

LABORATORY MICROMOTOR **HP45** MULTIFUNCTION

 **USER AND MAINTENANCE MANUAL**



1. DESCRIPTION

HP45 Multifunction is a powerful and reliable micromotor, expressly designed for daily use in the Dental, Gold and Jewellery fields.

The speed of the collector motor varies from 1.000 to 45.000 rpm and can be adjusted progressively by means of the potentiometer knob on the control unit (max speed adjustment) or by pushing gradually the foot rheostat.

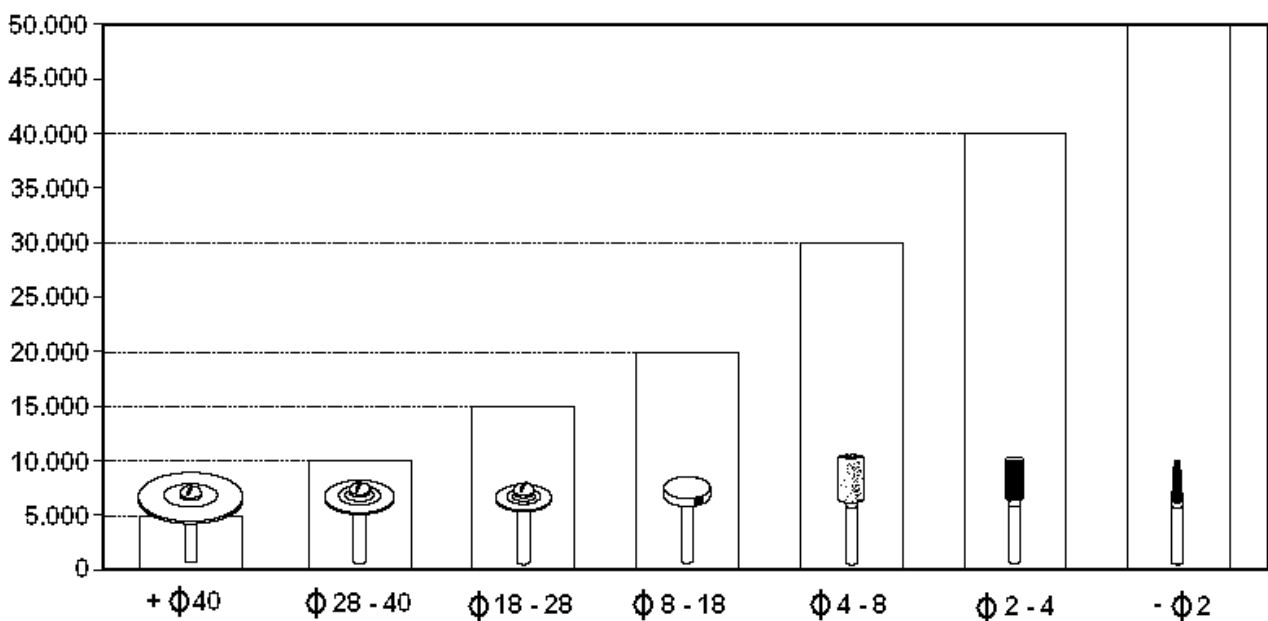
The electronic power and control circuit is embodied in a sturdy shock-absorbing case which is ideally positioned on the working bench.

The handpiece is perfectly balanced, ergonomic and very light. The chuck pliers support a Ø 2.35mm bur, but additional pliers for Ø 3.00mm burs can be fitted upon request.

2. GENERAL PRECAUTIONS

- Read carefully the present manual before carrying out any starting, operating or maintenance operation on the machine.
- Safety of the User depends on the skill ability, on the good sense and on the caution when using the machine; for this reason, it is of utmost importance to know in detail the allocation and the function of all the controls.
- The final User of the machine is a skilled and well trained professional and not merely an occasional worker.
- Check regularly the parts which tend to wear out due to the specific working conditions.
- Do not tamper the electrical wiring system of the machine
- The built-in safety mechanisms shall in no way be removed or modified.
- Do not allow unauthorised persons to try to repair the machine.
- Do not utilise petrol, solvents or any other inflammable fluids to clean some parts of the machine – use exclusively non-toxic and non-inflammable products available on the market for this specific purposes.
- Always use high-quality, well balanced and rectified burs and tips.
- Do not exceed maximum recommended speed according to the size of the instrument in use, in order to prevent vibrations and potential damages.
- Carefully handle the handpiece, protecting it from shocks and accidental drops. When not in use, place always the handpiece on the support supplied with the micromotor.
- Accurately clean the pliers every time a tool is replaced.

MAXIMUM RECOMMENDED SPEED ACCORDING TO THE TOOL SIZE



3. INSTALLATION INSTRUCTIONS

1. First of all, find a proper location to position the control unit.
2. Secure the handpiece support in the proper seat on the right side the control unit
3. Connect the round handpiece coupling to the fixed base on front of the control unit (Motor)
4. Connect the round foot-control coupling to the fixed base assembled on the control unit rear panel (Variable Foot)
5. Check the data label (stuck aside the control unit) for electrical connection and absorption. Plug in the feeding cable to an homologated ground socket (be careful that AC Input commutator is on 220V)
6. Place the handpiece on the rubber support or secure it to the support aside the control unit.

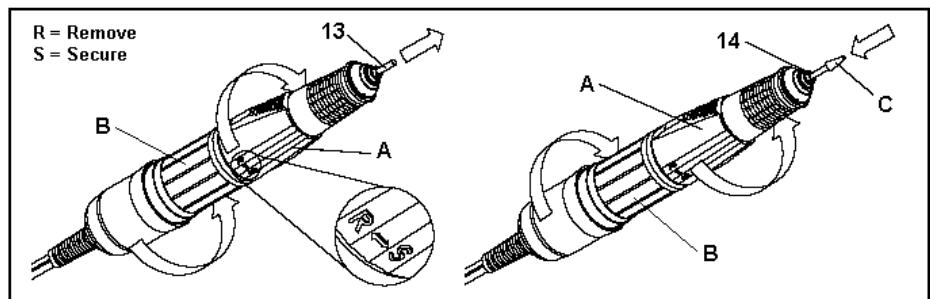
4. INSTRUCTIONS FOR USE

Push on the main switch (POWER), the activation led will start lighting.

The micromotor will not start working unless a tool has been properly inserted and locked in the pliers,

turn the handpiece central ring nut leftwards up to the click

fully insert the tool shank
turn the ring nut back to its initial position.



In normal mode (switch on Foot), the unit will start by pushing the foot-control.

In manual mode (switch on Hand), the foot control is excluded and the rotating speed is adjusted by turning the potentiometer knob (SPEED). To switch to manual mode, it will be necessary to stop the micromotor and turn the knob down to the minimum; then press HAND, size the handpiece and turn the knob till the desired speed. Under this operating mode, the motor works till the potentiometer knob is set again to the lowest limit.

It may be requested, when carrying out specific working procedures, **to reverse rotation of the motor**: in idle mode, it will be sufficient to commute the change-over switch marked by arrows.



 ATTENTION	Ensure that the tools you work with are carefully and deep inserted in the plier. The shank should be well inside the plier, and should not come out of the handpiece too much, which could cause the tool to be unbalanced, tend to excessive vibrations and susceptible to become dangerous.
 ATTENTION	Avoid touching the rotating tips. Use glasses, masks and other protective devices to prevent small particles from getting into your eyes or from being inhaled.

5. SPECIFIC FEATURES AND SAFETY DEVICES

The electronic control system features an efficient torque compensation device which allows to use the micromotor with adequate power even at lower speed. This safety device automatically starts when the motor detects an excessive fatigue.

With the aim to protect the motor, its maximum absorption is electronically limited: when this limit is attained and kept for some seconds, the power supply blocks automatically and cuts off tension. (warning red OVERLOAD will switch on).

To restart the motor, turn it off and wait for the unit to cool down.

6. MAINTENANCE

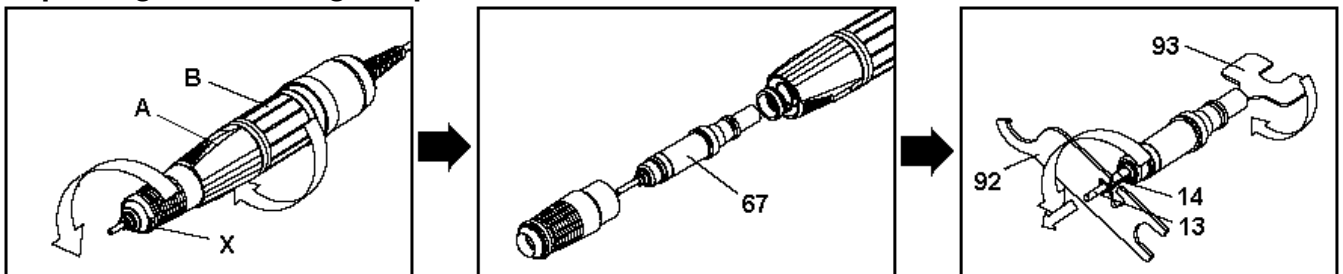
 <u>ATTENTION</u>	Before carrying out any maintenance operation inside the machine or any technical service to the connections, disconnect the electric cable from the socket; in such a way the machine will be completely insulated from the electric wiring system. If you still have any doubts, difficulties or any possibility of mistake, contact our Technical Service to avoid any risks or damages.
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Cleaning the pliers and the handpiece front part

We recommend to keep the front part of the handpiece always clean from dust particles. Unlock the plier opening nut and blow in compressed air. If necessary, uncover internal part as explained in next paragraph.

If necessary access to the internal part as explained in next paragraph.

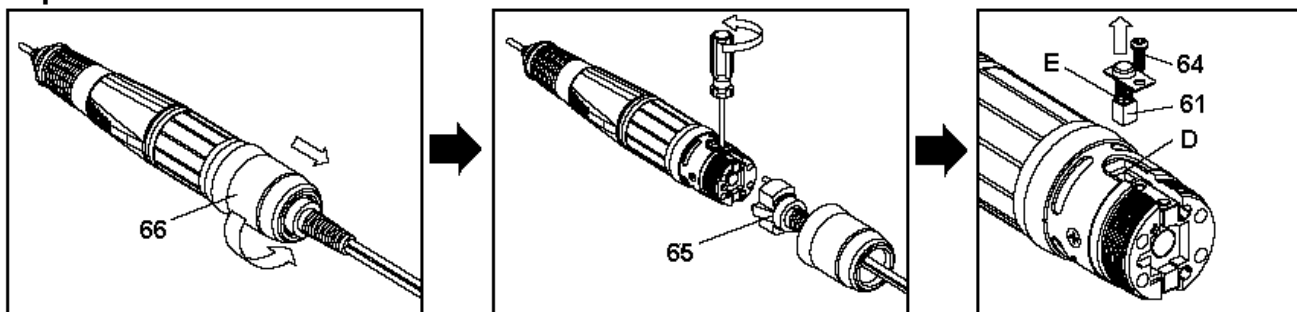
Replacing or removing the pliers



To remove or replace the pliers 14, follow the operating sequence and comply with the procedure by help of the above pictures (work with the sample test bur inserted - 13).

1. Unscrew the whole handpiece front part (X) and separate it from the motor unit B.
2. extract the transmission unit 67 paying utmost attention to the positioning of the components.
3. by means of key 93, hold the shaft in place and lock the pliers by means of the special key 92 supplied with the machine.
4. unscrew the worn out pliers 14, extract it, replace with a new one, screw tight
5. reassemble all components following the procedure in reverse sequence.

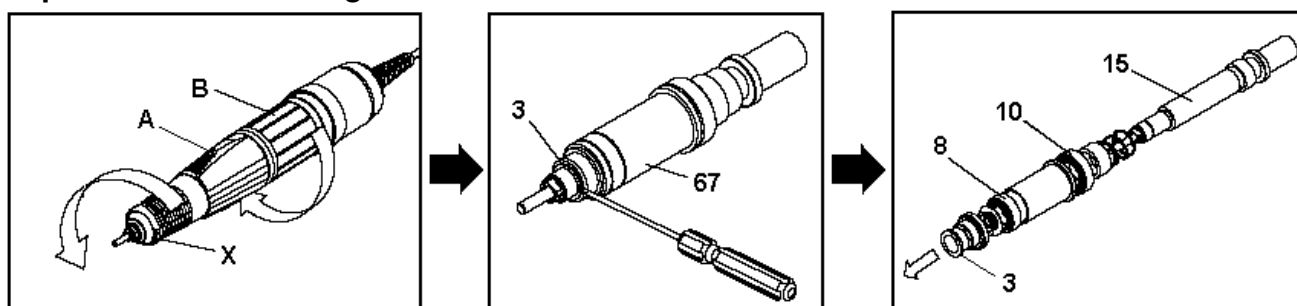
Replacement of carbon brushes



To replace carbon brushes (61), follow carefully the operating sequence and refer to the above pictures.

1. Unscrew the contact protection cap 66 and disconnect feeding cable 65
2. Unscrew the carbon brushes fixing screw 64 and remove them
3. Insert new carbon brushes in their seat (D) making sure that the spring (E) is deeply inserted. Re-assemble the components.
4. Turn on the motor in manual mode at about 20.000rpm, letting it turn free (no load) for about 30 minutes. Then restart normal working.

Replacement of bearings

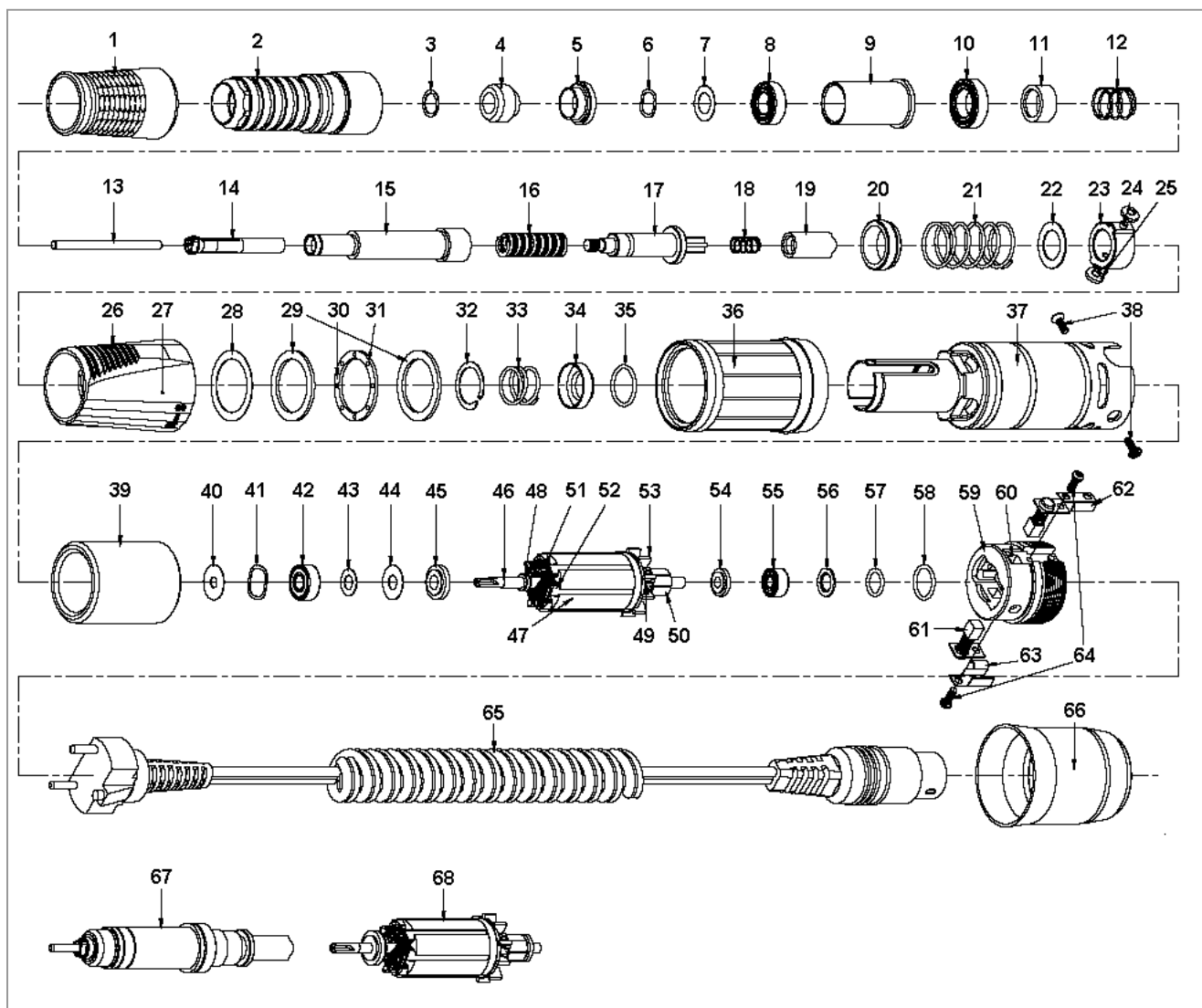


To replace bearings (8-10), follow carefully the operating sequence and refer to the above pictures.

1. Unscrew the whole front part (X) of the handpiece, and separate it from the motor unit B.
2. Extract the transmission unit 67 paying utmost attention to the positioning of the components.
3. Remove the front locking ring fixing the elements
4. Remove carefully every bearing, then reassemble them
5. Turn on the motor in manual mode at about 20.000rpm, letting it turn free for about 15-20 minutes. Then re-start working.

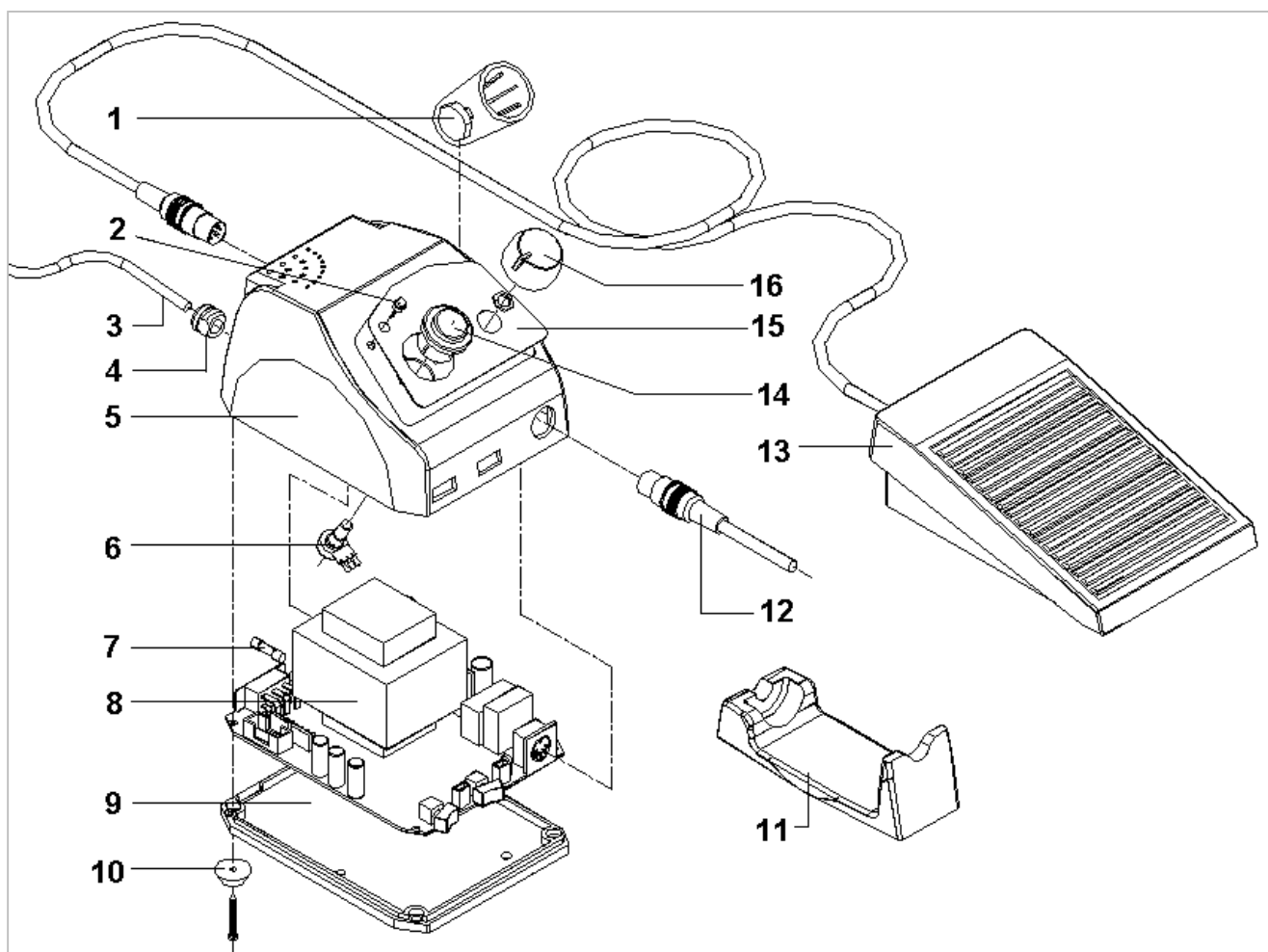
7. EXPLODED DRAWING AND SPARE-PART LIST HP45 Multitfunction (A5035P) Handpiece

NO.	CODE	DESCRIPTION
1	5035015	COVER ON REAR HOUSING
2	5035030	REAR HOUSING
3	5035031	STOP RING
4	5035032	COLLAR
5	5035033	SPACER ON BEARING
6	5035034	WAVE WASHER 1260
7	5035035	WASHER 1260
8	5035036	BEARING 1260ZZ
9	5035037	SPACER BUSH
10	5035038	BEARING 1480ZZ
11	5035039	SPRING SHEET
12	5035040	FRONT SPRING
13	5035041	TEST BUR
14	5035042	CHUCK PLIERS Ø2.35
15	5035043	PLIERS HOUSING
16	5035044	SPRING ON PLIERS
17	5035045	DRIVESHAFT
18	5035046	JOINT SPRING
19	5035047	JOINT
20	5035048	SPRING SHEET
21	5035049	JOINT SPRING
22	5035050	ANTIFRICTION WASHER
23	5035051	ROLLER BODY
24	5035052	ROLLER BODY PIN
25	5035053	ROLLER GUIDE
26	5035054	PLIERS RING NUT
27	5035055	CAM
28	5035056	TEFLON WASHER
29	5035057	SLIDE WASHER
30	5035058	BALL GUIDE
31	5035059	BALL
32	5035060	LOCKING RING
33	5035061	MOTOR CASE SPRING
34	5035062	MOTOR CASE SPRING SHEET
35	5035063	FIXING RING 1030
36	5035064	MOTOR CASE COVER
37	5035065	MOTOR CASE
38	5035066	MOTOR CASE SCREW
39	5035067	MAGNET
40	5035068	COPPER WASHER
41	5035069	WAVE WASHER 1030
42	5035070	BALL BEARING 1030ZZ
43	5035071	COPPER WASHER
44	5035072	TEFLON WASHER 1030
45	5035073	SPACER 1030
46	5035074	DRIVESHAFT
47	5035075	CORE
48	5035076	FRONT WASHER
49	5035077	REAR WASHER
50	5035078	SLIP RING
51	5035079	WINDING
52	5035080	INSULATION
53	5035081	FAN
54	5035082	SPACER 830
55	5035083	BEARING 830ZZ



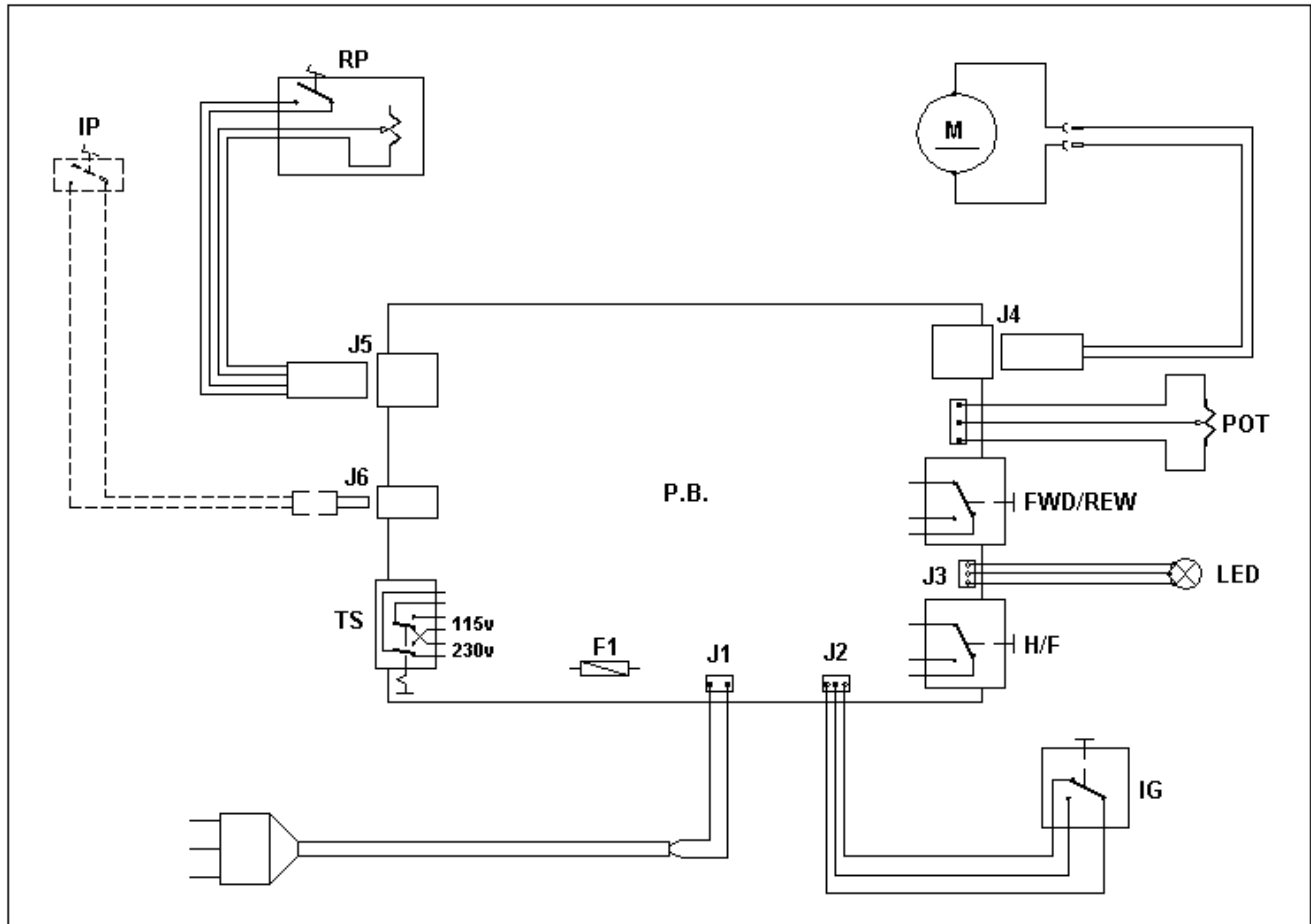
NO.	CODE	DESCRIPTON
56	5035084	WASHER ON REAR COVER
57	5035085	REAR OR RING
58	5035086	LOCKING RING 830
59	5035087	REAR COVER
60	5035088	CARBON BRUSH HOUSING
61	5035089	PAIR OF CARBON BRUSHES
62	5035090	LEFT TERMINAL
63	5035091	RIGHT TERMINAL
64	5035092	CARBON BRUSH FIXING SCREW
65	5035093	MOTOR CABLE
66	5035094	CONTACTS PROTECTION CAP
67	5035095	SPINDLE UNIT
68	5035096	ROTOR UNIT
-	A5035M	45.000rpm BRUSH HANDPIECE COMPLETE

8. EXPLODED DRAWING AND SPARE-PART LIST HP45 Multitfunction (A5035P) Control unit



No.	ITEM	DESCRIPTION
1	5030006	HANDPIECE SUPPORT (ON CONTROL UNIT)
2	5035P007	SIGNAL LAMP
3	5025039	FEEDING CABLE 2X0.75 WITH PLUG
4	NEA107	CABLE LOCKING RING
5	5035P004	UPPER SHELL
6	5035P005	POTENTIOMETER – SPEED REGULATION
7	NEA070	FUSE
8	5035P002	POWER BOARD
9	5035P003	LOWER SHELL
10	---	RUBBER FEET
11	5030010	RUBBER HANDPIECE SUPPORT
12	---	MOTOR CONNECTOR
13	5035026	VARIABLE SPEED FOOT CONTROL
14	5035P006	MAIN SWITCH
15	5035P001	MARK LABEL
16	5030008	POTENTIOMETER KNOB

9. WIRING DIAGRAM



POS.	DESCRIPTION
P.B.	Power board
TS	Voltage change-over switch
F1	Fuse
IG	Main switch
LED	Signal lamp
POT	Potentiometer - speed regulation
F/H	Switch - foot control / manual use
FWD/REW	Switch - direction of rotation
M	Brush motor
J4	Motor cable connector
IP	ON-OFF foot control
J6	Foot control cable connector
RP	Variable speed foot control
J5	Foot control cable connector (variable speed)

10. DEMOLITION AND WASTE DISPOSAL

According to International regulations, this unit has been classified as AEE (electric and electronic device, whose correct operation depends on electric currents and electromagnetic fields) and as a consequence, at the end of its lifetime, it can not be treated as normal waste material but it must be disposed separately, complying with the Directive 2002/96/EEC.



11. TECHNICAL REFERENCE REGULATIONS AND TEST PROCEDURES

Dentalfarm HP micromotors (30.000-45.000rpm) are mass-manufactured by Dentalfarm in compliance with technical and safety rules in force, as provided for by the 2006/42 EEC Community Directive on machinery.

Careful inspection and full testing is carried out singularly on each machine which is furtherly tested by an automatic test installation assuring compliance with the fixed limits is printed.

12. TECHNICAL SPECIFICATIONS

Description	
Control unit width	120 mm
Control unit depth	150 mm
Control unit height	95 mm
Net and gross weight	2,7 kg – 3,0 kg
Feeding tension	230 v AC – 50/60 Hz
Absorption	120 W
Motor type	DC collector motor
Motor tension	Low voltage (0-25v DC)
Rotating speed	1.000 – 45.000 rpm
Rotation	Reversible
Motor power	100W
Max torque	33 mNm
Handpiece size	Ø 29 mm (MAX) – length 155 mm
Chuck pliers	Ø 2.35 mm – (Ø 3.00 mm optional)

DENTALFARM s.r.l.

Via Susa, 9/a - 10138 TORINO - ITALY

 **TECHNICAL-COMMERCIAL SERVICE - (+39) 011/4346588**

 **AFTER-SALE SERVICE - 011/4346632**

 **FAX 011/ 4346366**

E-mail: info@dentalfarm.it - Website: www.dentalfarm.it