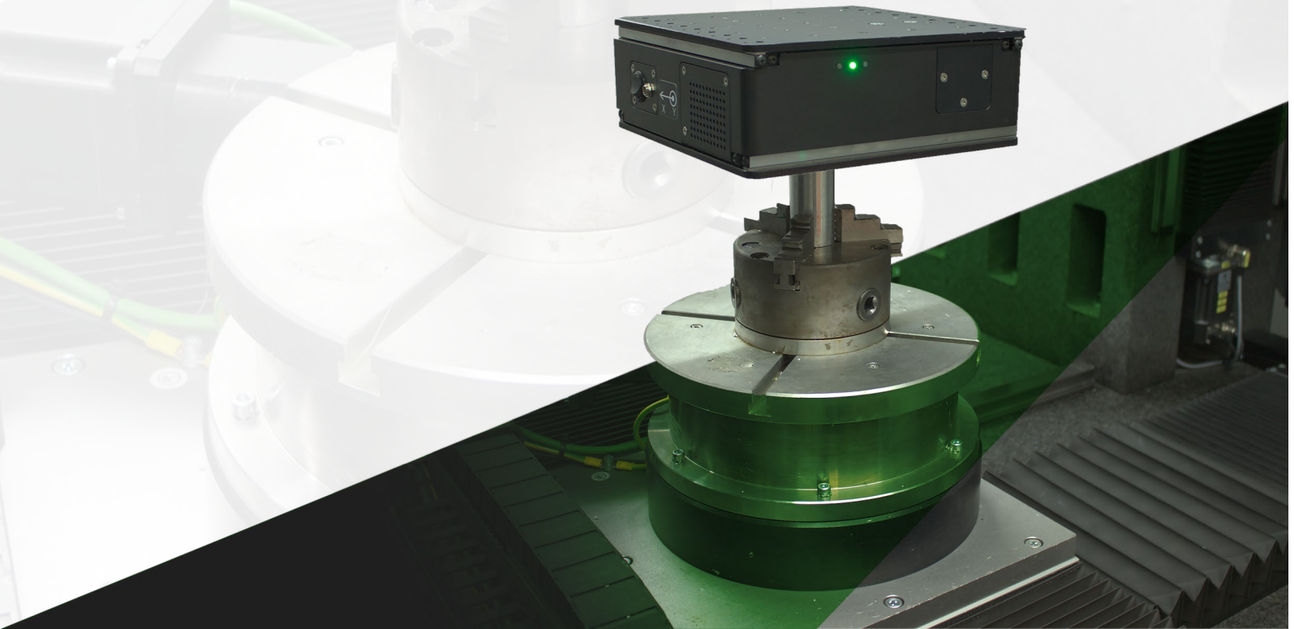
SaguaroX

INSTRUCTION HANDBOOK

SaguaroX M | SaguaroX S | SaguaroX M Heavy



CACTUX

Instruction handbook for SaguaroX | Version 3.0.e | Issue date 2022

Contents

IMPORTANT
READ BEFORE USE
SAVE FOR FUTURE REFERENCE

1. Introduction to this Instruction Handbook

The purpose of the instruction handbook is to provide the user with information that is necessary to use effectively and safely the product during its life cycle.

The instruction handbook consists of the technical data, data and instructions for the product's installation and transport. It also contains information concerning the operation and commissioning of the product.

The user of the product should read the entire instruction handbook. It contains important information on work safety, especially during the operation of this product, which largely depends on its proper use.

- If you do not understand some of the information in the instruction handbook, contact the product manufacturer.
- The instruction handbook can be found at www.cactux.cz/instruction-handbooks.

1.1. How to read and apply the Instruction Handbook

These instructions are marked in the operating instructions with the following safety alert symbols:

⚠WARNING CAUTION RISK OF HEALTH OR DAMAGE TO USER,
⚠CAUTION VERY IMPORTANT INFORMATION FOR THE USER,
NOTICE GENERAL IMPORTANT INFORMATION FOR THE USER.

Type of instruction handbook: user guide.

1.2. Safety Symbols

The main risks are addressed by the safety pictograms on the Device and the warnings in the operating instructions.

	Name: **Warning crushing of hands** (Ref. number: ISO 7010-W024) Description: There is a risk of deformation of the hands from mechanical parts of the Device.
	Name: **Not to be serviced by users** (Ref. number: ISO 7010-P069): Description: There is a risk of injury due to dangers that users do not recognize.
	Name: **Refer to instruction manual/booklet** (Ref. number: ISO 7010-M002) Description: The user is obliged to start work and / or operation of the Device only after reading the instructions for use.

Other important risks are addressed by the safety pictograms in this instructions handbook.

	Name: **Do not extinguish with water** (Ref. number: ISO 7010-P011) Description: To prohibit using water to extinguish a fire.
	Name: **No open flame; Fire, open ignition source and smoking prohibited**(Ref. number: ISO 7010-P003) Description: To prohibit smoking and all forms of open flame.
	Name: **Disconnect mains plug from electrical outlet** (Ref. number: ISO 7010-M006) Description: The mains plug must be disconnected from electrical outlet for the purposes of maintenance of el. equipment, in the case of malfunction or when left unattended.
	Name: **General warning sign** (Ref. number: ISO 7010-W001) Description: To signify a general warning

2. Declaration of Conformity SaguaroX

issued in accordance with the meaning of Article 5 (1) (a) (e) and Annex II, Part 1, Section A to Directive 2006/42/EC of the European Parliament and of the Council

Producer: CactuX s.r.o.
Address: Jundrovská 1230/19, Komín, 624 00 Brno
VAT ID (IČ): 09001468

hereby declares on his sole responsibility that the product:

Device identification: SaguaroX
Type/mark: M, S, M Heavy

is in conformity with the provisions of the following European Directives:

Directive 2015/863/EU	RoHS	ref. OJ L 137, 4.6.2015, p. 10-12
Directive 2014/30/EU	EMC	ref. OJ L 96, 29.3.2014, p. 79-106
Directive 2006/42/EU	MD	ref. OJ L 157, 9.6.2006, p. 24-86
Directive 2014/53/EU	RADIO	ref. OJ L 153, 22.5.2014, p. 62-106
Directive 2006/66/EC		ref. OJ L 266, 26.9.2006, p. 1 - 14

Harmonised standards and other technical specifications used in determining compliance:

- EN ISO 12100:2010 - Safety of machinery - General principles for design - Risk assessment and risk reduction
- IEC 62133-2:2017 - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems
- EN IEC 55014-1:2021 - Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
- EN IEC 55014-2:2021 - Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
- EN IEC 61000-3-2:2019 - Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)
- EN 61000-3-3:2013 - Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection
- EN IEC 61000-6-3:2021 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments
- EN 61010-1:2010/A1:2019 – Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
- EN IEC 61010-2-201:2018 – Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-201: Particular requirements for control equipment
- EN IEC 62368-1:2020 - Audio/video, information and communication technology equipment - Part 1: Safety requirements
- EN 62479:2010 - Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
- ETSI EN 301 489-17 V3.2.4 (2020-09) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagentic compatibility
- ETSI EN 301 489-1 V2.2.3 (2019-11) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic compatibility
- ETSI EN 300 328 V2.2.2 (2019-07) - Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band; Harmonised Standard for access to radio spectrum
- ETSI EN 300 220-2 V3.2.1 (2018-06) – Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment

The product meets basic safety requirements for electrical equipment according to the above documents.

The manufacturer has taken measures to ensure continued compliance with the technical documentation and the essential requirements to the safety of the above documents.

Under normal conditions and conditions specified by the manufacturer, the product is safe.

In Brno
Date 31. 8. 2022

Ing. Tomáš Zikmund, PhD.
Executive manager

The product also complies with China ROHS Limits - SJ/T 11364-2006 Standard.

3. UK Declaration of Conformity SaguaroX

issued in accordance with EN ISO 17050-1:2010

Producer:	CactuX s.r.o.
Address:	Jundrovská 1230/19, Komín, 624 00 Brno
VAT ID (IČ):	09001468

hereby declares on his sole responsibility that the product:

Device identification:	SaguaroX
Type/mark:	M, S, M Heavy

is in conformity with the following UK Statutory Instruments (and their amendments):

Safety	Supply of Machinery Regulations 2008
	The Batteries and Accumulators Regulations 2008
EMC	Electromagnetic Compatibility Regulations 2016
Radio	Radio Equipment Regulations 2017
RoHS	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
Waste	The Waste Batteries and Accumulators Regulations 2009

Harmonised standards and other technical specifications used in determining compliance:

- EN ISO 12100:2010 - Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN IEC 62368-1:2020 - Audio/video, information and communication technology equipment - Part 1: Safety requirements
- EN 62479:2010 - Assessment of the compliance of low-power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
- IEC 62133-2:201- Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems
- EN IEC 55014-1:2021- Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
- EN IEC 55014-2:2021- Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
- EN IEC 61000-3-2:2019 - Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)
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- EN 61010-1:2010/A1:2019 - Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
- EN IEC 61010-2-201:2018 - Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-201: Particular requirements for control equipment
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- ETSI EN 301 489-1 V2.2.3 (2019-11) - ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic compatibility
- ETSI EN 300 328 V2.2.2 (2019-07) - Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band; Harmonised Standard for access to radio spectrum
- ETSI EN 300 220-2 V3.2.1 (2018-06) - Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz; Part 2: Harmonised Standard for access to radio spectrum for non specific radio equipment

The product meets basic safety requirements for electrical equipment according to the above documents.

The manufacturer has taken measures to ensure continued compliance with the technical documentation and the essential requirements to the safety of the above documents.

The technical documentation for the machinery is available from the manufacturer at the address above.

Under normal conditions and conditions specified by the manufacturer, the product is safe.

In Brno
Date 31. 8. 2022

Ing. Tomáš Zikmund, PhD.
Executive manager

4. Declaration of Conformity

According to 47 CFR, Part 15 of the FCC Rules

Producer:	CactuX s.r.o.
Address:	Jundrovská 1230/19, Komín, 624 00 Brno
VAT ID (IČ):	09001468

hereby declares on his sole responsibility that the product:

Device identification:	SaguaroX
Type/mark:	M, S, M Heavy

complies with part 15 of the FCC Rules.

It´s confirmed and found to comply with the requirements setup by ANSI C63.4 & FCC part 15 regulation for the evaluation of electromagnetic compatibility.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

In Brno
Date 31. 8. 2022

Ing. Tomáš Zikmund, PhD.
Executive manager

6. Device Overview SaguaroX M

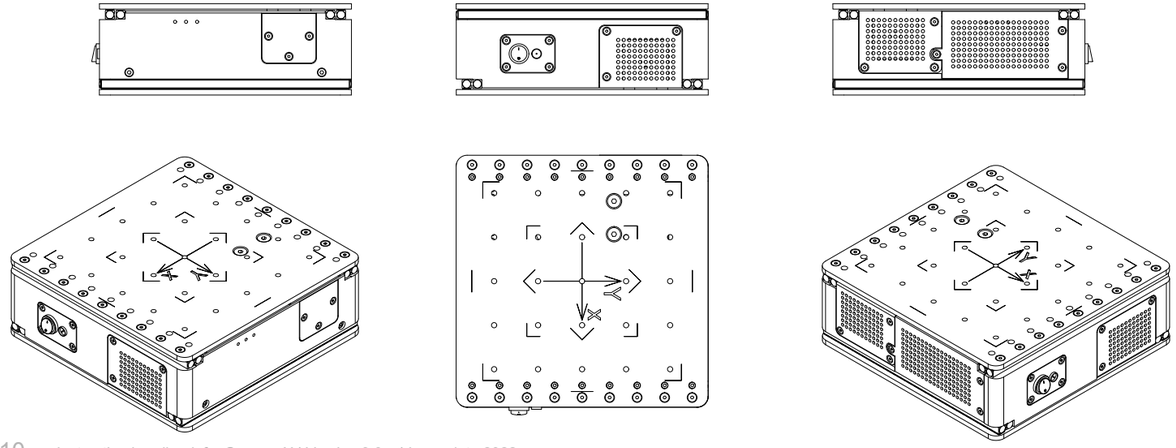
6.1. Intended Use

The Device is designed for sample mounting and sample centering in respect to the X-ray tube primarily in industrial and laboratory X-ray Computer Tomography (CT) systems.

6.2. Device Specification

x,y axes travel	100 mm × 100 mm
Sample area	220 mm × 220 mm
Maximum load	15 kg
Weight	9 kg
Dimensions	229 mm × 229 mm × 82 mm (w/o adapters)
Device battery	Li-ion (14.6 V/5.54 Ah)
Runtime	Ca. 16 h continuous run (depends on the condition of Device battery)
Input power	50 W
IP Code	IP20
Operation speed	10 mm per second (fast movement)
Characteristics of the power supply	24V/2.5 A with barrel connector (DC Jack) 5.5 x 2.1 mm
RF Power	< 4 mW

6.3. Graphical Descriptions



7. Device Overview SaguaroX S

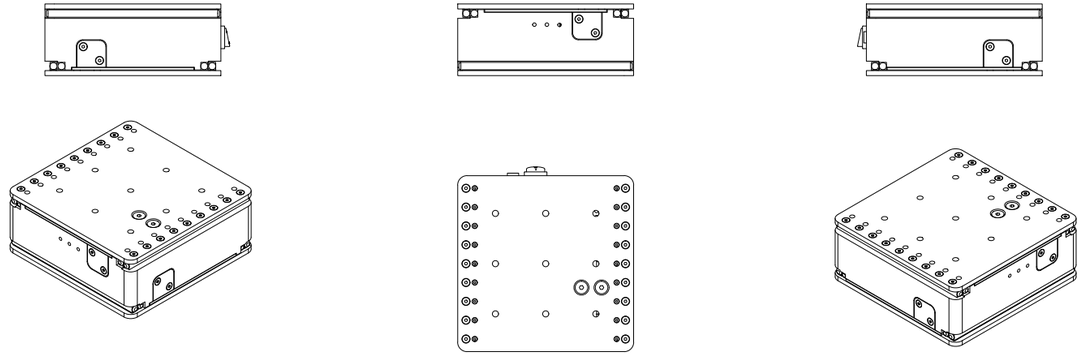
7.1. Intended Use

The Device is designed for sample mounting and sample centering in respect to the X-ray tube primarily in industrial and laboratory X-ray Computer Tomography (CT) systems.

7.2. Device Specification

x,y axes travel	50 mm × 50 mm
Sample area	135 mm × 135 mm
Maximum load	7 kg
Weight	2.6 kg
Dimensions	140 mm × 140 mm × 58 mm (w/o adapters)
Device battery	Li-ion (14.4 V/3.4 Ah)
Runtime	Ca. 8 h continuous run (depends on the condition of Device battery)
Input power	50 W
IP Code	IP20
Operation speed	9 mm per second (fast movement)
Characteristics of the power supply	24V/2.5 A with barrel connector (DC Jack) 5.5 x 2.1 mm
RF Power	< 4 mW

7.3. Graphical Descriptions



8. Device Overview SaguaroX M Heavy

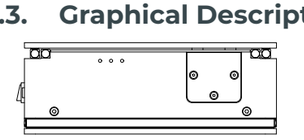
8.1. Intended Use

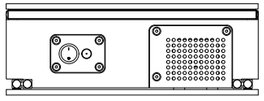
The Device is designed for sample mounting and sample centering in respect to the X-ray tube primarily in industrial and laboratory X-ray Computer Tomography (CT) systems.

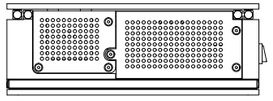
8.2. Device Specification

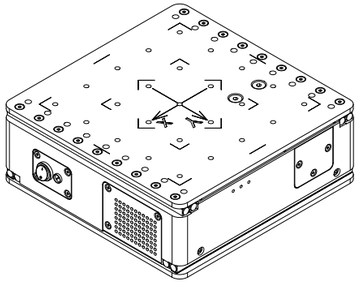
x,y axes travel	100 mm × 100 mm
Sample area	220 mm × 220 mm
Maximum load	30 kg
Weight	13.5 kg
Dimensions	229 mm × 229 mm × 82 mm (w/o adapters)
Device battery	Li-ion (14.6 V/5.54 Ah)
Runtime	Ca. 16 h continuous run (depends on the condition of Device battery)
Input power	50 W
IP Code	IP20
Operation speed	10 mm per second (fast movement)
Characteristics of the power supply	24V/2.5 A with barrel connector (DC Jack) 5.5 x 2.1 mm
RF Power	< 4 mW

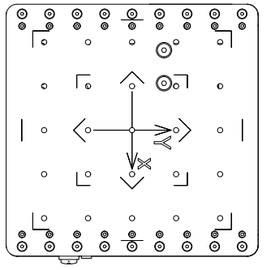
8.3. Graphical Descriptions

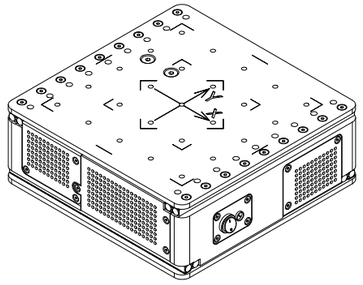












9. Package Content SaguaroX M

The Device and its equipment is delivered in packaging designed for a safe transport. Optional accessories are delivered in a separate package.

9.1. Contents of the Standard Package

Art. no.	Component	Pieces
A0012	SaguaroX M	1 pc.
A0006	Desktop Stand	1 pc.
A0008	Adapter D20	1 pc.
A0009	Adapter D50	1 pc.
A0010	Adapter D150	1 pc.
A0005	Mandrel	1 pc.
S0046	Adapter D20 (Top)	1 pc.
S0064	Transmitter USB Dongle	1 pc.
B0010	Wafer D330	1 pc.
B0049	USB Extension Cable	1 pc.
B0022	Flash Drive	1 pc.
B0023	Power Adapter	1 pc.
B0034	Imbus Key (90 mm)	1 pc.
B0033	Bolt M6×8 ISO 10642	4 pcs.
B0019	Bolt M6×14 AN 9084	4 pcs.
B0019-A	Bolt M6×14 ISO 10642	4 pcs.
B0047	Instruction Handbook	1 pc.
Z0001	Arizona Software	1 pc.
B0050	Plastic Case	1 pc.

9.2. Contents of the Economy Package

Art. no.	Component	Pieces
A0012	SaguaroX M	1 pc.
A0006	Desktop Stand	1 pc.
A0005	Mandrel	1 pc.
S0064	Transmitter USB Dongle	1 pc.
B0049	USB Extension Cable	1 pc.
B0022	Flash Drive	1 pc.
B0023	Power Adapter	1 pc.
B0034	Imbus Key (90 mm)	1 pc.
B0019-A	Bolt M6×14 ISO 10642	4 pcs.
B0047	Instruction Handbook	1 pc.
Z0001	Arizona Software	1 pc.

9.3. Optional Accessories

Art. no.	Component	Pieces
A0011	Joystick	1 pc.
S0080	Folding Aluminum Hand Truck	1 pc.
-	Magnetic Adapters	-
XS0034	Rod Holder (1 - 10 mm)	1 pc.
-	CT-Igel Hedgehogs	-

10. Package Content SaguaroX S

The Device and its equipment is delivered in packaging designed for a safe transport. Optional accessories are delivered in a separate package.

10.1. Contents of the Standard Package

Art. no.	Component	Pieces
XS0047	SaguaroX S	1 pc.
A0006	Desktop Stand	1 pc.
A0008	Adapter D20	1 pc.
A0009	Adapter D50	1 pc.
XS0034	Rod Holder (1 - 10 mm)	1 pc
A0005	Mandrel	1 pc.
S0046	Adapter D20 (Top)	1 pc.
S0064	Transmitter USB Dongle	1 pc.
B0049	USB Extension Cable	1 pc.
B0022	Flash Drive	1 pc.
B0023	Power Adapter	1 pc.
B0034	Imbus Key (90 mm)	1 pc.
B0019	Bolt M6×14 AN 9084	4 pcs.
XS0048	Bolt M6×12 ISO 10642	4 pcs.
B0047	Instruction Handbook	1 pc.
Z0001	Arizona Software	1 pc.
B0050	Plastic Case	1 pc.

10.2. Optional Accessories

Art. no.	Component	Pieces
A0011	Joystick	1 pc.
-	Magnetic Adapters	-
XS0034	Rod Holder (1 - 10 mm)	1 pc.
-	CT-Igel Hedgehogs	-

11. Package Content SaguaroX M Heavy

The Device and its equipment is delivered in packaging designed for a safe transport. Optional accessories are delivered in a separate package.

11.1. Contents of the Standard Package

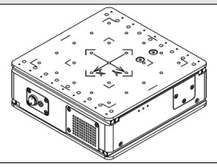
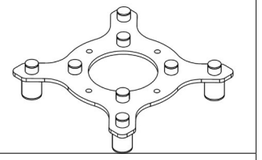
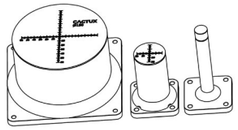
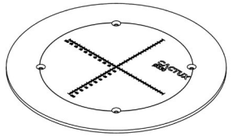
Art. no.	Component	Pieces
XH0001	SaguaroX M Heavy	1 pc.
A0006	Desktop Stand	1 pc.
A0008	Adapter D20	1 pc.
A0009	Adapter D50	1 pc.
A0010	Adapter D150	1 pc.
A0005	Mandrel	1 pc.
S0046	Adapter D20 (Top)	1 pc.
S0064	Transmitter USB Dongle	1 pc.
B0010	Wafer D330	1 pc.
B0049	USB Extension Cable	1 pc.
B0022	Flash Drive	1 pc.
B0023	Power Adapter	1 pc.
B0034	Imbus Key (90 mm)	1 pc.
B0033	Bolt M6×8 ISO 10642	4 pcs.
B0019	Bolt M6×14 AN 9084	4 pcs.
B0019-A	Bolt M6×14 ISO 10642	4 pcs.
B0047	Instruction Handbook	1 pc.
Z0001	Arizona Software	1 pc.
B0050	Plastic Case	1 pc.

11.2. Optional Accessories

Art. no.	Component	Pieces
A0011	Joystick	1 pc.
S0080	Folding Aluminum Hand Truck	1 pc.
-	Magnetic Adapters	-
XS0034	Rod Holder (1 - 10 mm)	1 pc.
-	CT-Igel Hedgehogs	-

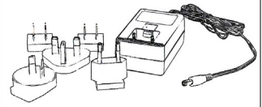
11.3. Device, its equipment, and Optional Accessories Description

Note: The figures in this chapter are not in scale and are placed here for demonstration purposes only.

Component	Description	Picture
SaguaroX	- is used for centering the sample in respect to the X-ray tube. - Variants are SaguaroX M, SaguaroX S, SaguaroX M Heavy.	
Desktop Stand	- is used to hold the Device, for example during charging of batteries.	
Adapters	- are used for placement of the sample closer to X-ray tube, - three steel-plate equipped Adapters are delivered with different upper diameters (D 150 mm, D 50 mm and D 20 mm). - Adapter D20 is delivered with 1 additional plastic top.	
Mandrel	- is mounted to the Device with Bolt M6x14 ISO 10642, - is used to attach the Device to the chuck inside of the CT shielding cabinet of a CT Device.	
Transmitter USB Dongle	- is connected to the acquisition computer via the appropriate USB port available inside the shielding cabinet of the CT Device or via the provided USB Extension Cable, - provides the communication between Arizona Software and the Device.	
Wafer D330	- is used for the placement of samples that need it according their proportions, - it is used for samples with a weight between 10-15 kg, samples are placed on a marked circle, - should be attached to the Device with Bolt M6×8 ISO 10642.	

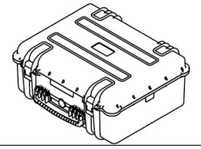
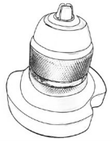
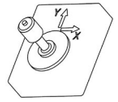
Component	Description	Picture
USB Extension Cable	- is used to connect the acquisition computer and Transmitter USB Dongle.	

Flash Drive	- consists of:
	  - Instruction Handbook for SaguaroX (this Instruction Handbook),
	  - Driver folder,
	  - Arizona folder.
		

Power Adapter	- is used for charging the Device.	
Imbus Key (90 mm)	- is used to install the Bolts.	

Bolts	- are used to attach:
	  - Mandrel to the Device with Bolt M6×14 ISO 10642 (SaguaroX M, SaguaroX M Heavy or Bolt M6×12 ISO 10642 (SaguaroX S)
	  - Wafer D330 to the Device when are used for placement of samples that need it according to their proportions with Bolt M6×8 ISO 10642,
	  - Adapter when a firm connection with the Device with Bolt M6×14 AN 9084 is required.
		 Bolt M6×8 ISO 10642
		  Bolt M6×14 AN 9084
		  Bolt M6×14 ISO 10642
		Bolt M6×12 ISO 10642

Arizona Software	- is used to control the Device.	

Component	Description	Picture
Plastic Case	- is used for transportation and storage of the Device and other content of the package.	
Rod Holder (1 - 10 mm)	- is used to hold cylindrical samples. - It is compatible for cylindrical samples with diameters from 1 to 10 mm.	
Joystick (optional accessory)	- is used for control of the Device, - does not need to be powered by an extra power cable, - is powered via a USB cable connected to the computer.	
CT-Igel Hedgehogs (optional accessory)	- It allows positioning of components in a simple, flexible, fast way, without adhesive materials. - The underside equipped with magnets allows easy positioning on magnetic disks. - Suitable for most foamed materials, such as B. Styrofoam, Styrodur.	
Folding Aluminum Hand Truck (optional accessory)	- Is used for transporting the Device, its equipment and optional accessories in the original packaging.	

12. Safety

12.1. General Warning

⚠WARNING Follow safety instruction to avoid risk of injury to yourself or others!
⚠CAUTION Do not modify product. Any consequences will not be covered by support service or product warranties!
⚠CAUTION Arbitrary changes to product without manufacturer's permission release manufacturer from liability from consequential damage or injury!
NOTICE Product might not conform to European Directives if any part of product is replaced with part not supplied by manufacturer.

12.2. Requirements for Operator

⚠WARNING Do not work on Device under influence of alcohol, drugs or medication.
⚠CAUTION Do not operate Device unless you have read all instructions supplied by manufacturer and understand procedure.
⚠CAUTION Do not exceed limitations specified in instruction handbook.
NOTICE The Device may only be operated by a person:
- who is professionally qualified to work with the CT Device in which the Device is installed,
- who is well acquainted with the Device's characteristics and is familiar with the relevant regulations for its operation,
- who follows currently valid regulations concerning occupational safety and accident prevention.

12.3. Safety Instructions

Environmental Conditions

Limits for intended operating environmental conditions	
Location	Indoor use only
Maximum altitude	2,000 m
Temperature range	5 °C to 40 °C
Maximum humidity	80% RH at 31°C

⚠WARNING Do not exceed any limitation of environmental conditions.
⚠WARNING Operations outside environmental limits may adversely affect operator safety. For example, if Device is exposed to extreme temperatures, battery fire or explosion may result.
⚠WARNING Use of Device outside above conditions releases manufacturer from liability for consequential damage or injury!
⚠CAUTION Device must not be rinsed with water.
⚠CAUTION Protect Device from moisture, direct sunlight and dusty environment.

12.4. Hazards

Mechanical Hazards

WARNING Risk of injury and deformation of hand or other part of body due to movement of Device. Take extra care when handling to avoid injuring yourself or others.
WARNING Improper positioning of Device may damage Device due to fall.
WARNING Improper handling of Device can result in injury of person or damage to Device.
WARNING Do not expose the Device to mechanical shocks.

Electromagnetic Hazards

WARNING Use of Device can negatively influence electrical controlled medical Devices, such as ICDs and Pacemakers.
NOTICE All equipment must be checked within the signal area of Transmitter USB Dongle before first switching on Device. All equipment which could possibly use same range of frequency must be switched off.

Thermal Hazards

In connection with the above-mentioned warning and in accordance with the provisions of the relevant law, the user is obliged to prevent fire.

WARNING Do not store flammable liquids or other hazardous substances and gases near Device.
WARNING No open fire should be used near Device, do not smoke when operating Device.
CAUTION In case of fire, follow fire instructions according to the workplace.
NOTICE Manufacturer does not equip Device with fire-fighting equipment. User is obliged to secure building where Device is installed:
- Suitable extinguishing media of approved type, in appropriate quantities, place dat visible place and protected against damage and misuse.
- Fire extinguishers are subject to regular inspections and operator must be demonstrably acquainted with their use, as required by applicable law and decree.

Electrical Hazards and Battery Hazards

WARNING Electrical equipment must not be extinguished with water!
CAUTION Risk of overheating, damage, or explosion of a damaged battery when using Device improperly. Reduce risk of unauthorized manipulation of Device by user.
WARNING Damage of battery may cause fire, which may cause injury.
NOTICE Recommended: powder, snow or halonous fire extinguisher Devices. Operator must be introduced to use them.

13. Disposal

Expected lifetime of the Device is at least 3 years.
Note: Expected lifetime does not apply to the Lion batteries and the provided equipment and optional accessories.
All equipment and optional accessories have a lifespan of at least 1 year, then it is possible to purchase them. For more information, visit our website or contact us at support@cactux.cz.

CAUTION Device is no longer viable if it does not move and / or cannot be charged or / and if operating time is disproportionately shortened.
CAUTION Do not dispose any equipment included in package with general household waste. Observe and comply with national and federal laws and regulations that are equivalent to EC directives. Contact support@cactux.cz about disposal, once Device reaches end of its lifetime. disposal.

14. Transportation, Handling and Storage

14.1. Transportation and Storage

NOTICE Use original packaging for transorting Device, its equipment and accessories.
NOTICE Store product in original package provided.
NOTICE Store package in horizontal position.
NOTICE If Device is to be shut down for more than two months, it must be:
- stored in place corresponding to limits for intended operating environmental conditions,
- disconnected form elektricity,
- stored in original packaging,
- we recommend to fully chargé Device before its storage.

NOTICE Shutting down Device for more than 6 months must be consulted with manufacturer.
NOTICE If cell is kept for a long time (3 months or more), i tis strongly recommended that cell is preserved at dry and low-temperature.

14.2. Handling

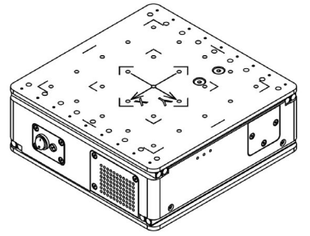
CAUTION Avoid damaging CT Device during handling of Device.
NOTICE During handling of Device inside of CT cabinet, it must be placed at least 15 cm away from the wall of the cabinet and from tube and detector of CT Device.

The Device must be handled safely to prevent harmful impacts.

During handling, the Device:
- must be unplugged from the power source,
- must be turned off.

Device must be handled:
- according to its weight,
- by a physically fit person who can carry at least 15 kg in both hands for at least 1 minute.

Placing of the Device:
- only with the stainless steel plate with engraved *x,y* coordinate system up.



15. Installation and Commissioning

NOTICE After unpacking product, keep original packaging for later storage or transport.

After unpacking from the protective packaging the Device is ready to be used.

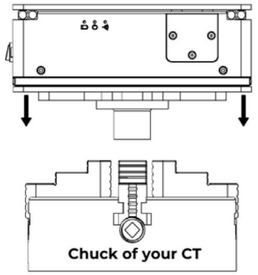
For installation of the Joystick please consult the installation manual attached to this optional accessory.

15.1. Installation of the Device to the CT Machine

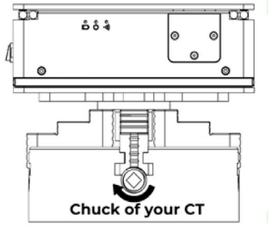
If the rotation stage of your CT system is equipped with a chuck, then follow steps 1 and 2. In other cases please contact support@cactux.cz for further instructions if needed.

1. Insert the Device with the attached Mandrel into the CT machine chuck (Mandrel should face down, in the direction of the CT's chuck).
2. Fasten the chuck of your CT.
3. For the installation of the Device, a free USB port inside the shielding cabinet and within the range of the Device is needed.
4. This port is connected to the computer where the Device control software (Arizona) will be installed. Preferably, this computer should be the acquisition computer of the CT Device.
5. If no USB port inside the shielding cabinet is available, or the available USB ports are not in the sight of the Device, the attached USB extension cable should be used.
6. Place the Transmitter USB Dongle inside the shielding cabinet of the CT machine inside the USB port within the range of the Device.

NOTICE Orient the Transmitter USB Dongle in such a way, that the CactuX sticker is facing towards the Device.



Step 1.



Step 2.

15.2. Software Installation

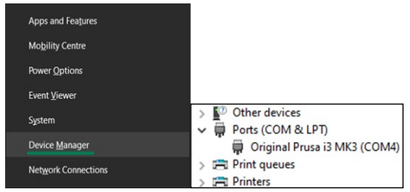
- Arizona software can only be installed on OS Win 10 and higher.
- The software and configuration file are located on a Flash Drive.
- The latest version of the software can also be found on the webpage www.cactux.cz/arizona-software, whereas the configuration file is only on the Flash Drive since it is unique for each Device.

1. Step

a. Plug in the Flash Drive to your computer.
b. Copy folder Arizona to the local folder which has a read/write access (usually Documents).
c. Disconnect the Flash Drive.

2. Step

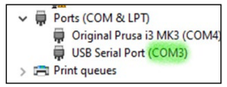
a. Open the Device Manager.
b. Open Ports (COM and LPT) tab and check which COM port is already being used. In the figure below, a Device is already using - COM4.
c. If you cannot see the Ports tab in the Device Manager, just continue with the 3rd step.



Step 2. b

3. Step

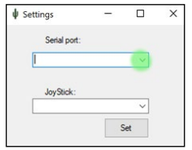
a. Plug the Transmitter USB Dongle into a free USB port inside of the CT system connected your computer.
b. Windows should recognize the Transmitter USB Dongle and assign a new COM port number which should appear in the tab. For example COM3 like in the picture 3b.
c. If you cannot see any new Devices in the Ports tab or you cannot see the Ports tab at all, please contact the CactuX support on support@cactux.cz.



Step 3. b

4. Step

a. Open Arizona.exe in folder Arizona on your computer.
b. Press keys Ctrl + S.
c. Choose the COM port number of your Transmitter USB Dongle into the Serial port box. Then click on Set.
d. JoyStick port can stay blank when it is not being used.
e. Close and open Arizona software again.



Step 4. d

15.3. Commissioning

Commissioning of the Device

1. After the Device has been installed inside the CT shielding cabinet it is ready to be used.
2. Switch the Device on.
3. In case the diode indicates a low battery, charge the Device (see charging of the Device).

⚠CAUTION Do not operate Device when charging. While charger is plugged in, movement of Device is disabled.

4. Open Arizona software on the acquisition computer.
5. The Device receives a signal when the blue diode starts to flash.
6. In case the battery is full and the blue diode does not flash, move the Transmitter USB Dongle closer to the the Device.
7. The Device is now ready to be used.

16. Operation

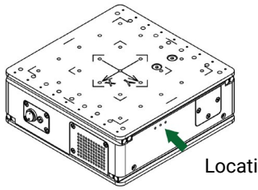
16.1. Operation Environment

In the shielding cabinet of the CT machine.

⚠WARNING Only operate Device when shielding cabinet door is closed in order to prevent injuries to yourself and others.

16.2. Operation Modes - Diodes

Three diodes (blue, green, red) are located on the side of Device.



Location of diodes

Blue Diode

Blue diode indicates the signal from the Transmitter USB Dongle.
Diode always flashes when the stage receives the Transmitter USB Dongle signal.

Green Diode

Green diode indicates Device is switched on.

Red Diode

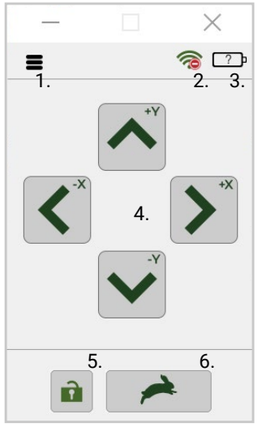
Red diode indicates the status of the battery. In case the charger is not connected and the red diode is flashing, the battery is low and the Device must be connected to the charger. In case the charger is connected, the red diode is on and indicates charging. Red diode turns off when the battery is fully charged.

16.3. Operation Instructions

The operator controls the Device from outside the shielding cabinet using either Arizona or a Joystick (optional accessory).

Instructions to Control Device via Software Arizona

The software displays the positive and negative directions of the axes, which correspond to the symbols on the Device.



Software environment

The Device can be moved:
- by clicking the screen buttons on Arizona software,
- with keyboard buttons.

Keyboard control:
- keyboard arrows can be used instead of screen buttons,
- control (Ctrl) works the same as the number 5 button,
- spacebar switches speed regimes,
- ctrl + S opens the settings window (where the port name can be set).

Arizona buttons description:
1. about window,
2. signal indicator - shows the strength of connection,
3. battery level indicator,
4. control arrows - move Device,
5. lock button - locks control buttons (arrows and keyboard control),
6. speed switcher - changes regimes between fast and slow.

The Device communicates when the signal icon is green, and the blue LED flashes.

⚠WARNING Do not use this Device or stop using Device immediately when:
- it is emitting smoke,
- it is unusually hot to touch,
- it is emitting unusual odor,
- it is emitting unusial noise,
- it is in any other abnormal state or wear or damage,
- it is no longer safe to use, for example due to aging.

If problem appears, switch off power and if connected, then disconnect electronics power supply.
Contact support@cactux.cz and request repairs.

16.4. Sample Placement

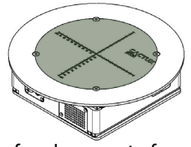
- The samples can be placed directly on the stainless steel plate (with the engraved *x,y* coordinate system).
- Adapters help to place the sample in a better position relative to the X-ray tube.
- Always pay attention to the weight of the sample and, if the sample is rather heavy, use the appropriate equipment.

⚠WARNING Please note that sample will rotate during CT analysis.
⚠WARNING Always place sample so that 36 degree rotation is enabled.
⚠CAUTION Manufacturer is not responsible for damage to Device or CT associated with improper sample handling.
NOTICE Please use appropriate Adapter for your sample. We recommend not to exceed upper part of Adapter by sample.

Specification for SaguaroX M

Sample with weight < 10 kg
- Samples lighter than 10 kg can be placed directly on the stainless steel plate (with the engraved *x,y* coordinate system).
- The samples can be placed onto the provided Adapters.

Sample with weight between 10 - 15 kg
- The maximum weight of the load on the Device is 15 kg.
- For a sample heavier than 10 kg, the circular steel plate (wafer D330) must be attached to the Device with four bolts (M6x8 ISO 10642).
- The sample must be placed within the marked circle on the wafer D330.



Area for placement of sample with weight between 10 - 15 kg

Sample with weight > 15 kg
⚠WARNING Do not measure samples heavier than 15 kg using SaguaroX M.

Specification for SaguaroX S

Sample with weight < 7 kg
- Samples lighter than 7 kg can be placed directly on the stainless steel plate (with the engraved *x,y* coordinate system).
- The samples can be placed onto the provided Adapters.

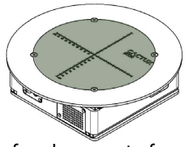
Sample with weight > 7 kg
⚠WARNING Do not measure samples heavier than 15 kg using SaguaroX M.

Specification for SaguaroX M Heavy

Sample with weight < 10 kg
- Samples lighter than 10 kg can be placed directly on the stainless steel plate (with the engraved *x,y* coordinate system).
- The samples can be placed onto the provided Adapters.

Sample with weight between 10 - 30 kg

- The maximum weight of the load on the Device is 30 kg.
- For a sample heavier than 10 kg, the circular steel plate (wafer D330) must be attached to the Device with four bolts (M6x8 ISO 10642).
- The sample must be placed within the marked circle on the wafer D330.



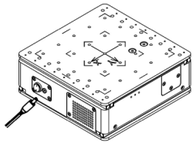
Area for placement of sample with weight between 15 - 30 kg

Sample with weight > 30 kg

⚠WARNING Do not measure samples heavier than 30 kg using SaguaroX M Heavy.

16.5. Charging of the Device

1. Switch on the Device before charging.
2. Plug the charging connector of the Power Adapter into the power supply connector of the Device.
3. Unplug the charging connector when the battery is fully charged.
4. Proceed to use the Device as specified in the instruction handbook.



Charging connector

⚠CAUTION Only use supplied Power Adapter for charging.
⚠CAUTION Do not operate Device when charging. While Power Adapter is plugged in, movement of Device is disabled.
⚠CAUTION Inverse charging should be strictly prohibited. If cell is connected improperly, it may be damaged.
NOTICE In case of daily use it is recommended to charge Device every night.
NOTICE Continuous charging under appropriate voltage does not cause any loss of characteristics. However, charge timer is recommended to be installed from safety consideration, which shuts off further charging at time specified in product specification.
NOTICE Over-discharging may occur by self-discharge if battery is left for a very long time without any use.
NOTICE Cell should be used within a short period after charging because long-term storage may cause loss of capacity by self-discharging.
NOTICE If long-term storage is necessary, cell should be stored at lower voltage within a range specified in product specification, because storage at higher voltage may cause loss of characteristics.

Charging Method	CC-CV (constant voltage with limited current)
Charging Current Standard charge	1,375 mA
Charging Time Standard charge	3 hours
Max. Charge Current	2,750 mA (not for cycle life)
Max. Discharge Current	5,500mAh (continuous discharge) 8,250mAh (not for continuous discharge)
Operating Temperature (Cell Surface Temperature)	Charge : 0 to 45°C, Discharge : -20 to 60°C

⚠WARNING Operator is obliged to check Device, Equipment and accessories before starting work for signs of damage or other properties that could lead to threat to health or property.
NOTICE Switch off Device and disconnect Power Adapter form Device before maintenance.

NOTICE Package includes Power Adapter with interchangeable adapters (USA, EU, UK and AUS).
NOTICE Power Adapter is CE/UL/CCC certified.

17. Inspection, Testing and Maintenance

17.1. Cleaning of the Device

Wipe off dirt with a dry, lint-free cloth only.
If the line has been cleaned with a more aggressive substance (eg IPA, ethanol, ..), it is necessary to restore the oil film on the linear line. Use ordinary oil for fine mechanics to restore the oil film on the linear guide.
Keep the Device clean and dry.

NOTICE Cleaning of Device is only performed when Power Adapter is disconnected from Device. Switch off Device during cleaning.
⚠CAUTION Do not use flammable liquids or abrasives to clean Device.
⚠CAUTION Do not clean with pressurized water.
NOTICE Labels with instructions for operation, maintenance and identification must be kept legible.

17.2. Troubleshooting and Repair

NOTICE Device stops moving when
- there is too much load on Device,
- obstacle prevents Device from moving,
- battery status is too low (indicator),
- movement is blocked by software (button in software),
- Device loses communication with Transmitter USB Dongle,
- Other reasons occur.

Solution: remove obstacles, charge battery, unlock Device, or proceed to next info.

NOTICE If Device does not move
- First check speed. In turtle mode, movement may not be noticeable. Switch to rabbit mode and check speed of movement. If it does not help and Device still does not move, move on to next step.
- Check battery status, if battery is low, charge Device. If it does not help and Device still does not move, move on to next step.
- Check communication status:
- if blue Led diode on Device is not flashing,
- and / or symbol in Arizona is stop sign of wifi symbol.

If one of situations occurs, move Transmitter USB Dongle to better position in range of Device.
- If LED flashes and at same time there is no stop sign on wifi symbol, but Device is still not moving, restart Device (switch off / on) and perform above steps again.
- If Device still does not move, contact support@cactux.cz.

NOTICE If liquid has entered Device then:
- switch off Device,
- disconnect power supply cable,
- contact support@cactux.cz and request repairs.

NOTICE If Device has been stored at low temperature or in environment of high humidity, it must be allowed to reach ambient conditions before being powered up.

18. List of used Abbreviations

CT	X-ray Computed Tomography
µCT	micro-CT
IP Code	Ingress Protection Code
RF	Radio Frequency

19. Glossary

Manufacturer	A company CactuX
Product	All contents of the package including optional accessories
Device	SaguaroX
Operator	An user qualified to operate the Device

20. About CactuX s.r.o.

CactuX s.r.o. is a start-up company developing and producing addons for microCT instruments. Our first product is the translation stage SaguaroX - a new unique motorized sample stage designed specifically for µCT stations. It provides quick and easy sample mounting and motorized movement. CactuX was founded in March 2020 by the researchers from Laboratory of X-ray micro and nano computed tomography at CEITEC Brno University of Technology who have long-term experience with R&D in the computed tomography field.

21. Contact

support@cactux.cz
www.cactux.cz

CactuX s.r.o.
Jundrovská 1230/19, Komín, 624 00 Brno
CRN (IČO): 09001468
VATIN (DIČ) CZ09001468
www.cactux.eu

CE Marking Compliance

EN IEC/IEEE 85079-1 Compliance

ISO 3864 and ANSI Z535.6 Compliance

Machinery Directive and EN ISO 20607 Compliance

Contact

support@cactux.cz
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