth can now be read on the scale.

Drilling with limit stop function:

If you prefer to work with an exactly defined machining depth, proceed as follows:

1. Release the Allen screw 6 at the scale ring.
2. With the machine switched off, set down the bits and cutters very lightly on the surface of the work piece.
3. Set the required machining depth with the scale ring at the marking on the machine.
4. Tighten Allen head screw 6.

When operating the drilling lever, the movement of the spindle is now stopped when the set value is reached: drill holes can now be drilled with exactly the same same depth, for example.

Caution!

Please note that toggle screw 4 must always be tightened if machining regularly, i.e. without the drilling lever!

Spindle fine feed item no. 24140

When using this accessory, there is the option of effecting spindle feed via the drill lever or by turning the handwheel 1 (Fig. 9a).

The handwheel is fitted with a moveable scaling ring: This can be set to "0" for adjusting the required feed simply and exactly.

When the handwheel is turned, this produces a spindle feed of 1.5 mm.

Fitting the fine feed is simple:

1. Insert the shaft on the fine feed into the drill hole for the drill lever shaft on the milling cutter. During assembly, it is essential to observe the following: The "spring" on the fine feed 2 fits into the slot on the drill lever shaft 3.
2. Align the fine feed and secure it with the screw provided.
3. You can now switch the fine feed on or off with the coupling shaft. To switch on, press your finger on the shaft (4) and turn the handwheel at the same time.
4. The spring clicks into position in the slot. To switch off the fine feed, simply pull the coupling out again.

Moveable scaling ring:

The moveable scaling ring 5 can be set to "0". In this way, you can precisely set the desired feed from any position. A rotation of the handwheel corresponds to a feed of 1.5mm, the distance between two large scale divisions is 0.1mm.

Rotating milling spindle

The entire milling spindle may be rotated along 2 axes. To rotate along the vertical axis, loosen screw 4 (Fig. 6) and rotate entire pillar to the desired position. Then retighten screw.

To rotate along the horizontal axis, loosen screw 1 (Fig. 10) and rotate milling spindle to the desired position. Adjust to the desired degrees on scale 2 and retighten screw 1.

Installation of the collet chucks

Important!

Never insert the collet chuck alone into the spindle! Always engage the collet chuck into the nut first! Always ensure that collet chuck and milling tool have the correct diameter for proper fit.

Please note: Further collet chuck dimensions are available as accessory equipment in addition to those collet chucks supplied. These are listed in our equipment catalogue. Please consult our customer service department for further information.

1. Loosen union nut 7 (Fig. 11).
2. Place desired collet chuck 2 into union nut and allow to engage.
3. Insert union nut with collet chuck in the spindle and turn slightly by hand.
4. Insert milling tool into collet chuck.
5. Lock milling spindle using the spanners supplied and tighten union nut.
6. To remove collet chuck loosen union nut and remove milling tool.
7. Now remove union nut with collet chuck completely from milling spindle.
8. Disengage collet chuck using light sideways pressure 3 (Fig. 11) and remove from union nut.

Setting the spindle speed

Important!

Disconnect the mains plug before making any adjustments on the milling machine!

A total of 6 spindle speeds may be adjusted by shifting the V-

belt (Fig. 12 a/b): 280, 540, 780, 910, 1710, and 2500 rpm.

Note:

Tighten belt only lightly! A belt installed too tightly places excessive loads on the motor and machine mechanical system!

Important:

The belt cover must always be closed during operation.

1. Loosen knurled screw **4** (Fig.13) and open cover **7**.
2. Loosen screw **5** using Allen key **1** by approx. 2 turns in order to release belt pulley tension.
3. Place both belts in the desired position.
4. Press belt pulley **1** outwards with the belt tightener **8** below the gear wheels until the belt is tight. Tighten screw **5**.
5. Should both belts be tensioned unevenly, the upper belt may be tensioned separately. To do so, loosen screw **2** and push motor **3** outwards until upper belt is tensioned.
6. Retighten screw **2**.

Milling

Important!

Always wear protective goggles when milling. Always observe the enclosed safety regulations.

1. Securely fasten the work piece using clamps, in a vice, or to the support of the lathe chuck.
2. Alternatively, you can clamp the work piece in a machine vice and mount the vice on the work table using the T-grooves.
3. Adjust desired milling depth.
4. Tighten clamping screws **3** and **4** (Fig. 9).
5. Ensure that the milling tool does not touch the work piece.
6. Ensure that the proper spindle speed has been adjusted.
7. Switch on milling machine at switch **3** (Fig. 1).
8. Work using a suitable feed

Note!

When milling, always ensure that the feed is against the cutting direction of the milling tool (Fig. 14).

Important!

Always provide feed by hand only! When using the milling machine in conjunction with the lathe, feed action must not occur via the lathe's automatic feed. Risk of injury!

Repair and maintenance

Important!

Disconnect mains plug prior to all repair and maintenance work!

Belt replacement

If the belts are worn, you can replace these yourself. Replacement belts are available from PROXXON Central Service (address on reverse side of this manual).

1. Loosen screw **5** (Fig. 13) in order to release tension on pulley **1**.
2. Loosen the 3 screws **6** (Fig. 13) and lift off motor.

3. You can now remove the belts and replace them.
4. Assembly is in reverse order of removal.

Setting compound-type table guide play

If, after a time, the compound-type table guide is found to have too much or too little play, the play can be reset using the adjusting screws **2** (Fig. 15). For this purpose, loosen adjustment screw lock nuts **1** and screw in all adjustment screws evenly until play is eliminated. Retighten lock nuts afterwards.

Setting compound-type table spindle play

If play of the spindles increases, release the nut **1** using a socket spanner **2** (Fig. 16) approx. one half turn until play is eliminated. Then turn the hand wheel to the right hand direction until the play has been eliminated. Now retighten the nut **1** firmly (lock).

Note:

See exploded view, page 48 Where necessary, play in the individual spindle threads can also be achieved by slightly tightening the spindle nut, Item 3, with the bolt, Item 25.

Machine lubrication

To ensure a long service life of your machine, please observe the lubrication diagram in Fig. 17 (A: Lubricate each time before use / B: Lubricate once a month). Only use acid-free machine oil for lubrication.

After use

Important!

Disconnect milling machine mains plug before cleaning. Risk of injury!

Clean compound-type table and milling machine using a soft cloth and brush after use. Then lightly oil the guides and distribute the oil by moving the table. Never use compressed air for cleaning the compound-type table as cuttings entering the guides in this manner could destroy the guides.

Disposal:

Please do not dispose of the device in domestic waste! The device contains valuable substances that can be recycled. If you have any questions about this, please contact your local waste management enterprise or other corresponding municipal facilities.

EC Declaration of Conformity

Name and address:

PROXXON S.A.
6-10, Härebjerg
L-6868 Wecker

Product designation: PF/FF 230
Article No.: 24104/24108

In sole responsibility, we declare that this product conforms to the following directives and normative documents:

EU EMC Directive 2014/30/EC

DIN EN 55014-1/09.2016
DIN EN 55014-2/01.2016
DIN EN 61000-3-2/03.2015
DIN EN 61000-3-3/03.2014

EU Machinery Directive 2006/42/EC

DIN EN 62841-1/07.2017

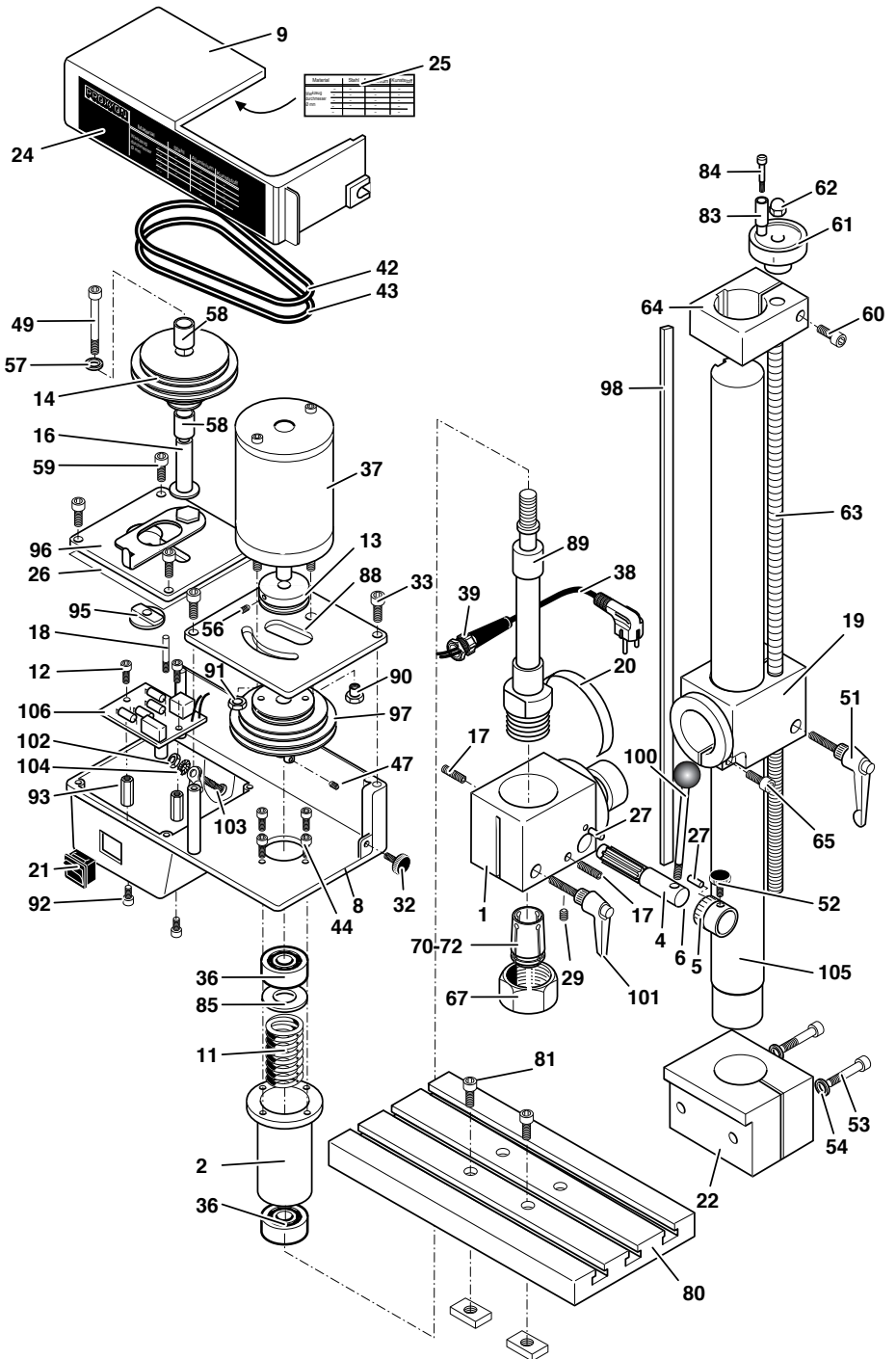
Date: 31.01.2017



Dipl.-Ing. Jörg Wagner

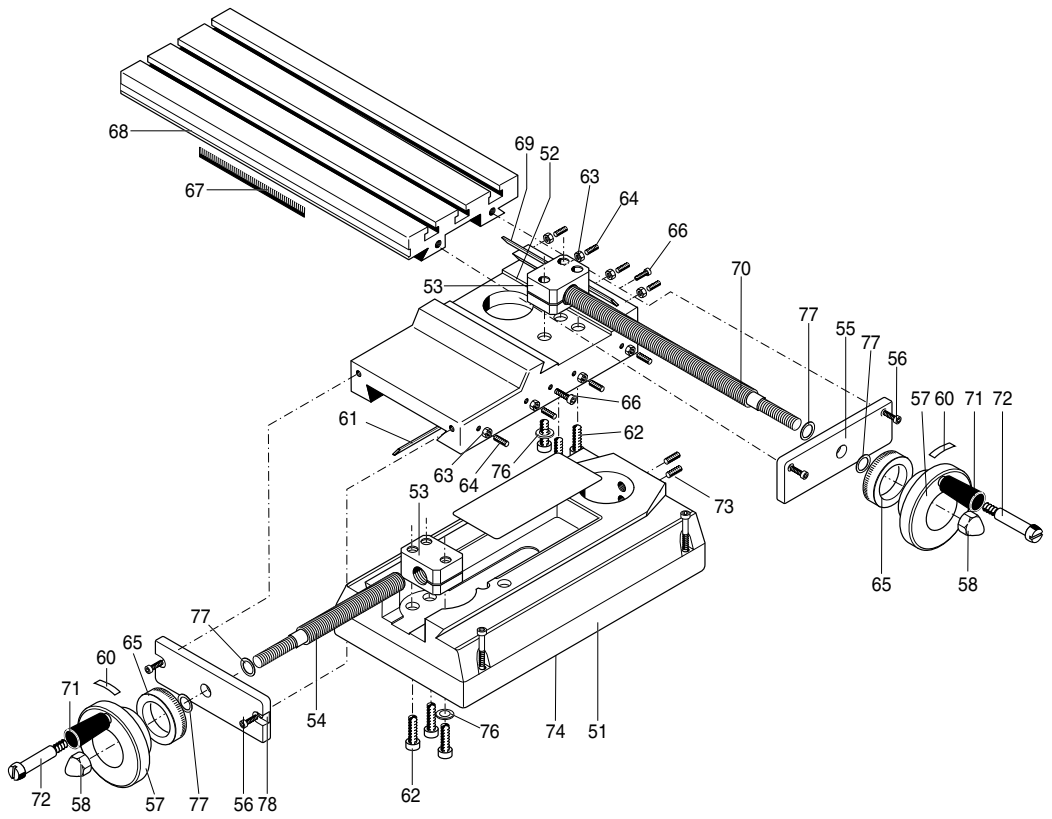
PROXXON S.A.
Machine Safety Department

The CE document authorized agent is identical with the signatory.



FF 230

ET - Nr. :	Description	ET - Nr.:	Description
24104-01	Pinolenflansch / Flange for quill	24104-81	Befestigungsschrauben für Frästisch inkl. Vierkantmuttern / Screw for milling table inc. square nut
24104-02	Pinole / Quill	24104-83	Pin / Pin
24104-04	Schaft für Vorschub / Feed shank	24104-84	Schraube / Screw
24104-05	Skalening / Graduated collar	24104-85	Scheibe / Washer
24104-06	Aufkleber für Skalening / Label for graduated collar	24104-88	Platte / Plate
24104-08	Getriebegehäuse / Gear box	24104-89	Spindel / Spindle
24104-09	Abdeckhaube / Cover	24104-90	Mutter mit Bund / Nut with collar
24104-11	Rückholfeder / Recuperating spring	24104-91	Mutter / Nut
24104-12	Schraube / Screw	24104-92	Schraube / Screw
24104-13	Motorriemenscheibe / Motor belt pulley	24104-93	Distanzbolzen / Distance bolt
24104-14	Zwischenriemenscheibe / Intermediate belt pulley	24104-95	Mutter / Nut
24104-16	Hülse / Bushing	24104-96	Spannplatte / Tensioning plate
24104-17	Spannstift / Locking pin	24104-97	Riemenscheibe / Poully
24104-18	Achse für Abdeckhaube / Axle for cover	24104-98	Keilleiste / Wedge gip
24104-19	Flansch für Fräskopf / Flange for quill	24104-99	Bedienungsanleitung (inkl. Sicherheitshinweise) / Manual (incl. Safety instructions)
24104-20	Winkelskala / Graduation label	24104-100	Bohrhebel / Drilling lever
24104-21	Ein-/ Ausschalter / Ein-/ Ausschalter	24104-101	Klemmschraube / Clamping screw
24104-22	Flansch für Drehmaschine / Connection flange for lathe	24104-102	Mutter für Erdung / Nut for grounding
24104-24	Tabelle für Schnittgeschwindigkeiten / Sheet for cutting speeds	24104-103	Erdungsschraube / Screw for grounding
24104-25	Tabelle für Riemenposition / Sheet for belt positions	24104-104	Zahnscheibe / Toothed washer
24104-26	Kunststoffabdeckung / Plastic cover	24104-105	Säule (ø 35 mm) / Column (ø 35 mm)
24104-27	Stift / Pin	24104-106	Platine / Board
24104-29	Gewindestift / Set screw		
24104-32	Rändelschraube / Knurled screw		
24104-33	Schraube / Screw		
24104-36	Kugellager / Ball bearing		
24104-37	Motor / Motor		
24104-38	Zuleitung mit Stecker / Power cord with plug		
24104-39	Zugentlastung / Strain relief		
24104-42	Riemen für Motorriemenscheibe / Belt for motor pulley		
24104-43	Riemen für Spindelriemenscheibe / Belt for spindle pulley		
24104-44	Schraube / Screw		
24104-47	Gewindestift / Set screw		
24104-49	Schraube / Screw		
24104-51	Klemmschraube / Clamping screw		
24104-52	Schraube / Screw		
24104-53	Schraube / Screw		
24104-54	Scheibe / Washer		
24104-56	Gewindestift / Set screw		
24104-57	Unterlegscheibe / Washer		
24104-58	Buchse / Buchse		
24104-59	Schraube / Screw		
24104-60	Schraube / Screw		
24104-61	Handrad / Handwheel		
24104-62	Hutmutter / Cap nut		
24104-63	Gewindestange / Thread rod		
24104-64	Flansch / Flansch		
24104-65	Schraube / Screw		
24104-67	Überwurfmutter für Spindel / Cap nut		
24104-70	Spannzange 6 mm / Collet 6 mm		
24104-71	Spannzange 8 mm / Collet 8 mm		
24104-72	Spannzange 10 mm / Collet 10 mm		
24104-80	Frästisch / Milling table		



KT 230

ET - Nr.:			Description
24106-51	Maschinenfuß	/	Machine base
24106-52	Support	/	Support
24106-53	Spindelmutter	/	Spindle nut
24106-54	Spindel für y-Verstellung	/	Spindle for Y-axle
24106-55	Frontplatte x-Achse	/	Plate x-Axle
24106-56	Schraube	/	Screw
24106-57	Handrad	/	Hand wheel
24106-58	Hutmutter	/	Cap nut
24106-60	Blechfeder	/	Spring
24106-61	Einstellblech für y-Verstellung	/	Adjusting plate for y-Axle
24106-62	Schraube	/	Screw
24106-63	Kontermutter	/	Counternut
24106-64	Gewindestift	/	Set screw
24106-65	Skalenring	/	Graduated collar
24106-66	Klemmschraube	/	Screw
24106-67	Skala	/	Scale
24106-68	Tisch	/	Table
24106-69	Einstellblech für x-Verstellung	/	Adjusting plate
24106-70	Spindel für x-Verstellung	/	Adjusting plate for x-Axle
24106-71	Hülse	/	Bushing
24106-72	Schraube	/	Screw
24106-73	Gewindestift	/	Set screw
24106-74	Abdeckblech	/	Cover plate
24106-75	Schraube	/	Screw
24106-76	Scheibe	/	Washer
24106-77	Scheibe	/	Washer
24106-78	Frontplatte y-Achse	/	Plate y-Axle

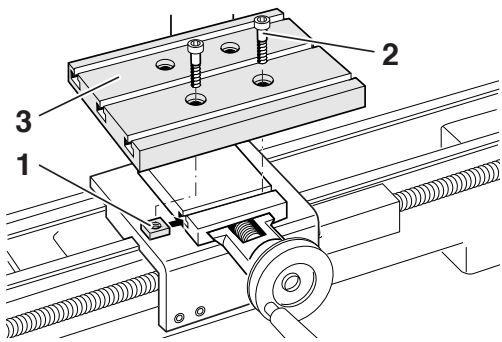


Fig. 7

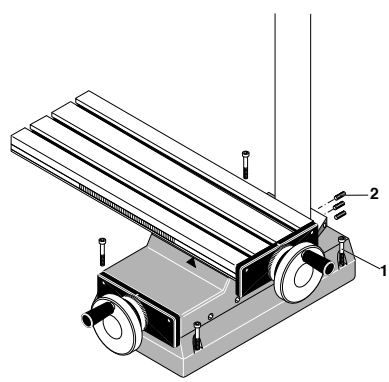


Fig. 8

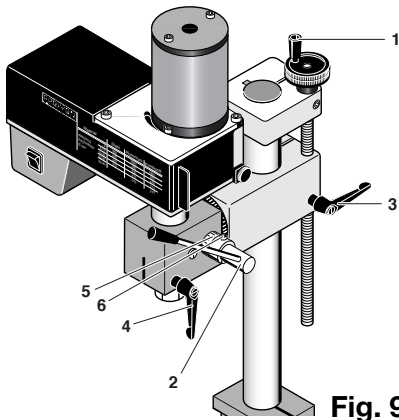


Fig. 9

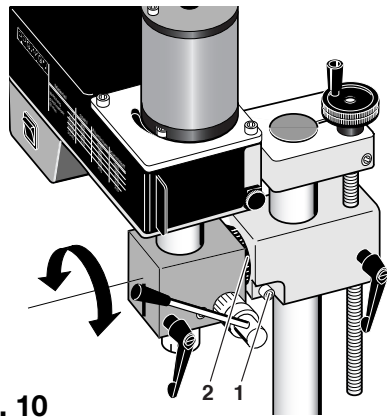


Fig. 10

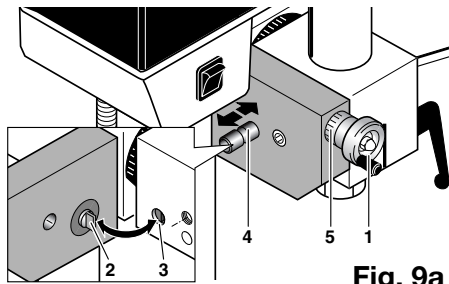


Fig. 9a

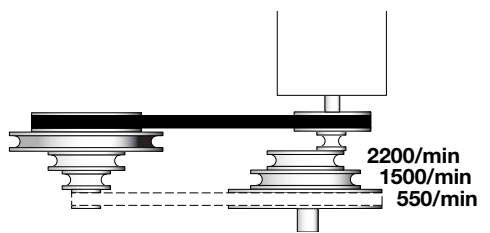


Fig. 12a

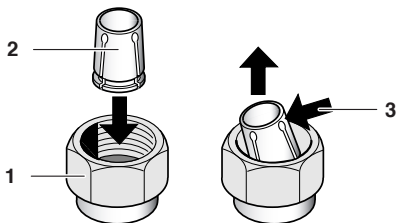


Fig. 11

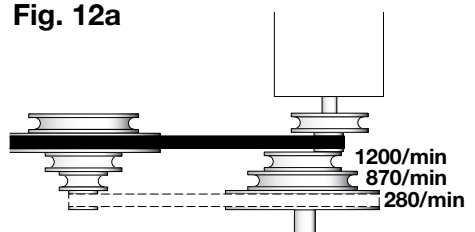


Fig. 12b

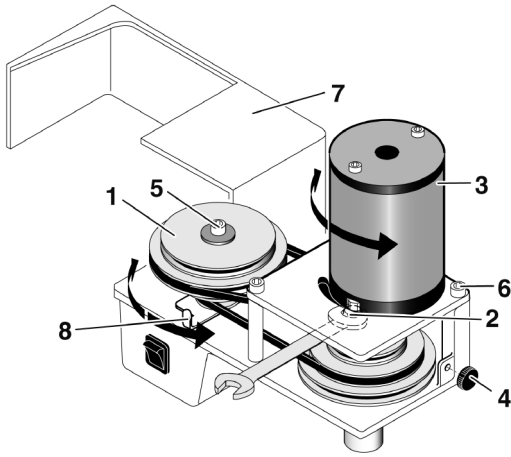


Fig. 13

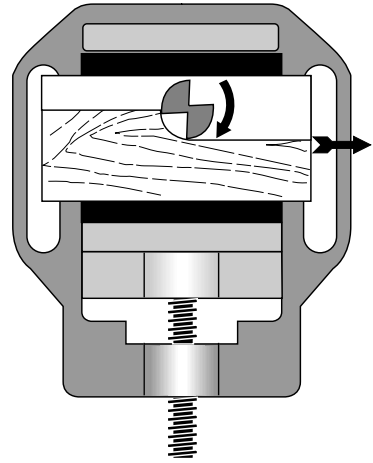


Fig. 14

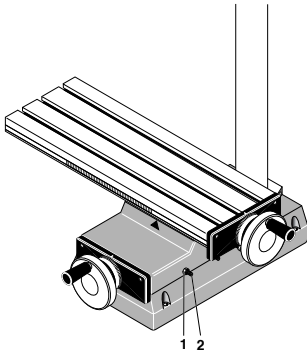


Fig. 15

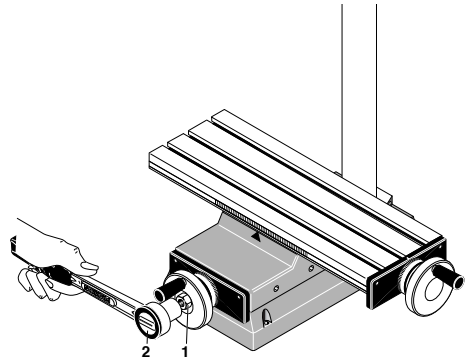


Fig. 16

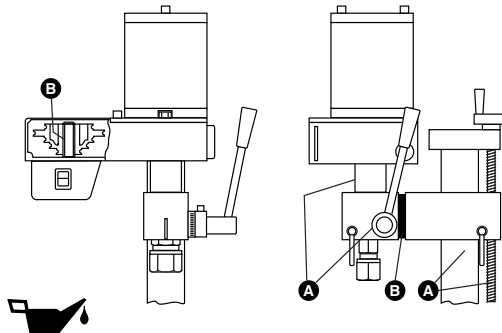


Fig. 17

PROXXON

GB **Service note**

All PROXXON products are thoroughly inspected after production. Should a defect occur nevertheless, please contact the dealer from whom you purchased the product. Only the dealer is responsible for handling all legal warranty claims which refer exclusively to material and manufacturer error.

Improper use, such as capacity overload, damage due to outside influences and normal wear are excluded from the warranty.

You will find further notes regarding "Service and Spare Parts Management" at www.proxxon.com.