



| MSA | Voltage | Size mm | Kg |
|--------|------------------|----------------|-------|
| 19.108 | Dual 110 V/220 V | 155 x 172 x 55 | 1.235 |

HOROTEC® FLASHTEST, multifunction tester for analogue quartz watches and movements. Possible to update the software and calibration thanks to the set MSA 19.108-S (sold separately).

Functions :

- battery tension
- battery tension under load
- coil impulse (sound signal)
- power supply for movements 1,5 and 3 V
- coil resistance
- circuit consumption
- fast gear train rotation
- watch accuracy (forward/delay s/m).

Display : LCD light screen 29 x 23 mm, numerals height 15 mm.

Measurement capacity : 0-19.999 V, μ A or k Ω .

Precision : 1/100 of V, μ A or k Ω .

Delivered with 2 probes , adaptor 110/220 V, 9 V battery, multi-lingual manual instructions with chart for electric controls (movements consumption under load et coils continuity).

Accessorie :

| MSA | Item |
|----------|--|
| 19.108-S | Calibration kit (1) and USB Flashtest update (2) |

Replacement parts :

| MSA | Items |
|----------|----------------|
| 19.108-A | Pair of probes |



| MSA | Voltage | Size mm | Kg |
|--------|------------------|---------------|-------|
| 19.110 | Dual 110 V/220 V | 90 x 150 x 30 | 0.785 |

Apparatus for releasing train wheels and testing electronic function of quartz watches.

Delivered with 110/220 V adapter (works also with 9V battery, not included) and instructions.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.106 | 60 x 105 x 28 | 0.225 |

HOROTEC® PULSE tester for testing the electronic functions (coils and circuits) of the analogue quartz watches. Delivered with 9 V battery and use instructions.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.107 | 60 x 105 x 28 | 0.235 |

HOROTEC® TURBO, tester for releasing gear train of analogue quartz watches.

Delivered with 9 V battery and use instructions.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.000 | 100 x 70 x 40 | 0.115 |

Universal battery tester suitable for any type of batteries from 1.5 to 22.5 V : 1.5 V type AA, AAA button, lithium 3 V, Photo 6 V, 9 V...

Delivered with use instructions.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.100 | 80 x 160 x 40 | 0.475 |

Multifunction watch tester. It measures battery voltage, resistances and current consumption.

Delivered with batteries and instructions.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.105 | 85 x 150 x 55 | 0.250 |

Battery, coil and electronic function tester for analogical quartz watches.

Delivered with 9V battery and instructions.



| MSA | Version | Voltage |
|--------|-------------|------------------|
| 19.128 | COMPACT 900 | Dual 110 V/220 V |

The GREINER® COMPACT 900 is an universal watch timing instrument for testing all types of mechanical and quartz watches. The device is equipped with :

- automatic detection for the beat number (A / h)
- 1 colour LCD screen 320 x 240 pixels, 256 colours
- 2 test probes
- 2 checking lights
- 1 interface for printer and computer
- 1 integrated speaker for beat noise control
- adjustable feet.

The following values are measured and indicated :

For mechanical watches : beat number (automatic), beat error, time deviation, amplitude, escapement noise (graphic). Special program for the quick check of pendulum clocks and special program for special escapements.

For Quartz watches : Time deviation (with/without Inhibition), no load consumption, average consumption, impulse consumption, resistance of motor coil, battery voltage (High Drain/Low Drain), lower working-voltage limit and EOL.

Additional functions : Calibration of the device with a calibration signal. Device for calibration with GPS available. Standby mode while the machine is not used. Software for long-time-measurement available.



| MSA | Size mm | Kg |
|-----------|----------------|-------|
| 19.125-MP | 110 x 120 x 85 | 0.840 |

GREINER® MP86M microphone for VIBROGRAF B800, directional in all positions (**mechanical watches only**).



| MSA | Size mm | Kg |
|-----------|----------------|-------|
| 19.125-QM | 105 x 80 x 100 | 0.530 |

GREINER® QM06 microphone for VIBROGRAF B800 (**mechanical and quartz watches**). Works in horizontal position.



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|-------|
| 19.129 | 220 V | 260 x 170 x 110 | 1.000 |

Thermal printer GREINER® MARTEL 7810 for all GREINER® testers.

Replacement thermo paper :

| MSA | Width mm | ø mm |
|----------|----------|------|
| 19.167-B | 57 | 60 |



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|-------|
| 19.126 | 220 V | 170 x 120 x 100 | 0.720 |

GREINER® THERMOPRINT II for all GREINER® apparatus.

Replacement thermo paper :

| MSA | Width mm | ø mm |
|----------|----------|------|
| 19.126-P | 60 | 63 |



| MSA | Versions | Voltage | Kg |
|-------------|--|---------|-------|
| 19.138-A | VIBROGRAF B600 (Pict.) without microphone | 220 V | 4.500 |
| 19.138-A110 | VIBROGRAF B600 without microphone | 110 V | " |
| 19.138 | VIBROGRAF B600 with microphone MSA 19.138-M | 220 V | 5.400 |
| 19.138-110 | VIBROGRAF B600 with microphone MSA 19.138-M | 110 V | " |
| 19.139 | VIBROGRAF B600 with microphone MSA 19.139-MQ | 220 V | 5.500 |
| 19.139-110 | VIBROGRAF B600 with microphone MSA 19.139-MQ | 110 V | " |

GREINER® VIBROGRAF B600 timing apparatus for **mechanical, quartz and tuning fork watches**. Automatic selection of standard beats. It displays time deviation, amplitude and beat errors. Possible printer connection.

Case dimension : 430 x 330 x 210 mm.



| MSA | Size mm | Kg |
|----------|----------------|-------|
| 19.138-M | 110 x 120 x 85 | 0.840 |

GREINER® MP86M microphone for VIBROGRAF B600, directional in all positions (**mechanical watches only**).



| MSA | Size mm | Kg |
|-----------|----------------|-------|
| 19.139-MQ | 190 x 90 x 130 | 1.100 |

GREINER® QM4 microphone for VIBROGRAF B600 (**mechanical, quartz and tuning fork watches**).



| MSA | Voltage | Size mm | Kg |
|----------|---------|----------------|-------|
| 19.125-P | 220 V | 180 x 105 x 85 | 1.230 |

Printer CBM910 with plain paper for all GREINER® apparatus.

Replacement parts

| MSA | Items |
|-----------|------------------------------------|
| 19.125-PC | Connection cable 1.8 m |
| 19.125-PP | Roll of paper width 57 mm, ø 65 mm |
| 19.125-PR | Ink ribbon |



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|-------|
| 19.127 | 220 V | 170 x 110 x 100 | 1.400 |

CITIZEN CT-S280 thermo printer for all GREINER® apparatus.

Replacement thermo paper :

| MSA | Width mm | ø mm |
|----------|----------|------|
| 19.127-P | 57 | 63 |

Spare parts for GREINER® testers :

| MSA | Items |
|----------|-------------------------------------|
| 19.140-B | Paper roll ø 30 mm for B200 |
| 19.140-C | Paper roll ø 36 mm for B200/300/500 |
| 19.140-D | Ribbon carbon for B200 |
| 19.140-E | Paper ZACMONO 36 mm |



| MSA | Voltage | Size mm | Kg |
|------------|---------|----------------|-------|
| 19.180 | 220 V | 135 x 60 x 140 | 0.460 |
| 19.180-110 | 110 V | " | " |

WITSCHI® CYCLONIC tester for analogue quartz watches. This apparatus generates a rotating magnetic field with adjustable intensity and rotational speed in the vicinity of the watch support. When an analogue quartz watch movement is placed within this rotating field, the stepping motor rotor is also excited into rotation. This enables the gear train to be driven at high speed without having to physically intervene in the watch mechanism itself. By fast gear train rotation, the old solid and dirty oils move out from the wheels.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.158 | 220V | 260 x 130 x 150 | 1.500 |
| 19.158-110 | 110V | " | " |

WITSCHI® NEW TECH HANDY II tester for **quartz watches**. Measurement possibilities : Rate accuracy, consumption, coil resistance, isolation and battery voltage. For repair service, the watchmaker needs a test instrument with a simple way to perform all electrical measurements and tests on quartz watches. The instrument provides all measuring and test facilities required in a professional search for defects in quartz watches. Operation is very easy, due to largely automated measurement functions, the functional layout of operating elements and the highly readable results and parameters on an illuminated display. Optional printer : see page 19 13.

Replacement parts :

| MSA | Items |
|----------|--------------------------------------|
| 19.158-A | Measuring cables (X 2) with 2 probes |
| 19.160-B | Mobile probes (X 2) |

Available accessories, see chart page 19 13.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.152 | 220V | 290 x 170 x 180 | 2.800 |
| 19.152-110 | 110V | " | " |

WITSCHI® ANALYZER Q1 tester for **quartz watches**. This apparatus is the perfect test instrument to be used quickly and efficiently in the repair service, but also for analysis in the sales department and the watch-testing laboratory. New technologies provide extended test and measurement facilities, allowing a professional troubleshooting of quartz watches. Measuring cycles are largely automated. The combined rotating/push button provides a simple and quick parameter setting. The ergonomic and functional layout of the operating elements and the large LCD display are user-friendly. Optional printer : see page 19 9.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.153 | 220V | 290 x 170 x 180 | 3.800 |
| 19.153-110 | 110V | " | " |

Fast and efficient tester WITSCHI® ANALYZER TWIN for **quartz and mechanical watches**. Large measurement possibilities (new : generator and impulse analysis) and controls allowing fast and professional troubleshooting of quartz and mechanical watches. The measurement process is widely made automatically for a fast and efficient operation. Additional measurement modes provide a way to measure watches with special escapements. The instrument, based on the "all-in-one" concept, only requires a very small work area. Colour display TFT 1/4. Large VGA.

Available accessories, see chart page 19 13.

WITSCHI® testers for quartz and mechanical watches :

| Comments | CYCLONIC MSA 19.180 | NEW TECH HANDY II MSA 19.158 | ANALYZER Q1 MSA 19.152 | ANALYZER TWIN MSA 19.153 |
|--|------------------------|---------------------------------|---------------------------|-----------------------------|
| Mechanical watches tests | | | | ✓ |
| Rate measurement | | ✓ | ✓ | ✓ |
| Measurement of current consumption | | ✓ | ✓ | ✓ |
| Module supply with variable voltage | | ✓ | ✓ | ✓ |
| Motor coil and isolation test | | ✓ | ✓ | ✓ |
| Watch battery test | ✓ | ✓ | ✓ | ✓ |
| Display of the chopping rate of motor pulses | | | ✓ | ✓ |
| Display of the motor pulse by LED | ✓ | ✓ | ✓ | ✓ |
| Inductive (magnetic) signal sensor | | ✓ | ✓ | ✓ |
| Acoustic signal sensor | | ✓ | ✓ | ✓ |
| Capacitive signal sensor | | ✓ | ✓ | ✓ |
| Digital LCD display | | ✓ | | ✓ |
| Graphic LCD display | | | ✓ | ✓ |
| Release of blocked gear trains by fast rotation | ✓ | | | |
| Demagnetization of mechanical watches and tools | | | | |
| GPS Interface for check/adjustment or synchronisation of the time base | | | ✓ | ✓ |
| RS 232 interfaces | | ✓ | ✓ | ✓ |
| Long time analysis | | | ✓ | ✓ |
| Result printout | | ✓ | ✓ | ✓ |
| Saving of the measuring results | | Optional software | Optional software | |
| Accessories | MSA 19.180 | MSA 19.158 | MSA 19.152 | MSA 19.153 |
| Thermo printer MSA 19.169 (see page 19 13) | | ✓ | ✓ | ✓ |



| MSA | Versions | Voltage | Casing size mm | Kg |
|------------|--------------------|---------|----------------|-------|
| 19.155 | With micro (Pict.) | 220 V | 225 x 200 x 87 | 3.400 |
| 19.156 | Without micro | " | " | 2.800 |
| 19.155-110 | With micro (Pict.) | 110 V | " | 3.400 |
| 19.156-110 | Without micro | " | " | 2.800 |

WITSCHI® CHRONOSCOPE S1 tester **for mechanical, quartz and tuning fork watches**. This apparatus is the instrument of choice for effective and professional testing of mechanical watches by the repair service, by specialized shops and in industrial field. A refined design and the functional layout of operating elements, including the large LCD display provide a comfortable handling of the instrument.

Measuring possibilities :

- Rate deviation, beat error and amplitude of mechanical watches. Diagram of the beat noises.
- Rate deviation of quartz and tuning fork watches with the Expert Q signal sensor, available as an accessory.

Beat number : automatic selection of all common beat numbers. Manual selection of any beat number between 3'600 to 36'000 b/h. Determination of an unknown beat number. The automated microphone offers 7 different measurement cycles. Measurement results, average values and largest deviations are available. The new "VARIO" display mode provides a fast overview of the quality and stability of the rate accuracy. Optional printer : see page 19 9.

Delivered with manual microphone, AC adapter, casing protection cover and instructions.

Accessories :

| MSA | Items |
|----------|-------------------|
| 19.150-A | Complete barrel |
| 19.150-B | Foot microphone |
| 19.155-B | Micromat S |
| 19.150-H | Hub 4x USB output |

Available accessories, see chart page 19 13.

| MSA | Voltage | Casing size mm | Kg |
|------------|---------|-----------------|-------|
| 19.157 | 220 V | 250 x 101 x 135 | 2.100 |
| 19.157-110 | 110 V | " | " |

WITSCHI® WATCH EXPERT III tester, an economic measuring instrument ideally suited for testing mechanical watches. The diagram is displayed noiselessly on the new, illuminated LCD graphic display. Measured values for rate deviation, amplitude and beat error are automatically calculated and displayed numerically. As with all other instruments, the beat number of all common watches can be automatically recognised. Different measuring modes can be selected for watches with special escapements. Mobile in all testing positions, the microphone is used with movements and watches, with or without bracelets.

Available accessories, see chart page 19 13.

Replacement microphone for MSA 19.157 :

| MSA | Kg |
|----------|-------|
| 19.157-M | 1.300 |



| MSA | Versions | Voltage | Casing size mm | Kg |
|--------|-------------------------|---------|-----------------|-------|
| 19.188 | With Micromat C (Pict.) | 220 V | 264 x 275 x 158 | 2.500 |

Tester WITSCHI® CHRONOSCOPE X1 for mechanical watches suitable for Manufacturing, After Sales Service and Watch-test lab. Thanks to microphone Micromat C, test cycles can be made in 6 different measuring positions. It provides 4 different display modes as well as a graphical display of beat noises.

Measurement Possibilities :

Rate deviation, amplitude and beat error of mechanical watches. Diagram of the beat noises.

Beat Number :

Automatic selection of all common beat numbers and manual selection for the non common beat numbers. Adjustment for all beat number range between 3'600 to 72'000 b/h. Different measuring modes: standard, for watches with Swiss escapement, for watches with coaxial escapement, for watches with AP escapement, with specific amplitude filter for the measurement of watches with the Swiss escapement and for Chronograph "Foudroyante"

Delivered with 1 automatic microphone Micromat C, 1 universal main adapter, 1 protection cover and use instructions.

Available accessories, see chart page 19 13.

WITSCHI® testers for mechanical watches :

| | WATCH EXPERT III MSA 19.157 | CHRONOSCOPE S1 MSA 19.155 et MSA 19.156 | CHRONOSCOPE X1 MSA 19.188 |
|--|--------------------------------|---|------------------------------|
| Performances | | | |
| Diagram tracing | ✓ | ✓ | ✓ |
| VARIO display mode | ✓ | ✓ | ✓ |
| Visualization of the beat noises (Scope) | | ✓ | ✓ |
| Calculation of the gravity point of balance wheels with software | | | |
| Acoustic measurement | ✓ | ✓ | ✓ |
| Number of measuring channels | 1 | 1 | |
| Automatic microphone | | Optional | ✓ |
| Built in LCD display | ✓ | ✓ | ✓ |
| PC software | | Optional | ✓ |
| GPS interface (check/adjustment of the time base) | ✓ | ✓ | ✓ |
| RS 232 interface | ✓ | ✓ | Universal, USB + COM1 |
| Number of measuring programs and parameter sets | | 20 | 99 |
| Graphic long time analysis | | | |
| Result printout | ✓ | ✓ | ✓ |
| WiCoTrace (SQL data base) | | Optional software | Optional software |
| Saving of the measuring results | Optional software | Optional software | Optional software |
| Fourier analysis (spectral analysis) | | Optional software | Optional software |
| Accessories | | | |
| Thermo printer MSA 19.169 | ✓ | ✓ | ✓ |



| MSA | Voltage | Size mm | Kg |
|----------|---------|-----------------|-------|
| 19.155-C | 220 V | 115 x 125 x 220 | 1.700 |

Automatic microphone Micromat C able to combine 10 channels and 11 positions. Ideal for adjustment and control of small production series As well as after sales service.

Measurement possibilities :

- Standard measurement rate accuracy, amplitude and beat error of mechanical watches. Endless measurement continuous diagram recording or graphic display of the beat noises. Interval measurement execution of the measurements in a definable interval during a certain period. Graphically display of the measurement results over the complete period. Measurement of the gravity localisation of the balance wheel's unbalanced error. Long Term Measurement (Reserve) this mode allows tests of watches with a power reserve of several days (max 12.5 days).

| MSA | Voltage | Size mm | Kg |
|-------------|---------|-----------------|-------|
| 19.155-B | 220 V | 115 x 125 x 220 | 1.650 |
| 19.155-B110 | 110 V | " | " |



MICROMAT S automatic microphone for WITSCHI® CHRONOSCOPE S1 control device. Automatic rate measurement in 6 positions.



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|-------|
| 19.134 | 220 V | 120 x 170 x 100 | 0.960 |

Thermo printer JB01-740RS232 for WITSCHI® testers.

Replacement thermo paper :

| MSA | Width mm | o mm |
|----------|----------|------|
| 19.134-P | 60 | 51 |



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.169 | 220 V | 260 x 170 x 110 | 1.000 |
| 19.169-110 | 110 V | " | " |

Standard thermo printer JB01-MCP7810 for WITSCHI® testers.

Replacement thermo paper :

| MSA | Width mm | o mm |
|----------|----------|------|
| 19.167-A | 54 | 57 |
| 19.167-B | 57 | 60 |

Accessories suitable for WITSCHI® testers :

| | MSA 19.152 | MSA 19.153 | MSA 19.155 | MSA 19.156 | MSA 19.157 | MSA 19.158 | MSA 19.180 | MSA 19.188 |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| MSA 19.134 Printer 740RS232 | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| MSA 19.143-B Micro protection | | | ✓ | ✓ | | | | |
| MSA 19.146-A Movement HOLDER | ✓ | | | | | ✓ | | |
| MSA 19.150-B Foot microphone | | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| MSA 19.155-B Micromat S | | | ✓ | ✓ | | | | |
| MSA 19.157-A Universal adapter | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| MSA 19.158-A Test probes | ✓ | | | | | ✓ | | |
| MSA 19.160-B Mobile probes | ✓ | | | | | ✓ | | |
| MSA 19.169 Printer 7810 | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| MSA 19.170 Auto print software | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| MSA 19.178 Switchbox 4 Auto | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| MSA 19.184 Optoelectronic captor | | | ✓ | ✓ | ✓ | | | ✓ |
| MSA 19.185 Clamp microphone | | | ✓ | ✓ | ✓ | | | ✓ |
| MSA 19.188-P Touchscreen pen | | | | | | | | ✓ |



➤ Non available on the Swiss market.

| MSA | Voltage | Casing size mm | Kg |
|--------|---------|-----------------|-------|
| 19.159 | 220 V | 240 x 160 x 100 | 2.160 |

MTG 3000 tester **for mechanical watches**. Semi professional for fast and simple multifunction use.

Functions :

- measuring of beat rate (s/d)
- measuring of beat error (ms)
- automatic beat number detection (can also be set manually)
- measurable beat numbers: 18.000, 19.800, 21.600, 25.200, 28.800 and 36.000 a/h
- acoustic watch beat simulation (can be switched off)
- measuring of amplitude (°)
- programmed 6-position test mode with test report
- stores 2048 beats
- "PAUSE" and "SHIFT" function to stop measuring and view the previous 2048 beats
- thermo printer connection (THERMOPRINT available optionally)
- connection for automatic microphone (AUTOMIC-1 available optionally).

Delivered with a 6 positions microphone ROTOMIC-1, 1 universal adapter, 1 protection cover and use instructions.



➤ Non available on the Swiss market.

| MSA | Voltage | Casing size mm | Kg |
|--------|---------|-----------------|-------|
| 19.162 | 220 V | 190 x 115 x 100 | 1.500 |
| 19.176 | " | " | 1.550 |

MTG 500 tester **for mechanical watches**. Simple version ideal for fast test in the shop after sales service.

Functions :

- measuring of beat rate (s/d)
- measuring of beat error (ms)
- automatic beat number detection
- measurable beat numbers : 18.000, 19.800, 21.600, 25.200, 28.800 and 36.000 a/h
- acoustic watch beat simulation (can be switched off)

Monochrome LCD screen 101 x 36 mm.
Delivered with a microphone SMIC-1 for MSA 19.162 and a microphone ROTOMIC-1 for MSA 19.176, 1 universal adapter, 1 protection cover and use instructions.



➤ Non available on the Swiss market.

| MSA | Voltage | Casing size mm | Kg |
|--------|---------|-----------------|-------|
| 19.171 | 220 V | 200 x 135 x 100 | 1.970 |

MTG 1000 tester **for mechanical watches**. Compact model for fast and simple use.

Functions :

- measuring of beat rate (s/d)
- measuring of beat error (ms)
- automatic beat number detection (can also be set manually)
- measurable beat numbers: 18.000, 19.800, 21.600, 25.200, 28.800 and 36.000 a/h
- acoustic watch beat simulation (can be switched off)
- measuring of amplitude (°)

Delivered with a 6 positions microphone ROTOMIC-1, 1 universal adapter, 1 protection cover and use instructions.

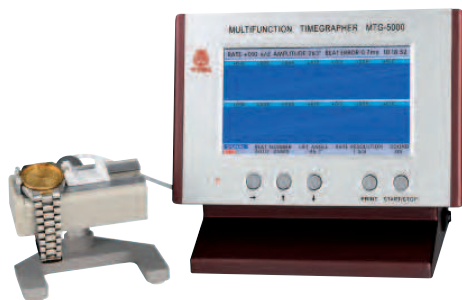
| MSA | Versions | Voltage | Size mm | Kg |
|--------|---------------|---------|-----------------|-------|
| 19.172 | 1 microphone | 220 V | 260 x 170 x 115 | 3.255 |
| 19.173 | 2 microphones | " | " | " |
| 19.174 | 3 microphones | " | " | " |

MTG 4000 tester **for mechanical watches**. Complete multifunction version for professional use.

Functions :

- measuring of beat rate (s/d)
- measuring of beat error (ms)
- automatic beat number detection (can also be set manually)
- measurable beat numbers: 18.000, 19.800, 21.600, 25.200, 28.800 and 36.000 a/h
- acoustic watch beat simulation (can be switched off)
- measuring of amplitude (°)
- programmed 6-position test mode with test report
- stores 720 beats
- "PAUSE" and "SHIFT" function to stop measuring and inspect the previous stored beats
- TYAPS signal processing unit which automatically controls the signal level and filters side noise
- highly stable TCXO time base (only PRO version)
- german/english menu (only PRO version)
- thermal printer connection (THERMOPRINT available optionally)
- connection for automatic microphone (AUTOMIC-1 available optionally)

Delivered with a 6 positions microphone ROTOMIC-1, 1 universal adapter, 1 protection cover and use instructions.



➤ Non available on the Swiss market.

| MSA | Voltage | Casing size mm | Kg |
|--------|---------|-----------------|-------|
| 19.175 | 220 V | 240 x 195 x 135 | 2.320 |

MTG 5000 tester **for mechanical watches**. Complete multifunction version for professional use, ideal for efficient and fast tests during production, after sales service and watch-test lab.

Functions :

- measuring of beat rate (s/d)
- measuring of beat error (ms)
- automatic beat number detection (can also be set manually)
- measurable beat numbers: 18.000, 19.800, 21.600, 25.200, 28.800 and 36.000 a/h
- acoustic watch beat simulation (can be switched off)
- measuring of amplitude (°)
- programmed 6-position test mode with test report
- long-term monitoring mode for rate and amplitude
- own test programs can be created for long term monitoring mode
- horizontally divisible screen
- selectable graphic or numeric resolution 0,2 s/d or 1 s/d
- TYAPS signal processing unit which automatically controls the signal level and filters side noise
- highly stable TCXO time base
- thermal printer connection (THERMOPRINT available optionally)
- connection for automatic microphone (AUTOMIC-1 available optionally)

Delivered with a 6 positions microphone ROTOMIC-1, 1 universal adapter, 1 protection cover and use instructions. Delivered without microphone under reference MSA 19.175-A



➤ Non available on the Swiss market.

| MSA | Item |
|----------|----------------------|
| 19.175-B | Microphone AUTOMIC-1 |



➤ Non available on the Swiss market.

| MSA | Voltage | Size mm | Kg |
|--------|---------|----------------|-------|
| 19.177 | 220 V | 155 x 165 x 65 | 1.030 |

Thermo printer THERMOPRINT for MTG testers MSA 19.159, 19.172, 19.173, 19.174, 19.175 et 19.176.

Replacement thermo paper :

| MSA | Width mm | ø mm |
|----------|----------|------|
| 19.177-A | 57 | 30 |



| MSA | Nb of watches | Dim. mm | Kg |
|--------|---------------|-----------------|-------|
| 19.362 | 1 | 128 x 140 x 156 | 0.600 |

Single watch winder. Noiseless and reliable with modern design with large transparent lid.

Functions :

1. Wind clockwise and anticlockwise by switch operating.
2. Count down : auto rotate during 1 hour and rest during 3 hours.

Works with adaptor 110/220 V delivered with the winder.

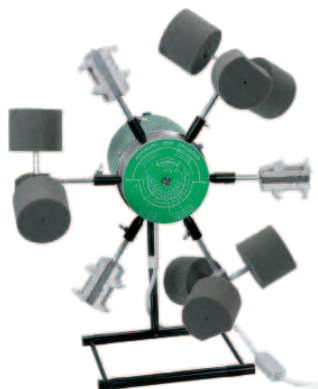


| MSA | Nb of watches | Dim. mm | Kg |
|--------|---------------|-----------------|-------|
| 19.363 | 2 | 167 x 138 x 243 | 1.175 |

Watch winder for 2 watches. Noiseless and reliable and modern design with large transparent lid.

Winding Functions :

1. Wind clockwise, auto (bi-directional) and anticlockwise by switch operating
 2. Timer Functions :
 - Mode a : Auto rotate during 33 seconds, rest during 12 minutes
 - Mode b : Auto rotate during 10 minutes, rest during 90 minutes
 - Mode c : Auto rotate during 30 minutes, rest during 3 hours
 - Mode d : Auto rotate 1 hour, rest during 3 hours
- Works with adaptor 110/220 V delivered with the winder.



| MSA | Apparatus | Rotation | Voltage | Kg |
|------------|----------------------------------|----------|---------|-------|
| 19.205 | REGLOMAT Final-Test | 1 RPM | 220 V | 2.780 |
| 19.205-110 | " | " | 110 V | " |
| 19.305 | CYCLOTEST (Pict.) Automatic-Test | 4 RPM | 220 V | 2.905 |
| 19.305-110 | " | " | 110 V | " |

Rotation apparatus for 18 watches including :

- 3 arms with clips for 9 watches without bracelets
- 3 arms with foam for 9 watches with bracelets

The REGLOMAT apparatus (1 RPM) tests the following : slow winding, power on wrist, shock tests, calendar and detects hidden defects.

The CYCLOTEST apparatus (4 RPM) tests the following : accelerated winding, wheel (and pinion) speed, and power reserve.

| MSA | Apparatus | Rotation | Voltage | Kg |
|------------|-----------------------------|----------|---------|-------|
| 19.206 | REGLOMAT (Pict.) Final-Test | 1 RPM | 220 V | 2.780 |
| 19.206-110 | " | " | 110 V | " |
| 19.306 | CYCLOTEST Automatic-Test | 4 RPM | 220 V | 2.905 |
| 19.306-110 | " | " | 110 V | " |

Rotation apparatus for 20 watches including :

- 2 arms with clips for 6 watches without bracelets
- 2 arms with foams for 6 watches with bracelets
- 2 arms with springs for 8 watches with bracelets

The REGLOMAT apparatus (1 RPM) tests the following : slow winding, power on wrist, shock tests, calendar and detects hidden defects.

The CYCLOTEST apparatus (4 RPM) tests the following : accelerated winding, winding speed and power reserve.

Replacement parts for MSA 19.205, 19.206, 19.305 and 19.306 :

| MSA | Items |
|----------|--|
| 19.201-A | Arm with springs for 1 watch with bracelet |
| 19.201-B | Arm with clips for 2 watches without bracelets |
| 19.205-A | Arm with clips for 3 watches without bracelets |
| 19.205-B | Arm with foams for 3 watches with bracelets |
| 19.205-C | Arm with springs for 4 watches with bracelet |
| 19.205-E | Foam only without arm |



| MSA | Apparatus | Rotation | Voltage | Kg |
|--------|-------------|------------|-----------|--------|
| 19.451 | CYCLOMOTION | 1 and 4 TM | 110/220 V | 11.000 |

Watch winder CYCLOMOTION for automatic watch winding and for work testing. Noiseless motor equipped with a clutch system suitable for heavy and big watches. It is controlled by soft touch keys on the front plate.

Capacity : 24 watches (6 arms for 4 wrist watches each).

Rotation speed : 1 or 4 r.p.m.

Replacement Parts :

| MSA | Items |
|----------|------------------------------------|
| 19.450-A | Arm for 2 watches with bracelet |
| 19.450-B | Arm for 4 watches with bracelet |
| 19.450-C | Arm for 2 watches with bracelet |
| 19.450-D | Arm for 4 watches with bracelet |
| 19.450-E | Arm for 4 watches without bracelet |
| 19.450-F | Fixing kit on wall. |



MSA 19.450-A



MSA 19.450-B



MSA 19.450-C



MSA 19.450-D



MSA 19.450-E



MSA 19.450-F



| MSA | Apparatus | Rotation | Voltage | Kg |
|--------|--------------------------|----------|---------|-------|
| 19.320 | CYCLOTEST Automatic-Test | 4 RPM | 220 V | 8.000 |

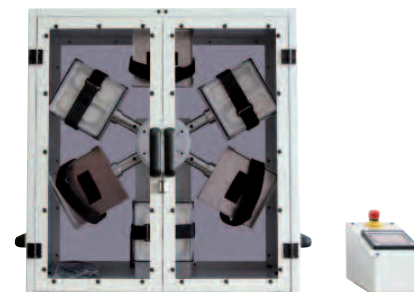
Rotation apparatus for 60 watches including :

- 6 arms with 6 boxes for 10 watches without bracelets or 10 movements.

The CYCLOTEST tests the following : winding acceleration, winding speed and power reserve.

Replacement parts :

| MSA | Items |
|-----------|--|
| 19.320-B | Button only for closing the rubber MSA 19.320-E |
| 19.320-C | Box for 10 watches or movements |
| 19.320-E | Rubber only for holding the box MSA 19.320-C |
| 19.320-EB | Rubber with 2 buttons for holding the box MSA 19.320-C |



| MSA | Voltage | Size mm | Kg |
|--------|-----------|-----------------|--------|
| 19.370 | 110/220 V | 560 x 600 x 330 | 37.000 |

Watch winder DUOTEST 48 for automatic watch winding and for work testing. Gives real acceleration undergone by the wearer wrist. Noiseless and sturdy, it is suitable for work shop and sales points and can be installed in safe box. Week mode programme with time switch or full time mode.

Capacity : 48 watches with or without bracelets (storage box and lid available 130 x 130 mm at 4 compartments, non included).

Speed : 1 or 4 r.p.m.

Opening the door automatically stops the machine.



| MSA | Apparatus | Rotation | Voltage | Kg |
|------------|-------------|----------|---------|-------|
| 19.321 | CYCLOMAT 12 | 4 RPM | 220 V | 2.800 |
| 19.321-110 | " | " | 110 V | " |

Watch winder CYCLOMAT 12 for 12 watches of with 12 arms and clips for 1 watch with bracelet of each. The CYCLOMAT 12 tests the following : winding acceleration, winding speed and power reserve.

Replacement Parts :

| MSA | Items |
|----------|-----------------------------|
| 19.321-A | Arm only with axle and clip |
| 19.321-B | Clip only without axle |



| MSA | Voltage | Size mm | Kg |
|--------|---------|-------------------|---------|
| 19.375 | 220 V | 1100 x 1100 x 500 | 128.000 |

DUOTEST apparatus for winding automatic watches and for working tests. Reproduces accurately the undergone accelerations by the watches when worn on the wrist. Programmable in weekly, timer, stop watch or continual mode. Sturdy and silent.

Capacity : 300 watches without bracelet or 90 watches with bracelet.

Rotation frequency : 1 or 4 RPM.

It stops with the opening of the door. Provided with key locking.



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|--------|
| 19.372 | 220 V | 550 x 400 x 450 | 13.000 |

Watch winder CLINAX for automatic watch winding in small series. Ideal for small production, after sales service and for shops for keeping watches wound.

Week mode programme with time switch or full time mode.

Capacity : until 60 watches without bracelets or movements and 16 watches with bracelets.

Speed : 18 r.p.m.



| MSA | Voltage | Size mm | Kg |
|--------|---------|------------------|--------|
| 19.371 | 220 V | 1100 x 480 x 490 | 63.000 |

STANDARD III apparatus for the industrial winding and shock tests of watches. It works on an optimized balance mode to reduce winding time. Programmable in weekly, timer or continual mode.

Capacity : up to 250 watches

Rotation frequency : 15 to 36 cycles/minute.

It stops by opening the hood.

Torque limiter with release in case of overload.



| MSA | Voltage | Size mm | Kg |
|--------|---------|------------------|--------|
| 19.376 | 220 V | 1380 x 480 x 490 | 98.000 |

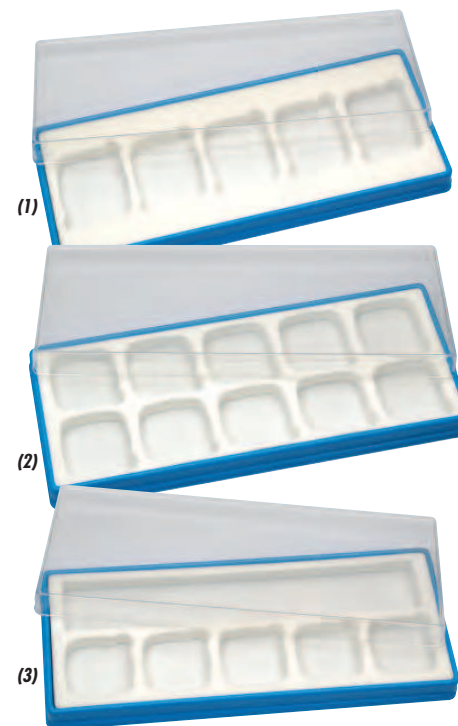
SUPER E apparatus for the industrial winding and shock tests of automatic watches. It works on an optimized balance mode to reduce winding time. Programmable in weekly, timer or continual mode.

Capacity : 500 to 860 watches or movements

Rotation frequency : 15 to 36 cycles/minute.

It stops with the opening of the door.

Torque limiter with release in case of overload.



| MSA | Items | Size mm |
|----------|-----------------------|----------------|
| 19.373-F | Synthetic blue bottom | 312 x 128 x 23 |
| 19.374-F | Transparent cover | 312 x 128 x 18 |

Available cut foams :

| MSA | Shape | Divisions | Size mm | Notches |
|----------|-----------------|-----------|-----------|---------|
| 19.373-A | Rectangular | 8 | 70 x 50 | Without |
| 19.373-B | Television (1) | 5 | 66 x 53 | 2 |
| 19.373-C | Television (2) | 10 | 51 x 50.5 | 1 |
| 19.373-D | Television | 10 | 62 x 55 | 2 |
| 19.373-E | TV+Bracelet (3) | 5+1 | 51 x 50.5 | 1 |
| 19.374-A | Round | 10 | 50 | 1 |
| 19.374-B | Round | 10 | 40 | 1 |
| 19.374-C | Round | 10 | 45 | 1 |
| 19.374-D | Round | 10 | 48 | 1 |
| 19.374-E | Watch+bracelet | 2 | - | Without |

Synthetic blue tray with cut foams in different shapes and PET transparent cover. To be used with apparatus MSA 19.371, 19.372, 19.375 and 19.376 ; for watches with or without bracelets and movements.



| MSA | Item | Size mm |
|--------|---------------------------------------|----------------|
| 19.373 | Tray for 10 watches without bracelets | 240 x 110 x 20 |

Green tray 10 compartments and transparent lid with protection foams. Suitable for the winders MSA 19.371, 19.372, 19.375, 19.376 (according to tray holder).



| MSA | Size mm | Kg |
|--------|-----------------|-------|
| 19.380 | 110 x 190 x 160 | 1.200 |

ELMA® CYCLOMATIC DUE winding apparatus specially made for collectors of top range automatic watches with lunar phases and continuous calendar. Works with 4 supplied batteries or with adaptor (not included) ; suitable for 2 watches. Cycle : rotates during 2 minutes in every 30 minutes. It is possible to have a continuous rotation by using the adapter (not included). Supplied without watches.

Replacement part :

| MSA | Item | Kg |
|----------|---------------|-------|
| 19.381-A | 220 V adapter | 0.350 |



| MSA | Size mm | Kg |
|-----------|----------------|-------|
| 19.109 | 140 x 160 x 70 | 0.470 |
| 19.109-US | " | " |

SEIKO Kinetic® capacitors recharger.
Delivered with an adaptor 110/220V (19.109-US, with USA plug).



Water



| MSA | Model | Size mm | Kg |
|--------|----------|-----------------|-------|
| 19.406 | Standard | 200 x 170 x 270 | 3.500 |

CALYPSO waterproof tester up to 10 bars used with **water**. The pressure is generated by a **manual pump**. Cylinder ø 80 mm suitable for 2 watches.

| MSA | Model | Size mm | Kg |
|--------|-------|-----------------|-------|
| 19.424 | Plus | 200 x 170 x 270 | 3.500 |

CALYPSO waterproof tester up to 10 bars used with **water**. Suitable for both air admission by a **manual pump or compressor** (not delivered). On Compressor mode, the pressure adjustment inside the cylinder ø 80 mm (for 2 watches) is made with an air-gate located in front of the tester.



Water



| MSA | Model | Size mm | Kg |
|--------|-------|-----------------|-------|
| 19.425 | Minus | 200 x 170 x 270 | 3.500 |

CALYPSO waterproof tester up to 10 bars used with **water**. Cylinder ø 80 mm for 2 watches. To be used with 1 **compressor** (not included). The pressure adjustment is made with an air-gate located in front of the tester.

Replacement Parts for MSA 19.406, 19.424 and 19.425 :

| MSA | Items |
|----------|--|
| 19.406-A | O'ring gasket ø 70 mm between cylinder and cover |
| 19.406-B | Cover screw |
| 19.406-C | Plexiglas cylinder ø 80 mm |
| 19.406-D | Plexiglas cylinder ø 70 mm |
| 19.406-E | O'ring gasket ø 80 mm between cylinder and cover |

- 0.2 à - 0.8 bar
0.2 à 10 bar



| MSA | Voltage | Dim. mm | Kg |
|------------|---------|-----------------|-------|
| 19.187 | 220 V | 245 x 240 x 240 | 6.700 |
| 19.187-110 | 110 V | " | " |

WITSCHI® PROOFMASTER M waterproof tester, suitable for Manufacturing, After Sales Service and Watch-test lab. Analyzes watch deformation **under pressure and/or vacuum**. Automatic cycle of complete test, intuitive operation with colour touch screen (TFT colour 320 x 240 pixels) 9 pre-defined and 45 free programmable tests such as pressure, tolerance, measuring time and test sequences with up to 3 different pressures, from -0.8 up to +10 bars. The Leak Finder allows the localization of the watch leakage in water. Connections : mains adapter, PC (USB) and RS 232 for thermo printer MSA 19.169 (see page 19 13).

Compressor delivered separately (see page 19 32).

- 0.2 à - 0.8 bar
0.2 à 10 bar



| MSA | Voltage | Dim. mm | Kg |
|------------|---------|-----------------|-------|
| 19.183 | 220 V | 245 x 240 x 240 | 6.100 |
| 19.183-110 | 110 V | " | " |

WITSCHI® PROOFMASTER S waterproof tester, suitable for Manufacturing, After Sales Service and Watch-test lab. Analyzes watch deformation **under pressure and/or vacuum**. 7 pre-defined universal programs and 10 individual freely programmable tests such as pressure, tolerance, measuring time and test sequences with 1 or 2 pressures. RS 232 interface to connect the optional printer MSA 19.169 (see page 19 13).

Compressor delivered separately (see page 19 32).

- 0.7 bar
10 bar



| MSA | Voltage | Size mm | Kg |
|--------|------------------|-----------------|-------|
| 19.407 | Dual 110 V/220 V | 320 x 250 x 280 | 7.500 |

GREINER® POSEIDON LT100 high-tech waterproof tester with the following characteristics: universal use with all types of watches with or without bracelets. The test starts automatically under **vacuum and pressure**. Automatic determination of stabilisation and measuring time for reliable results. With colour display in 8 languages. Indication of the results in numerical way as well as in analogical colour diagram. 12 available programs including 7 individually programmable from -0.7 to 10 bars. Serial interface for printout of certificate on optional printers, see pages 19 5 and 19 6.

Compressor delivered separately (see page 19 32).

- 0.7 bar



| MSA | Voltage | Size mm | Kg |
|--------|-----------|-----------------|-------|
| 19.403 | 220/110 V | 340 x 260 x 340 | 7.000 |

GREINER® LEAK-CHECKER PRIME waterproof tester for testing leaks up 0.7 bar vacuum. No additional compressor needed thanks to integrated pump. Suitable for any type of watches, included very small timepieces, ceramics. Results displayed on a colour 5" TFT capacity touch-screen (800 x 480 pixels) or on thermo printer (see here below).

Accessorie :

| MSA | Voltage | Size mm |
|--------|---------|-----------------|
| 19.129 | 220 V | 260 x 170 x 110 |

GREINER® thermo printer MARTEL 7810 suitable for all GREINER® testers.

Replacement thermo paper :

| MSA | Width mm | o mm |
|----------|----------|------|
| 19.167-B | 57 | 60 |

- 0.8 bar

Air



| MSA | Voltage | Size mm | Kg |
|------------|---------|-------------|-------|
| 19.402 | 220 V | ø 155 x 315 | 3.500 |
| 19.402-110 | 110 V | " | " |

The ELMA® LEAK CONTROLLER 2000 waterproof tester produces a pressure difference between the interior and the exterior of the watch, thanks to a **built-in vacuum**. The 1/100 mm precision dial comparator records each variation on the watch case and indicates its pressure compensation. The equipment is almost mechanical, which allows even the tests of cheap watches with deformable glasses (no risk of glass breaking). Do not require any maintenance.

40 bar

Water



| MSA | Size mm | Kg |
|--------|-----------------|-------|
| 19.416 | 250 x 270 x 250 | 7.000 |

ROXER® NATATOR 40 waterproof tester up to 40 bars. Suitable for after sales service single test. Doesn't require any electric plug in. Stainless steel tank ø 65 x 650 mm. After the **water** filling (max 0.2 L), the lid with window is locked. The control is made by using the lateral handle which will be screwed until the desired pressure indicated on the manometer.

No Compressor required.

- 0.5 bar

Air



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.405 | 220 V | 180 x 250 x 270 | 5.000 |
| 19.405-110 | 110 V | " | " |

GREINER® LEAK-CHECKER 2000 apparatus, easily used for testing watches by dry waterproofing; a must for the after sales service department and watchmakers workshop. Measuring system by depression of -0.5 bar using a powerful vacuum integrated in the apparatus. The automatic indication of test results is digitally displayed and acoustically announced by the simple handling of the buttons.

Accessorie :

| MSA | Item |
|----------|-------------------|
| 19.405-A | Transparent cover |

125 bar

Water



| MSA | Size mm | Kg |
|--------|-----------------|--------|
| 19.429 | 310 x 330 x 300 | 12.000 |

ROXER® NATATOR 125 waterproof tester up to 125 bars. Suitable for after sales service single test. Doesn't require any electric plug in. Stainless steel tank ø 80 x 65 mm. After the water filling (max 0.33 L), the lid is locked. The control is made by using the lateral handle which will be screwed until the desired pressure indicated on the manometer.

No Compressor required.

- 0.7 bar
10, 20, 30 et 50 bar



| MSA | Versions | Voltage | Size mm | Kg |
|--------|---------------|---------|-----------------|-------|
| 19.442 | 0.7 to 10 bar | 220 V | 210 x 310 x 220 | 6.750 |
| 19.443 | 0.7 to 20 bar | " | " | 7.200 |
| 19.444 | 0.7 to 30 bar | " | " | 9.850 |

SIGMA® SM-8850 high performance waterproof tester. Measuring chamber specially built to reduce the air filling time during high pressure tests, while increasing the available space for large-sided watches. The measuring head positions automatically the watch for the test. A LCD display indicates the test results. Compressor delivered separately. With RS232 interface for optional BIXOLON printer, see here bellow.



| MSA | Versions | Use for tester | Kg |
|----------|-------------------|----------------|-------|
| 19.433 | 3.5x 11 to 20 bar | 19.443 | 4.280 |
| 19.434 | 2.0x 11 to 20 bar | 19.443 | " |
| 19.440-1 | 3.5x 9 to 30 bar | 19.444 | " |

Pressure booster SIGMA® able to produce 20 or 30 bars from a **compressor producing at least 9 bars.**



BIXOLON printer suitable for all SIGMA® waterproof testers. Use plain paper.

Accessories :

| MSA | Item |
|----------|---------------------------|
| 19.170-A | Printer cable for SM-8810 |
| 19.170-B | Printer cable for SM-2000 |
| 19.170-C | Printer cable for SM-8850 |
| 19.170-D | Paper roll ø 80 x 76 mm |

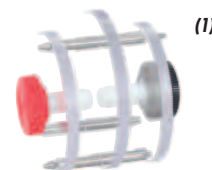


| MSA | Size mm | Kg |
|--------|-----------------|-------|
| 19.418 | 440 x 290 x 310 | 5.700 |

GREINER® WPL 310 waterproof tester working with water for visualization of the leak origin for watches up to ø 60 mm. The test is done between 0.5 and 10 bars. The automatic lifting as well as the overpressure in the watch case make impossible any water infiltration coming inside it. The plexiglas movement holder prevents disassembling of the watch glass. Suitable for testing 2 watches at the same time. Watch holders and compressor delivered separately.

Accessories :

| MSA | Items |
|--------------|------------------|
| 19.418-A (1) | 2 watches holder |
| 19.418-B (2) | 1 watch holder |



(1)



(2)

» **Compressors.** The models with tank release the air under pressure immediately ; waterproof tests proceed quicker.

11 bar



| MSA | Voltage | Capacity | Kg |
|------------|---------|------------------|--------|
| 19.409 | 220 V | 10 litres/minute | 32.000 |
| 19.409-110 | 110 V | 10 litres/minute | " |

JUNAIR compressor 11 bars, safety valve, water separator and 10 litre stainless steel tank.

Delivered in cardboard box 50 x 50 cm, height 58 cm.

Accessories :

| MSA | Items |
|----------|---------------------|
| 19.409-H | Compressor oil - 1L |
| 19.409-T | Air pipe connector |

10 bar



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|--------|
| 19.435 | 220 V | 312 x 144 x 213 | 10.700 |
| 19.435-110 | 110 V | 312 x 144 x 213 | 10.700 |

GAST compressor 10 bars (50 Hz/ 0.12 kW), compact, reliable and practically do not require any maintenance. Generates clean air, without dust and oil.

Pressure up to 10 bars in 25 seconds, directly driven by the waterproof tester.

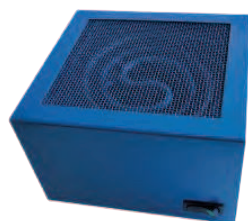
20 bar



| MSA | Voltage | Capacity | Size mm | Kg |
|--------|---------|------------------|-----------------|--------|
| 19.439 | 220 V | 75 litres/minute | 410 x 330 x 400 | 22.000 |

BAMBI high pressure compressor 20 bars (50 Hz), equipped with a tank. Very quiet, practically doesn't generate any vibration. Pressure up to 1.5 bars in 25 seconds, directly driven by the waterproof tester. This type of compressor can also produce a depression allowing watches to be tested in vacuum condition.

» **Hot air drier.**



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.750 | 220 V | 190 x 175 x 120 | 2.810 |
| 19.750-110 | 110 V | " | " |

T8 drier with hot air ventilator for drying watches, jewellery, etc. Power 600 W.

» **Steam Cleaners.**



Professional ELMA® steam cleaners are recommended for cleaning any component or item of watch and jewellery like polishing dusts, oil... Easy works without chemical products thanks to a steam jet at max 8 bars. Works with tap or distilled water. Constant steam availability, no pressure losses and constant pressure level. These Steam cleaners are delivered according to different executions en capacities (see chart here below).

» Options should be precised at the order as no one apparatus modification can be made afterwards.

Accessories :

| MSA | Items |
|--------|---------------------------------|
| 19.845 | Air pipe |
| 19.673 | ElmaSteam 3000 Pump |
| 19.674 | ElmaSteam 5000 Pump |
| 19.672 | Air pipe connector |
| 19.675 | Flexible handpiece (right side) |

| MSA | Items |
|----------|---|
| 19.676 | Ball valve for tank |
| 19.679-G | Large basket |
| 19.679-P | Small basket |
| 12.910 | Tweezers for handling items under steam jet |

| | MSA | Designation | Capacity litres | Dim. mm | Kg |
|--|----------------------|---|-----------------|-----------------|--------|
| | 19.651 19.651-110 | ElmaSteam 3000 with fixed nozzle and foot pedal | 3 | 385 x 445 x 330 | 16.000 |
| | 19.649 19.649-110 | ElmaSteam 3000 with flexible handpiece (1.7 m) | 3 | 385 x 445 x 330 | 16.000 |
| | 19.653 19.653-110 | ElmaSteam 3000 with flexible handpiece (3.0 m) | 3 | 385 x 445 x 330 | 16.000 |
| | 19.657 | ElmaSteam 5000 with fixed nozzle and foot pedal | 5 | 385 x 415 x 435 | 21.500 |
| | 19.656 | ElmaSteam 5000 with flexible handpiece (1.7 m) | 5 | 385 x 415 x 435 | 21.500 |
| | 19.658 | ElmaSteam 5000 with flexible handpiece (3.0 m) | 5 | 385 x 415 x 435 | 21.500 |
| | 19.648 19.648-110 | ElmaSteam 5000 with flexible handpiece (1.7 m), fixed nozzle and foot pedal | 5 | 385 x 415 x 435 | 21.500 |

» Ultrasonic Cleaning machines.



Models 220 V

| MSA | Type | Volume (L) | Internal size (tank) | Power | Heating | Handles | Drain | Cover |
|--------|-----------|------------|----------------------|--------|---------|---------|---------|---------|
| 19.660 | SW 1 | 0.80 | 190 x 85 x 60 | 35 W | Without | Without | Without | Without |
| 19.661 | SW 1H (1) | " | " | 95 W | With | Without | Without | " |
| 19.662 | SW 3 | 2.75 | 240 x 137 x 100 | 85 W | Without | With | Without | " |
| 19.663 | SW 3H (3) | " | " | 285 W | With | With | Without | " |
| 19.671 | SW 3H | " | " | 285 W | With | With | With | " |
| 19.664 | SW 6H (4) | 5.75 | 300 x 150 x 150 | 600 W | With | With | With | " |
| 19.665 | SW 12H | 12.75 | 300 x 240 x 200 | 1100 W | With | With | With | " |
| 19.666 | SW 30H | 28.00 | 500 x 300 x 200 | 1600 W | With | With | With | " |
| 19.667 | SW 45H | 45.00 | 500 x 300 x 300 | 2100 W | With | With | With | " |
| 19.668 | SW 90H | 90.00 | 600 x 500 x 300 | 3000 W | With | With | With | " |

New SONOSWISS® ultrasonic units for fine cleaning of jewellery and watches (worn or repaired, in shop stock or work-shop).

The modern ultrasonic cleaning technology of these devices meets the high demands of today and exceeds all conventional ultrasonic cleaning methods. It is suitable for the cleaning process itself and for further rinsing baths.

Features and advantages :

- useful and practical accessories. The cover can also serve as drop-off collecting basin for the wet basket.
- connection for drain duct at the back, therefore the workplace can be chosen with or without a wash basin. Comfortable operating switch on the unit side.
- the tanks, all made of stainless steel, allows hygienic cleaning and disinfection (if required) of the unit surfaces.
- waterproof operating panel. The operating elements themselves are protected against splash water (in addition any spilled water is guided along the sides).

» Accessories for SONOSWISS® ultrasonic cleaning machines.



| MSA | Items |
|----------|---|
| 19.660-A | Plastic cover for MSA 19.660 and 19.661 |
| 19.662-A | Plastic cover for MSA 19.662, 19.663 and 19.671 |
| 19.664-A | Plastic cover for MSA 19.664 |
| 19.665-A | Plastic cover for MSA 19.665 |
| 19.666-A | Plastic cover for MSA 19.666 |
| 19.667-A | Stainless steel cover for MSA 19.667 |
| 19.668-A | Stainless steel cover for MSA 19.668 |
| 19.669-A | Plastic cover for MSA 19.669 and 19.670 |

The cover, **delivered without basket**, can also be used as a tray for the wet basket.



| MSA | Items |
|----------|--|
| 19.660-B | Stainless steel basket for MSA 19.660 and 19.661 |
| 19.662-B | Stainless steel basket for MSA 19.662, 19.663 and 19.671 |
| 19.664-B | Stainless steel basket for MSA 19.664 |
| 19.665-B | Stainless steel basket for MSA 19.665 |
| 19.666-B | Stainless steel basket for MSA 19.666 |
| 19.667-B | Stainless steel basket for MSA 19.667 |
| 19.668-B | Stainless steel basket for MSA 19.668 |
| 19.669-B | Stainless steel basket for MSA 19.669 and 19.670 |



| MSA | Items |
|--------|---|
| 19.655 | Stainless steel immersion basket ø 59 x 60 mm |
| 19.680 | Stainless steel immersion basket ø 78 x 60 mm |



| MSA | Items |
|--------|--|
| 19.612 | Stainless steel tray for 2 beakers for MSA 19.660 and 19.661 |
| 19.652 | Stainless steel tray for 2 beakers for MSA 19.662 and 19.663 |
| 19.681 | Stainless steel tray for 2 beakers for MSA 19.664, 19.665 and 19.666 |



| MSA | Item |
|----------|---|
| 19.633-C | Jewellery plastic rack with 10 double hooks |



| MSA | Items |
|----------|--|
| 19.614 | Glass beaker ø 80 mm with cover and rubber ring |
| 19.640-F | Glass beaker ø 95 mm with cover and rubber ring |
| 19.682 | Set of 2 glass beakers 600 ml for MSA 19.660 et 19.661 with lids and tray. |
| 19.683 | Lid only for MSA 19.640-F |

EQUIPPED WITH
BASKETS Ø 80 mm



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|--------|
| 19.540 | 220 V | 420 x 420 x 560 | 29.000 |
| 19.540-110 | 110 V | " | " |

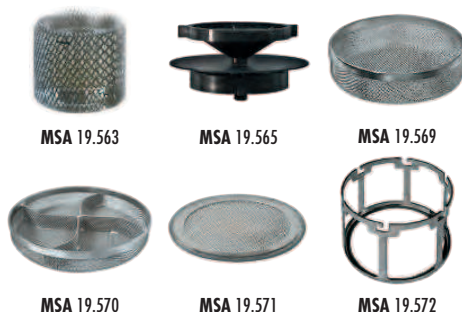
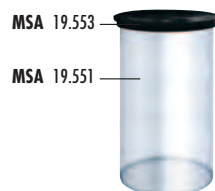
GREINER® VIBRASONIC ACS-900 ultrasonic cleaning machine with 4 baths (2x pre-rinsing, rinsing et drying). Fully automatic and electronically activated alternative rotation. Suitable for baskets Ø 80 mm.

Replacement parts for ACS 900 :

| MSA | Item |
|-------------|--------------------------|
| 19.550-C110 | Ultrasonic circuit 110 V |
| 19.550-C220 | Ultrasonic circuit 220 V |
| 19.550-U | Ultrasonic tank |

The ultrasonic machine MSA 19.540 is delivered with the following accessories in Ø 80 mm :

| MSA | Items | |
|----------|--|-------|
| 19.550-U | Ultrasonic beaker | |
| 19.551 | Glass beakers (3x) | |
| 19.553 | Lid for glass beakers (4x) | |
| 19.563 | Wave-breaker for baskets (3x) ø 64 and 80 mm | |
| 19.565 | Superior basket holder (1x) | |
| 19.569 | Basket 1 compartment (1x) | 0.018 |
| 19.570 | Basket 4 compartments (3x) | 0.024 |
| 19.571 | Basket cover (1x) | 0.030 |
| 19.572 | Inferior basket holder (1x) | 0.037 |



Optional accessories available for MSA 19.540 in Ø 80 mm :

| MSA | Items | Kg |
|--------|---|-------|
| 19.561 | Upper basket holder with clamp (suitable for both Ø 64 and 80 mm) | 0.027 |
| 19.566 | Upper special basket holder | 0.118 |
| 19.567 | Basket 11 compartments | 0.033 |
| 19.568 | Basket 8 compartments | 0.029 |



Optional accessories available for MSA 19.540 in Ø 80 mm :

| MSA | Items |
|----------|---|
| 19.542 | Metal basket 2 compartments Ø 80 mm, Ht 10 mm |
| 19.543 | Metal basket 1 compartment Ø 80 mm, Ht 40 mm |
| 19.573 | Metal basket cover |
| 19.574 | Metal basket 1 compartment |
| 19.574-D | Metal basket 1 compartment, double mesh |
| 19.575 | Metal basket 4 compartments |
| 19.576 | Metal basket 8 compartments |
| 19.577 | Metal basket 12 compartments |
| 19.577-D | Metal basket 12 compartments, double mesh |
| 19.578 | Basket 6 compartments and 2 mini baskets MSA 19.564 |
| 19.579 | Basket 6 compartments with 2 mini baskets MSA 19.564 and 2 capsules MSA 19.552 |
| 19.580 | Basket 1 compartment with 1 basket MSA 19.557 |
| 19.581 | Basket 1 compartment with 1 basket MSA 19.556 |
| 19.582 | Basket 1 compartment with 1 basket MSA 19.562 |
| 19.583 | Basket 8 compartments with outer double mesh |
| 19.584 | Metal basket 9 compartments + central compartment Ø 40 mm, Ht 10 mm |
| 19.585 | Set of 7 cleaning metal baskets |
| 19.586 | Delrin® basket 1 compartment, Ht 16 mm |
| 19.587 | Delrin® basket 4 compartments, Ht 8 mm double mesh |
| 19.588 | Delrin® basket 1 compartment, Ht 8 mm double mesh |
| 19.589 | Delrin® basket 1 compartment, Ht 24 mm double mesh |
| 19.590 | Plastic basket divider for MSA 19.575 et 19.576 |
| 19.591 | Delrin® basket 4 compartments, Ht 8 mm for 2 Main plates Ø 38 mm |
| 19.591-D | Delrin® basket 4 compartments, Ht 8 mm for 2 Main plates Ø 38 mm, double mesh |
| 19.592 | Delrin® basket 4 compartments, Ht 8 mm for 2 Main plates Ø 25 mm |
| 19.593 | Delrin® basket 4 compartments, Ht 8 mm for Main plate Ø 31 mm |
| 19.594 | Delrin® basket 8 compartments + central compartment Ø 39 mm, Ht 8 mm |
| 19.594-D | Delrin® basket 8 compartments + central compartment Ø 39 mm, Ht 8 mm, double mesh |
| 19.595 | Delrin® basket 16 compartments, Ht 8 mm |
| 19.595-D | Delrin® basket 16 compartments, Ht 8 mm, double mesh |
| 19.596 | Delrin® basket 4 compartments, Ht 16 mm |
| 19.597 | Delrin® basket 8 compartments, Ht 32 mm |
| 19.598 | Delrin® basket 4 compartments, Ht 8 mm |
| 19.599 | Delrin® basket 8 compartments, Ht 8 mm, tight mesh |

EQUIPPED WITH
BASKETS Ø 64 mm

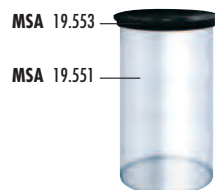


| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|--------|
| 19.550 | 220 V | 420 x 420 x 560 | 29.000 |
| 19.550-110 | 110 V | " | " |

GREINER® VIBRASONIC ACS-900 ultrasonic cleaning machine with 4 baths (2x pre-rinsing, rinsing et drying). Fully automatic and electronically activated alternative rotation. Suitable for baskets Ø 64 mm.

Replacement parts for ACS 900 :

| MSA | Items |
|-------------|--------------------------|
| 19.550-C110 | Ultrasonic circuit 110 V |
| 19.550-C220 | Ultrasonic circuit 220 V |
| 19.550-U | Ultrasonic tank |



MSA 19.553
MSA 19.551



MSA 19.552 MSA 19.554 MSA 19.555



MSA 19.556 MSA 19.557 MSA 19.558



MSA 19.559 MSA 19.560 MSA 19.563

The ultrasonic machine MSA 19.550 is delivered with the following accessories in Ø 64 mm :

| MSA | Items |
|----------|--|
| 19.550-U | Ultrasonic beaker |
| 19.551 | Glass beaker (3x) |
| 19.552 | Mini plastic basket (3x) Ø 22 x 6 mm |
| 19.553 | Cover for glass beaker (4x) |
| 19.554 | Upper basket holder |
| 19.555 | Lower basket holder |
| 19.556 | Basket 4 compartments (2x) |
| 19.557 | Basket 1 compartment |
| 19.558 | Basket cover |
| 19.559 | Support for 5 movements holders |
| 19.560 | Movements holder for 3 movements (5x) |
| 19.563 | Wave-breaker for baskets (3x) Ø 64 and 80 mm |



MSA 19.541



MSA 19.561



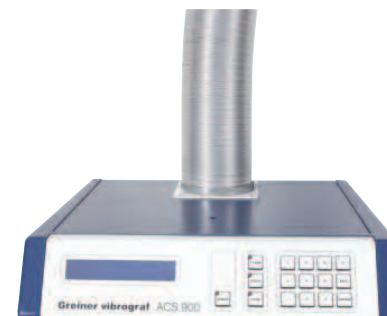
MSA 19.562



MSA 19.564

Special optional accessories available for MSA 19.550 in Ø 64 mm :

| MSA | Items |
|--------|----------------------------------|
| 19.541 | Movements holder for 6 movements |
| 19.561 | Upper basket holder with clamp |
| 19.562 | Basket 5 compartments |
| 19.564 | Mini basket with lid Ø 20 mm |



Special optional accessories available for MSA 19.540 and MSA 19.550 :

| MSA | Items |
|----------|---|
| 19.540-A | Flexible exhauster pipe, min 20 cm / max 100 cm |
| 19.540-B | Flexible exhauster pipe, min 50 cm / max 250 cm |
| 19.540-P | Pipe connector |
| 19.540-R | Connector with screw |



MSA 19.547(1)



MSA 19.547-A(2)

HOROTEC® special optional accessories available for MSA 19.540 in Ø 80 mm :

| MSA | Items |
|--------------|--|
| 19.547 (1) | Basket for 8 large dimensions Main plates, from 2.50 to 3.60 mm thickness |
| 19.547-A (2) | Set of Main plates support for MSA 19.547 |
| 19.548 | Basket for 11 large dimensions Main plates, from 1.60 to 2.50 mm thickness |
| 19.548-A | Set of Main plates supports for MSA 19.548 |
| 19.549 | Basket for 14 large dimensions Main plates, from 0.90 to 1.60 mm thickness |
| 19.549-A | Set of Main plates supports for MSA 19.549 |

HOROTEC® special baskets for cleaning large dimensions Main plates, (8, 11 or 14 items). Simple, fast and secured Main plates fixing.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-------------|--------|
| 19.520 | 220 V | ø 330 x 500 | 10.500 |
| 19.520-110 | 110 V | " | " |

ELMA® SUPER ELITE washing machine. Economical alternative to clean movements of disassembled watches. The parts are manually placed in the 3 baths. The heater in the metallic cylinder allows the drying of the parts without smearing them.

Included accessories :

- 1 cleaning basket MSA 19.530-B
- 3 complete cleaning glass beakers MSA 19.521.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|--------|
| 19.530 | 220 V | 350 x 350 x 640 | 27.600 |
| 19.530-110 | 110 V | " | " |

ELMA® RM 90 washing machine fully automatic to clean movements of assembled or disassembled watches. Two cleaning systems tested and linked in only one machine :

- the cleaning of assembled movements using the movements holder
- the cleaning of disassembled parts in a sieve basket.

Delivered with the accessories :

- 1 movement holder for 6 Movements MSA 19.530-N
- 3 cleaning glass beakers MSA 19.521-C.

Replacement parts for MSA 19.520 and 19.530 ø 64 mm :

| MSA | Éléments |
|----------|--|
| 19.521 | Glass jar, with lid and cork gasket |
| 19.521-A | Lid with cork gasket |
| 19.521-B | Cork gasket only, for lid |
| 19.521-D | CPL heating plate for MSA 19.520 |
| 19.521-E | Heater/Motor switch for MSA 19.520 |
| 19.530-A | Set including support for basket holder MSA 19.530-K, basket holder MSA 19.530-L, basket MSA 19.530-M, 2 baskets MSA 19.530-J, small basket MSA 19.530-G, lid MSA 19.530-F, lid MSA 19.530-H |
| 19.530-B | Set including basket holder MSA 19.530-L, basket MSA 19.530-M, 2 baskets MSA 19.530-J, small basket MSA 19.530-G, lid MSA 19.530-F, lid MSA 19.530-H |

| MSA | Éléments |
|----------|---|
| 19.530-C | Basket ø 64 mm, height 15 mm, with 4 compartments |
| 19.530-D | Basket ø 64 mm, height 15 mm, with 9 compartments |
| 19.530-E | Basket ø 64 mm, height 45 mm, undivided |
| 19.530-F | Lid ø 64 mm, for baskets |
| 19.530-G | Small basket ø 20 mm, without lid |
| 19.530-H | Lid ø 20 mm, for small basket |
| 19.530-I | Beaker cork-oak ring gasket 95 x 22 x 3 mm |
| 19.530-J | Basket ø 64 mm, height 15 mm, with 5 compartments |
| 19.530-K | Support for basket holder |
| 19.530-L | Basket holder |
| 19.530-M | Basket ø 64 mm, height 15 mm, undivided |
| 19.530-N | Movement holder, for 6 movements |
| 19.530-P | Mesh Capsule with lid for MSA 19.520/530 |



| MSA | Versions | Voltage | Size mm | Kg |
|---------|--------------------------------------|---------|------------------|--------|
| 19.755 | Without device of gas reinjection K2 | 220 V | 375 x 350 x 560 | 58.000 |
| 19.756* | With device of gas reinjection K2N | " | " | " |
| 19.757 | Without device of gas reinjection K3 | 220 V | 520 x 372 x 590 | 74.000 |
| 19.758* | With device of gas reinjection K3N | " | " | " |
| 19.752 | Without device of gas reinjection K4 | 220 V | 520 x 1036 x 765 | 74.000 |
| 19.753* | With device of gas reinjection K4N | " | " | " |

Professional vacuum packaging machine VC999®. This compact model has perfectly its place in a laboratory, store or for shipping department. This machine is economic, small, easy to handle and always ready to use. Microprocessor control to simplify the choice of programs and users guide. Lid with window to supervise the process. Double welded line with a length of 325 mm and output 10 m3/h (MSA 19.755-19.756) or 470 mm and output 20 m3/h (MSA 19.757-19.758) or 470 mm and output 40 m3/h (MSA 19.752-19.753). Automatic separation of extra film. Liquids packaging is also possible.

*Attention : the manometer MSA 19.756-A is compulsory for the machines equipped of the gas re-injection system : MSA 19.756, 19.758, 19.753.

Accessories :

| MSA | Items |
|------------|--|
| 19.756-A | Manometer for gaz re-injection system* |
| 17.706-100 | Bag PA/PE 20/70, 100 x 150 mm (1'000 pieces) |
| 17.706-130 | Bag PA/PE 20/70, 130 x 380 mm (1'000 pieces) |
| 17.706-140 | Bag PA/PE 20/70, 140 x 210 mm (1'000 pieces) |
| 17.706-200 | Bag PA/PE 20/70, 200 x 300 mm (1'000 pieces) |
| 17.706-225 | Bag PA/PE 20/70, 225 x 300 mm (1'000 pieces) |

*Please mention the gas nature you use when ordering the manometer.

➤ Plastic bags are deliverable on request according to the nature and size of the parts to be packed.

| MSA | Capacity | Voltage | Size mm | Kg |
|--------|------------------|---------|-----------------|-----|
| 19.850 | up to 12 benches | 220 V | 500 x 700 x 800 | 100 |

AIRcenter is a new system which combines Air pressure and vacuum in 1 machine adapted to final watch assembling as well as the after sales service using small and medium quantity of air. All-in-one concept which doesn't require fixed air main masonry and electricity settlement. Flexible and easy to move wherever in the watch shop. Bench air supply is made with soft pipes and individual pedal for each work place. Oil free motor which gives high air quality.

Delivered with air drier.

Technical information :

Air pressure max. : 8 bars.

Vacuum : 800 mbar.

Air tank volume : 16 L.

Vacuum tank volume : 40 L.

Noise level : 50 Db.

Connections : 2 x AC and 1 x vacuum.

Accessories :

| MSA | Items |
|-----------|--|
| 19.850-01 | Jar ½ |
| 19.850-02 | Air drier FX1 |
| 19.850-03 | Pre-filter DD9-¾ |
| 19.850-04 | Pre-filter PD9-¾ |
| 19.850-05 | Filter Standard filter ¼ |
| 19.850-06 | Filter Standard filter ½ |
| 19.850-07 | Pressure reducer ¼ with manometer |
| 19.850-08 | Pressure reducer ½ with manometer |
| 19.850-09 | Filter for reducer ¼ |
| 19.850-10 | Filter for reducer ½ |
| 19.850-11 | Automatic drain |
| 19.833 | HOROTEC® air proof vacuum pencil |
| 19.834 | Vacuum pipe 14 mm (unit in meter) |
| 19.812 | Vacuum pipe 10 mm (unit in meter) |
| 19.826 | Air pressure pipe 6 mm (unit in meter) |
| 19.817 | HOROTEC® air nozzle |
| 24.521 | Single neck swan |
| 24.520 | Double neck swan |
| 19.816 | Vacuum pencil and air nozzle Support on spring |

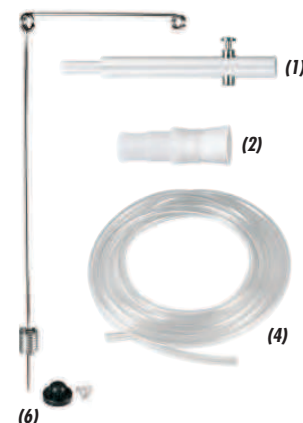
➤ Other accessories available : brushes, Téflon® nozzle, connectors... see chart page 19 45.



➤ Machine for the Swiss Market only.



VACUUM



New system with **vacuum**. Oil free engine, very noiseless (48 decibels only) and compatible for use in a white room.

Technical information :

- flow 2300 litres/hour

- absolute empty value : 80 mbar

- pressure 1 bar uninterrupted (maximum 2.8 bar).

Illustrated :

| MSA | Versions | Voltage | Size mm | Kg |
|----------------|-----------------|---------|-----------------|-------|
| 19.808 (Pict.) | 2 work stations | 220 V | 295 x 200 x 220 | 8.300 |
| 19.808-110 | 2 work stations | 110 V | " | " |

Delivered with :

- 2 vacuum pencils MSA 19.811 (1)
- 2 soft brushes MSA 19.813 (2)
- 2 PVC pipes ø 10 mm (2 x 3 metres) MSA 19.812 (4)
- 2 screw-on supports MSA 19.816, with base and fixing screw, height 37 cm (6).

Not illustrated :

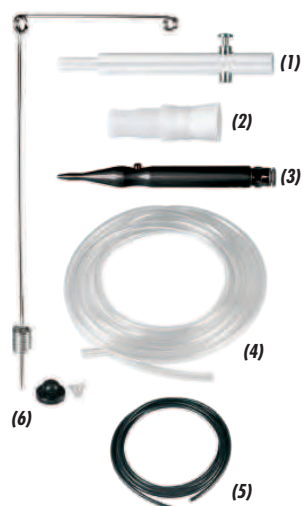
| MSA | Versions | Voltage | Size mm | Kg |
|------------|----------------|---------|-----------------|-------|
| 19.807 | 1 work station | 220 V | 295 x 200 x 220 | 8.300 |
| 19.807-110 | 1 work station | 110 V | " | " |

Delivered with :

- 1 vacuum pencil MSA 19.811 (1)
- 1 soft brush MSA 19.813 (2)
- 1 PVC pipe ø 10 mm (3 metre) MSA 19.812 (4)
- 1 screw-on support MSA 19.816, with base and fixing screw, height 37 cm (6).



AIR PRESSURE
AND VACUUM



| MSA | Versions | Voltage | Size mm | Kg |
|------------|----------------|---------|-----------------|-------|
| 19.820 | 1 work station | 220 V | 295 x 200 x 220 | 9.400 |
| 19.820-110 | 1 work station | 110 V | " | " |

New system with **double functions air pressure and vacuum**. Oil free engine, very noiseless (48 decibels only) and compatible for use in a white room. 1 work station with 2 foot switches and 1 recovery bowl.

Delivered with :

- 1 vacuum pencil MSA 19.811 (1)
- 1 soft brush MSA 19.813 (2)
- 1 bellow MSA 19.817 (3)
- 1 PVC pipe ø 10 mm (3 metre) MSA 19.812 (4)
- 1 black pipe ø 6 mm (3 metre) MSA 19.826 (5)
- 2 screw-on supports MSA 19.816, with base and fixing screw, height 37 cm (6).

Technical information :

- flow 2300 litres/hour
- absolute empty value : 80 mbar
- pressure 1 bar uninterrupted (maximum 2.8 bar).

Accessories for MSA 19.807, 19.808, 19.820 and 19.850 :

Regulation, filtration :

| MSA | Items |
|-----------|-------------------------------|
| 19.822 | Pump filter |
| 19.831 | Filter ø 225 mm/750 PE806 |
| 19.831-G¼ | Quick acting coupler G¼ |
| 19.836 | Transair regulator female |
| 19.837 | Transair manometer male 1/8 |
| 19.838 | Quick connection mini tap 2/2 |



MSA 19.822



MSA 19.831-G¼



MSA 19.838



MSA 19.811



MSA 19.843



MSA 19.819



MSA 19.832



MSA 19.821



MSA 19.817



MSA 19.813



MSA 19.823



MSA 19.824



MSA 19.829



MSA 19.833



MSA 19.814



MSA 19.825



MSA 19.824-A



MSA 19.829-A



MSA 19.816



MSA 19.815



MSA 19.828-A



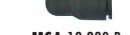
MSA 19.827-A



MSA 19.830



MSA 19.830-B



MSA 19.830-G¼



MSA 19.830-D



MSA 19.830-G¼



MSA 19.830-D



MSA 19.815



MSA 19.828-A



MSA 19.827-B



MSA 19.830



MSA 19.830-G¼



MSA 19.830-G¼



MSA 19.830-D



MSA 19.830-G¼



MSA 19.830-D

Accessories for MSA 19.807, 19.808, 19.820 and 19.850 :

Pencils and endpieces :

| MSA | Items |
|----------|---|
| 19.811 | Vacuum pencil |
| 19.817 | Nozzle |
| 19.833 | Air proof vacuum pencil for MSA 19.850 only |
| 19.843 | Vacuum end piece ø 10 mm for vacuum pencil |
| 19.813 | Soft brush |
| 19.814 | Hard brush |
| 19.819 | Marten-hair brush |
| 19.823 | White nylon brush ø 15 mm |
| 19.825 | Badger-hair brush |
| 19.832 | Marten-hair brush ø 15 mm |
| 19.824 | Long fine tip 25 mm, ø 2.3 mm |
| 19.824-A | Short fine tip 15 mm, ø 2.3 mm |
| 19.821 | Tip 45° with nylon filter |
| 19.829 | Beak 15 mm, ø 4 mm |
| 19.829-A | Beak 15 mm, ø 6 mm |

| MSA | Items |
|-----------|---|
| 19.816 | Base and fixing screw support |
| 19.815 | "Y" link ø 6 mm |
| 19.828-A | Straight connector for pipe ø 6 mm |
| 19.828-B | Straight connector for pipe ø 10 mm |
| 19.827-A | Small "T" connector ø 6 x 6 x 6 mm |
| 19.827-B | Large "T" connector ø 10 x 10 x 10 mm |
| 19.827-C | Large "T" connector ø 14 x 14 x 14 mm |
| 19.827-D | Large "T" connector ø 12 x 6 x 12 mm |
| 19.830 | Straight connector D6 male M5 for nozzle |
| 19.830-B | 90° connector for pipe 10 mm |
| 19.830-G¼ | Connector G¼ for pipe ø 6 mm |
| 19.830-D | 90° connector for pipe Ø14 mm |
| 19.839-A | Reducer 10-6 mm |
| 19.839-B | Reducer 14-10 mm |
| 19.839-C | Reducer 12-6 mm |
| 19.812 | PVC pipe ø 10 mm |
| 19.826 | Black pipe ø 6 mm |
| 19.834 | Transparent pipe 14/12 mm (unit in meter) |
| 19.840 | PVC soft pipe 10/7 mm (unit in meter) |
| 19.841 | Polyamide white semi-rigid pipe (25 m) |
| 19.842 | PVC soft pipe 4/2.5 mm (unit in meter) |
| 19.835-A | Plug for pipe ø 6 mm |
| 19.835-B | Plug for pipe ø 10 mm |
| 19.835-C | Plug for pipe ø 14 mm |
| 19.835-D | Plug for pipe ø 12 mm |



| MSA | Versions | Voltage | Size mm | Kg |
|------------|----------------|---------|-----------------|-------|
| 19.800 | 1 work station | 220 V | 190 x 220 x 120 | 5.800 |
| 19.800-110 | 1 work station | 110 V | " | " |

VACUUM GREINER® system for dusts and tiny glass dusts of watch cases. Oil free motor, noiseless (55/57 decibels) and suitable for use in white room.

Delivered with :

- 1 vacuum pencil
- 1 soft brush
- 1 PVC pipe ø 10 mm (unit in meter)
- 1 screw-on support MSA 19.816, with base and fixing screw support height 37 cm.

Technical information :

- max. output volume 3.2-4.0 m³/hour
- final vacuum : 150 mbar
- vacuum continuity work : 250 mbar absolute.



| MSA | Voltage | Size mm | Kg |
|--------|------------------|-----------------|-------|
| 19.770 | Dual 110 V/220 V | 150 x 165 x 178 | 1.200 |

Automatic dispenser TS250 which accurately and consistently dispenses low, medium and high viscosity fluids and adhesives thanks to syringes of 10 and 30 ml. This dispensing system includes digital display timer allowing a deposit time precision of 0.001 second. Works in manual, sequence and automatic modes and is able to dispense in drops, lines and pot filling.

Technical information :

DUAL power source 110/220 V, air source max. 6.9 bar (100 PSI) and applicable air pressure 0.1 – 6.9 bar (1 – 100 PSI)

Delivered with foot switch, 1 syringe barrel stand, 1 air hose and fittings kit, 1 cable holder and set of dispensing tips for syringes 10 and 30 ml, and use instructions.



| MSA | Voltage | Size mm | Kg |
|--------|------------------|-----------------|-------|
| 19.771 | Dual 110 V/220 V | 152 x 165 x 178 | 1.200 |

Automatic dispenser TS350 which accurately and consistently dispenses low, medium and high viscosity fluids and adhesives thanks to syringes of 10 and 30 ml. This dispensing system includes digital display timer allowing a deposit time precision of 0.001 second. Works in manual, sequence and automatic modes and is able to dispense in drops, lines and pot filling.

Double dispensers for 2 different fluids successively. Electronic setup and large display.

Technical information :

DUAL power source 110/220 V, air source max. 6.9 bar (100 PSI) and applicable air pressure 0.1 – 6.9 bar (1 – 100 PSI)

Delivered with foot switch, 1 syringe barrel stand, 1 air hose and fittings kit, 1 cable holder and set of dispensing tips for syringes 10 and 30 ml, and use instructions.

**Dispensing tips for MSA 19.770 and MSA19.771 :**

| MSA | Points | Colour | ø mm |
|-------------|-----------------|-------------|------|
| 19.770-A015 | Metal 90° | Lavender | 0.15 |
| 19.770-A020 | " | Transparent | 0.20 |
| 19.770-A025 | " | Red | 0.25 |
| 19.770-A033 | " | Orange | 0.33 |
| 19.770-A041 | " | Blue | 0.41 |
| 19.770-A051 | " | Purple | 0.51 |
| 19.770-A061 | " | Pink | 0.61 |
| 19.770-A084 | " | Green | 0.84 |
| 19.770-A137 | " | Amber | 1.37 |
| 19.770-A160 | " | Olive | 1.60 |
| 19.770-B015 | Metal 45° | Lavender | 0.15 |
| 19.770-B020 | " | Transparent | 0.20 |
| 19.770-B025 | " | Red | 0.25 |
| 19.770-B033 | " | Orange | 0.33 |
| 19.770-B041 | " | Blue | 0.41 |
| 19.770-B051 | " | Purple | 0.51 |
| 19.770-B061 | " | Pink | 0.61 |
| 19.770-B084 | " | Green | 0.84 |
| 19.770-B137 | " | Amber | 1.37 |
| 19.770-B160 | " | Olive | 1.60 |
| 19.770-C020 | Conical plastic | Transparent | 0.20 |
| 19.770-C025 | " | Red | 0.25 |
| 19.770-C033 | " | Orange | 0.33 |
| 19.770-C041 | " | Blue | 0.41 |
| 19.770-C051 | " | Purple | 0.51 |
| 19.770-C061 | " | Pink | 0.61 |
| 19.770-C119 | " | Grey | 1.19 |
| 19.770-C084 | " | Green | 0.84 |
| 19.770-C137 | " | Amber | 1.37 |
| 19.770-C160 | " | Olive | 1.60 |
| 19.770-M010 | Straight metal | Yellow | 0.10 |
| 19.770-M015 | " | Lavender | 0.15 |
| 19.770-M020 | " | Transparent | 0.20 |
| 19.770-M025 | " | Red | 0.25 |
| 19.770-M033 | " | Orange | 0.33 |
| 19.770-M041 | " | Blue | 0.41 |
| 19.770-M051 | " | Purple | 0.51 |
| 19.770-M061 | " | Pink | 0.61 |
| 19.770-M084 | " | Green | 0.84 |
| 19.770-M137 | " | Amber | 1.37 |
| 19.770-M160 | " | Olive | 1.60 |

**Accessorie :**

| MSA | Item |
|------------|--------------------|
| 19.770-KIT | Dispensing Tip Kit |

Adapters and syringes for MSA 19.770 and 19.771 :

| MSA | Items |
|-------------|--|
| 19.760-O | Cap only for MSA 19.760-Q |
| 19.760-P | Syringe adaptor 10 ml |
| 19.760-Q | Transparent syringe 10 ml |
| 19.760-R | Black syringe 10 ml |
| 19.760-S | End cap only for MSA 19.760-Q-R, 773-03, 775-S |
| 19.772 | Syringe holder |
| 19.773-03 | Transparent syringe 3 ml |
| 19.773-03-B | Cap only for MSA 19.773-03 |
| 19.774-03 | Syringe adaptor 3 ml |
| 19.774-04 | O'ring gasket for adaptor 3 ml |
| 19.775-05 | O'ring gasket for adaptor 5 ml |
| 19.775-10 | O'ring gasket for adaptor 10 ml |
| 119.775-S | Transparent syringe 5 ml |



| MSA | Voltage | Size mm | Kg |
|--------|------------------|----------------|-------|
| 19.761 | Dual 110 V/220 V | 192 x 210 x 90 | 3.000 |

LOCTITE® volumetric dosing machine. The timing and the dosing rate are freely programmable. It is possible to take the product directly from a bottle or other recipient.

Technical information :

DUAL power source 110V/220V (different cable for 110V mains) and consumption of 10W.

Delivered with dosing box, several types of pipes and the corresponding adapters and a user's manual.



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|--|
| 19.762 | 220 V | 305 x 525 x 575 | 17.000 (controller) 12.000 (controller) |

The LOCTITE® UVALOC 1000 UV Cure Chamber is a high-performance modular curing system consisting of a cure chamber, lamp housing, and controller. The key feature of this unit is the lamp intensity is continually monitored and a low-level output condition can be established to ensure optimal curing performance. The chamber has four

rack levels to accommodate a slide-in tray that allows for easy positioning of parts of various heights at the level of optimum exposure. A perforated aluminium plate allows positioning of customized part holders. The lamp is shielded by a timed control shutter that eliminates UV exposure to operators during loading or unloading of parts. A safety door switch prevents opening while exposure is in progress. The cure time is controlled by the built-in timer and can be operated in a continuous or timed mode. The exposure cycle is triggered by footswitch, panelmount start button, or PLC interface.

Technical information : power supply 220 V, consumption 1200 W and emission spectrum from 200 to 400 nm. Delivered with controller, UV cure chamber, connection cord of the lamp housing, mains cable, foot switch and user's manual.

Replacement parts :

| MSA | Items |
|----------|--|
| 19.762-A | UVA bulb (iron doped) |
| 19.762-B | UVC standard bulb (pure mercury vapour) |
| 19.762-C | Ampoule UV / lumière visible (gallium doped) |



| MSA | Voltage | Size mm | Kg |
|--------|---------|-----------------|--------|
| 19.763 | 220 V | 220 x 300 x 472 | 11.500 |

The LOCTITE® UVALOC 400 System is suitable for the UVA and visible light curing of Loctite® UV products. It can be used at workstations such as in shops and laboratories. It is used for manual loading or inline integration. The lamp's emission spectrum (UVA + visible light) and radiant power capacity have been designed specifically to meet the

requirements of UV-curable Loctite® adhesives. The UVALOC 400 System is a modular system. It includes a power unit with integrated power switch, hour counter and ballast as well as a stand, a lamp house with the bulb, the reflector and the ignition capacitor/starter unit. The system includes no timer, so the curing time has to be controlled with an external timer to ensure precise repeatability of curing results. The work surface is covered by a special silicone rubber mat which resists UV deterioration and chemical attack. The average working life of the lamp is 1000 hours.

Technical information : power supply 220 V AC / 50 Hz, consumption 450 W, warm-up time of UV lamp 3 minutes, intensity 60 mW/cm² et emission spectrum from 350 to 400 nm.

Delivered with mains cable, pair of gloves, safety spectacles, shoe with silicone, protection curtain with assembly components and user's manual.

Replacement parts :

| MSA | Items |
|----------|-------------------|
| 19.763-A | UVA bulb of 400 W |
| 19.763-B | Anti-UV goggles |
| 19.763-C | Anti-UV box |



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.751 | 220 V | 255 x 155 x 485 | 5.800 |
| 19.751-110 | 110 V | 255 x 155 x 485 | " |

Apparatus for polymerisation of UV-active adhesives and resins. Suitable for optics, jewellery and watch industries as well as Watch Lab, workshop and small series for sealing case glasses. It is equipped with a safety device which stops UV radiation in case the drawer is opened.

Technical information : power source 110 or 220 V (upon request) Consumption 75 W and emission spectrum from 350 to 400 nm.



| MSA | Voltage | Size mm | Kg |
|--------|---------|---------------|-------|
| 19.764 | 220 V | 210 x 50 x 40 | 0.170 |

Manual UV lamp used for rapid UV glue drying specially made for manual use and mobile applications.

Technical information : Power supply 230V, consumption 9 W and emission spectrum from 350 to 400 nm.

Delivered with mains cable, integrated ballast, lamp rest and user's manual.

Replacement part :

| MSA | Item |
|----------|-----------------|
| 19.764-A | 9W UV tube only |

| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.765 | 220 V | 215 x 240 x 100 | 1.800 |
| 19.765-110 | 110 V | " | " |

UV lamp tunnel for fast drying Watch glass UV glue.

Power 36W.

Delivered with 4 tubes of 9 W each (should work simultaneously).

3 timing modes :

Position (I) : 90 seconds
Position (II) : 120 seconds
Position (o) : Permanent

Replacement part :

| MSA | Item |
|----------|-----------------|
| 19.765-A | 9W UV Tube only |

- » The magnetic field of an object consists of several non-aligned fields. Each pressure on the start button generates a complete cycle of magnetization/demagnetization, which lasts about 1 to 2 seconds. The cycle begins with a strong magnetizing signal then slowly regresses to obtain a zero value.



| MSA | Size mm | Kg |
|--------|---------------|-------|
| 19.900 | 60 x 105 x 28 | 0.357 |

Electronic demagnetizer for small watch parts, screwdrivers blades, tweezers tips, ...
Delivered with 9V battery and instructions.



| MSA | Voltage | Size mm | Kg |
|--------|-------------|---------------|-------|
| 19.903 | 110 V/220 V | 90 x 150 x 30 | 0.905 |

Professional electronic demagnetizer for watchmaker tools, tweezers, ...
Delivered with 110V/220V dual adapter and instructions.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.901 | 220 V | 230 x 180 x 120 | 1.170 |
| 19.901-110 | 110 V | " | " |

GREINER® ANTIMAG 2 apparatus for demagnetizing watches and small watch parts.
Delivered with instructions.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.902 | 220 V | 130 x 195 x 140 | 2.500 |
| 19.902-110 | 110 V | " | " |

GREINER® MAGNOMATIC powerful apparatus for demagnetizing watches, small watch parts and tools. The mentioned objects are demagnetized efficiently without mechanically affecting the delicate parts such as hairsprings. Simple, reliable and fast handling.
Delivered with user's manual.



| MSA | Voltage | Size mm | Kg |
|------------|---------|-----------------|-------|
| 19.186 | 220 V | 135 x 62 x 1377 | 0.400 |
| 19.186-110 | 110 V | " | " |

The WITSCHI® TESLASCOPE is an "all-in-one" instrument with three test cycles. The first cycle determines the initial magnetisation state. The second cycle is carried out if it is necessary to demagnetise the watch. The new, demagnetised state of the watch is checked again during the next and last cycle. The Teslascope includes a convenient, freestanding support for the sensor, allowing watches with or without bands as well as steel movements and watch parts to be easily tested. The result is a yes/no verdict displayed to the user by two LED.
Delivered with use instructions.

» Magnetism detector apparatus.



| MSA | Voltage | Kg |
|--------|---------|-------|
| 19.182 | 220 V | 0.220 |

GREINER® MAGNOTEST II high sensibility apparatus for detection of magnetism in watches and other small watch parts.
Delivered with user's manual.