

CitoVac

Instruction Manual

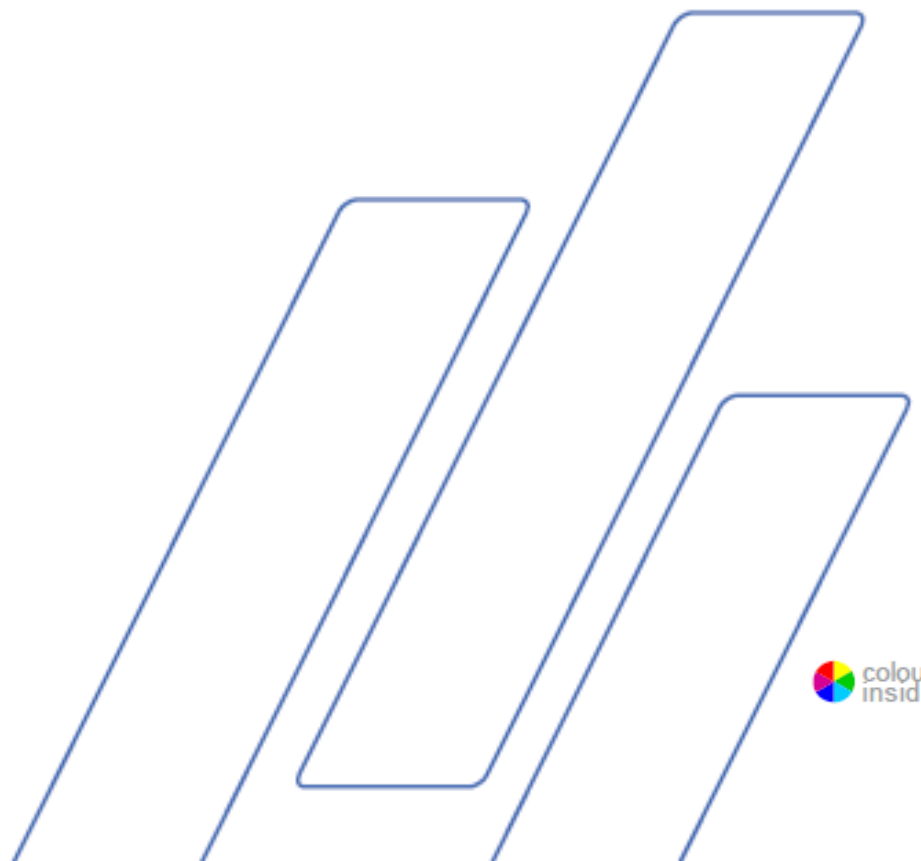


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Intended use

For professional materialographic impregnating or gluing of materials for further materialographic inspection. Only to be operated by skilled/trained personnel. The machine is designed only to be used with Struers consumables specially designed for this purpose and this type of machine.

Do NOT use the machine for:

Impregnating or gluing of materials other than solid materials suitable for materialographic studies. In particular, the machine must not be used for any type of explosive and/or flammable material, and materials or consumables which are not stable under vacuum.

The machine is for use in a professional working environment (e.g. a materialography laboratory).



NOTE:

READ the instruction manual carefully before use.
Keep a copy of the manual in an easy-to-access place for future reference.

Always state *Serial No* and *Voltage/frequency* if you have technical questions or when ordering spare parts. You will find the *Serial No.* and *Voltage* on the type plate of the machine itself. We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:
Instruction Manuals: Struers Instruction Manual may only be used in connection with Struers equipment covered by the Instruction Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to changes without notice. The manual may mention accessories or parts not included in the present version of the equipment.

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Struers
Pederstrupvej 84
DK 2750 Ballerup
Denmark
Telephone +45 44 600 800
Fax +45 44 600 801



CitoVac Safety Precaution Sheet

Read carefully before use

1. Ignoring this information and mishandling of the equipment can lead to severe bodily injuries and material damage.
2. The machine must be installed in compliance with local safety regulations.
3. The operator(s) must read the Safety and User's Guide sections of this manual and the relevant sections of the manuals for any connected equipment and accessories.
The operator(s) must read the Instructions for Use and, where applicable, Safety Data Sheets for the applied consumables.
4. The machine must be placed on a safe and stable support table which is able to carry at least 20 kg/45 lbs.
5. Never use vacuum lids other than the ones delivered from Struers.
6. If any cracks occur in the vacuum lid it must be replaced immediately.
7. Ensure that the compressed air and vacuum are switched off before removing the hoses.
8. Use only consumables (Resins and Hardeners) which are suitable for vacuum impregnation.
See the Safety Data Sheet (SDS) on Struers.com for relevant hazards and precautions.
7. In case of fire, alert bystanders, the fire brigade and cut power.
Use a powder fire extinguisher. Do not use water.
8. Struers recommends the machine to be installed in a well-ventilated and well-lit (300 lux) fume hood.

The equipment should only be used for its intended purpose and as detailed in the Instruction Manual.

The equipment is designed for use with consumables supplied by Struers. If subjected to misuse, improper installation, alteration, neglect, accident or improper repair, Struers will accept no responsibility for damage(s) to the user or the equipment.

Dismantling of any part of the equipment, during, service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Icons and typography

Struers uses the following icons and typographical conventions. A list of the Safety Messages used in this manual can be found in the chapter on [Cautionary Statements](#).

Always consult the Instruction Manual for information on the potential hazards marked by the icons fixed to the machine.

Icons and Safety Messages



ELECTRICAL HAZARD

indicates an electrical hazard which, if not avoided, will result in death or serious injury.



DANGER

indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING

indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION

indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



CRUSHING HAZARD

indicates a crushing hazard which, if not avoided, could result in minor, moderate or serious injury.

General Messages

**NOTE:**

indicates a risk of damage to property, or the need to proceed with special care.

**HINT:**

indicates additional information and tips.

Colour Inside Logo



The 'colour inside' logo on the cover page of this Instruction Manual indicates that it contains colours which are considered to be useful for the correct understanding of its contents.

Users should therefore print this document using a colour printer.

Typographic conventions

Bold type	indicates button labels or menu options in software programs
<i>Italic type</i>	indicates product names, items in software programs or figure titles
■ Blue text	indicates a link to another section or webpage
■ Bullets	indicates a necessary work step

User's Guide

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1. Getting Started

Device Description

CitoVac is a vacuum unit for impregnating of porous solid and stable (non-explosive) materials with Struers' impregnation (mounting) materials specially designed for vacuum impregnation. The level of vacuum and process time can be adjusted during the process.

The vacuum chamber is closed by a spring loaded transparent lid and the nozzle of the disposable tube for dosing of the impregnation (mounting) material.

The impregnation process starts by placing the specimens in a mounting cup, place the mounting cup(s) in the vacuum chamber and setting up the process parameters. A disposable tube is mounted, and the vacuum valve is closed.

The operator starts the unit manually and closes the vacuum chamber by pressing the lid down on the pivot joint.

The cup with mixed impregnating material is placed in the cup holder and the operator manually opens the vacuum valve to let the impregnation material flow into the mounting cups.

The unit stops automatically and the mounting cup with the specimen can be removed. The disposable tube is removed together with remained impregnation material.

Unpacking CitoVac

- Cut the packing tape on the top of the box.
- Remove the bag of loose parts.
- Carefully lift CitoVac from the box, supporting from underneath the machine.

Checking the Contents of Packing

In the packing box you should find the following parts:

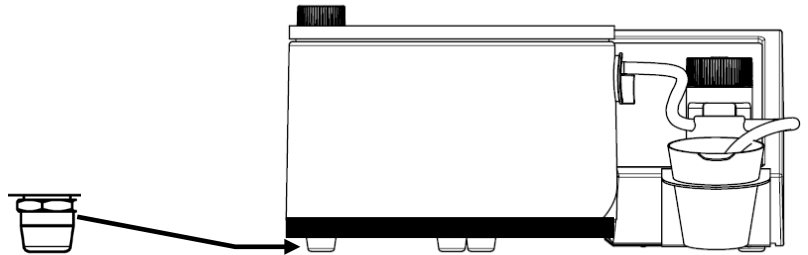
- 1 CitoVac unit
- 2 Power cables
- 1 Universal mounting cup holder (inside vacuum chamber)
- 1 Hose for vacuum
- 1 Coupling for vacuum hose
- 2 Hose clamps
- 1 Washer (sealing ring for vacuum chamber)
- 1 Instruction Manual set

Consumables

- 1 Chamber protector (inside vacuum chamber)
- 1 Mixing cup
- 1 Dispensing tube
- 1 Clip for dispensing tube

Placing CitoVac

- Place CitoVac on a safe and stable support table or work bench.
 - The table must be able to carry at least 20 kg/45 lbs.
 - The table should have an adequate working height. Recommended height 80-90cm.
- Level CitoVac using the adjustable leg.



- Place CitoVac close to connections for mains power.
- Place CitoVac close to the outlet for compressed air/ vacuum.



HINT

Ensure that the work station has adequate lighting. Avoid direct glare (dazzling light sources within the operator's line of vision) and reflected glare (reflections of light sources).

Getting Acquainted with CitoVac

Take a moment to familiarise yourself with the location and names of the CitoVac components.



- ① Pivot joint of the lid
- ② Lid
- ③ Washer
- ④ Vacuum chamber
- ⑤ Wheel for rotating mounting cups

- ⑥ Front Panel
- ⑦ Vacuum valve
- ⑧ Dispensing tube
- ⑨ Mixing cup holder

Main Switch

The main switch is located at the rear of CitoVac.

Supplying Power



ELECTRICAL HAZARD

Switch the power off when installing electrical equipment. The machine must be earthed (grounded). Check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine. Incorrect voltage may result in damage to the electrical circuit.

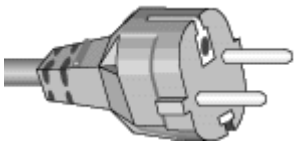


ELECTRICAL HAZARD

Disconnection of the power supply may only be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.)

CitoVac is shipped with 2 types of Mains cables:

European plug

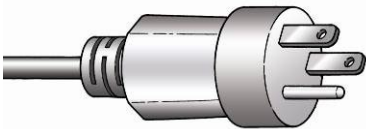


The 2-pin (European Schuko) plug is for use on single-phase connections.

If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug. The leads must be connected as follows:

Yellow/green: earth
Brown: phase (live)
Blue: neutral

American plug



The 3-pin (North American NEMA) plug is for use on single-phase power connections.

If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug. The leads must be connected as follows:

Green: earth
Black: phase (live)
White: neutral

Connection to the Machine



Both cables are on the other end equipped with an IEC 320 cable connector that must be connected to CitoVac.

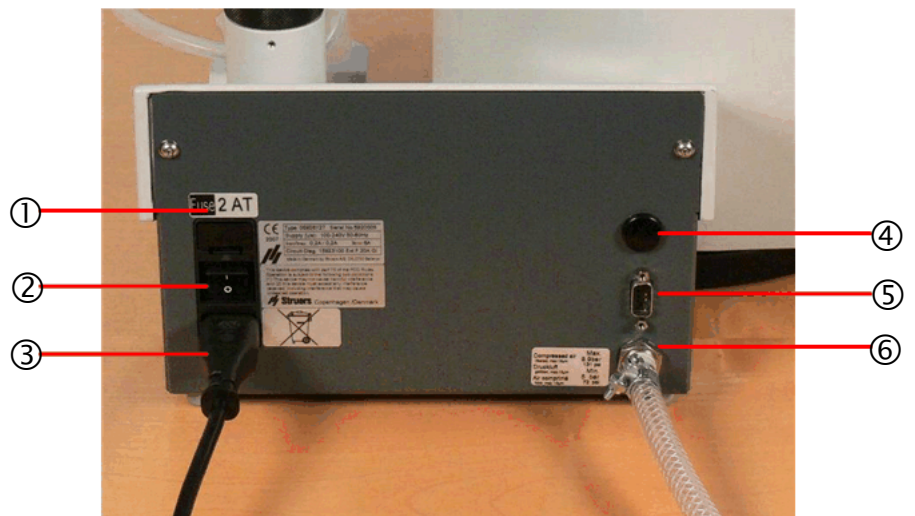
Connection to Compressed Air/ Vacuum

- Mount the coupling on the vacuum hose and secure with a hose nipple.
- Connect the vacuum hose to the rear of CitoVac.
- Mount the hose on the compressed air / vacuum supply.



NOTE:

See [Technical Data](#) in the rear of the Instruction Manual for information on the maximum and minimum levels.



- | | |
|----------------|---------------------------------------|
| ① Fuse | ④ Communication cable to Control Unit |
| ② Main switch | ⑤ Communication socket |
| ③ Power supply | ⑥ Compressed air / Vacuum connection |

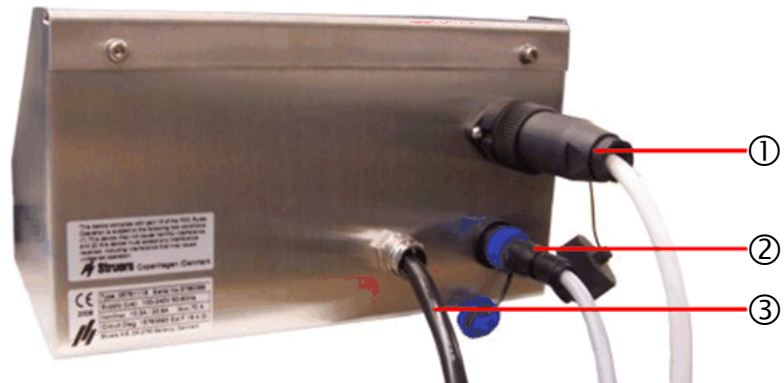
CitoVac for External Vacuum
Pump
Accessory

CitoVac models for use with an external vacuum pump can be connected to the vacuum pump using a Cooli-1 Control Unit.

- Connect the CitoVac and the Cooli-1 Control Unit using the communication cable supplied.

Rear of Cooli Control Unit

- Mount a four pole plug on the power lead from the vacuum pump and connect to the Cooli-1 Control Unit.



- ① Power supply to Vacuum pump (four pole plug)
- ② Mains power cable
- ③ Communication cable, connected to CitoVac



NOTE:

Four-pole plug must be ordered separately, Cat. No: 2XM10221.
The plug must be assembled by a qualified technician.

Vacuum / Compressed Air Hose

- Check that the hose does not have any sharp bends.
If a longer hose is required it is recommended to choose a hose with a larger internal diameter, to secure a sufficient flow.

Noise






See [Technical Data](#) in the rear of the Instruction Manual for information on the sound pressure level value.

2. Operation

Using the Controls Control Panel of CitoVac



Control Panel Functions

Name	Key	Function	Name	Key	Function
UP MENU KEY		Moves highlighted menu item upwards and increases values of selected parameters, and moves cursor left in menus.	DOWN MENU KEY		Moves highlighted menu item downwards and decreases values of selected parameters and moves cursor right in menus.
ESCAPE	Esc	Moves one step backward in menus.	ENTER		Selects highlighted menu items and enters (saves) modified parameter values.
START		Starts the vacuum process.	STOP		Stops the vacuum process: Press once to pause the process, press twice to stop the process.

Main switch

The Main switch is located at the rear of CitoVac.

Software Settings

Initial Start Up Screen

When CitoVac is initially powered up, using the mains switch, the following two screens will be displayed:

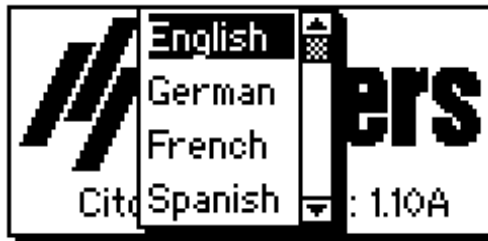







HINT

The sample screens in this Instruction Manual show a number of possible texts. The actual display screen may differ from the samples in the Manual.



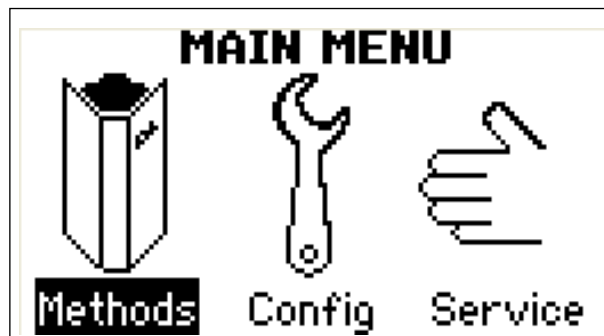
A pop-up will appear to select the preferred Language setting:



-  Use the up  and  down menu keys to highlight the required language then press the  enter key to select it.
- 

Main Menu

The MAIN MENU will automatically replace these screens.



Using Software Menus
Up and Down Menu Keys



ESC Key

Esc

Enter Key



- Press the up and down menu keys to highlight menu items.

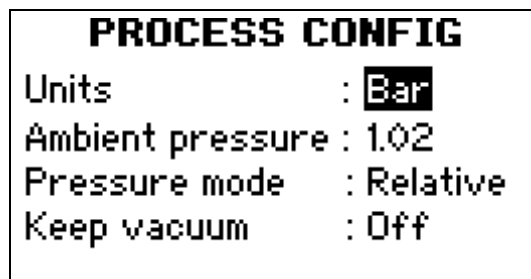
- Press the ESC key to return to the previous menu.
- Press the ESC key to exit a selected item.

- Press the enter key to select a highlighted item.
- Press the enter key to save a value that has been changed

Configuration Menu

Two sub menus that can be accessed from the CONFIGURATION menu *Process Configuration* and *Options*.

Process Configuration



Units

Units can be set to Bar (default), kPa or PSI.

Ambient Pressure

CitoVac measures the difference in relative pressure and not the actual absolute pressure.
The actual value of ambient pressure can be input for greater accuracy. This is particularly important when using *Absolute Pressure* mode (see below).

Pressure Mode

Pressure mode can be set to *Absolute* or *Relative*.
The difference in pressure between ambient pressure and the pressure inside the chamber is measured.

Relative: *Vacuum* is shown in the method display.

METHODS		
	Vacuum (Bar)	Time (h:m:s)
Method A	0.60	1:00:00
Method B	0.90	0:30:00
Method C	0.40	0:10:00

Absolute: Absolute pressure is calculated using the value of *Ambient pressure* set in PROCESS CONFIG. *Pressure* is shown in the method display

METHODS		
	Pressure (Bar)	Time (h:m:s)
Method A	0.42	1:00:00
Method B	0.12	0:30:00
Method C	0.62	0:10:00

Keep Vacuum

CitoVac can be set to *On* to maintain vacuum after the process is complete or to *Off* to release the vacuum. The default is *Off*.

Options

OPTIONS	
Language	: English
Display contrast	: 60
Acoustic signal	: Off

Language

The language can be set to English (default), German, French, Spanish or Italian.

Display contrast

The contrast settings of the display can be adjusted to suit individual preferences (default value: 60, adjustment range: 1-100).

Acoustic signal

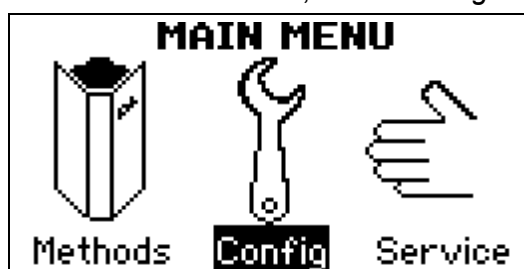
The option to have the machine signal audibly when it has completed the impregnation process for a specimen can be switched **On** or **Off**. If switched **On**, CitoVac will “beep” when keypads are pressed.

Setting the Language

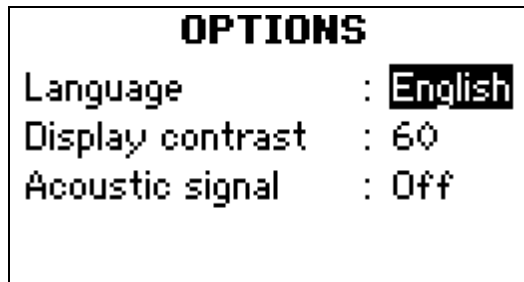
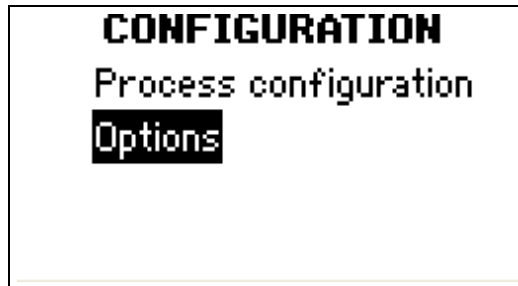
When the machine is first started the language selected will be English.

To change the language after the initial start up:

- From the *MAIN MENU*, select *Config*.



- Select *Options* and then *Language*.



- Push ENTER ↵ to activate the Language pop-up.



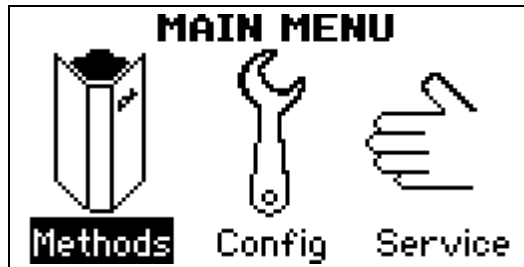
- Select the required language and press ENTER ↵ activate.
- Press ESC to return to the *MAIN MENU*.

Selecting a Method

CitoVac has three built-in methods where the pressure/ vacuum and process time can easily be set and saved.

From the *MAIN MENU*:

- Select *Methods*, then select one of the three programmed methods.



- The *Vacuum* and *Process Time* settings for each method will be shown.

METHODS		
	Vacuum (Bar)	Time (h:m:s)
Method A	0.60	1:00:00
Method B	0.90	0:30:00
Method C	0.40	0:10:00

Editing a Method

Each of the three methods can be edited and saved.

From the *METHODS* menu:

- Push ENTER ↵ to open the Method window.

Method A – Ready		
	Pressure (Bar)	Time (hh:mm:ss)
Set	0.42	1:00:00
Actual	✓	1:00:00

- Highlight the setting to be edited e.g. Vacuum.
- Push ENTER ↵ to open the editing scroll bars.

Method A – Ready		
	Pressure (Bar)	Time (hh:mm:ss)
Set	0.42	1:00:00
Actual	✓	1:00:00

- Adjust the value and push ENTER ↵ to accept the new value.

Running a Process without cycles

From the **METHODS** menu:

- Select the required method (A, B, or C)

Method A – Ready		
Pressure[Bar]		Time Cycles
Min	Max	
0,17		0:10:00 0
--		0:10:00

- For running the process without cycles, select 0, close the lid and press Start ◊.
The screen will change to show the process view.

Method A – Running		
Pressure[Bar]		Time Cycles
Min	Max	
0,17		0:10:00 0
✓		0:09:33
100%		

To pause the process:

- Press Stop ⊙ once.
The screen will change to show that the method is paused.

Method A – Paused		
Pressure[Bar]		Time Cycles
Min	Max	
0,17		0:10:00 0
✓		0:08:47
Press start to resume		

Method settings can be edited whilst the process is paused.

E.g. if the vacuum is too high and the epoxy resin (impregnation material) is seen to create bubbles.

Press start to resume or to stop the process:

- Press Stop ◉ again.

Method A – Stopped			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17		0:10:00	0
--		0:10:00	
New proc.: Push Start			

Once the process is completed the screen will show - completed successfully.

Method A – Ready			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17		0:10:00	0
--		0:10:00	
Completed successfully			

Running a Process with cycles

Cycles are fluctuations from high to low vacuum.
The time for the two pressure levels are set in the configuration.

From the **METHODS** menu:
Select the required method (A,B or C)

Method A – Ready			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17	0,82	0:10:00	2
--		0:10:00	

Select number of cycles needed. It is possible to select up to 10 cycles.

Select the min. and max. pressure.

Close the lid and Press Start ◊.

The screen will now change to show the process view.

Once vacuum is obtained, the screen will show a tick mark and is ready to start the cycling process.

Method A – Running			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17	0,82	0:10:00	2
✓		0:09:18	
100%		⌚ Cycling	

To start the cycle process, press ENTER.
 While the cycles are running, the cycle number is shown as a count down and the arrow is spinning around.

Method A – Running			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17	0,82	0:10:00	2
		2/2	⌚

To pause the process while cycling:

Press Stop ⏹ once.

The screen will change to show that the method is paused

Method A – Paused			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17	0,82	0:10:00	2
✓		1/2	⏹
Press start to resume			

To stop the process:

Press Stop ⏹ again

Method A – Ready			
Pressure[Bar]		Time	Cycles
Min	Max		
0,17	0,82	0:10:00	2
--		0:10:00	
Completed successfully			

Once the cycle process is completed the screen will show - completed successfully

Preparing the Impregnation

- Place the clean and dry specimen in a suitable mounting cup.



HINT

Before impregnation the specimens should be cleaned and degreased.

- Check that the chamber protector is in place.
- Place the mounting cups in the vacuum chamber.
- Check that each of the cups will be directly under the nozzle of the dispensing tube by turning the rotating wheel.



HINT

Struers have a holder specially designed for Struers mounting cups. The mounting cup holder is delivered with a support for safe storage when not placed in the vacuum chamber.



① Mounting cup holder

② Support

Checking the
Vacuum Chamber



CAUTION

Before operation, check that the lid is not cracked or has fissures, or it might implode when exposed to vacuum.

- Check that the washer is clean and undamaged.
- Put the nozzle of the dispensing tube through the opening in the vacuum chamber and press firmly into place.



- Position the dispensing tube in the groove of the Vacuum valve.
 - The valve must be fully open (the line on the valve should be facing front).
 - Stretch the tube slightly to ease correct positioning in the groove.



The groove (line) on the valve must face the front of the machine.

- Turn the lid so that it is directly over the chamber.
- Close the valve and press Start.
- Press down on the pivot joint of the lid until it forms a seal with the vacuum chamber.



- Ensure that the lid is directly over the chamber and that there are no leaks around the edges. Should some leaking occur, release the vacuum, reposition the lid and reapply vacuum.

Impregnation

For mounting, Struers manufactures a number of mounting cups that can be used without releasing agent.

- When the specimens have been under vacuum for an appropriate time - from a couple of minutes for not very porous specimens up to half an hour for very porous specimens - the impregnation can begin:
- Place the Mixing Cup with the ready-mixed impregnation material in the holder.
- Place the end of the dispensing tube in the bottom of the cup and secure with the clip placed on the lip of the mixing cup. Check that the tube is near the bottom of the cup, or air may be sucked into the system and create splashing in the vacuum chamber.



- Turn the Holder with the mounting cups until one of the cups is directly under the dispensing tap.
- Slowly open the vacuum valve until the impregnation material runs into the cup with an appropriate flow.



- When the specimen is covered with impregnation material, turn off the flow, turn the holder so that the next mounting cup is under the dispensing tap and repeat the filling procedure. Repeat until all mounting cups have been filled up. If necessary, refill the mixing cup with impregnation material.



- When all cups have been filled, press stop to release the vacuum. Release the vacuum, even if there is time left in the method. This will avoid the formation of air bubbles in the mount.



HINT

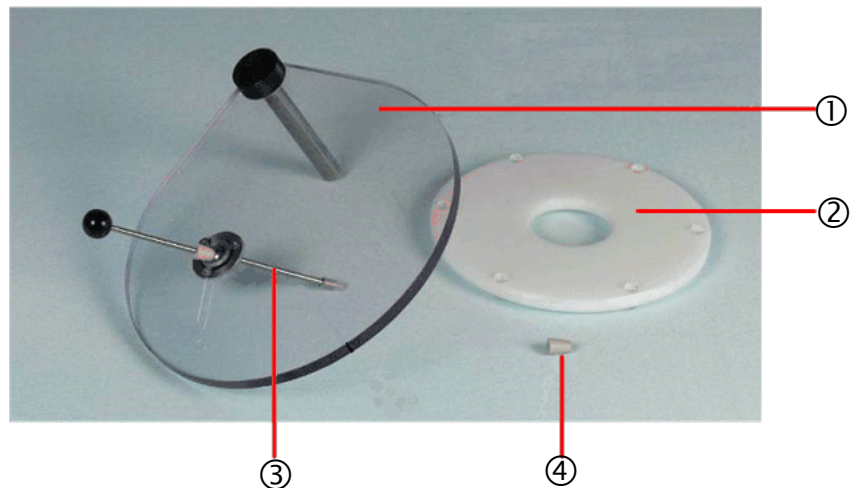
Some impregnation material, e.g. Struers EpoFix, may be heated a little (max. 40°C/104°F) before pouring it over the specimen. This gives the mixture a lower viscosity, thus ensuring a more thorough penetration into the pores of the specimen whilst filling the cups.

HINT

At too high vacuum some of the components in the epoxy evaporate and air bubbles can be created in the mount. This can be avoided by reducing the vacuum. The impregnation process can be paused whilst the vacuum setting is adjusted accordingly.

Gluing

Accessory



- | | |
|----------------|--------------------------------------|
| ① Lid | ③ Pressing rod |
| ② Support ring | ④ Spare rubber plug for pressing rod |

- Place the lid with the pressing rod on CitoVac.
- Position the support ring underneath the holder so that it does not move when gluing.
- Apply a suitable amount of mounting material or epoxy to the specimen. One drop is usually enough.
- Place the specimen with the glued surface up and place a glass slide on the specimen.
- Set vacuum to maximum (pressure to minimum) and start CitoVac.
- Press the glass slide with the pressing rod and gently move the slide back and forth. When the specimen is firmly stuck to the slide, stop CitoVac.
- Remove the slide with glued specimen and leave to harden.

3. Maintenance

Proper maintenance is required to achieve the maximum uptime and operating lifetime of the machine. Maintenance is also important in ensuring your machine's continued safe operation.

The maintenance procedures described in this section must be carried out by skilled or instructed persons.

General Cleaning

To ensure a longer lifetime for your CitoVac Struers recommends daily cleaning accessible surfaces.

Daily Machine

- Clean all accessible surfaces with a soft, damp cloth.

Monthly *Cleaning the Lid*

- Clean the lid periodically with ethyl alcohol.

**NOTE:**

Never use acetone, benzol or similar solvents.

Changing the Washer

Check the vacuum chamber washer at regular intervals to ensure there is no wear or damage. Should there be problems with persistent leaks, this may indicate that the washer needs replacing.

To insert a new washer:

- Hold the two ends of the new washer together and slot into the groove in the vacuum chamber.
- Carefully press the washer into the groove making sure that it is seated evenly around the chamber.
- Check the vacuum to ensure there are no leaks. Should leaks occur, take the washer out and reposition.
- Clean thoroughly if CitoVac is not to be used for a longer period of time.

Spare Parts

For further information, or to check the availability of replacement parts, please contact your local Struers Service department. Contact information is available on Struers.com.

4. Cautionary Statements

List of Safety Messages in the Manual



ELECTRICAL HAZARD

Switch the power off when installing electrical equipment. The machine must be earthed (grounded). Check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine. Incorrect voltage may result in damage to the electrical circuit.



ELECTRICAL HAZARD

Disconnection of the power supply may only be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.)



CAUTION

Before operation, check that the lid is not cracked or has fissures, or it might implode when exposed to vacuum.

5. Transport and Storage

Relocating CitoVac

- Discard the dispensing tube and mixing cup.
- Disconnect power and compressed air/vacuum.
- Remove the mounting cup holder and place in the support.
- Move the machine to its new location.

If the machine is bound for long-time storage or shipping, follow these additional steps:

- Clean the machine.
- Wrap the machine in plastic (place dessicant (silica gel) with the machine).
- Place the machine in the transport box and tape closed.




NOTE:

Package the machine securely before transportation. Insufficient packaging could cause damage to the machine and will void the warranty. Contact Struers Service for advice. Struers recommends that all original packaging and fittings are kept for future use.

6. Disposal



Equipment marked with a WEEE symbol  contain electrical and electronic components and must not be disposed of as general waste.

Please contact your local authorities for information on the correct method of disposal in accordance with national legislation.

Reference Guide

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1. Accessories and Consumables

Please refer to the [Struers Cold Mounting Accessories brochure](#) and the [CitoVac brochure](#) for details of the range available.

Additional Accessory

Specification	Cat. No.
<i>Cooli-1 Control Unit</i>	
For controlling of external vacuum pump	05761116
four pole plug to connect the lead from the pump to Cooli 1.	2XM10221

2. Trouble Shooting

Whilst running a process the screen will display if the set vacuum has been reached.

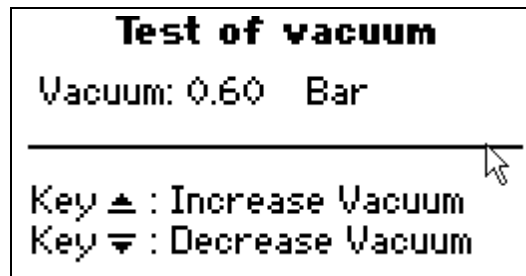
✓: Vacuum setting has been reached

✗: Vacuum setting has not been reached

A message will appear to inform the User that the vacuum setting has not been reached and will allow the User to choose to proceed with the process or to stop.

Vacuum Quality Test

To check the vacuum, perform a Vacuum quality test.



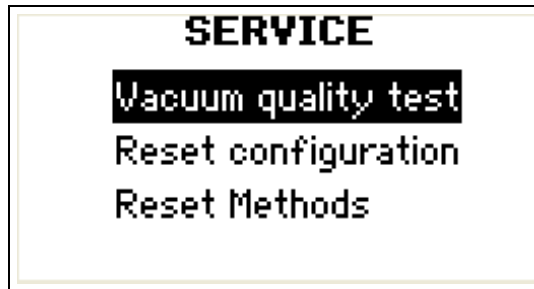
- Check that the vacuum valve is closed properly.
- Check that the nozzle of the dispensing tube is firmly in place.
- Check the washer in the vacuum chamber.
- Check that the compressed air/ vacuum supply is functioning adequately, for example, that there are no bends or kinks in the hose.

If the problem persists, contact a Struers Service Technician.

3. Service

Service Menu

The Service menu is accessed from the Main Menu.



Vacuum quality test: To test the vacuum

Reset configuration: To reset configuration to factory settings

Reset Methods: To reset Methods to factory settings



NOTE:

Servicing may only be performed by a Struers engineer or a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Contact Struers Service for information.

4. Spare Parts and Diagrams

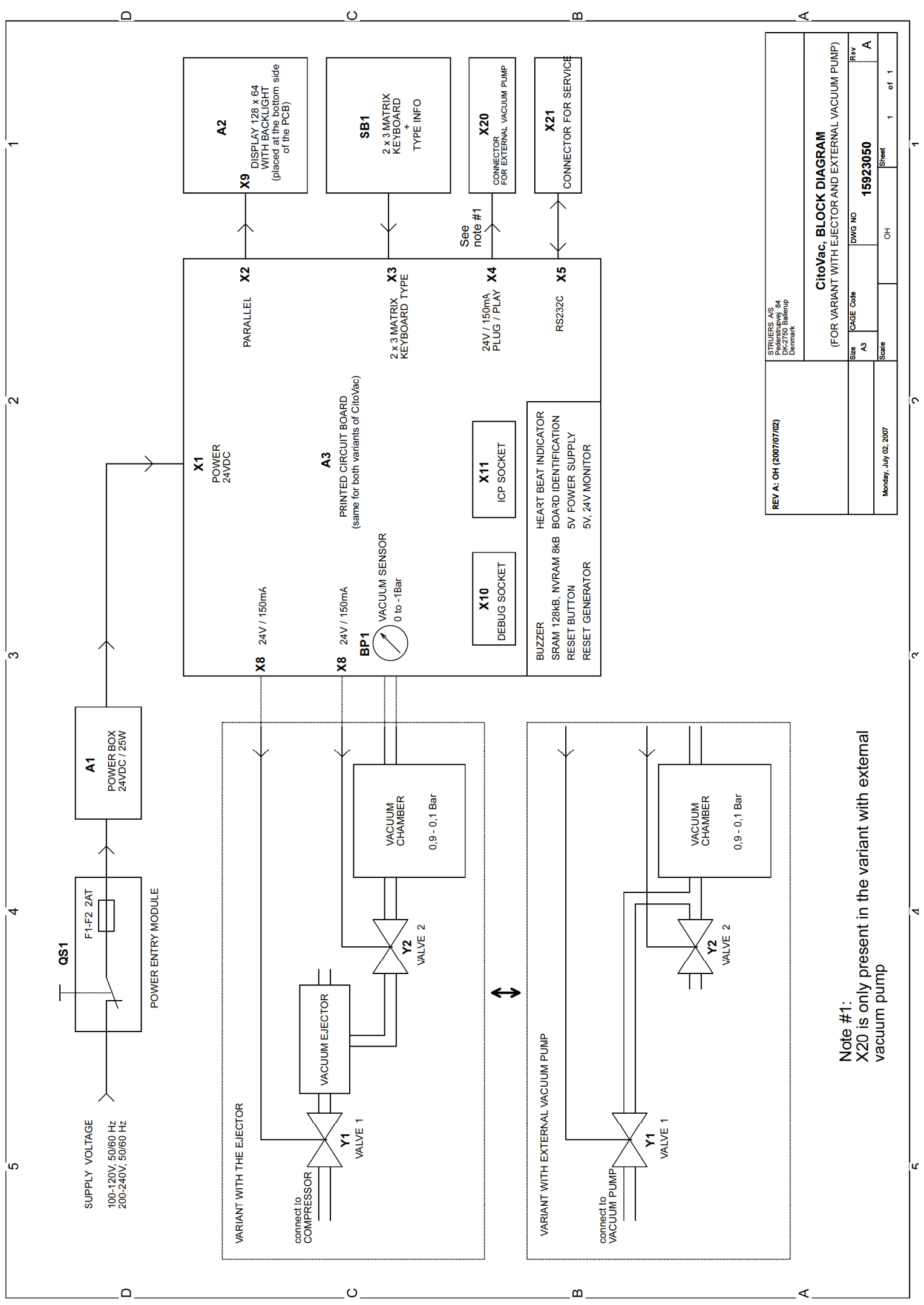
Spare Parts

To check the availability of replacement parts, please contact your local Struers Service department.
Contact information is available on Struers.com.

Diagrams

Block Diagram, CitoVac with ejector.....	15923050
Wiring Diagram, CitoVac with ejector	15923450
Air diagram, CitoVac with ejector	15922000
Air diagram, CitoVac without ejector.....	15922001

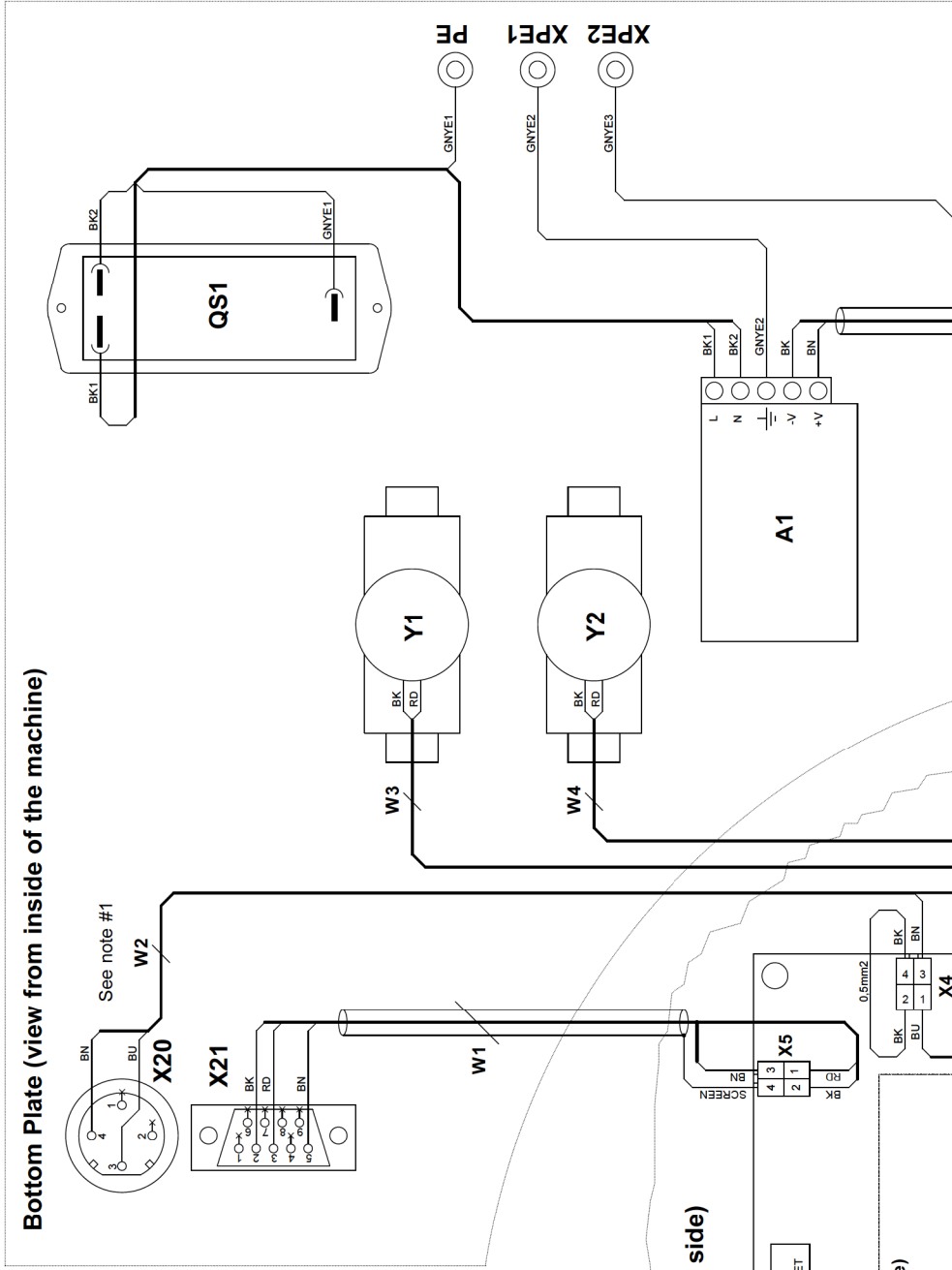
Please see the following pages.



REV A: OH (2007/07/02)		STRUEBS AS Prestevangvej 84 DK-2750 Ballerup Denmark	
Citovac, BLOCK DIAGRAM (FOR VARIANT WITH EJECTOR AND EXTERNAL VACUUM PUMP)			
Size	CAGE Code	DWG NO	Rev
A3		15923050	A
Scale		OH	Sheet 1 of 1
Monday, July 02, 2007			

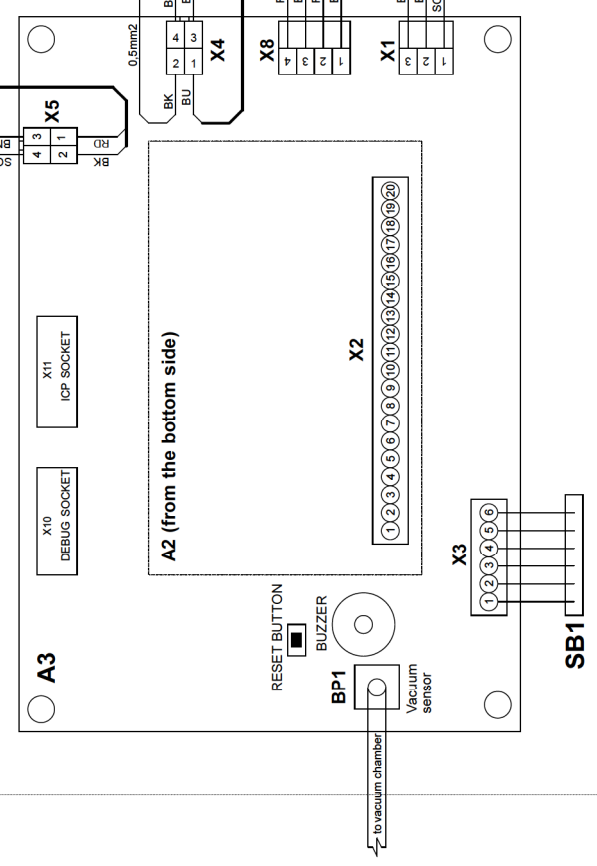
Note #1:
X20 is only present in the variant with external vacuum pump

Bottom Plate (view from inside of the machine)



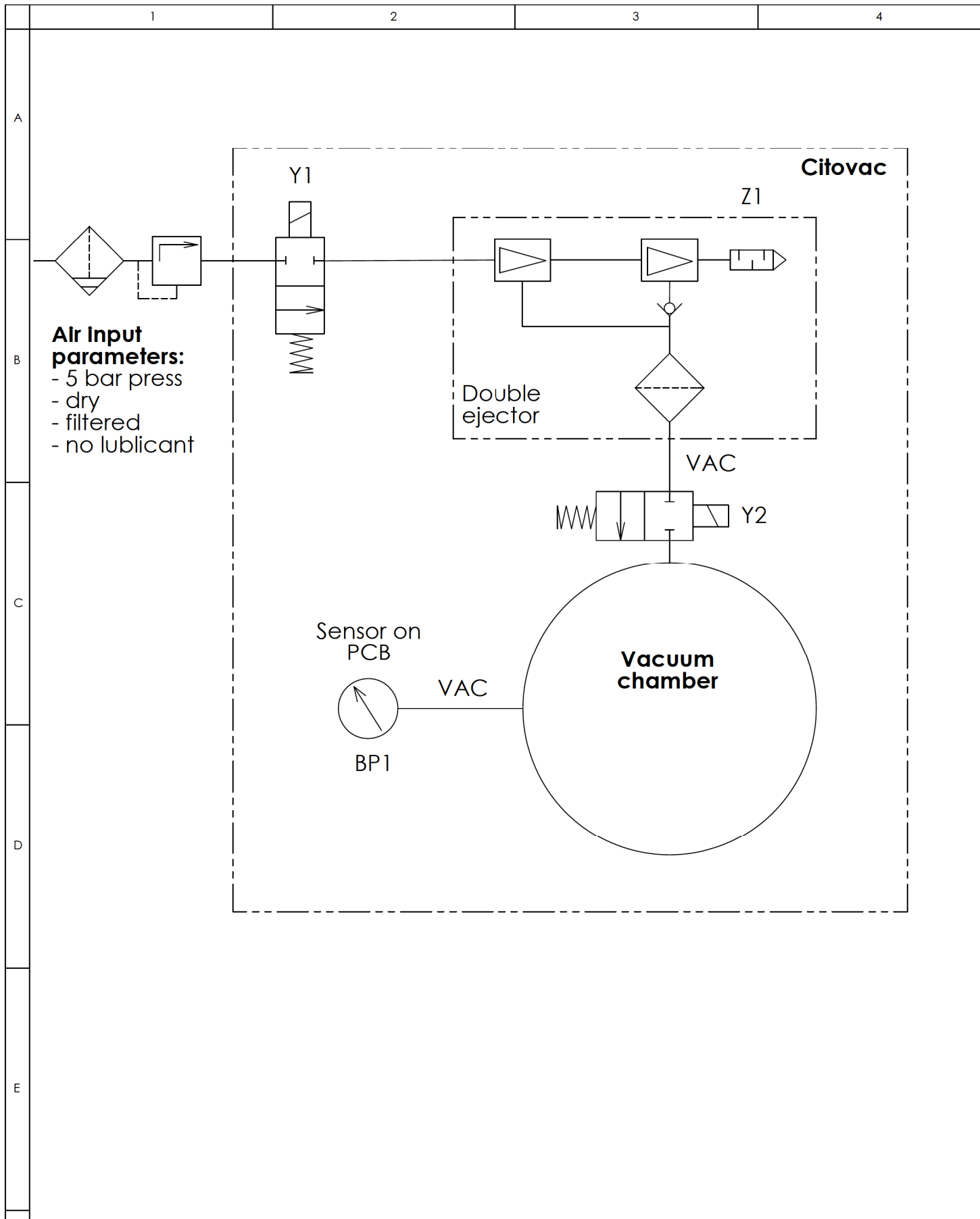
COLOR CODE:
 BK = black
 BN = brown
 BU = blue
 OG = orange
 YE = yellow
 RD = red
 BU = blue
 VI = violet
 WH = white
 PK = pink
 GR = grey
 BG = beige
 GNVE = yellow-green

Front panel (view from the bottom side)

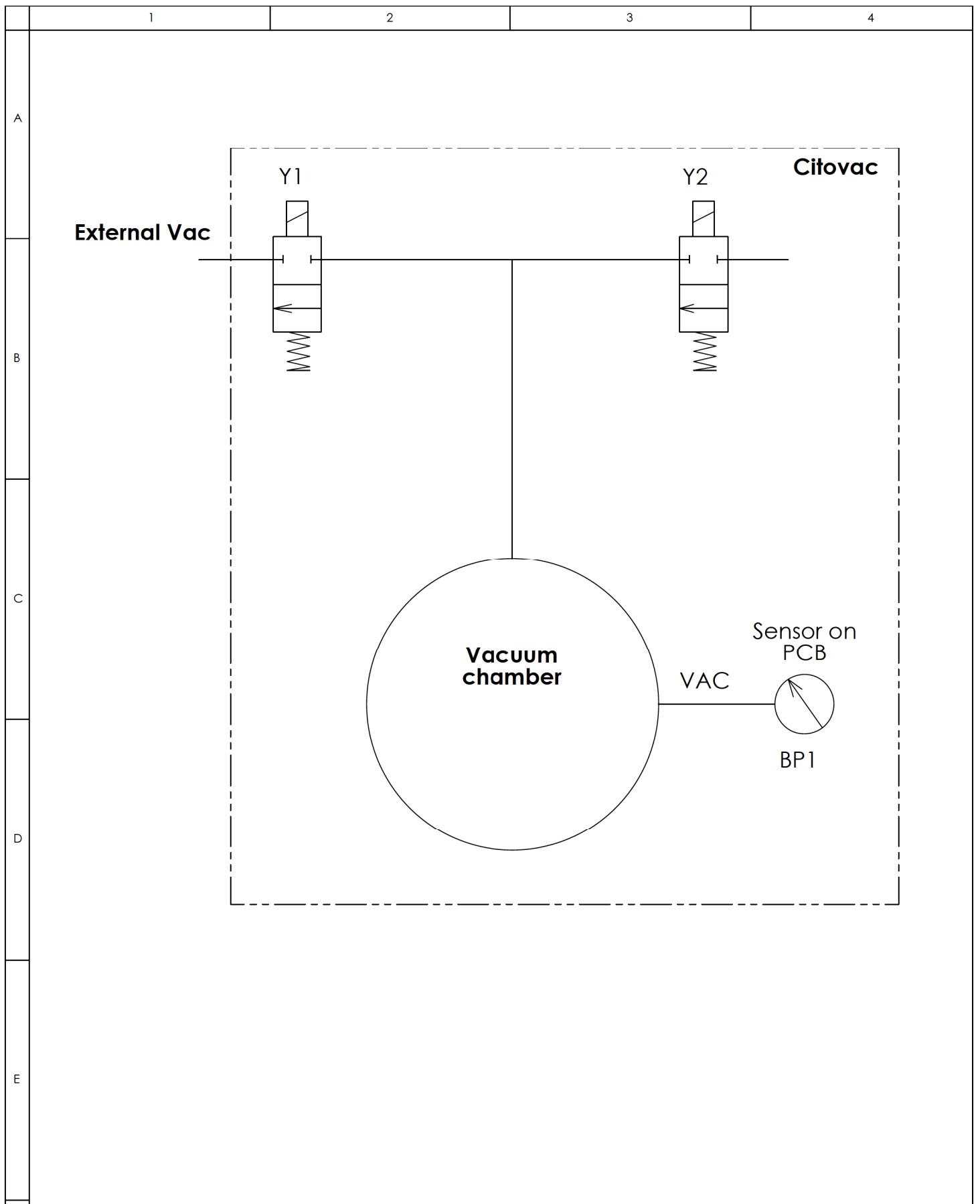



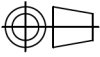
S TRUIERS A/S DK-2350 Ballup Denmark		Cito Vac, WIRING DIAGRAM (FOR VARIANT WITH EJECTOR AND EXTERNAL VACUUM PUMP)	
REV. A: CH 020707020	REV. B: AUK (23.08.08) Names on	Scale	Sheet 1 of 1
REV. C: BRY (22.09.14-05-01)	AS3A - BK20-BK	OH	
AS3A - BK20-BK	15923450		

Note #1:
 W2 and X20 is only present
 in the variant with external
 vacuum pump



B	23-06-08	Reference letters added	BRY		
A	21-05-07		PP	21-05-07	JF
Rev	Crea. date dd-mm-yy	Revision description	Draw. Init	Appr. date dd-mm-yy	Appr. Init
F	 Pederstrupvej 84 DK-2750 Ballerup Copenhagen Denmark Phone: +45 44600 800 Fax: +45 44600 804		Scale: 1:1	Format: A4	Tolerance: DS/ISO 2768 - Surface treat.:
		ID:	Description: 15922000 Air diagram Citovac - ejector		



B	23-06-08	Reference letters added	BRY		
A	21-05-07		PP	21-05-07	JF
Rev	Crea. date dd-mm-yy	Revision description	Draw. Init	Appr. date dd-mm-yy	Appr. Init
F	 Pederstrupvej 84 DK-2750 Ballerup Copenhagen Denmark Phone: +45 44600 800 Fax: +45 44600 804	 Material:	Scale: 1:1	Format: A4	Tolerance: DS/ISO 2768 - Surface treat.:
		ID: Description:	15922001 Air diagram Citovac - no ejector		

5. Legal and Regulatory

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this product not expressly approved by Struers ApS could cause harmful radio interference and void the user's authority to operate the equipment.

6. Technical Data

Subject		Specifications	
		Metric/ International	US/Imperial
Dimensions	Outer dimensions:		
	Height	190 mm	7.5"
	Width	380 mm	15"
	Depth	370 mm	14.5"
	Weight	9.5 kg	21 lbs
	Vacuum Chamber:		
	Inner diameter	ø200 mm	ø7.9"
	Inner height	100 mm	4"
Power	Power – constant	0.031 A	
	Power – intermittent	0.030-0.031 A	
	Maximum power	0.106 A	
	Current spikes (usually start-up and start of operation)	0.039 A	
Air supply CitoVac with built-in ejector:	Compressed air:	4.5 - 6 bar	58 - 87 psi
	Recommended Air quality:	Class-3 as specified in ISO 8573-1	
	Consumption of compressed air:	12.5 l/min	3.2 gallon/min
	Hose connection:	ø1/4"	
	Vacuum (at compressed air 6 bar):	860 mBar	645 mm Hg
Vacuum CitoVac for External Pump	Recommended Vacuum	min. 900 mBar	675 mm Hg
	Recommended Output:	~30 l/min	~8 gallon/min
	Hose connection:	5/16"	
Operating Environment	Surrounding temperature	5-40°C	41-104°F
	Humidity	< 95% RH non-condensing	
Storage / transport Conditions	Surrounding temperature	0 – 60°C	32 – 140°F
	Humidity	< 90% RH non-condensing	
Subject			
EU Directives		Please refer to the Declaration of Conformity	
Noise level	A-weighted sound emission pressure level at workstations	LpA = 67 dB(A) (measured value), Uncertainty K = 4 dB(A) Measurements made in accordance with EN ISO 11202.	

CitoVac, Pre-Installation Checklist

Read the Installation instructions in the Instruction Manual *before* installing the machine.

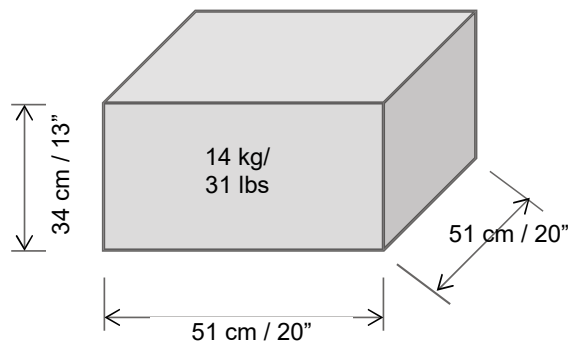
Installation Requirements

- Table: - able to carry at least 20 kg/45 lbs

Required Accessories and Consumables (ordered separately)
(Please refer to the [Struers Cold Mounting Accessories brochure](#) and the [CitoVac brochure](#) for details of the range available.).

CitoVac for external pump – an external vacuum pump is required (See Accessories on page 5 for details).

Crating Specifications



Location

The machine must be placed close to the power supply.
The machine should be placed on a safe and stable support table with an adequate working height.
The table must be able to carry at least 20 kg/45 lbs.
Struers recommends the machine to be installed in a well-ventilated and well-lit (300 lux) fume hood.
Ensure that the work station has adequate lighting. Avoid direct glare (dazzling light sources within the operator's line of vision) and reflected glare (reflections of light sources).

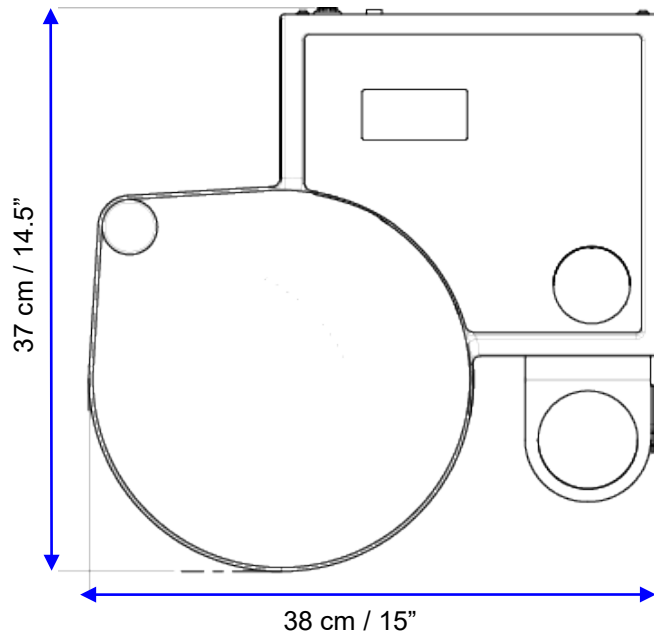
Dimensions



Vacuum Chamber

Inner diameter: $\varnothing 200$ mm / 7,9"
Inner height: 100 mm / 4"

Footprint



Recommended Space

- Front:** Recommended space at the front: 100 cm / 40".
- Rear:** The machine may be placed against a wall.
■ Check there is approx. 10 cm / 4" behind the machine for the connections.
- Sides:** ■ Check there is approx. 8 cm / 3" on the left side of the machine to open the lid fully.

Unpacking

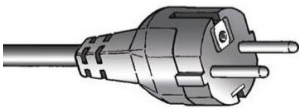
- Cut the packing tape on the top of the box.
- Remove the bag of loose parts.
- Carefully lift CitoVac from the box, supporting from underneath the machine.

Lifting

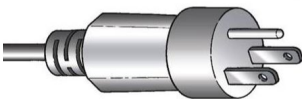
Weight: 9.5 Kg/ 21 lbs.

Power Supply

The machine shipped with 2 types of Mains cables (length 2.5 m/ 8.2').



The 2-pin (European Schuko) plug is for use on single-phase connections. If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug.



The 3-pin (North American NEMA 5-15P) plug is for use on single-phase connections. If the plug supplied on this cable is not approved in your country, then the plug must be replaced with an approved plug.

Electrical Data

Voltage/frequency	Max. Load
1 x 220-240V / 50-60 Hz	20 A

Water Supply

Required

Option

Not required.

Water outlet – Drain

Required

Option

Not required.

Compressed air

Required

Option

Required (*CitoVac with built-in vacuum ejector*)

Pressure: 4.5 - 6 bar / 58 - 87 psi

Consumption: approx 12.5 l/min

Recommended quality: Class-3, as specified in ISO 8573-1.

Hose supplied: ¼" dia. pressure hose x 3 m, coupling and hose nipple. Hose connection: ¼"

Vacuum

Required

Option

Required (*CitoVac for External Pump*)

See Accessories on page 5 for details.

Hose supplied: ¼" dia. pressure hose x 3m, coupling and hose nipple. Hose connection: 5/16".

Exhaust

Required

Option

Not required.



NOTE

Impregnation materials such as epoxy may produce fumes.

CitoVac should only be operated where ample ventilation is possible, e.g. in a fume cupboard.

Ambient Conditions



5 – 40 °C / 41 – 104 °F (operation)
0 – 60 °C / 32 – 140 °F (storage)



< 95% RH non-condensing (operation)
< 90% RH non-condensing (storage)

Accessories & Consumables

Please refer to the [Struers Cold Mounting Accessories brochure](#) and the [CitoVac brochure](#) for details of the range available.

CitoVac for External Pump

External vacuum is Required

Recommended

Vacuum Pump 115 V / 60 Hz - Cat. no: 06196121

With vacuum: ~907 mbar and output: ~34 l/min.

Dimensions L x W x H, cm (in): 37.5 x 21 x 25.5 (14.8 x 8.3 x 10.0)

Vacuum Pump 230 V / 50 Hz - Cat. no: 06196133

With vacuum: ~907 mbar and output: ~28 l/min.

Dimensions L x W x H, cm (in): 37.5 x 21 x 25.5 (14.8 x 8.3 x 10.0)

Struers Cooli-1 Control Unit (Cat. No: 05761116) and four pole plug Cat. No: 2XM10221) to control the external vacuum pump.

The use of Struers consumables is recommended.

Other products (e.g. coolants) may contain aggressive solvents, which dissolve e.g. rubber seals. The warranty may not cover damaged machine parts (e.g. seals and tubes), where the damage can be directly related to the use of non-Struers consumables.

Declaration of Conformity

Manufacturer	Struers ApS • Pederstrupvej 84 • DK-2750 Ballerup • Denmark
Name	CitoVac
Model	N/A
Function	Vacuum impregnation unit
Type	592
Cat. no.	05926119, 05926219
Serial no.	



Module H, according to global approach



We declare that the product mentioned is in conformity with the following legislation, directives and standards:

2006/42/EC	EN ISO 12100:2010, EN 60204-1:2018, EN 60204-1-2018/Corr.:2020,
2011/65/EU	EN 63000:2018
2014/30/EU	EN 61000-3-2:2014, EN 61000-3-3:2013, EN 61000-6-2:2005, EN 61000-6-2:2005/Corr.:2005, EN 61000-6-3:2007, EN 61000-6-3:2007/A1:2011, EN 61000-6-3-A1-AC:2012
Additional standards	NFPA 79, FCC 47 CFR Part 15 Subpart B

Authorized to compile technical file/
Authorized signatory

Date: [Release date]



Pederstrupvej 84
DK-2750 Ballerup
Denmark