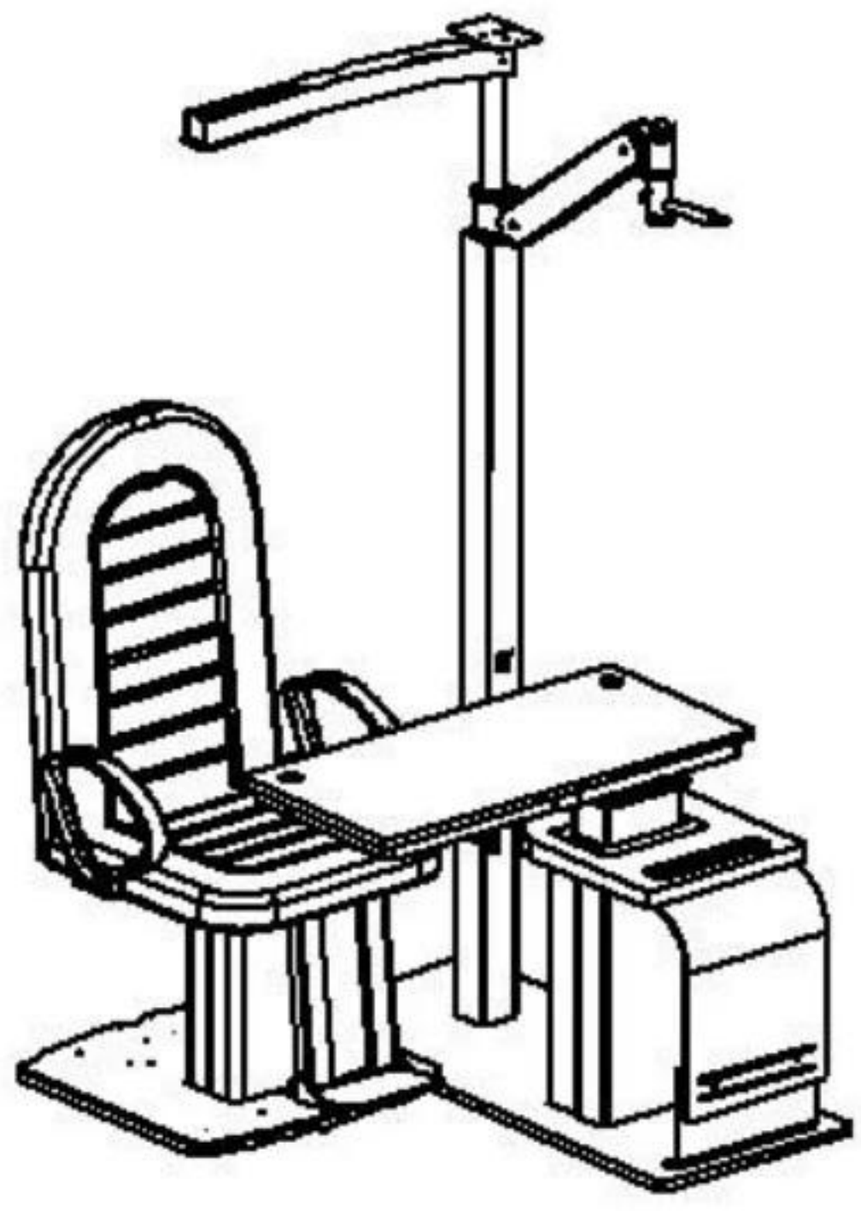
FIRENZE

Refraction Unit



User Manual

Version 2.1 issued 2019-01-14

US OPHTHALMIC LLC
NW 14 ST STE 105 Doral FL 33172

CE

Safety precaution

1. This equipment must not be used in an area that is in danger of explosions and in the presence of flammable, explosive, or volatile solvent such as alcohol, benzene or similar chemicals.

2. Do not put or use this device in humid rooms. Humidity should be maintained between 50% and 80% for normal operation. Do not expose the device to water splashes, dripping water, or sprayed water.

3. Only person who has undergone proper training and instructions are authorized to install and maintain this equipment.

4. Do not force cable connections. If a cable does not connect easily, be sure that the connector (plug) is appropriate for the receptacle (socket). If you cause any damage to a cable connector(s) or receptacle(s), let the damage(s) be repaired by an authorized service technician.

5. Please do not pull on any cable. Always hold on to the plug when disconnecting cables.

6. Before every operation, visually check the equipment for exterior mechanical damage(s) and for proper function.

7. Do not cover any ventilation grids or slits. Immediately turn off and unplug any equipment that gives off smoke, sparks, strange noises, or odors.



"Warning" indicates the presence of a hazard that could result in severe personal
injury, death or substantial property damage if ignored.



WARNING: TO PREVENT
ELECTRICAL CHOCK, DO NOT
REMOVE COVER

Disposal



1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, wastel governing ordinances and recycling plans regarding disposal or recycling of instrument or device components.

When disposing packing materials, sort them by the materials and follow local
governing ordinances and recycling plans.

WARNING!
Any replacements made without coordination with manufacturer are strictly prohibited.
If replacements are made, the unit must be tested to ensure the continued safe operation.

WARNING!
Connecting electrical equipment to the multiple socket-outlet effectively leads to creating a medical equipment SYSTEM and result can be reduced level of safety. Requirements for medical equipment system follow IEC 60601-1.

WARNING!
To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

1. Technical specification

Dimensions	Width 134cm / 53” Depth 152 cm / 60”
Power supply voltage/frequency	220-240 V/110-120V ~ 50/60 Hz
Current absorbed	220-240 V~ max 1.4 A 110-120V~ max 3A
2 main fuses located in the fuse-holder on the back side of the column base	T6.3A250V
Table lifting range	70-95 cm / 27”-37”
Table lifting power	Max 160 kg / 352 lbs
Chair lifting range (optional)	52-67 cm / 20”-26”
Chair lifting power	Max 160 kg / 352 lbs
Overhead lams	4 x LED ~700mA 3 W
Power supply voltage of instrument outlets	From 5V to 20V AC From 7V to 23V DC
Maximum power supplied by instrument outlets	50 VA
Instruments light intensity controlled by means buttons on Operational Panel	
Chin-rest mounting support supplied	

Technical data may be subject to modification

Before assembling and using the instrument, you must read this manual carefully.

2. Installation

2.1. Assembling the column for chart projector and phoropter arm.

Insert the chart projector’s power cable into the hole located on the upper back side of the column (remove the plug from the cable, if present) and push it until it comes through the hole located on the right front bottom side of the column.

The cable of overhead lamp is already inserted into the column.

Insert decorative square ring on the column.

Place the column its seat. At the same time push the cables (lamp and projector) through the hole under the table top of console.



Fasten the column by means of supplied nut M12 and washer.

Fix the decorative square ring to the table top by means of double-faced adhesive tape.

Pull out the cables coming from the upper column through the hole in lower column. Connect the cable coming from the Lamp with the corresponding cable marked “LAMP”. Connect the cable coming from the Projector with the corresponding cable marked “PROJECTOR” (pay attention to connect yellow/green cable with the yellow/green corresponding one. The other two couple of cables can be connected indifferently).

Push connected cables inside the lower column and close the lid by means of two M3 bolts.

2.2. **Assembling the chair**

Assemble the chair to the chair column by means of the 4 supplied screws and washers.

2.3. **Installation of the (optional) phoropter arm**

Remove the chart projector support plate located on top of the column of chart projector by loosing and removing the screw sited on top.

Insert the phoropter arm on the chart projector’s columns.

Reassemble the chart projector support plate.

2.4. Installation of a chart projector

The chart projector support plate is located on top of the chart projector’s column. It is provided with:

- 4 screw-holes at the border of each side (PI, P2, P3, P4) for mounting chart projector
- 2 screw-holes in the middle of the plate (TC and TD) for attaching the plate to the chart projector’s column.

Depending on the type of projector, use either TC or TD screw-hole to attach the plate (either rotated or not rotated of 90°) to the chart projector’s column and use either P1 and P2 or P3 and P4 to attach chart projector to the plate.

2.5. Installation of a chin rest



Note: The refraction unit is supplied with the sliding table top provided with a chin-rest support plate with two housings. This is suitable for mounting different types of chin-rests. To install some other types of chin-rests, it could be necessary to make some adaptations.

Attach chin-rest support plate in the desired place on the bottom side of sliding table top by supplied four screw nails.

Put the chin-rest in the support housings and fix it by screwing the two 6x8 dowels in the related housings

2.6. Installation of Instruments upon the table top

Install the instruments upon the table top according to the instruction manual of the instrument themselves.

Attention: be sure that the instruments are well stable even during the movement of the table top from one position to the other.

LOW VOLTAGE INSTRUMENTS

Mount the supplied connectors to the power supply cables of the instruments, connecting only the two diametrically opposite poles (central pole is not used). Insert the connectors into the instruments power supply outlets.

Attention: be sure that instruments to be supplied by the power supply outlets present on the table top have the same technical specifications as those indicated on the plate sited on the control box, i.e.: 50 VA maximum power, 6 or 12 V power supply voltage (as specified on the plate).

MAIN VOLTAGE INSTRUMENTS

Replace the plug of the instrument power cord with the supplied connector. Connect main phases to the two diametrically opposite poles (central pole could be used for ground cable). Insert the connector into the instrument power supply outlet on the sliding table top.

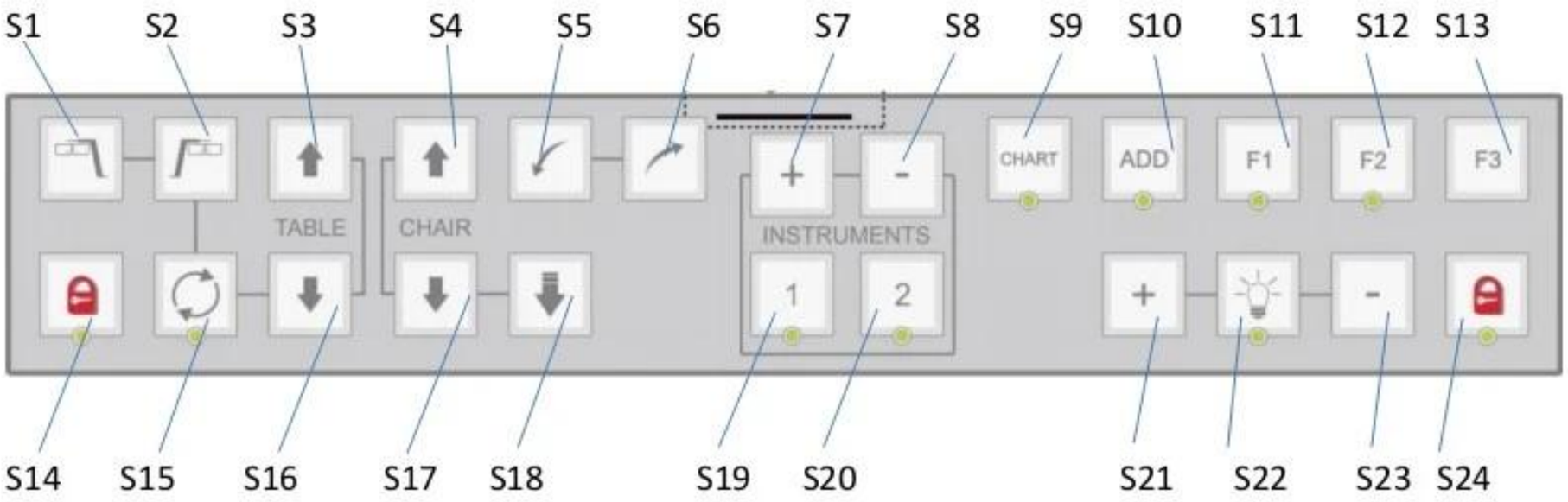
Main power supply connection

Insert the main power cable into the related socket located on the lower back column. Insert the plug into a main power outlet.

Attention: be sure that local main voltage corresponds to voltage indicated on the plate sited on the back panel of the column base

Use

Meaning of buttons on control panel



S1 – Phoropter to the left (not used)
S2 – Phoropter to the right (not used)
S3 – Table/Phoropter UP
S4 – Chair Up
S5 – Chair forward
S6 – Chair backwards
S7 – Instrument dim increase
S8 – Instrument dim decrease
S9 – Chart
S10 – ADD ON/OFF
S11 – F1
S12 – F2
S13 – F3

S14 – Lock
S15 – Auto adjustment (Liftboy)
S16 – Table/Phoropter Down
S17 – Chair Down
S18 – Chair to lowest position
S19 – Instrument 1
S20 – Instrument 2
S21 – Lamp dim increase
S22 – Lamp ON/OFF
S23 – Lamp dim decrease
S24 – Lock

Switching on the unit

Turn the main power switch sited on projector column to ON (1) position.

Moving up/down the table

In order to control height of the table, Phoropter must be in rest position.
Act on the "Table" UP/DOWN buttons on control panel.

Moving up/down the Phoropter

In order to control height of the Phoropter, Phoropter must be in work position.
Act on the "Table" UP/DOWN buttons on control panel.

Moving up/down the chair (optional)

Act on the "Chair" UP/DOWN buttons on control panel.

Press button S7 to move chair to lowest position.

Moving forward/backwards the chair (optional)

Act on the "Chair" Forward/Backwards buttons on control panel.

Short click (less than 0.2 sec) of buttons moves chair to the marginal position.

Rotating the chair

Loosen the chair rotation lock lever, sited on the external lateral side of the chair, to unlock rotation.

Rotate the chair in the desired position within the allowed rotation range.

Lock chair rotation by tightening the chair rotation lock lever.

Switching on/off overhead light

Press on "Lamp" button on control panel.

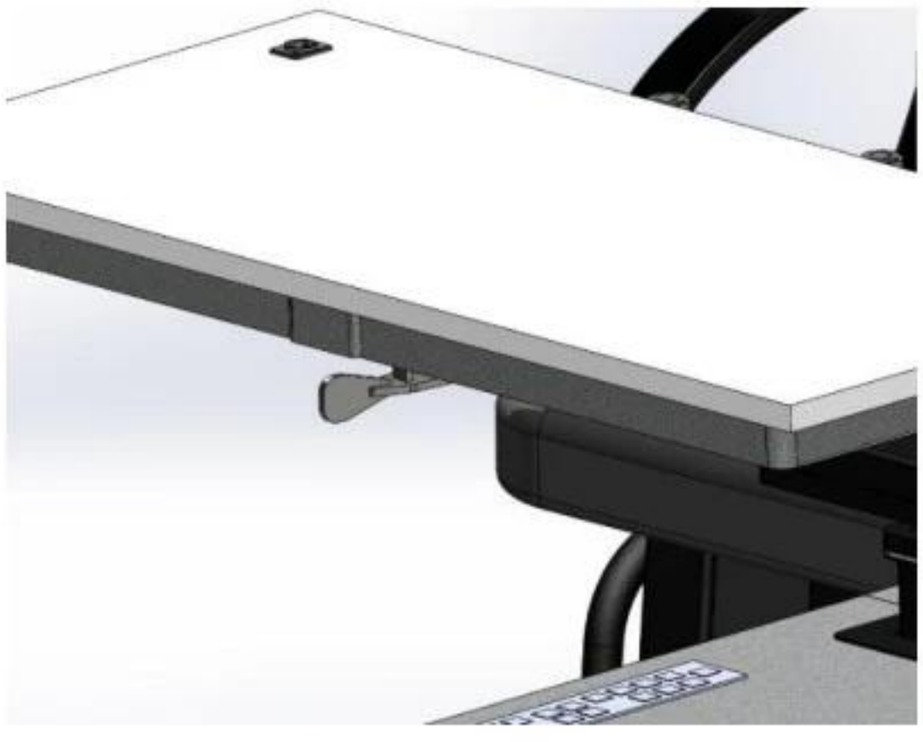
Press corresponding buttons to adjust the light intensity of overhead lamp.

Switching on/off chart projector

Press "Chart" button on control panel.

Horizontal lock of sliding table top

Use handle located under the sliding table top to stop horizontal movement of table top.
Move handle to the right to stop horizontal movement of table top.
Move handle to the left to allow horizontal movement of table top.



Instrument light intensity controlling

Use the corresponding button on control panel to control light intensity of the instrument installed on table top: push button “+” to increase light intensity and button “-“ to decrease it.

(Corresponding "Instrument" LED should be ON).

Liftboy assistant

Description and instructions in document “Liftboy_adjustment”

Switching off the unit

Turn the main power switch, sited on projector column, to OFF (0) position.

Remove the power cord plug from the main power socket if the table top is going not to be used for a long period.

Switching off the unit

Turn the main power switch, sited on the control panel, to OFF (0) position.

Remove the power cord plug from the main power socket if the table top is going not to be used for a long period.

3. *Maintenance*

Attention: *before any maintenance operation, be sure turn the main power switch OFF (0) and take off the plug from the wall socket.*

Replacing overhead lamp bulb

Remove the bulb by releasing ring spring.

Replace the bulb

Attention: *Use max 12V35W bulb*

Attention! *Just after turned off the bulb may be hot. Before touching the bulb, wait for a few minutes until it has become cold.*

Reassemble overhead lamp ring spring.

Replacing main protection fuses

Two main delayed fuses are sited in the fuse-holder located just under the main power supply socket on the back side of the back lower column.

Replace them only with fuses of same values as indicated on the label sited on the back side of the console.

Cleaning the unit

Attention: *never use alcohol or any solvent to clean the unit but use a dump cloth.*

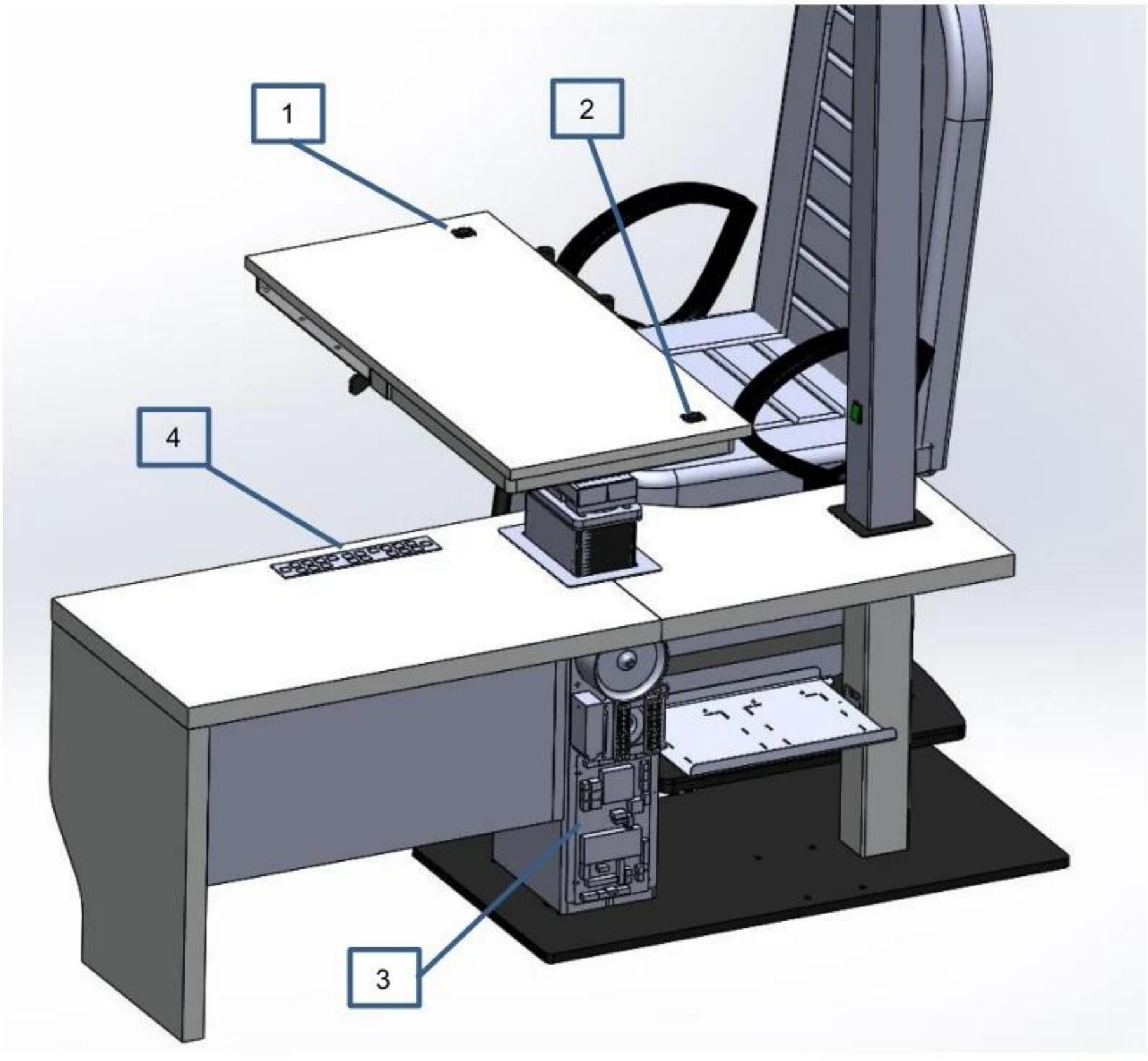
Clean the coated surfaces with a cloth moistened (never dripping wet). Please do not use any abrasive or aggressive cleaning supplies. Make sure that no moisture gets in between the keyboard keys. It is advisable to protect the instrument table against dust with a protective hood at the end of each working day, simply because open measuring and examining instruments are inherently sensitive to dust.

4. *Labels*

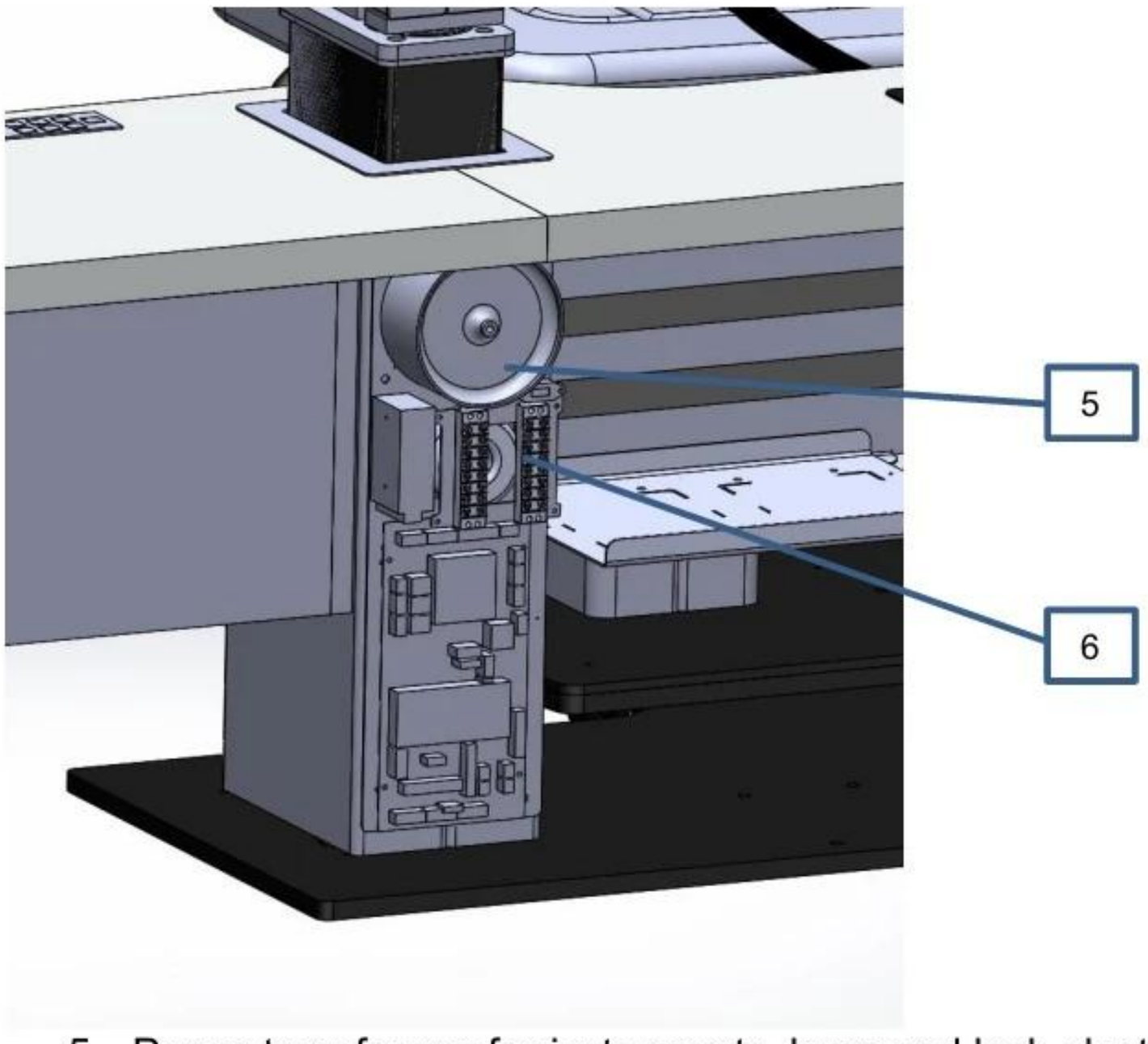
The label with CE mark and product electrical data is located on the rear side of the column base.

Selecting, setting and adjusting voltages for instruments on table top

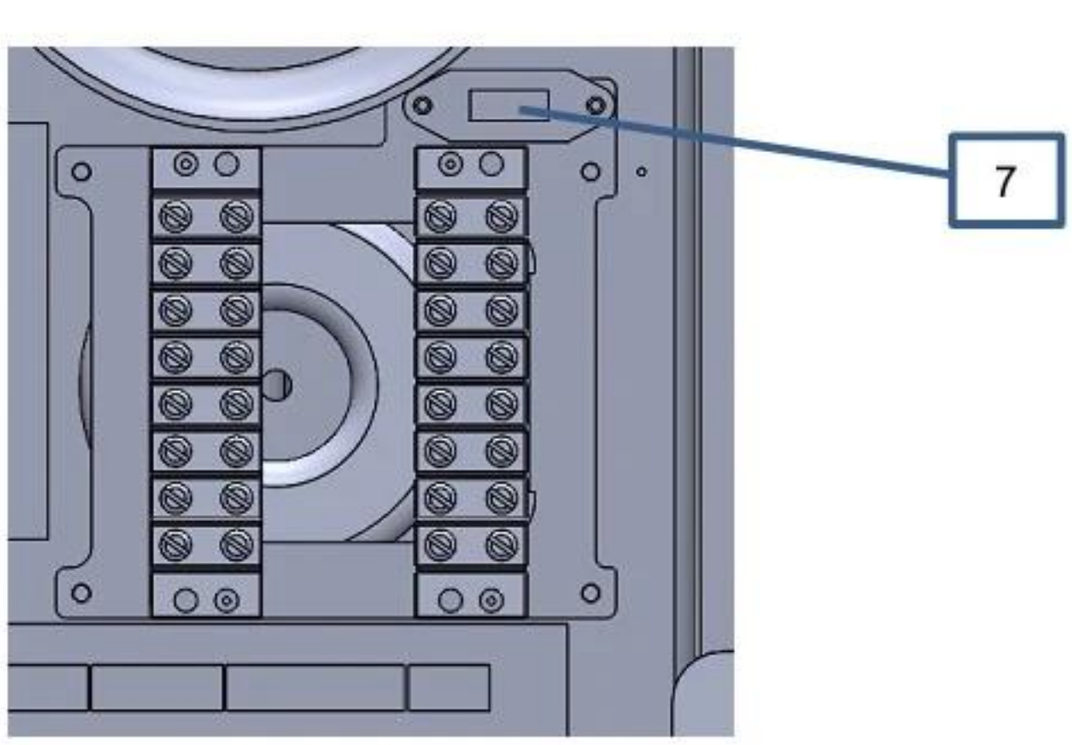
Related components



1. Outlet for 1st instrument
2. Outlet for 2nd instrument
3. Electrical block
4. Operational panel



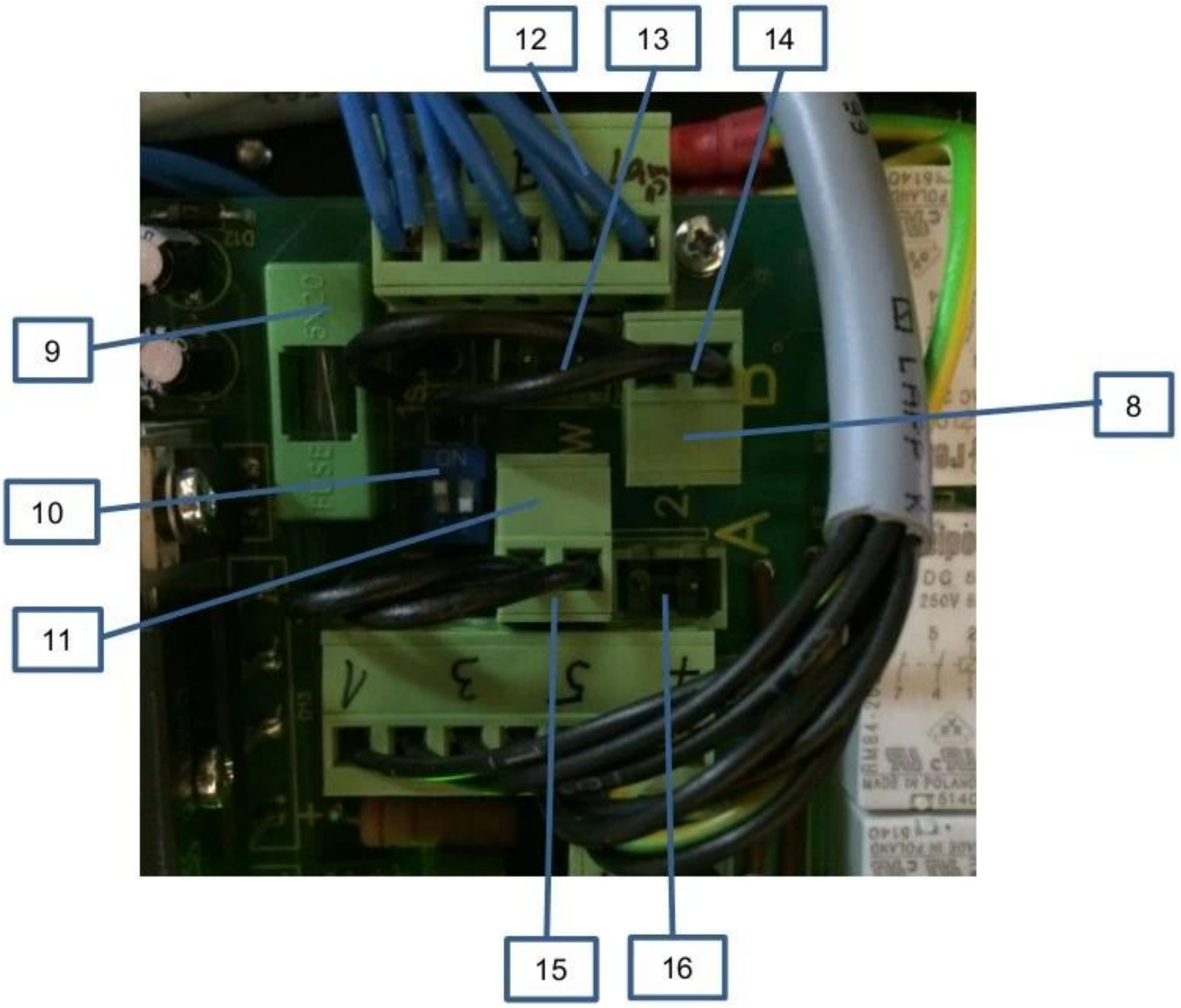
5. Power transformer for instruments, lamp and lock electromagnet
6. Voltage selector
7. Voltage selector 115/230V



Voltage selector

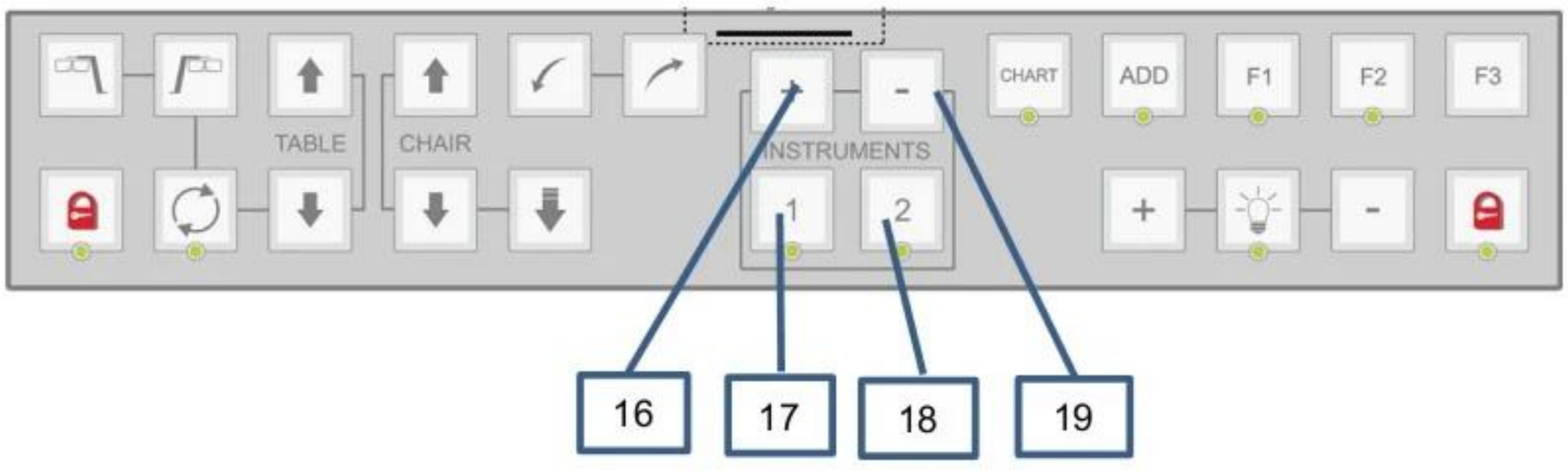
The following wires are connected to voltage selector:

- “0V” – common wire, must be always connected to 0V
- “A” – power supply for Channel A
- “B” – power supply for Channel B
- “Lamp” – power supply for Lamp
- 3 wires for lock electromagnet, they are already connected at factory



8. Plug. Wires to the 1st position (1) on table top
9. Fuse for transformer secondary winding 8A
10. DIP switch for selecting of channel
11. Plug. Wires to the 2nd position (2) on table top
12. Plug. Wires from voltage selector
13. Socket. Channel B. Low voltages 3-17V
14. Socket. Channel B. 115/230V
15. Socket. Channel A. Low voltages 3-17V
16. Socket. Channel A. 115/230V

Operational Panel



16. Dim button to increase the light intensity of instrument
17. 1st instrument on/off
18. 2nd instrument on/off
19. Dim button to decrease the light intensity of instrument

Choosing the right channel: A or B

Each instrument: 1st or 2nd can be connected to one of channels: A or B.

Channel A can give the following voltages:

- Dimmable low voltage. Any diapason from 3 to 17V
- AC 115/230V

Channel B can give the following voltages:

- Fixed AC voltage from 3 to 17V (step 1V)
- AC 115/230V

If 1st instrument should be connected to channel A, plug (7) must be inserted in one of sockets of channel A (14 for low voltage or 15 for 115/230V). DIP switch No1 must be switched OFF.
If 1st instrument should be connected to channel B, plug (7) must be inserted in one of sockets of channel A (12 for low voltage or 13 for 115/230V). DIP switch No1 must be switched ON.

If 2nd instrument should be connected to channel A, plug (10) must be inserted in one of sockets of channel A (14 for low voltage or 15 for 115/230V). DIP switch No2 must be switched OFF.
If 1st instrument should be connected to channel B, plug (10) must be inserted in one of sockets of channel A (12 for low voltage or 13 for 115/230V). DIP switch No2 must be switched ON.

Choosing low voltages for channels A and/or B in voltage selector

To assign any voltage for channel A, connect wire marked “A” to necessary voltage in voltage selector.
To assign any voltage for channel B, connect wire marked “B” to necessary voltage in voltage selector.

Setting min and max values of low voltage for channel A

For example, channel A is assigned to 1st instrument on table top. 1st instrument requires dimmable 6V .
In this case, plug (7) is inserted in to the socket (14), DIP switch No1 is OFF.
To set min and max values proceed as follows:

- Connect wire marked “A” to contact 6V or 7V in voltage selector (6)
- 1st instrument must be off (LED on button “1” (17) must be off)
- Press and keep pressed button “1”(17) for about 6 seconds until beep will occurs
- Bulb of instrument will turn on, LED on button (17) will start blinking
- Press button (16) until you get max voltage you need for the instrument. At the moment of releasing button (16) you will have max programmed voltage for channel A.
  If you cannot get requested voltage drop wire marked “A” to higher voltage in voltage selector(6)
- Press button (19) until you get min voltage you need for the instrument. At the moment of releasing button (19) you will have min programmed voltage for channel A.
- Press button “1” or “2” to memorize min and max values. Double beep will sound.

EXAMPLES

Example No1
You have the following configuration:
1st instrument – 12V dimmable
2nd instrument – 12V fixed

1st instrument requires dimmable voltage, accordingly it must be assigned to channel A

- Wire marked “A” connected to one voltages 12-13-14-15-16 V (depending on power of bulb and voltage dropping)
- Wire marked “B” connected to one voltages 12-13-14-15-16 V (depending on power of bulb and voltage dropping)
- Plug (7) – in socket (14)
- Plug (10) – in socket (12)
- DIP switch No1 – OFF
- DIP switch No2 - ON

Example No2
You have the following configuration:
1st instrument – 115/230V
2nd instrument – 6V dimmable

2nd instrument requires dimmable voltage, accordingly it must be assigned to channel A

- Wire marked “A” connected to one voltages 6-7-8-9 V (depending on power of bulb and voltage dropping)
- Wire marked “B” connected to any voltage
- Plug (7) – in socket (13)
- Plug (10) – in socket (14)
- DIP switch No1 – ON
- DIP switch No2 - OFF

Example No3
You have the following configuration:
1st instrument – 115/230V
2nd instrument – 115/230V

- Wire marked “A” connected to any voltage
- Wire marked “B” connected to any voltage
- Plug (7) – in socket (13)
- Plug (10) – in socket (15)
- DIP switch No1 – ON
- DIP switch No2 - OFF

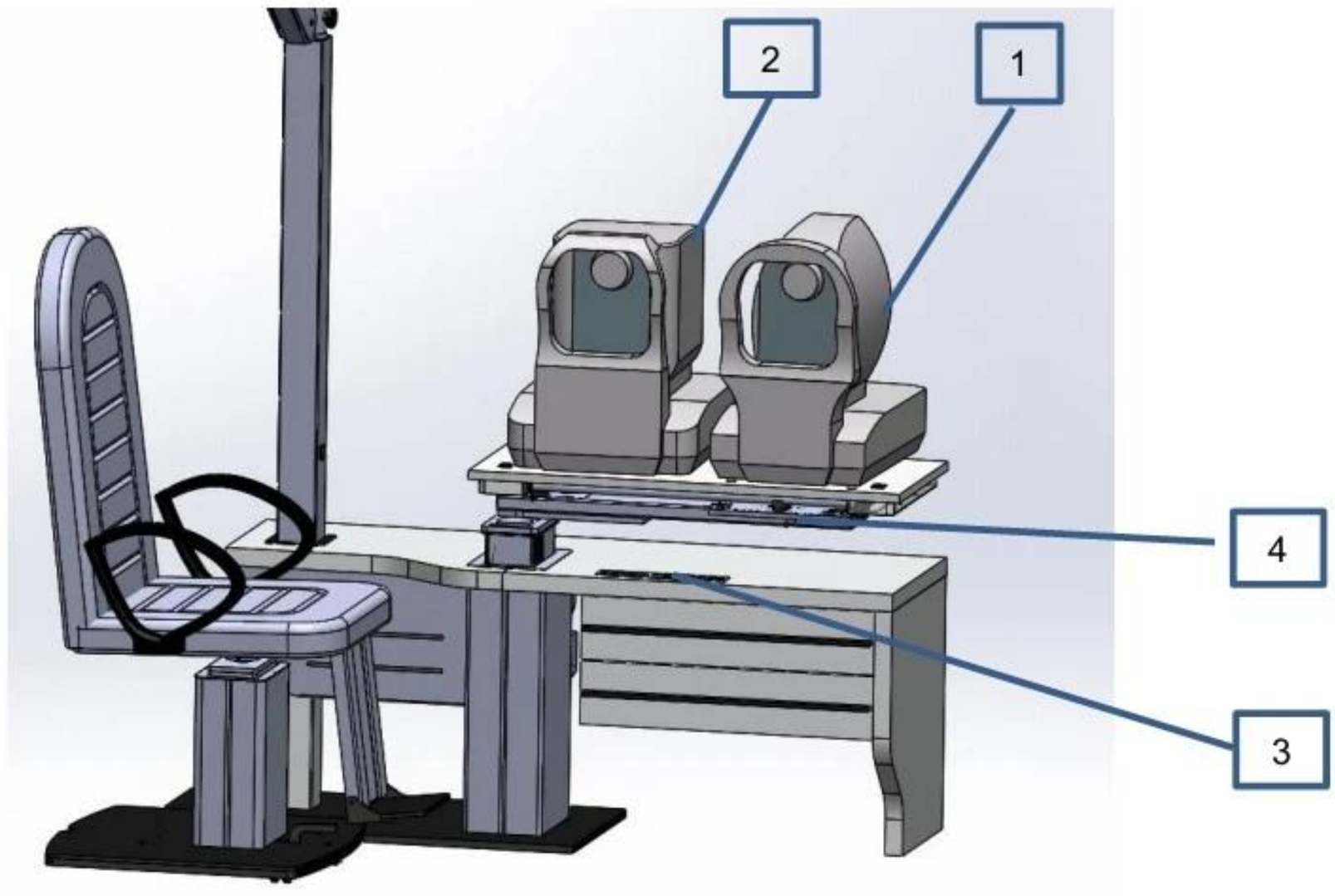
Example No4
You have the following configuration:
1st instrument – 19V dimmable
2nd instrument – 115/230V

1st instrument requires dimmable voltage, accordingly it must be assigned to channel A

- Wire marked “A” connected to one voltages 9-10-11-12 V (depending on power of bulb and voltage dropping)
- Wire marked “B” connected to any voltage
- Plug (7) – in socket (14)
- Plug (10) – in socket (13)
- DIP switch No1 – OFF
- DIP switch No2 - ON

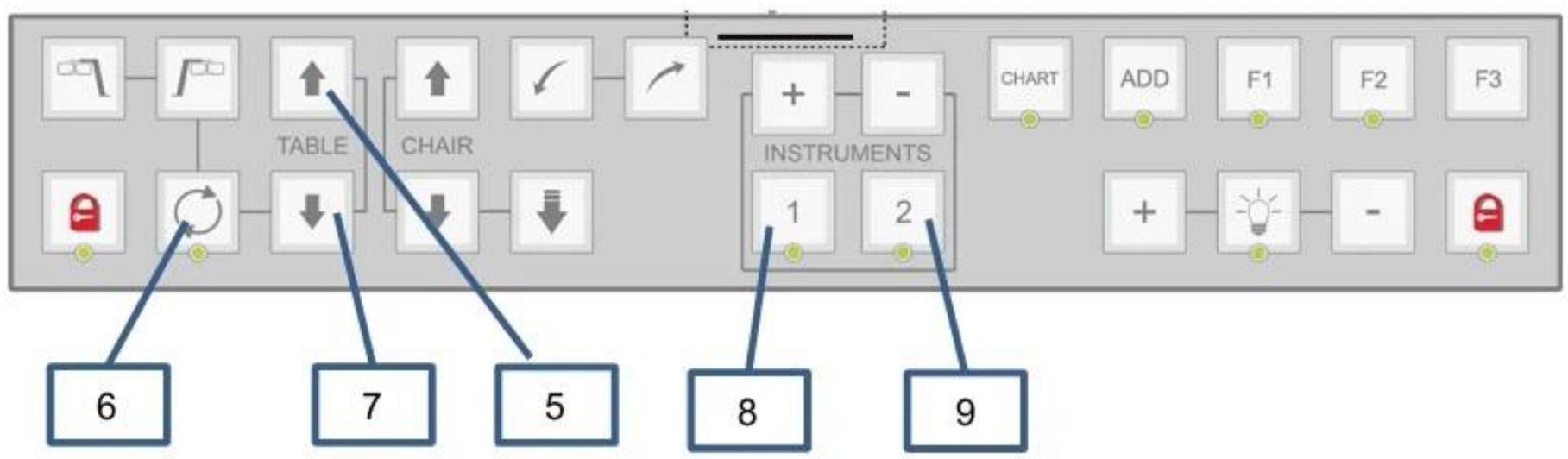
LIFTBOY- calibration and heights adjustment

Related components



Right-handed refraction unit

1. Instrument on position 1
2. Instrument on position 2
3. Operational panel
4. Height security plate/switch

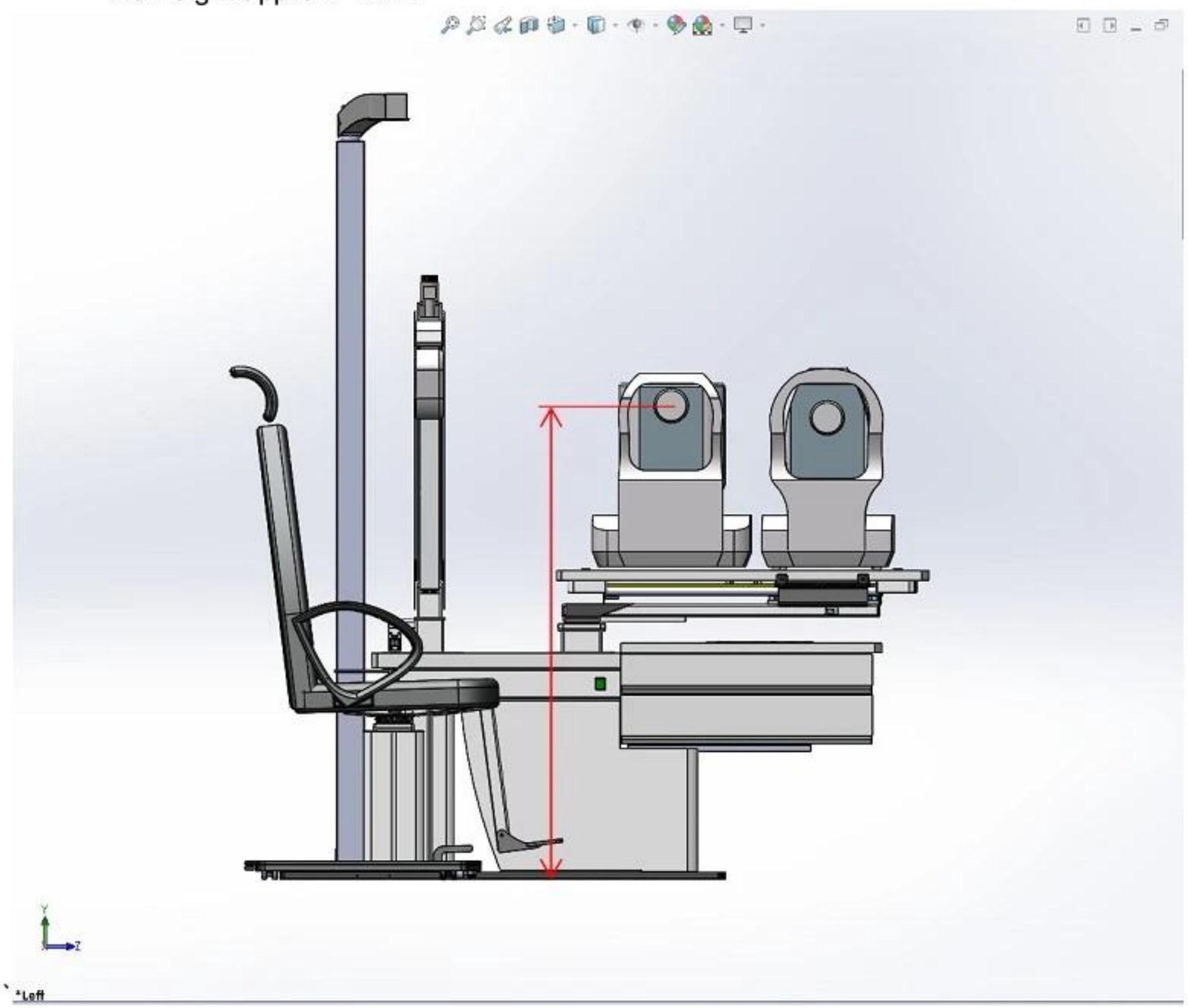


Operational Panel

5. Table UP
6. Auto
7. Table DOWN
8. Instrument on position 1 ON/Off
9. Instrument on position 2 ON/Off

Adjustment of heights for Position1(1) and, Position2(2)

1. Turn AUTO (6) Off.
2. Instrument table swiveled to REST position.
3. Press and keep pressed button AUTO(6) for about 8 seconds. Short beep will follow.
4. Release button AUTO(6), LED on button AUTO(6) will start blinking.
5. Using buttons UP (5) or DOWN (7) arrange height of eye level of instrument2 (2) to the height approx. 1.2m.



6. Press button Instrument2 (2), short beep will follow.
7. Using buttons UP (5) or DOWN (7) arrange height of eye level of instrument1 (1) to the same height.
8. Press button Instrument1 (1), short beep will follow.
   After this, system will calculate height difference between eye levels of Instrument1 and Instrument2.
9. Press button AUTO (6), two short beeps will follow.
10. Adjustment is finished.