



Remote Operation for Materialographic Analysis of Materials

User-friendly and reliable equipment for materialographic preparation in enclosed cells.

Manipulators in enclosed cells

To meet the demand for preparation of materials in enclosed area, Struers has designed a complete range of sturdy and reliable equipment, which can be used for remote operation.

Requirements

Preparation of materials that need to be isolated must take place in enclosed cells. It is necessary that these materials are handled without human contact. To avoid any contact with the operator, the equipment must therefore be able to be operated with manipulators.

For easy and fast operation of the equipment, the control panel is located outside the enclosed area.





TegraSystem Remote



Bottom of TegraSystem Remote

Design principles

The special requirements when working in enclosed cells need a very special design. Struers' Remote equipment is developed according to the following design principles:

Installation in enclosed cells

The control panel with most electronics is placed outside the enclosed cell. The distance between the control panel and the equipment inside the enclosed cell can be rather long (standard cables are 8 meters long).

Easy handling and operation with manipulators

The equipment is adapted to allow remote operation and handling of specimens, and is designed to make it simple to change consumables between preparation steps. The use of the MD System – which has magnetic fixation of grinding discs and polishing cloths – simplifies manipulation in the enclosed cell.

Efficient preparation process

Struers' e-Metalog methods ensure short preparation times and the highest degree of reproducibility. With the MD-grinding discs, a grinding process using very little water can be carried out.

Easy to clean and decontaminate

Cabinets are made of stainless steel with a shape and smooth surface treatment designed for easy cleaning.

Special resistant materials

Parts are selected to be able to resist a contaminated environment. Whenever possible, plastic and rubber has been replaced by metal, and electrical parts have been placed outside the enclosed cell.

Easy maintenance in enclosed cells

The sturdy and reliable design minimizes the need for service and repair. The equipment can be moved and turned in the enclosed cell for easy access. The cabinet is fastened with cylindrical Allen screws, making it easy to detach. Electrical elements are connected with plugs for individual removal. Maintenance and exchange of vital parts – including motors, belts and plastic tubes – can be carried out in the cell with manipulators.

Minimal contaminated waste

The equipment is as small as possible. The use of the MD-system means very little water is used, which minimizes contaminated waste per specimen prepared. The bowl, which is the most contaminated part of a grinding/polishing machine, can be disposed of.

Materialographic lab in enclosed cells

All Struers' Remote equipment is designed to operate with materials that need to be isolated in an enclosed environment:

- Secotom R with its large movable cutting table and large selection of clamping tools, allows precision cutting of larger and deeper workpieces.
- Minitom R is used for low-speed precision cutting of all types of material with a specimen size up to 30 mm in diameter.
- CitoPress R is designed for hot mounting of specimens.
- TegraSystem R enables automatic grinding and polishing. The use of Struers' standard MD-system simplifies handling and considerably reduces the amount of contaminated waste.
- TegraDoser R is very efficient for automatic supply of suspensions, lubricants and water.



TegraSystem Remote

Product variants of the Remote System

Secotom Remote

Secotom R is controlled from outside the cell using touchpad controls and a joystick located on the front plate of the control box. Data are shown on an LCD display. A wheel for adjusting the height of the cut-off wheel unit is placed on top of the machine and adjustments can be carried out in the cell using manipulators. Opening/closing of the splash guard is done inside the cell with manipulators.

The chassis is made of aluminum and the stainless steel cabinet is mounted with easy-to-remove screws. The cabinet has an electropolished surface. Located under the cutting chamber, the tank for cooling water is made of stainless steel and has

connecting pieces to make replacing water easy. The main motor and feed motor are screw-fastened and equipped with cable connectors, making it possible to replace the motors in the enclosed cell using manipulators. The feed motor belt, recirculation cooling pump and transparent plastic splash guard can be replaced in the same way.

All electric parts, except the motors and cooling water pump, are placed outside the cell. Only cables need to be led inside. The electric parts are mounted in a control box – either rack mounted or standalone – with the normal touchpad front plate.



Secotom Remote



Minitom Remote

Minitom Remote

Minitom R is controlled from outside the cell with touchpad controls located on the front plate of the control box. Operation in the enclosed cell can be carried out using manipulators.

The cabinet is made of painted aluminum and the cooling water tank is stainless steel. To make it possible to replace the main motor in the enclosed cell, it is fastened with screws and mounted with cable connectors.

All electric parts, except the motor and a stop micro switch, are placed outside the cell. Two cables need to be led into the cell. Electric parts are mounted in a control box. This box is made for rack mounting, or it can stand alone.

CitoPress Remote

CitoPress R, including the mounting cylinder, is controlled from outside the enclosed cell with touchpad controls located on the front plate of the control box. All operations can be carried out in the cell using manipulators.

The equipment is designed for two cooling options, water recirculation or air cooling. Made from stainless steel with an electropolished surface, the cabinet is fastened with easy-to-remove screws. The tank for the hydraulic oil is also stainless steel. Electric parts in the equipment in the cell are connected with plugs, which can be removed individually. Electrical parts that are not needed in the cell are contained in a control box, which can be rack mounted or stand alone.

The mounting unit is designed to allow remote handling. Opening, closing and replacing the mounting unit can be carried out directly in the cell using manipulators. The plastic parts in the top closure are made from resistant plastic (polysulfone PSU).



CitoPress Remote



The control box for TegraSystem R is detachable – it can either be placed at the back of TegraSystem MSM or in another suitable location.

TegraSystem Remote

TegraSystem R is controlled outside the cell using touchpad control, which is located on the front plate of the control box. All data are shown on the display. TegraSystem R is operated using manipulators.

All cooling and abrasive liquids are applied through TegraDoser Remote or manually. Made of stainless steel with an electropolished surface, the cabinet is mounted with easy-to-remove screws. The bowl surrounding the disc and the drainage outlet, as well as the splash ring, which protects against splashing from the rotating disc and specimen mover, are also made of stainless steel. The tray is detachable for easy removal of contaminated debris. The outlet is placed on the side of the machine for collection of the preparation debris. The bottom of the cabinet is open so that the drive belt can easily be replaced, and the whole cabinet can be

removed. To make it possible to replace the main motor directly inside the enclosed cell, it is fastened with Allen screws. Spider handles and cone nuts, for easy remote handling, are used wherever possible.

All TegraSystem R electric parts, except the motors, are placed outside the cell. The motor power supply cable is the only cable that needs to be fed into the cell. The electric parts are mounted in a control box, which can be rack mounted or standalone.

Since contamination in the enclosed cells will eventually attack plastics and electric parts, the use of these materials is reduced to a minimum TegraSystem R.



TegraSystem R is equipped with three lifting eyes for easy moving and positioning of the machine.

TegraSystem Remote

TegraSystem R can be installed using manipulators. The release handle for lifting the specimen mover plate is long, making it possible to operate with manipulators. It also includes a handle for easy lowering. The horizontal position of the specimen mover plate is adjusted with a large spider handle and it is exchanged by a push-in connector. Pressure feet are in flex metal design.

A control box for the compressed air for the polishing pressure can be installed inside or outside the enclosed cell, depending whether released air is allowed outside the cell. The box can be placed inside the cell away from the TegraSystem R itself in a shielded area. All electric parts, except for the motor and sensors system for compressed air, are placed in the TegraSystem R control box.

TegraDoser Remote

TegraDoser R is placed outside the enclosed cell. The liquids are pumped into the cell through seven plastic tubes: six for diamond suspensions or lubricants and one for water. The tubes are placed in an outer flexible plastic spiral hose. They are connected to a nozzle block with seven nozzles, which supply the liquids to the grinding/polishing disc. The block is made of aluminum, with a handle, and is located on the side of the specimen mover head, so it can easily be exchanged, along with the seven tubes. The pumps are not able to reverse, as this would lead liquid back out of the cell.

Go to [struers.com/remotesystem](https://www.struers.com/remotesystem)

Technical Data

SPECIFICATIONS		Cat. nr.
Secotom Remote		
Tabletop precision cut-off machine with movable cutting table and variable speed. Automatic feeding with electronic control of feed speed. Motorized positioning system and digital readout. Complete with control box with electric parts and controls for rack mounting outside the enclosed cell, recirculation cooling unit, and 65 mm diameter flange set. Cut-off wheels, specimen holders, cooling fluid additives and clamping tools are ordered separately. Length of supply cable is 8 m; if other lengths are required, specify when ordering. 1/3 x 200-240 V / 50-60 Hz.		06976127
Cutting motor	800 W	
Cut-off wheel sizes	75-203 mm / 3-8" dia.	
Rotational speed:	300-5000 rpm (in steps of 100 rpm)	
Cutting power	800 W	
Cutting table dimensions	Width: 196 mm / 7.7" – Length: 184 mm / 7.2" – T-slots: 8 mm	
Positioning range of cut-off wheel	0-40 mm up/down	
Feed speed	0.005 - 3 mm/s (in steps of 0.005 mm)	
Cutting length	0-190 mm (in steps of 1 mm)	
Cutting capacity	60 mm dia. or 160 x 50 mm / 2.3" dia. or 6.2" x 2"	
Dimensions		
Height	53 cm / 21"	
Width	56 cm / 22"	
Depth	69 cm / 27"	

SPECIFICATIONS		Cat. nr.
Minitom Remote		
Low-speed precision cut-off machine. Complete with control box with electric parts and controls for rack mounting outside the enclosed cell, universal specimen holder (04436901) and two flange sets (65 mm diameter and 42 mm diameter). Cut-off wheels and cutting fluid are ordered separately. Length of supply cable is 8 m; if other lengths are required, specify when ordering. 1 x 100-240 V / 50-60 Hz.		06986116
Specimen holder arm		
Balance weight	200 g / 7 ounces	
Cutting weight	350 g / 12 ounces	
Cut-off wheel		
Size	75 - 125 mm / 3 - 5"	
Arbor size	12.7 mm / 0,5"	
Rational speed	100 - 420 rpm	
Cutting capacity	30 x 40 mm / 1.2" x 1.6"	
Motor power	38 W	
Controls	Touchpad and turn knob	
Recirculation cooling tank	250 ml / 0.07 gallons	
Surrounding temperature	5 - 40° C / -13 -131° F	
Humidity	< 95 % RH non-condensing	
Supply		
Voltage / frequency	100 - 240 V / 50 - 60 Hz	
Dimensions		
Height	27 cm / 10.7" with arm down – 39 cm / 15.4" with arm upright	
Width	30 cm / 12"	
Depth	40 cm / 15.7"	

SPECIFICATIONS		Cat. nr.
CitoPress Remote		
Automatic, electro-hydraulic hot mounting press for one cylinder. Complete with control box with electric parts and controls for rack mounting outside the enclosed cell. Cooling by water or compressed air. Length of supply cable is 8 m; if other lengths are required, specify when ordering.		
With cylinder diameter 1 1/4". 1 x 100-240 V / 50-60 Hz.		06976127
With cylinder diameter 1 1/2". 1 x 100-240 V / 50-60 Hz.		06976227
With cylinder diameter 25 mm. 1 x 100-240 V / 50-60 Hz.		06976327
With cylinder diameter 30 mm. 1 x 100-240 V / 50-60 Hz.		06976427
With cylinder diameter 40 mm. 1 x 100-240 V / 50-60 Hz.		06976527
With cylinder diameter 50 mm. 1 x 100-240 V / 50-60 Hz.		06976627
Mounting parameters		
Pressure	50-350 bar / 725-5076 psi in steps of 25 bar / 363 psi	
Heating temperature	120-150-180°C / 248-302-356°F	
Heating time	1-15 min in steps of 0.5 min	
Cooling time	1-30 min in steps of 0.5 min	
Cooling rate	High: Full flow / Medium: 20% of full flow / Low: 3% of full flow	
Software and electronics		
Controls	Touch pads	
LCD display with white LED backlight	160x240 dots	
Working environment		
Temperature, operational	5-40°C / 41-104°F	
Humidity, non-condensing	< 85% RH	
Supply		
Voltage / frequency	100-120V / 50-60Hz, 200-240V / 50-60Hz. Auto detection and auto switch over	
Power inlet (IEC320-C13)	1-phase (N+L+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II"	
Power, idle	8W	
Power, max.	1300W@100-120V / 1300W@200-240V	
Current, max.	13A@100-120V / 5.6A@200-240V	
Air / Water pressure (tap water)	1-10 bar / 14.5-145 psi	
Air / Water inlet	10 mm / 3/4"	
Air / Water outlet	ø10 mm	
Dimensions		
Height	33 cm / 13"	
Width	39 cm / 15.4"	
Depth	34 cm / 13.4"	

SPECIFICATIONS		Cat. nr.
TegraSystem Remote		
<p>Grinding/polishing machine with variable speed (40-600 rpm in steps of 10 rpm) for 200 mm diameter discs. 370 W motor. Complete with control box with electric parts and controls for rack mounting outside the enclosed cell. Discs are ordered separately. Length of supply cable is 8 m; if other lengths are required, specify when ordering.</p> <p>Automatic specimen mover with variable speed (50-150 rpm in steps of 10 rpm) for fine grinding and polishing of 1-3 single specimens or grinding and polishing of 3 specimens fixed in a specimen holder. Dosing unit, specimen mover plates and specimen holders are ordered separately. Length of tube for compressed air is 8 m; if other lengths are required, specify when ordering.</p>		06966127
Grinding/ Polishing machine		
Power supply	1/3 x 200–240 V / 50-60 Hz.	
Disc diameter	Disc diameter 200 mm / 8"	
Disc speed	40 - 600 rpm	
Rotational direction	Contra-clockwise	
Motor Power continuous / max	370 W (555 W) / 0.5 Hp (0.7 Hp)	
Automatic torque control	Yes	
Touch Pad control	Yes	
Graphical display for easy selection of preparation methods	Yes	
Soft start with pre-dosing	Yes	
Controlled acceleration and deceleration	Yes	
Max. torque at disc	>20 Nm	
Automatic detection of connected equipment	Yes	
Polishing head		
Single specimens	Yes, 1 - 3 specimens	
Rotational speed	50 - 150 rpm	
Rotational direction	Contra-clockwise / Clockwise	
Motor Power continuous / max (power supplied from TegraPol)	35 / 53 W	
Force per specimen, single specimens	10 - 50 N	
Dimensions		
Height	50 cm / 20"	
Width	44 cm / 17.3"	
Depth	86 cm / 34"	

SPECIFICATIONS		Cat. nr.
TegraDoser Remote		
<p>Dosing unit and database of preparation methods. With peristaltic pumps. For automatic dosing of diamond suspensions and lubricants. Can be used for supply of water.</p> <p>TegraDoser R is placed outside the enclosed cell and the nozzle block is mounted on TegraSystem MSM. The peristaltic pumps cannot reverse. The built-in database contains 10 e-Metalog methods and has capacity for an additional 190 user-defined preparation methods. With 6 pumps for diamond suspensions or lubricants and 1 pump for water.</p>		06967804
Doser		
Precise dosing with peristaltic pumps	Yes	
Number of pumps	Up to 7 pumps	
Handles lubricant, suspension and all-in-one suspensions and water	Yes	
Graphical display for programming of preparation methods	Yes	
Integrated database	10 Metalog Guide methods and 200 user methods	
Dimensions		
Height	38 cm / 15"	
Width	20 cm / 8"	
Depth	21 cm / 8.5"	

Accessories and consumables

Secotom Remote	Cat. nr.
Clamping Tools	
Base plate clamping tool, for 8 mm T-slots	06316907
Quick clamping device, for 8 mm T-slots	06316913
Vertical clamping device, for 8 mm T-slots	05036915
Fixed stand	05996913
Specimen holders for fixed stand	
Three jaw-chuck	05036919
For general use. Vice type with max. opening 60 mm	04946903
For round or square specimens. Teardrop type with max. opening \varnothing 40 mm / \varnothing 1½"	04946904
For irregular specimens, with 7 screws. Max. width 40 mm / 1½"	04946905
With goniometer	04276911
For small specimens. Vice type	04276915
Double parallel vice	04946909
Flange sets	
Set of flanges, 42 mm dia.	05036901
Set of flanges, 110 mm dia.	05036902
Steel bands	
Replacement stainless steel bands, set of 2	05036920
Cut-off wheels	
All types of cut-off wheels from the size of 76-203 mm / 3-8", including abrasive cut-off wheels, can be used on Secotom. Struers offers a large variety of diamond, CBN, Al ₂ O ₃ , and SiC cut-off wheels, covering all possible applications. To find the perfect cut-off wheel for your job see the Cut-Off Wheel selection guide in the Consumables Catalog.	
Minitom Remote	Cat. nr.
Specimen holders	
For general use. Vice type with max. opening 25 mm / 1"	04436901
For long specimens. Double parallel vice with max. opening 25 mm / 1"	04436902
For round specimens. Max. opening 30 mm dia.	04436903
For irregularly shaped specimens. With five screws. Max. opening 30 mm.	04436904
For round specimens. Teardrop type with max. opening 20 mm dia.	04336906
Cut-off wheels	
Minitom uses CBN and diamond cut-off wheels with a diameter of 75 mm (3.0") to 127 mm (5.0") and a center hole diameter of 12.7 mm (1/2"). The cut-off wheels are available with different grain sizes and concentrations. To find the perfect cut-off wheel for your job see the Cut-Off Wheel selection guide in the Consumables Catalog.	
CitoPress Remote	Cat. nr.
Chamfered ram	
Lower, chamfered ram. To prevent sharp edge on the mount.	
Cylinder diameter 25 mm	05786900
Cylinder diameter 30 mm	05786901
Cylinder diameter 1 ¼"	05786902
Cylinder diameter 1 ½"	05786903
Cylinder diameter 40 mm	05786904
Cylinder diameter 50 mm	05786905
Hot mounting materials	
To find the perfect mounting material for your job see the selection guide in the Consumables Catalog.	
TegraSystem Remote	Cat. nr.
Preparation discs 200 mm dia.	
MD-Disc with driving pins	02426920
Aluminum disc with driving pins	03756902
Wet grinding disc with driving pins	02426935
Specimen mover plate	
For 3 specimens diameter 25 mm/1"	06476900
For 3 specimens diameter 30 mm	06476901
For 3 specimens diameter 1 1/4"	06476902
For 3 specimens diameter 1 1/2"	06476903
For 3 specimens diameter 40 mm	06476904
Specimen mover plate without holes	06476905
Consumables	
To find the perfect grinding and polishing consumables for your job see the Consumables Catalog.	
TegraDoser Remote	Cat. nr.
Consumables	
To find the perfect grinding and polishing consumables for your job see the Consumables Catalog.	

Ensuring certainty

Materialographic preparation and testing demands consistent, reproducible results. These come not only from your laboratory process, operators and equipment, but from your supply chain and your partner. We call this ensuring certainty. And as the global market leader in materialographic solutions, Struers is committed to ensuring certainty by helping you meet every one of these needs.

High quality design and engineering of equipment and consumables are only part of the story. As a Struers customer you can also ensure certainty through our unique knowledge base, robust global supply chain, and expert service and applications support – where and when you need it.

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