





**GRINDING & POLISHING** 

# FORCIPOL FORCIMAT











MODULAR CONFIGURATION

**GRINDING & POLISHING MACHINE** 



# **FORCIPOL 102/202 FORCIMAT 52/102**



The FORCIPOL Series grinding and polishing machines offer practical and economical solutions to your metallographic sample preparation needs...

The FORCIMAT Series automatic heads are designed to be used with FORCIPOL grinder / polishers. It is ideal for medium size laboratories where consistent results are desired.

#### **VERSATILE & DURABLE**

All materials testing laboratories in the industry, research or educational field have a demand for sample preparation. Whether your requirements call for individual components or basic sample preparation, FORCIPOL family of instruments will meet your needs. FORCIPOL Series of instruments are available as Single wheel [FORCIPOL 102] and Dual wheel [FORCIPOL 202] Units.

Both single and double wheel versions are suitable with Ø200, Ø250 and Ø300 mm wheels. The working wheel is powered by a high torque 1.0 HP electric motor with both clockwise and counterclockwise wheel rotation possibility. The state of the art frequency converter allows smooth speed variation (50-600 rpm) of the grinding wheel with soft start and soft stop. Both . This allows the setting of the optimum speed for each individual preparation process. It is perfect choice for laboratories preparing a wide range of different materials from very small to very large.

The stylish and functional housing is corrosion free and easy to clean. Molded wheel bowls and drains eliminate leaks and the build-up of residue is prevented by constant flushing of the bowl. The drive elements are fixed on heavy duty aluminium alloy casting. The wheels are mounted on ball bearings allowing the application of high pressures to prepare even large specimens. Ball bearings used provide quite and vibration free operation. Water inlet and flexible water outlets with control valves for wet grinding are standard features. FORCIPOL instruments can be used for grinding, lapping and polishing with magnetic backed discs and cloths or by quick and simple exchange of wheels.



FORCIPOL 102 with Control Unit

#### **ENVIRO Recirculating Filtering System**

Enviro Filter Unit is a closed loop recirculating filter system which is optionally available. It has a 20 lts. reservoir capacity with 1 micron filter entering the grinder / polisher intake. Enviro can also be coupled with line water and 80 micron filtering system for disposal.



Retractable water hose for easy cleaning



Splash Guard



Simple exchange of working discs



Enviro recirculating filtering unit (1 micron)



FORCIPOL 202 with Control Unit

#### **AUTOMATIC OPERATION**

When the number of specimens to be prepared increases, FORCIPOL instruments can be fitted with one of FORCIMAT automatic heads [FORCIMAT 52 or FORCIMAT 102] for automation. FORCIMAT automatic heads provide high rate sample preparation and frees the operator from the grinding and polishing procedures.

FORCIMAT series of Automatic Heads are available as two types: FORCIMAT 52 and FORCIMAT 102

# FORCIMAT 52 (Individual Force)

The FORCIMAT 52 Automatic Head is mounted on a rigid hardened post which is fixed to the base of the FORCIPOL grinder/polisher. It can be adapted to all FORCIPOL series grinder/polishers and is easily and rapidly positioned by means of a quick-locking clamping mechanism.

The sample holder can prepare 6 samples simultaneously and it is driven by a 100 Watt DC motor at 50–150 RPM. The pneumatically applied individual force is adjustable between 5 N (1.1 lb.) and 60 N (13.5 lb.) from the front panel and is displayed on a gauge. The housing is made of ABS with a touchpad front panel.

A choice of easily exchangeable sample holders with set of rings from 25 to 50 mm and 1" to 2" diameter are available for use on the FORCIMAT 52. The samples [1 to 6] are placed in the sample holder. Thanks to quick replacement mechanism, all individual force specimen holders can be removed and inserted on the equipment within seconds.

#### **MANUAL OPERATION**

FORCIPOL instruments are designed to modular configuration for manual, semi-automatic and programmable automatic equipment.

When only manual preparation is required, FORCIPOL Control Unit can be fitted on the FORCIPOL grinder / polisher. If automatic operation is required in the future, one of the FORCIMAT automatic heads can be installed at any time.

#### **FORCIPOL Control Unit**

The FORCIPOL Control Unit is ergonomically placed on the equipment. Modern touch pad controls with ergonomic turn knob allows fast and easy setting of parameters and increases productivity. Wheel speed, operation time, motor on/off and water on/off functions can be set in seconds. Cooling water is automatically activated and deactivated at the beginning and end of operation. The actual wheel speed and operation time are digitally displayed. All parameters can be changed during operation. The last parameter settings are always retained in the memory. An audible signal notifies the operator when the process is completed.

Automatic Disc Cleaning & Drying function can be activated with a single button to obtain perfectly cleaned disc surfaces in seconds. Smart Water Saving feature allows tons of water saving over the years.



FORCIPOL 102 with Forcimat 52

Modern touch pad controls with ergonomic turn knob allows fast and easy setting of parameters and increases productivity. Sample force, wheel speed, sample holder speed, operation time, motor on/off and water on/off functions can be set in seconds. When the start button is depressed, both the FORCIMAT 52 and FORCIPOL start operating simultaneously. Cooling water is automatically activated and deactivated at the beginning and end of operation. The actual wheel/head speed and operation time are digitally displayed. All parameters can be changed during operation. The last parameter settings are always retained in the memory. Upon completion of the cycle, both instrument stop and an audio signal notifies the operator.

Automatic Disc Cleaning & Drying function can be activated with a single button to obtain perfectly cleaned disc surfaces in seconds. Smart Water Saving feature allows tons of water saving over the years.

When needed, FORCIMAT 52 can work in manual mode to allow prepare specimens by hand.

#### FORCIMAT 102 (Individual Force + Central Force + Programmable)

FORCIMAT 102 Programmable Automatic Head is coloured HMI touch screen controlled and with the Base Unit, thus creating automatic preparation system. It is used to prepare high volumes of metallographic, ceramic and mineralogical specimens with consistent reproducible quality. The Automatic Head can apply both "Central" and /or "Individual" forces. It can accommodate single samples as well as multi - sample holders thus offering a perfect solution for all levels of sample throughput requirements. The Automatic Head is mounted to a hardened steel post which is affixed to the cast base of the FORCIPOL grinder/polisher. It can be adapted to all FORCIPOL series grinder/polishers and is easily and rapidly positioned by means of a quick-locking clamping mechanism.

The force on the specimen "individual" or "central" is pneumatically controlled by a pressure transducer. The system is enclosed in an ABS housing with touch screen LCD. The FORCIMAT 102 Automatic Head is rapidly positioned via a quick-locking clamping lever.

#### **Material Removal Measurement**

Optional encoder allows you to measure the amount of material removed from the surface. The desired grinding depth can be set to grind different type of samples and also for applications that need special accuracy.



FORCIMAT 102 Programmable Automatic Head



FORCIPOL 202 with FORCIMAT 102 & DOSIMAT 102

The "soft start and stop" feature automatically starts the sequence with a low inital force which is then increased to the preset. Towards the end of the cycle, the force is automatically reduced to 75 % of the setting to prevent scratching. A variety of sample holders for individual or central force applications are available for different sample sizes. Both individual and central force specimen holders can be removed and inserted easily with the help of quick release chuck. By holding the head button on the software, the specimen holder will rotate for easy insertion and removal of the specimens.

All preparation parameters can be stored in memory under a specific program number. Each program can be saved for a material specific name such as "Cast Iron, Bronze, Al-Si Alloy, etc." The parameters which can be saved are; Force, Cycle time, Wheel speed and direction, Mode of operation (individual or central presure). Dispensing frequency can also be saved when DOSIMAT peristaltic dispenser is available. These parameters are entered and stored in memory and displayed on the LCD screen as preset values. All the operator needs to do is to select the mode of operation (individual or central pressure), call up a specific program and press the "Start" key.

Upon completion of the cycle, an acoustic signal lets the operator know that the cycle is over and the samples are ready for the next step. When required, it is also possible to intervene in the program and change the parameters without stopping the instrument.

#### **Automatic Disc Cleaning & Drying**

Function can be activated with a single button to obtain perfectly cleaned disc surfaces in seconds. Smart Water Saving feature allows tons of water saving over the years.

When needed, FORCIMAT 102 can work in manual mode to allow prepare specimens by hand.

#### **DOSIMAT**

DOSIMAT Peristaltic Dispenser is an optional accessory for the FORCIMAT 52 and FORCIMAT 102 systems. It is an automatic fluid dispensing instrument used in combination to obtain consistent specimens and to save time and consumables. DOSIMAT can feed both diamond suspensions / lubricants and aluminium oxide suspensions.

Automatic dosing of consumables is applied precisely for perfect sample surfaces. Efficiency is further increased with high quality peristaltic pumps that guarantee exactly the same dosing every time for automation and control of consumable consumption. The liquid is dosed exactly to where the operator wants it on the polishing cloth. No vaporization or spray mist occurs.

It is possible to clean all the tubes with a single button at the end of preparation steps to eliminate the risk of clogged tubes.

Three different DOSIMAT Peristaltic Fluid Dispensers are available for FORCIMAT 52 and FORCIMAT 102:

#### DOSIMAT 12 (With 1 Peristaltic Pump)

DOSIMAT 12 has one peristaltic and non-misting pump for diamond suspensions, alumina suspensions, lubricant or 2 in 1 suspensions and can be matched with Forcimat 52 and Forcimat 102 Automatic Heads.

Modern touch pad controls with ergonomic turn knob allows fast and easy setting of dispensing parameters like; frequency, dosing time, etc. parameters and increases productivity. The last parameter settings are always retained in the memory.

#### DOSIMAT 52 (With 6 Peristaltic Pump)

DOSIMAT 52 has 5 peristaltic pumps for diamond suspensions / lubricant and 1 pump for aluminium oxide suspension or 2 in 1 suspensions and can be matched with Forcimat 52 Automatic Head.

Modern touch pad controls with ergonomic turn knob allows fast and easy setting of dispensing parameters like; frequency, dosing time, etc. parameters and increases productivity. The last parameter settings are always retained in the memory.

#### DOSIMAT 102 (With 6 Peristaltic Pump)

DOSIMAT 102 has 5 peristaltic pumps for diamond suspensions / lubricant and 1 pump for aluminium oxide suspension or 2 in 1 suspensions and can be matched with Forcimat 102 Automatic Head.

Dispensing parameters like; frequency, dosing time, fluid selection etc. are controlled through the LCD screen of the FORCIMAT 102 Automatic Head and can be stored in memory.



Dosimat 12/52/102

#### MOST VERSATILE MODULAR CONFIGURATION POSSIBILITY!

Possible to make manual, semi-automatic or programmable automatic configuration possibility for both single and dual wheel grinder / polisher. Optional dosing units with 1 or 6 bottles for both automatic heads for maximum automation. The Forcipol Series can be upgraded afterwards with a Forcimat Automatic Head and Dosimat Dosing Units.

#### **BASE UNITS**

**Single Wheel:** FORCIPOL 102 (Ø200/250/300 mm) **Dual Wheel:** FORCIPOL 202 (Ø200/250/300 mm)

#### **HEAD UNITS**

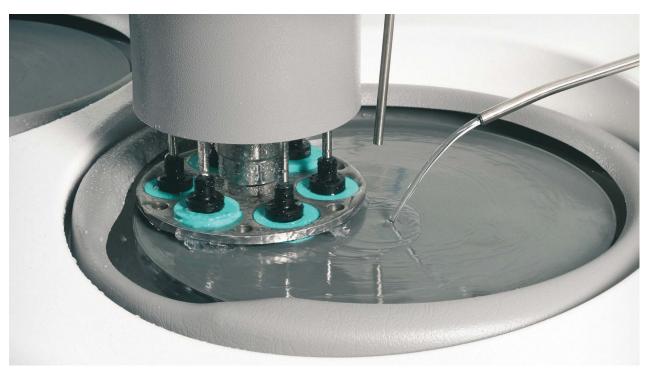
**FORCIPOL Control Unit:** For Manual Operation **FORCIMAT 52:** For Semi Automatic Individual Force Operation

**FORCIMAT 102:** For Programmable Automatic Individual and Central Force Operation

#### **DOSING UNITS**

**DOSIMAT 12:** With 1 for FORCIMAT 52/102 **DOSIMAT 52:** With 6 for FORCIMAT 52 **DOSIMAT 102:** Programmable with 6 Peristaltic Pump for FORCIMAT 102





Automatic Water Flow

| ORDER NO                 | 36 21<br>200/250/300     | 36 22<br>200/250/300     |
|--------------------------|--------------------------|--------------------------|
| MODEL NO                 | FORCIPOL 102             | FORCIPOL 202             |
| Number of Wheels         | 1                        | 2                        |
| Wheel Diameter           | Ø200/250/300 mm          | Ø200/250/300 mm          |
| Base Motor Power         | 1 HP                     | 1 HP                     |
| Wheel Speed              | 50-600 RPM               | 50-600 RPM               |
| Wheel Rotation Direction | CW/CCW                   | CW/CCW                   |
| Dimensions, WxDxH, (cm)  | 45 x 74 x 34             | 87 x 74 x 34             |
| Weight, kgs              | 40                       | 45                       |
| Mains                    | 230 V, 50/60 Hz, 1-Phase | 230 V, 50/60 Hz, 1-Phase |

| ORDER NO                             | 30 11  | 30 12                              | 30 14                                      |  |
|--------------------------------------|--|------------------------------------|--|--|
| MODEL NO                             | FORCIPOL Control Unit  | FORCIMAT 52                        | FORCIMAT 102                               |  |
| Operation                            | Mənuəl   | Semi Automatic                     | Programmable Automatic                     |  |
| Application of Force                 | -  | Individual                         | Individual + Central                       |  |
| Control Panel                        | Touch Pad Controls   | Touch Pad Controls                 | 7" HMI Touch Screen                        |  |
| Program Memory                       | Last Parameters Retained in Memory                                     | Last Parameters Retained in Memory | 30 Programs                                |  |
| Manual Operation Mode                | Yes  | Yes                                | Yes  |  |
| Head Motor Power                     | -  | 100 W                              | 100 W                                      |  |
| Sample Holder Rotation Direction     | -  | CW                                 | CW   |  |
| Sample Holder Speed                  | -  | 50-150 RPM                         | 50-150 RPM                                 |  |
| Individual Force                     | -  | 5-60 N                             | 5-60 N                                     |  |
| Central Force                        | -  | -                                  | 30-500 N                                   |  |
| Grinding Depth Measurement           | -  | -                                  | Optional                                   |  |
| Grinding Depth Measurement Accurracy | -  | -                                  | 10 µm                                      |  |
| Disc Cleaning & Drying Feature       | Yes  | Yes                                | Yes  |  |
| Smart Water Saving Feature           | Yes  | Yes                                | Yes  |  |
| Compatible Instruments               | FORCIPOL 102/202   | FORCIPOL 102/202                   | FORCIPOL 102/202                           |  |
| Compressed Air Requirement           | - 6 Bars   |                                    | 6 Bars                                     |  |
| Dimensions, WxDxH, [cm]              | 20 x 20x 39 mensions, WxDxH, (cm) (above FORCIPOL working disc) (above |                                    | 26 x 46 x 54 (above FORCIPOL working disc) |  |
| Weight, kgs                          | 5  | 16                                 | 16   |  |

| ORDER NO                  | 40 06                              | 40 07                              | 40 08  |  |
|---------------------------|------------------------------------|------------------------------------|--|--|
| MODEL NO                  | DOSIMAT 12                         | DOSIMAT 52                         | DOSIMAT 102                                  |  |
| Number of Pumps (Bottles) | 1 6                                |                                    | 6  |  |
| Control Panel             | Touch Pad Controls                 | Touch Pad Controls                 | Controllable from LCD Screen of FORCIMAT 102 |  |
| Program Memory            | Last Parameters Retained in Memory | Last Parameters Retained in Memory | 30 Programs                                  |  |
| Retract Function          | Yes                                | Yes                                | Yes  |  |
| Pre-Dosing Function       | No                                 | No                                 | Yes  |  |
| Compatible Instruments    | FORCIMAT 52/102                    | FORCIMAT 52                        | FORCIMAT 102                                 |  |
| Dimensions, WxDxH, (cm)   | 14 x 21x 16                        | 20 x 74 x 30                       | 20 x 74 x 30                                 |  |
| Weight, kgs               | 5                                  | 15                                 | 15   |  |

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#### 36 21-200 — FORCIPOL 102

Grinding and Polishing Machine
Single wheel, suitable for 200, 250 and 300 mm wheel size,
0.75 kW motor with overload protection, variable speed between
50-600 rpm, clockwise or counterclockwise rotation, soft start
and stop function, vibration-free and robust construction,
ergonomic design, quite operation, standard interface for all
head units (FORCIPOL Control Unit and FORCIMAT 52/102/TS),
retractable water hose, including water supply and drain tubes.
[One of the Head Units is required to operate the equipment] 230
V, 1-phase, 50/60 Hz.

#### Includes a standard set of grinding & polishing consumables;

- An assortment of 100 grinding papers (various grits), 200 mm dia.
- An assortment of 5 polishing cloths with 200 mm dia.
- Diamond suspensions, one of each of 6 mic. and 1 mic., plus lubricant

#### **36 21-250** — **FORCIPOL 102**

As above, but consumables kit for 250 mm dia. application.

#### 36 21-300 — FORCIPOL 102

As above, but consumables kit for 300 mm dia. application.

#### 36 22-200 — FORCIPOL 202

Grinding and Polishing Machine Double wheel, suitable for 200, 250 and 300 mm wheel size, 0.75 kW motor with overload protection, variable speed between 50-600 rpm, clockwise or counterclockwise rotation, soft start and stop function, vibration-free and robust construction, ergonomic design, quite operation, standard interface for all head units (FORCIPOL Control Unit and FORCIMAT 52/102/TS), retractable water hose, including water supply and drain tubes. (One of the Head Units is required to operate the equipment) 230 V, 1-phase, 50/60 Hz. Includes working kit "250 mm Aluminum wheel and splash guard",

#### Includes a standard set of grinding & polishing consumables;

- An assortment of 100 grinding papers(various grits), 200 mm dia.
- An assortment of 5 polishing cloths with 200 mm dia.
- Diamond suspensions, one of each of 6 mic. and 1 mic., plus lubricant

#### 36 22-250 — FORCIPOL 202

As above, but consumables kit for 250 mm dia. application.

#### 36 22-300 — FORCIPOL 202

As above, but consumables kit for 300 mm dia. application.

#### 30 11 — FORCIPOL Control Unit

For controlling of disc speed, operation time, water on/off and start/stop operation of FORCIPOL 102/202/TS. With touch pad front panel controls and digital display, with ergonomic turn knob for fast and easy setting of parameters, last parameter settings retained in the memory, automatic disc cleaning & drying function with single button, Smart Water Saving feature.

Communication capability with FORCIPOL 102/202/TS machines. Complete and ready for operation.

#### 30 12 — FORCIMAT 52

#### (Individual Force)

Automatic Specimen Mover Microprocessor controlled, pneumatically adjustable individual force loading system, up to 6 specimens, quick specimen holder replacement system, 100 Watt DC motor, variable rotational speed between 50–150 rpm, with robust steel mounting column, front panel with touch-pad controls and digital display, with ergonomic turn knob for fast and easy setting of parameters, last parameter settings retained in the memory, automatic disc cleaning & drying function with single button, Smart Water Saving feature, audible warning signal. Communication capability with FORCIPOL 102 and FORCIPOL 202 machines. With air supply tubes, complete and ready for operation.

#### 30 14 — FORCIMAT 102

#### (Individual Force + Central Force + Programmable)

Programmable Automatic Specimen Mover Programmable with colored 7" HMI touch screen control, pneumatically adjustable central and/or individual force loading system, quick replacement system for both central and individual specimen holders, 100 Watt DC motor, variable rotational speed between 50–150 rpm, with robust steel mounting column, audible warning signal, automatic disc cleaning & drying function with single button, Communication capability with FORCIPOL 102 and FORCIPOL 202 machines. With air supply tubes, complete and ready for operation.

# 40 06 — DOSIMAT 12 Peristaltic Fluid Dispenser [with 1 bottle for FORCIMAT 52/102/TS]

Microprocessor controlled, with peristaltic and non-misting pump for diamond suspensions, alumina suspensions, lubricant or 2 in 1 suspensions, front panel with touch-pad controls and digital display, with ergonomic turn knob for fast and easy setting of parameters, programmable dosing time and dosing period, purge and retract function, last parameter settings retained in the memory, with interface to be connected to all FORCIMAT 52/102/TS Automatic Heads. Complete and ready for operation.

# 40 07 — DOSIMAT 52 Peristaltic Fluid Dispenser (with 6 bottles for FORCIMAT 52)

Microprocessor controlled, with 6 peristaltic and non-misting pumps (5 for diamond suspensions/lubricant and 1 for alumina suspensions), front panel with touch-pad controls and digital display, with ergonomic turn knob for fast and easy setting of parameters, programmable dosing time and dosing period, purge and retract function, last parameter settings retained in the memory, with interface to be connected to FORCIMAT-TS automatic Heads, complete and ready for operation.

### 40 08 — DOSIMAT 102 Programmable Peristaltic Fluid Dispenser (with 6 bottles for FORCIMAT 102)

Programmable and controllable from touch screen of FORCIMAT 102, with pre-dosing function, with 6 peristaltic and non-misting pumps (5 for diamond suspensions/lubricant and 1 for alumina suspensions), with interface to be connected to FORCIMAT 102 Automatic Head, complete and ready for operation.

|                |   | Operational Accessories for FORCIPOL Grinder/Polishers:  |             | Specimen Holders for Central Force Application<br>(for FORCIMAT 102, ACCURA 102, VELOX 402)                          |
|----------------|---|--|-------------|--|
|                |   | 200 mm application   | 46 81 -     | Clamp type specimen holder, Ø130 mm,   |
| 31 01          |   | PVC wheel, 200 mm  | 46.00       | 6 specimens with Ø25 mm.   |
| 31 02<br>31 55 |   | Aluminum wheel, 200 mm<br>Splash guard, 200 mm   | 46 82 -     | <ul> <li>Clamp type specimen holder, Ø130 mm,</li> <li>6 specimens with Ø30 mm.</li> </ul>                           |
| 31 04          |   | Paper ring, 200 mm   | 46 83 -     | Clamp type specimen holder, Ø130 mm,   |
| 31 05          | _ | Cover  |             | 4 specimens with Ø40 mm.   |
| 31 13          | _ | Special Plexiglas Protection Unit, to be used with FORCIPOL  | 46 84 -     | Clamp type specimen holder, Ø130 mm, Consideration with Ø1".   |
|                |   | 102/TS (To be ordered simultaneously together with the machine order)  | 46 85 -     | 6 specimens with Ø1"  — Clamp type specimen holder, Ø130 mm,   |
|                |   | ,  |             | 6 specimens with Ø1 1/4"   |
| 75.05          |   | 250 mm application   | 46 86 -     | Clamp type specimen holder, Ø130 mm,   |
| 31 21<br>31 42 |   | PVC wheel, 250 mm<br>Aluminum wheel, 250 mm  |             | 4 specimens with Ø1 1/2"   |
| 31 65          |   | Splash guard, 250 mm   | 46 88 -     | — Teardrop specimen holder, Ø130 mm,   |
| 31 24          | _ | Paper ring, 250 mm   |             | 6 specimens with 10 - 32 mm.   |
| 31 05          | _ | Coverial Playings Protection Unit to be used with FORCIPOL   | 46 89 -     | Teardrop specimen holder, Ø130 mm,  A specimen with 10   |
| 31 13          |   | Special Plexiglas Protection Unit, to be used with FORCIPOL 102/TS (To be ordered simultaneously together with the machine |             | 4 specimens with 10 - 42 mm.   |
|                |   | order)   | 46 44 -     | <ul> <li>Clamp type specimen holder, Ø 130 mm,</li> </ul>  |
|                |   |  |             | 4 rectangular specimens with 25 X 32 mm.   |
| 31 31          |   | <b>300 mm application</b> PVC wheel, 300 mm  | 46 45 -     | <ul> <li>Clamp type specimen holder, Ø 160 mm,</li> <li>3 rectangular specimens with 40 x 70 mm.</li> </ul>          |
| 31 52          |   | Aluminum wheel, 300 mm   |             | 5 reciongolor specimens with 40 x 10 mm.   |
| 31 75          | _ | Splash guard, 300 mm   | 46 91 -     | <ul> <li>Clamp type specimen holder, Ø160 mm,</li> </ul>   |
| 3134           |   | Paper ring, 300 mm   | 46.00       | 10 specimens with Ø25 mm.  |
| 31 05<br>31 13 |   | Cover Special Plexiglas Protection Unit, to be used with FORCIPOL  | 46 92 -     | <ul> <li>Clamp type specimen holder, Ø160 mm,<br/>8 specimens with Ø30 mm.</li> </ul>                                |
| 31 13          |   | 102/TS (To be ordered simultaneously together with the machine   | 46 93 -     | Clamp type specimen holder, Ø160 mm,   |
|                |   | order)   |             | 6 specimens with Ø40 mm.   |
|                |   | Accessories for FORCIMAT 52/102 Automatic Heads  | 46 94 –     | <ul> <li>Clamp type specimen holder, Ø160 mm,</li> <li>4 specimens with Ø50 mm.</li> </ul>                           |
| GR 0872        |   | Z-axis material removal with depth control, for FORCIMAT 102   | 46 95 -     | Clamp type specimen holder, Ø160 mm,   |
|                |   | (To be ordered simultaneously together with the machine order)   |             | 10 specimens with Ø1"  |
| GR 0440        | _ | Air filtering and lubricating unit   | 46 96 -     | Clamp type specimen holder, Ø160 mm,     Scassimens with Ø11/4"  |
|                |   | Specimen Holders for Individual Force Application  | 46 97 -     | 8 specimens with Ø1 1/4"  — Clamp type specimen holder, Ø160 mm,   |
|                |   | (for FORCIMAT 52/102/TS, ACCURA 102, VELOX 402)  | 40 31       | 6 specimens with Ø1 1/2"   |
| 33 31          | _ | Individual force specimen holder, Ø145mm,  | 46 98 -     | Clamp type specimen holder, Ø160 mm,   |
| 33 32          |   | for 6 x Ø25 mm specimens.<br>Individual force specimen holder, Ø145mm,   | 46 39 -     | 4 specimens with Ø2"  — Clamp type specimen holder, Ø220 mm,   |
| 33 3L          |   | for 6 x Ø30 mm specimens.  | 40 33       | 3 specimens for irregular shaped samples   |
| 33 33          | _ | Individual force specimen holder, Ø145mm,  |             |  |
| 33 34          |   | for 6 x Ø40 mm specimens.<br>Individual force specimen holder, Ø145mm,   |             | (Specimen holders with Ø160mm can only be used with 300 mm wheels)   |
| 33 34          |   | for 3 x Ø50 mm specimens.  |             | min wheels   |
| 33 35          | _ | Individual force specimen holder, Ø145mm,  |             | Accessories for Specimen Loading   |
| 33 36          |   | for 6 x Ø1" specimens.   | 45 60 -     | LEVOMAT  Seesing a Leading Fixture to level the seesing as within the  |
| 33 30          |   | Individual force specimen holder, Ø145mm, for 6 x Ø1 1/4" specimens.   |             | Specimen Loading Fixture, to level the specimens within the central force specimen holders, without specimen loading |
| 33 37          | _ | Individual force specimen holder, Ø145mm,  |             | plate.   |
| 77.70          |   | for 6 x Ø11/2" specimens.  |             |  |
| 33 38          |   | Individual force specimen holder, Ø145mm, for 3 x Ø2" specimens.   | 45 10 -     | Specimen Loading Plates  — Specimen Loading Plate Ø130 mm  |
| 33 39          | _ | Individual force specimen holder, Ø145mm, Blank.   | 45 50 -     | Specimen Loading Plate Ø160 mm   |
| 77.00          |   |  |             |  |
| 33 02<br>33 03 |   | Set of insert rings for Ø30 mm (to be used with 33 33) Set of insert rings for Ø25 mm or Ø1" (to be used with 33 33)       |             | ENVIRO Recirculating Filtering System for FORCIPOL's and ACCURA  |
| 33 03<br>33 04 |   | Set of insert rings for Ø1.1/4" (to be used with 33.33)  | GR 0865 -   | ENVIRO Recirculating Filtering System,   |
| 33 05          |   | Set of insert rings for Ø1 1/2" (to be used with 33 33)  |             | Closed loop 1 micron filtering system with 20 lt. recirculating  |
|                |   |  |             | water tank, suitable to operate with line water on 80 micron   |
|                |   |  |             | filter as well. Requires 4 bar compressed air.<br>Ready for operation with all Metkon Grinder/Polishers              |
|                |   |  |             |  |
|                |   |  | YM 6214-00- | Filter, 10 inches 1 Micron   |
|                |   |  |             |  |

<sup>\*</sup> Other voltages and frequencies available upon request. Please state when ordering. All specifications are subject to change without notice.