SCHICK
Dentalgeräte

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Original

Operating Instructions
SCHICK - Milling machine S3-Master

We are pleased that you decided to buy a highly developed piece of equipment from SCHICK and would like to wish you every success when working with your new milling machine S3 Master.

We wrote these operating instructions to enable you to get accustomed to your new piece of equipment and to provide you with the correct operating and maintenance instructions.

Index

Serial parts	Art.-No.
Milling machine S3 complete	2500
Foot-switch (Magnet-coupling)	2110
Foot-switch (Motor)	2560
C3-Motor incl. Milling spindle and cable	7000/05
Light equipment	2510
Mains cable	2160
Collet chuck Ø 2,35 mm	4114
stop for short tools	4918
Chuck key	4115
Counter stay wrench	6223
Hexagon socket wrench w.a.f. 2	W602000200
Hexagon socket wrench w.a.f. 4	W602000400
Dust protection cover	2502

optionally	
Collet chuck Ø 3 mm	4117
stop for short tools	4925

2. Range of Applications

The S3 Master milling machine is designed for use in dental laboratories when trimming crowns and bridges, respectively acrylic and chrome cobalt dentures.

Highest precision, consistent quality control und minor maintenance are the merits of the S3 Master which has been developed under assistance of recognized experts in milling technics.

This novel construction - the model is moved up and down by means of the height adjustable milling table - is unique, and grants the technician ergonomic, relaxed sitting during work.
The 3D integrated arm supports are also outstanding and support optimal the guidance of the milling hand. This ergonomic construction allows optimal results through relaxed working.

Conditions of environment:

- interior 5° - 40°
- up to 2.000 meter over sea level

Categorie of overvoltage: II
Grade of pollution: 2

3. General Information

- Ascertain that your mains supply coincides with the data in the rating plate

- The milling machines S3 Master are not suitable for the following applications:
  - in areas where there is a risk of explosion
  - for medical applications

- Ensure that all regulatory requirements are observed during use (always waer protective glasses).

- Under no circumstances should the milling machine be cleaned with compressed air

- To keep the precision and the lifetime of the chuck always insert a rotary instrument or the pin, supplied with the unit, (37) - even if the motor stands still.

- Recycling WEEE-Reg.-Nr. DE 78620387

3. Safety informations

ATTENTION: 

- Water-cooled turbines are only indicated to use in connection with a SCHICK suction tub to avoid defects at the elctrical equipment and corrosion.

- When using rotary instruments, do not exceed the maximum speeds laid down by their manufacturer.

- Repairs and other technical procedures must only be carried out by suitable qualified personnel, authorized by SCHICK.

- SCHICK do not guarantee the S3 Master milling unit should it not have been used in accordance with the operating instructions

- For defects occured by using the S3 Master milling machine in another way or by inappropriate handling the manufacturer rejects any liability.

These operating instructions should be readily accessible and are best kept close to the milling machine itself !

4. Installation

Pict. 1

- Check the package for visible damages
- When unpacking handle all parts of consignment with care.
- Remove carefully the upper part of the inside package (withdraw slowly (pict.. 1)).
  Please look that parts of the milling machine do not become wedged with the package.

pict. 2

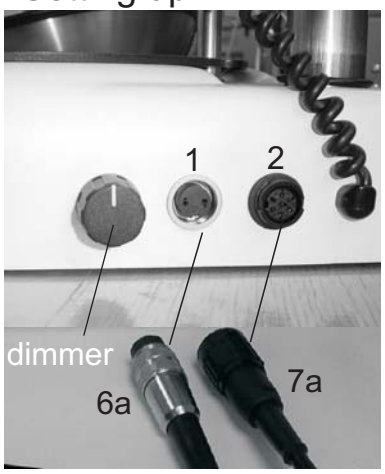
- Remove cartons containing accessories (pict. 2)
  IMPORTANT: When unpacking the accessories please note the sign "OBEN" (pict. 3) !
- Look for the space where to place the milling machine
- Using your left hand hold the milling machine at the column
  Do not hold at the milling arm !
- Withdraw the machine a little bit and then hold it with your rigth hand at the basic plate to take the milling machine out.
  Please look for the milling arm being fixed.

Pict. 3

- Check all parts for visible damages. Place all parts of inner package back into the outer carton.
  Store the complete package for an eventual return to manufacturer.

If you should intend to destruct the package, please be so kind to return the complete package to SCHICK.

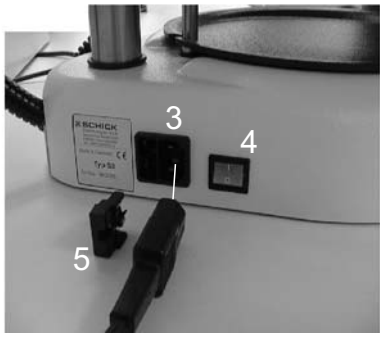
Setting up



Foot-switch

Put the connection plugs of foot-switch (magnet-coupling) (6a) and foot-switch (motor) (7a) on to the sockets situated on the right side of the milling machine (see picture). Press both plugs carefully into the sockets.
Please note at both plugs the security against torsion !
The foot-switch (magnet-coupling) is equipped with a thread connection, the foot-switch (motor) with a bayonet connection. So both plugs can be connected with the sockets tightly
Dimmer is used for the stepless adjustement of light intensity.

Mains cable



Connect the milling machine with the mains supply by placing the mains cable at first into the socket (3) situated on the left side of the milling machine and then into a safe wall socket with earth connection.

Please check that all plug connections are readily fixed !

5. Operation

activate mains switch (4)

3D-milling arm

jointed arm
- Fastening and loosening is done with the foot switch (6)
- adjust the additional, third joint with thumb drive (15)
- When the milling machine is not in use please place the milling arm into 'parking postion' (pict. 2; page 9)

vertical saddle
- adjust the vertical saddle at any position using knurled nut (8)
- use lever (11) to draw spindle down fine adjustment through micrometer spindle (9)

milling spindle
- tension lever (31) showing to the left when chuck is closed

operating unit

- motor on/off with switch "Motor - EIN/AUS" (18) resp. foot switch (7)
- speed adjustment variable with speed selector (19) - digital speed indicator (22)
- magnet on / off use switch "Magnet - EIN/AUS" (20)
- changing rotation of milling spindle by using switch "Motor - R/L" (21)

integrated arm supports

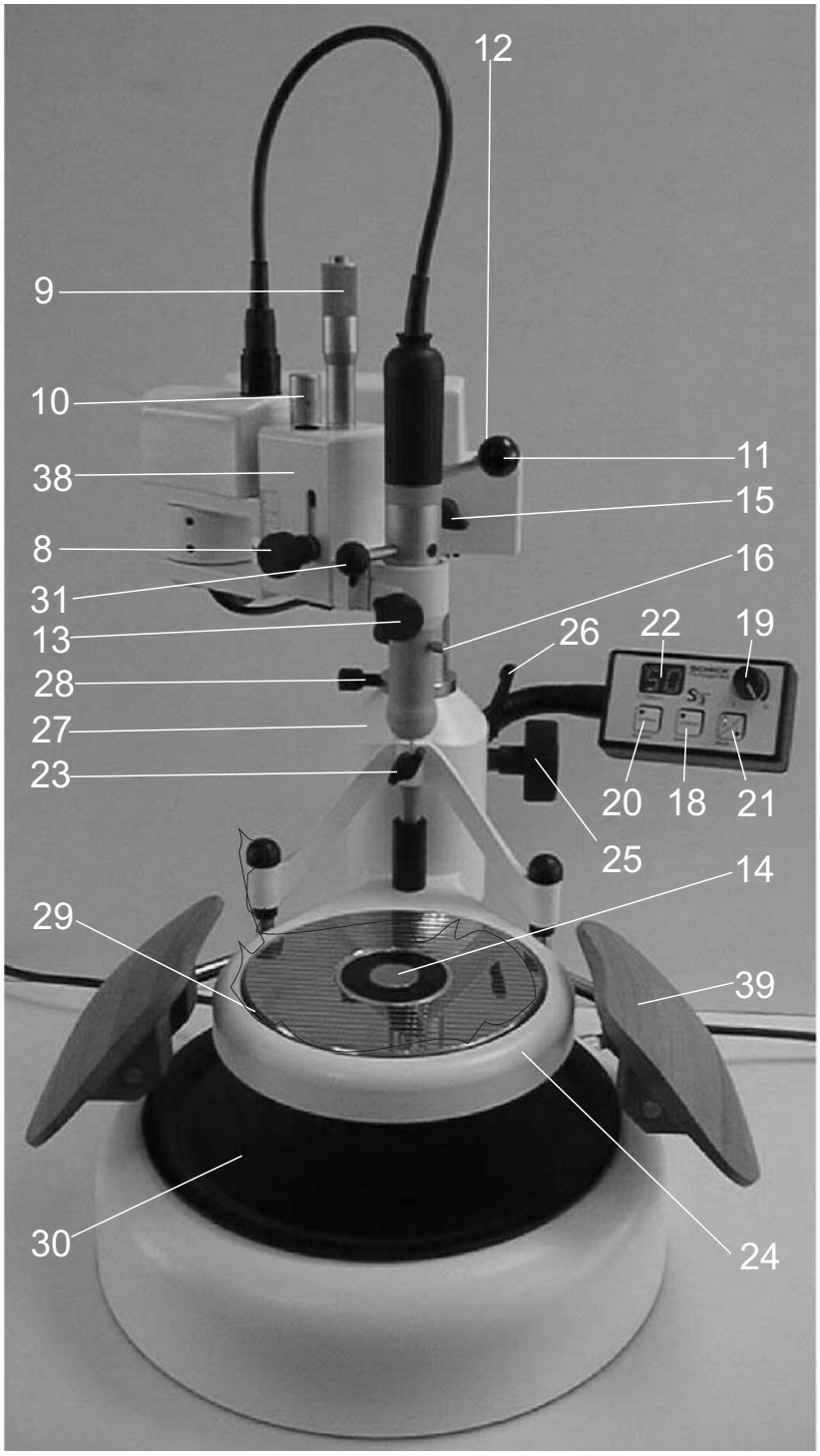
- adjusment possible at any position through notches
- height adjustment through thumb drive (23)

height-adjustable. Milling table

- loosen clamping lever (26); for height adjustment use handwheel (25)
- position of clamping lever can be adjusted at any position desired by pulling and turning.
- Height stop (28) to mark and to find again the starting point of the milling table
- gap (29) at magnet plate to remove easily cuttings etc.

Important !
Detailed description see point 7 "Operation"

6. S3-Master



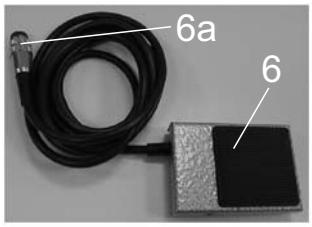
1. Socket for foot-switch (magnet-coupl.)
2. Socket for foot-switch (motor)
3. Socket for mains cable
4. Mains switch
5. Fuses
   (point 1 - 5 see page 6)
6. Foot-switch (magnet-coupl..)

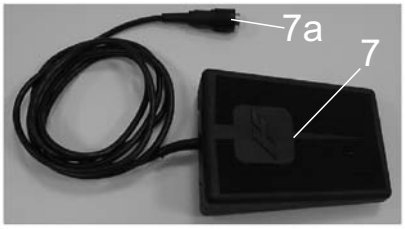
6.a Plug foot-switch (magnet-coupl.)

7. Foot-switch (motor)

7.a Plug foot-switch (motor)

8. Knurled nut / vertical saddle
9. Micrometer spindle / depth stop
10. Spring tension
11. Lever
12. Holding hole
13. Knurled nut / milling spindle
14. Magnet
15. Thumb screw / jointed arm
16. Knurled screw / light attachment
17. Measuring spindle (see page 10)
18. switch “Motor-ON/OFF”
19. Speed selection
20. switch “Magnet-ON/OFF”
21. Switch “Motor-right/left”
22. Digital speed indicator
23. Thumb drive / arm supports
24. Milling table
25. handwheel
26. Lever / milling table
27. Guidance for milling table
28. Height stop ring
29. Gap at magnet plate
30. Plate
31. Tension lever
32. Chuck key
33. Chuck
34. Hold fast key
35. Plug-in seal
36. cap
37. Pin
    (point 31 - 37 see page 13)
38. Vertical saddle
39. Arm supports





7. Operation

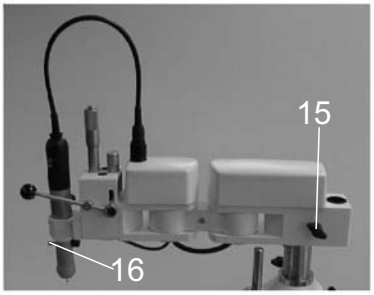
Mains switch

To activate the electric press mains switch (4) "ON". The switch itself becomes shining. Now all electrical functions are controllable. To switch the unit off press mains switch (4) "OFF" again.

Attention:: when the unit is switched off the magnetic couplings are no longer activated ! Put the milling arm into the resting position

7.1 3D - Milling arm

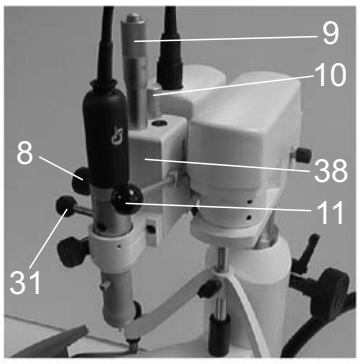
Jointed arm



pict. 1

Fastening and loosening of the arm by the electro-magnetic couplings is done with the foot switch (6). An additional, third articulation is loosened by turning the thumb screw (15) slightly to the left.
Then the milling arm can be adjusted and locked again in any desired position. When work is finished the milling arm can be put into a "parking position" - also when the jointed arm is not in use for longer time (pict. 2). Before activating the mains switch put milling arm into this position (left side stop).
A permanent magnet locks the arm. This is to avoid un unintended swing out of the milling arm when the unit is switched off.
The magnetic couplings are inactive after the unit is switched off.

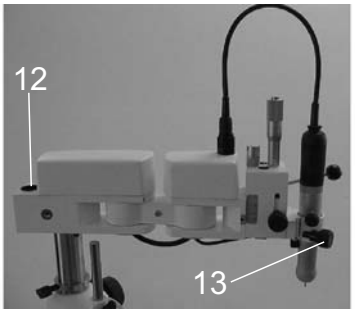
Vertical saddle



pict. 2

The vertical saddle (38) is to be fixed with a knurdel srew (8) in any position. On the top of this saddle there is the grip sleeve to adjust the depth stop (9).
The tension of the spring (10) in the vertical saddle can individually be adjusted at the bottom of the milling arm (40) (see point 7.5; page 12) using the supplied hexagon head socket wrench w.a.f. 4.
The spindle for depth stop (9) shows a radial graduation of 50 x 0,01 mm and an axial graduation of 0,5 mm.
One complete rotation of this spindle is a travel of 0,5 mm.
The vertical way of the saddle is 24 mm.
The drill-lever (11) can be screwed out if required.

Milling spindle



pict. 3

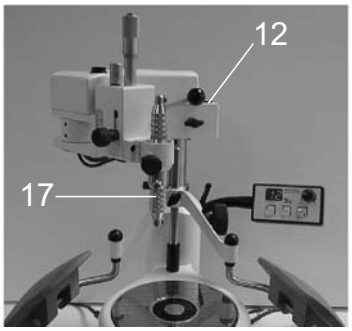
To remove the milling spindle detach light equipment and loosen knurled nut (13) (pull spindle out upwards). To detach the light equipment loosen knurled screw (16) (pict.. 1) and pull light equipment carefully down.
Put light equipment on again in reverse order.
When putting on the light equipment please take care that the connections click into place !

When replacing the milling spindle pull down until stop.

➔ **Please pay attention that the thread pin placed in the spindle holder clicks into the notch at the milling spindle.**

The lever (31) (pict. 2) at the milling spindle has to show into left direction. Tighten knurled nut (13).

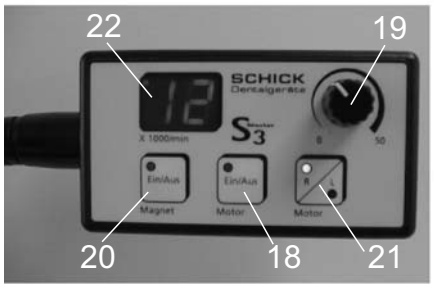
Function of milling spindle see " operating unit " (point 7.2)



Measuring spindle

The measuring spindle (17) is supplied as accessory and can be placed into the spindle holder in the same way as the milling spindle. There is no stop position what allows to place the measuring spindle in each desired height position.
If the measuring spindle is not in use it can be placed into the holding hole (12) in the back part of the milling arm.

7.2 Operating unit



The operating unit is flexible connected to the milling machine. This flexible connection allows positioning to the optimum ergonimic, individual working position.

Milling spindle ON / OFF

The milling motor is switched on and off either by using the operating unit directly (switch "Motor - EIN/AUS"(18)) or by using the supplied foot-switch (Motor) (7). If motor is switched on control light is shining.

Speed of milling spindle

The speed of the milling spindle is variable adjusted from 1.000 - 50.000 min^{-1} by turning speed selector knob (19) .
The choosen speed is clearly visible at the integrated digital display (22). If there is a point visible left from the shown speed the motor is not switched on (to select the speed). As soon as the spindle is rotating the point disappears.

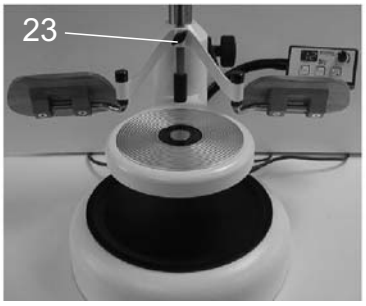
Magnet milling table

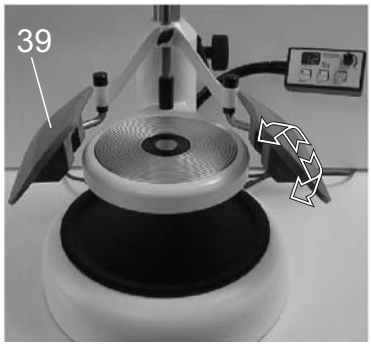
To lock resp. to loosen of f.e. model table or coordiante table an electric magnet is used. Press the switch "Magnet -EIN/AUS"(20) ; the control light in the switch is shining.
To inactivate the magnet press the switch again.

Direction of rotation of milling spindle

To change direction of rotation of milling spindle use switch "Motor - R/L" (21). If motor is running the direction right or left is shown through a green light in the switch. It is also possible to change the direction of rotation when motor is running.

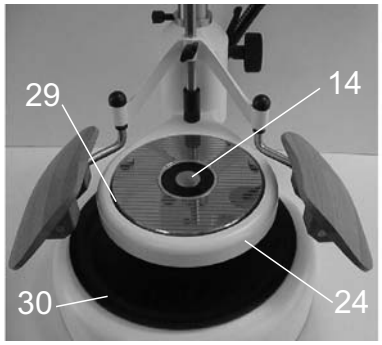
7.3 Integrated arm supports





To allow relaxed working the flexible three dimensional arm supports are both individually adjustable.
To adjust the height loosen thumb drive (23). To fix the arms bring them into desired position and lock the thumb drive.
In addition it's possible to fix the arm supports on their inner side with the holding device by means of a hexagon socket wrench w.a.f. 2.

7.4 Height adjustable milling table

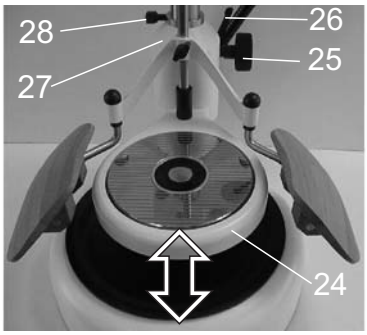


In contrary of conventional milling machines the height adjustment is not regulated through the milling arm but through the adjustable milling table (24).
This innovation allows working at constant eye level even with different heights of models.

Magnetic platform

To fix the model table or other accessories in the center of the magnetic platform an electro-magnet is placed (14) which is operated via the operating unit (see point 7.2; page 10). There is a gap at the magnetic platform (29) through which facings coming up when milling (precious metal), dust or liquids can be removed. To clear the platform you can easily take away the particles with a brush through the paralle grooves.
The plate below (30) is destined to collect the particels and can easily be removed and cleaned.

Height adjustment



To adjust the height of the milling table (24) turn handweel (25) which is placed on the right side of the column. But first loosen lever (26) working as additional clamp to fix the milling table.

Put milling table up or down according to your needs using the handwheel and then clamp lever (26) to avoid unintended movement of the table.
If needed you can put the lever (26) in different positions. Pull lever axial and turn to new position; when releasing the lever clicks into place

Height stop ring

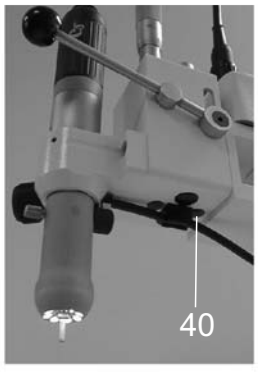
Is the milling arm adjusted in a certain position (f.e. when milling), but the space between model and milling spindle is to narrow to change the tool you can mark the position of the milling table using the height stop ring (28).
To find again the adjusted height loosen thumb screw at heigth stop ring (28), put the heigth stop ring down till it stops at guidance (27) and fix it. Now the milling table can be put down and after the tool is changed it can be returned to the original height.

7.5 Motor technics

The milling unit S3 Master is equipped with the new C3 technology. This means extrem and stable torque in all speed ranges, silent and vibration free running and highest balance.

With its 50.000 r.p.m. and 240 watt power the S3 milling spindle masters even the hardest grinding and milling.
Attention: Use only tools which are in accordance to the working speeds !

Maintenance of motor and spindle see " Maintenance and Care " (point 10; page 14)



The integrated light equipment guaranties excellent illumination and visibility of the working area.
Due to the direct connection with the milling spindle it's not necessary to place the light always into the right position. Light exactly where it is needed. The light equipment is joined with a plug connection and can easily be removed and attached. The light intensity can be adjusted by the dimmer knob (see page 6)

Removal of light equipment see "Operation - milling spindle" (point 7.1; page 9)

8. Exchanging the rotary instruments

The chuck is opened by turning tension lever (31) to the right till it stops.
When the shaft of the rotary instrument is placed into the chuck turn tension lever to the left till it stops.
With regard to the precision and service-life of the chuck, an instrument must always be inserted into it - even when the spindle is not in use.

> CAUTION: Only ever exchange the rotary instrument with the motor switched off! **Risk of damage !**

9. Replacing the chuck

- Take milling spindle out of the spindle holder

see "Operation - Milling Spindle" (point 7.1; page 9)

- Open chuck and remove the rotary instrument.
- Remove motorcable. Unscrew cap (36) from motor and loosen cable by pulling out the plug-in seal (35). Please insure that the chuck is open.
- Use a number 6223 wrench (34) to hold the motor end of the spindle.
- Engage the triangular section of the chuck (33) with a number 4115 tool (32). Hold tight No. 6223 (34) wrench and screw out the chuck by turning the tool no. 4115 (32) anti-clockwise.
  The chuck has a right-handed thread !
- Clean the chuck, grease its outside lightly and place it in the spindle. Use the tools as described to screw the chuck in - clockwise and as far as possible **and tighten it slightly.** Replace the plug-in seal (35) and screw the cap (36) back into place.
- Replace milling spindle in spindle holder.

10. Maintenance and care

⚠ CAUTION!: Do not clean milling machine and milling spindle with compressed air !

The chuck should be cleaned and re-greased once in a while, depending on how dirty it is

see "Replacement of chuck" (point 9; page 13)

- As the C3 milling spindle has no commutators, carbon brushes or ventilation parts, no further maintenance is required.
- The wood of the arm supports is natural and superficially waxed.
- All guideways are maintenance free.

For cleaning please use only a brush !
Before cleaning please switch the milling machine off and withdraw mains plug !

11. Possible faults

- Should the milling spindle be overloaded, respectively, jammed, for safety reasons the unit will switch off.
- turn speed selection (19) back to "0-postion"; select the desired speed and the machine is ready for use again.
- alternatively switch mains switch (4) off and on again.

If after that the machine is not working please check the fuses and replace them if necessary. The fuses (5) (230V→ 2x T2AH250V art.no.:3106) (100-115V 2x T4AH art.no.: 7306) are to be found beside the socket for the mains cable (3) (see page 6).

Should it not be possible to abolish the faults please contact SCHICK directly

Technical Data **S3 Master**

Rated voltage: 230V / 115V / 100V
Rated frequenzy: 50/60 Hz
Motor torque: 7,8 Ncm
Speedrange: 1.000 - 50.000 min-1
Concentricity: < 0,015 mm
chuck: Ø 2,35 mm series
Ø 3,00 mm on request

Width: 300 mm
Height: 500 mm
Depth: 420 mm
Weight: 23 kg

Subject to technical modification without prior notice

Accessory

Model table Art.-Nr. 2407/9

Separator Art.-Nr. 2655

Suction tube Art.-Nr . 2470

Adaptor ring Art.-Nr . 2508

Holding tray Art.-Nr. 2509

Coordinate table
Art.-Nr. 2505

Light head for turbine
Art.-Nr. 2510/1

Adjustable Anglel
Art.-Nr. 2506

Measuring spindle Art.-Nr. 2250/1

Milling tray Art.-Nr. 2507

Milling set 2,35 mm
(7 pcs) Art.-Nr. 2530

Polish set 2,35 mm
(3 pcs) Art.-Nr. 2665

Diammond tool set
Turbine 1,6 mm
(8 pcs) Art.-Nr. 2660

S3 - Ceramic-set cpl. (without S3 Master)	art.-no. 2650/01
turbine	art.-no. 2640/1
S3 Adaptor for turbine	art.-no. 2481
holding clip	art.-no. 2245
light head for turbine	art.-no. 2510/1
Suction tube	art.-no. 2470
Separator	art.-no. 2655
Model table	art.-no. 2407/9
Diamond-tool-set for Turbine 1,6 mm (8 pcs.)	art.-no. 2660
Polish-set 2,35 mm (3 pcs.)	art.-no. 2665

We, GEORG SCHICK DENTAL GmbH
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CE

declare herewith, that the product

Milling machine S3 Master Art.-Nr. 2500

is in conformity with the following provisions of Directive:

2001/95/EG	(general product safety)
2006/42/EG	(machinery directive)
2006/95/EG	(low voltage directive)
2004/108/EG	(EMV directive)

Name and adress of person in charge:
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Schemmerhofen, April 2010

W. Schick
Geschäftsführer

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