INSTRUCTIONS FOR USE

Refraction and diagnostic unit
HS-810

Version: IFU HS-810 V05
Date: 28.03.2023

WARNING!
Read the instructions for use carefully before you use this product. It contains important information about safety of users and patients.

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1 Foreword

With your decision to purchase an HS DOMS examination unit, you have given us a high level of trust. We thank you for that. You have chosen a mature product and modern design. The HS-810 is available in a not height-adjustable and a height-adjustable version. The unit is available as right-hand and left-hand unit. In this instruction for use, the examination unit is shown in right-hand version (unit stands on the right — from the perspective of the examiner). Technical changes in sense of further developments and product improvements are subject to change without prior notice.

1.1 Purpose

The ophthalmic examination unit is an accessory for ophthalmological instruments. It serves as a “carrier” for ophthalmological instruments and is a basic unit for designing workplaces for ophthalmologists, optometrists and opticians. The workstation supports the determination of refraction by the ophthalmological instruments, because it enables ergonomic positioning of patients and instruments. Any use other than specified is not permitted.

1.2 Areas of application of the device

This device is intended for use in professional healthcare facilities such as medical practices and premises of optometrists and opticians. It must not be operated near high-frequency surgery systems and within shielded rooms of ME systems for magnetic resonance tomography. Portable radio frequency devices such as mobile phones, or other RF phone accessories, including antennas, can affect the functioning of medical devices. Such devices must always have a minimum distance of 30 cm from each part of the instrument. Failure to observe this precaution may lead to an impairment of the proper functioning of the instrument. Do not use in emergency rooms and operating rooms.

1.3 Contraindication

The examination unit is not suitable for patients with a weight higher than 125 kg. Moreover, there are no known absolute contraindications for examinations with this examination unit. Professional judgment and caution are advisable.

2 Table of Contents

3 List of Illustrations and tables

3.1 Illustrations

3.2 Tables

4 Symbol explanations

	Follow the instructions for use
	Disconnect from the mains before opening
	Warning! Be sure to follow the instructions
	electrical device of protection class I, Protective earth
	CE — Certificate of Conformity
	Manufacturer
	Year of manufacture
	Serial number
	Reference number
	Medical device
	Applied part type B
	Note Disposal
	Warning! Electricity
	Warning! Hand injuries

	Do not sit, step on or lean on the device

Table 1 Symbol Explanation

5 Environmental conditions and transport

Before using the examination unit for the first time, please read the instructions for use. The examination unit may only be operated in accordance with the instructions for use.

5.1 Environmental conditions

Transport	Temperature Air pressure Relative Humidity	from from from	+ 10 °C 500 hPa 10 %	by by by	+ 35 °C 1 060 hPa 50 %
Storage	Temperature Air pressure Relative Humidity	from from from	+ 10 °C 500 hPa 10 %	by by by	+ 35 °C 1 060 hPa 50 %
Use	Temperature Air pressure Relative Humidity	from from from	+ 10 °C 700 hPa 10 %	by by by	+ 35 °C 1 060 hPa 50 %

Table 2 Environmental conditions

5.2 Transport

Transport, lifting or shifting work
All relevant safety regulations must be observed for all transport, lifting or shifting work. This also means that only suitable and tested lifting gear may be used!

Slipping / rolling on uneven floor
Please note that in case of an uneven floor or similar, the unit must be secured professionally against slipping/rolling to the side!

Risk of tipping
The units are usually delivered on EURO pallets. Only suitable pallet trucks, stair climbers or heavy-duty dollies may be used to transport or move the unit. The unit may be lifted or tilted from the ground up to a maximum of 10 cm (risk of tipping).

5.3 Resilient areas for transport

To move, lift or tilt the unit, the unit may be loaded or touched only on the following areas. These areas are on the column [1] on the support plate [2] and on the chair frame [3] (Image 1).
Loads in other places can cause damage to the unit.

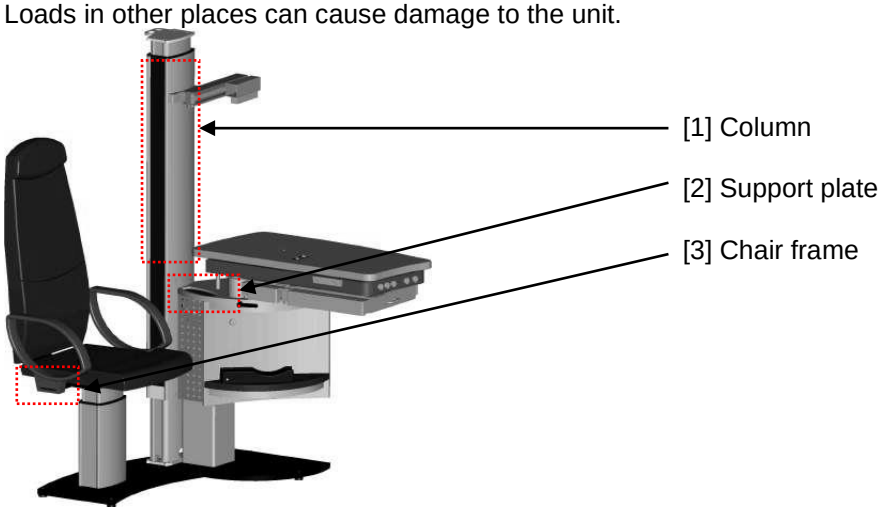


Image 1 Robust areas for transport and installation of the unit

During transport and storage, the following general environmental conditions apply:

- dry
- frost-free
- dustproof
- protected against corrosion (e.g. salt water)

5.4 Unpacking

Before unpacking the examination unit, check whether the packaging has traces of improper treatment or damage. If so, notify the transport company that delivered the goods to you. Unpack the examination unit together with a representative of the transport company. Create a log of any damaged parts. This must be signed by you and by the representative of the transport company. After unpacking, the examination unit must be checked for damage. Defective parts must be returned in proper packaging.

5.5 Set-up

The examination unit shall not be installed and operated in humid rooms. Drip and splash water should be avoided. Installation and dismantling as well as repair, maintenance and repair work may only be carried out by Haag-Streit or by authorised technical service of the Haag-Streit sales partners. If a third-party device is connected, this must be done in accordance with the standard EN 60601-1. Only original HS spare parts may be used.

5.6 Liability for function or damage

If the examination unit is set up, modified or repaired by unauthorised persons or improper maintenance is carried out the manufacturer no longer accepts any liability. In addition, all warranty claims expire. The product must be handled according to the instructions for use. Improper handling can damage the product. This will void all warranty claims. If a damaged product is still used, this can lead to personal injury. In this case, the manufacturer is not liable.

6 Safety instructions

The examination unit must be set up by Haag-Streit customer service or by authorized specialists. The mains connection cable may only be connected to a correctly and permanently installed power connection. It must be installed in accordance with the applicable standards and guidelines.

Risk of electric shock
To avoid the risk of electric shock, this device may only be connected to mains connectors with a protective earth conductor. HS-810 must be tested in accordance to the EN 62353 (IEC 62353) standard before it is put into operation. In the event of damage to electrical lines, the device must be taken out of operation and secured against unintentional operation. Before opening the HS-810 unit, it must be switched off (main switch “ON-OFF”).

Mains voltage
The mains voltage on the nameplate must be consistent with the local voltage.

Disconnect from mains before opening
The examination unit must be disconnected from the mains before opening.
(put into a voltage-free state)
It is essential to determine that there is no voltage before starting further work.

Impairment of EMC
Operation of other electrical equipment directly nearby or stacked may affect the EMC. The situation must be evaluated by the system designer.
The requirements of the standards EN 60601-1 and EN 60601-1-2 must be observed.

Third-party devices
If a third-party device is connected, this must be done in accordance with the EN 60601-1 standard. The connection of other electrical devices leads to the establishment of an ME system, which can result in a reduced level of safety. The requirements of EN 60601-1 must be observed.

Avoid collision when using phoropter arm
When using the phoropter arm, collision with the patient must be avoided.

Separator, junction box or wall connection box
The internal resistance of the supply network must be checked before installing the unit. This may be a maximum of 2 ohms.
The electrical connection must be a permanent connection (junction box or connection in the wall junction box). The circuit to which the examination unit is connected to must have a disconnector that can be locked in the OFF position (e.g. lockable switch). This separator must be provided by the customer. When connecting the examination unit, the supplied circuit diagram must be observed.

Do not lean on, sit on or step on the instruments table
Do not lean on, sit on or step on the instruments table, especially when the table is extended (position 2). Do not swivel back the table in the extended state. If this is not observed, the unit can tip over, which can lead to serious injuries.

7 Safety instructions patient chair

Protection against collision with the patient's thigh
When operating the electromotive lifting column, avoid colliding with the patient's thigh.

Maximum chair load
Pay attention to the maximum chair load. Do not place a patient with a weight of more than 125 kg (see technical data).

Danger of trapping! Always put patient feet on footrest
It is important to make sure that when the footrest is installed, the patient feet are always on the footrest during the lifting movement of the chair (up-down-automatically down) and are not below the footrest (risk of trapping).

RIGHT

WRONG

Image 2 Safety instructions Operation HS DOMS patient chair

When using a calf support, place the patient's feet straight on the floor in front of the calf support
To avoid trapping the patient's feet between the lower edge of the calf support and the floor when the chair is lowered, it is essential that the operator of the unit ensure that the patient's feet are straight on the floor in front of the calf support and not below the calf support.

RIGHT

WRONG

WRONG

Image 3 Safety instructions Operation patient chair with calf support

Placement of a handicapped patients
A handicapped patient must be supported by two qualified assistants when placed into the chair. For leaving the chair the handicapped patient must also be assisted by two people. The relocation of a disabled patient from the wheelchair to the patient chair of the examination unit and back again, must also be carried out jointly by two assistants. The repositioning of a handicapped patient from the wheelchair to the patient chair of the examination unit and back again must also be supported by two assistants.

The user must report serious incidents that have occurred in relation to the product to the manufacturer and the competent authority.

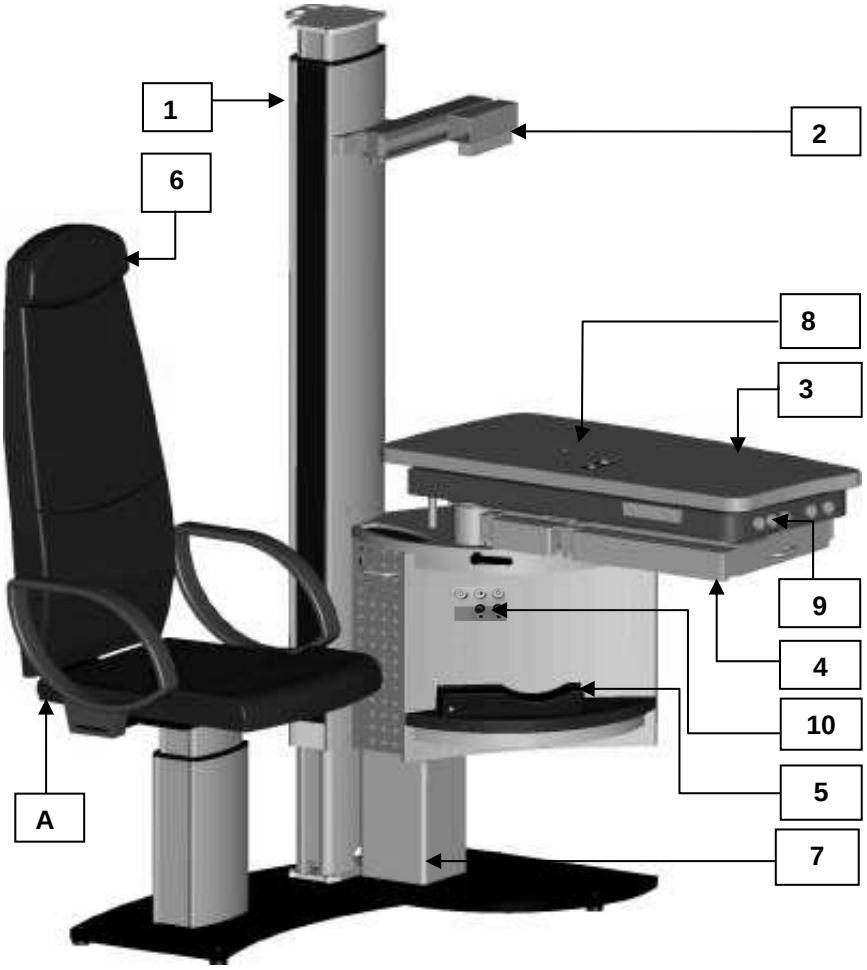
8 HS-810 Variants, construction and components

8.1 Variants HS-810 Standard or HS-810 motorised height adjustable

The standard version of the HS-810 is not height-adjustable and therefore equipped with a fixed column.

The height-adjustable version of the HS-810 has an adjustable column and associated control buttons (table UP and table DOWN). Height adjustment is an option that needs to be ordered in advance.

8.2 Structure HS-810



1. Column
2. Phoropter arm
3. instruments table
4. swiveling drawer for trial lenses
5. storage for hand-held instruments
6. Patient chair,
7. Lifting column for height adjustment of the unit
8. Connection sockets for table instruments
9. Control switches (front of the instruments table
10. Control switch body

A. Seat
Applied Part Type B

Image 4 HS-810 unit (right version, motor height adjustable)

*) optionally, the patient chair can be operated via external foot switch.

8.3 External foot switch (optional)

Art.nr.	Cable length	Description
31-513,14	3 m	Footswitch (2 functions UP/DOWN)
31-514,14	3 m	Foot switch (3 functions UP/DOWN/AUTO-DOWN)
31-516,14	3 m	Foot switch (4 functions UP/DOWN/FORWARD/BACKWARD)

Table 3 Optional external footswitch HS-810

8.4 Description of the components

Column (1)
To mount a chart projector or monitor,
Workplace lamp,
LED spot (reading light),
phoropter arm

Phoropter arm (2)
manually movable
optional adapters for different phoropters
(Option: cable chain for cables of automatic phoropter)

Instruments table (3)
(Maximum load 25 kg)
To place 2 ophthalmological devices
Power supply 6 V/12 V, automatic switching (for low-voltage connections)
(Option: IEC connector 230 V/50 Hz without automatic switching —
for e.g. auto-fractometers, noncontact tonometers)
instruments table locking manually
(Option: electromagnetic locking)

Swivel drawer for trial lenses (4)
to place a slotted frame

Storage for handheld devices (5)
self-switching “ON/OFF”

Patient chair (6)
electromotorically height-adjustable

Lifting column, (7)
for electromotor height adjustment (option)
for instruments table / phoropter arm
(Standard — without height adjustment)

Connection sockets (low voltage) (8)
Table instrument 1 and 2
self-switching

Control switches front (9)
Switches at instruments table front
or optionally on the drawer for trial lenses

Control switch body (10)
Main switch on the body
Switch for LED Spot
Room light switch with potentiometer 1+2

9 Commissioning

9.1 Unit without wall junction box “WJB”

Power connection
The mains connection cable may only be connected to a regular, permanently installed 230V power supply. The examination unit must be connected to a supply network with protective earth conductor.

The unit is switched on with the main switch (Image 5). The basic equipment of the examination unit HS-810 contains 1 switch for “ON-OFF” on the body, optionally additional switches for other functions can be implemented on the body.
Main switch in position “ON” = main switch lights green

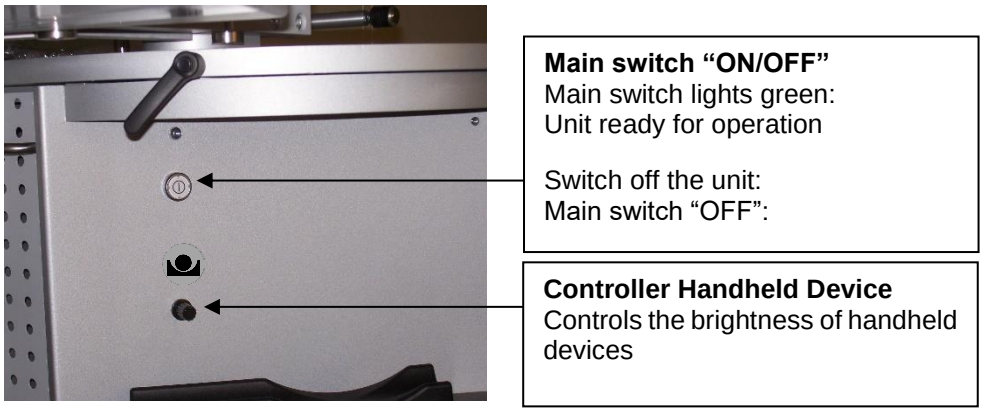


Image 5 Switch on front base unit

9.2 Unit with wall junction box “WJB”

The examination unit HS-810 can optionally equipped with wall junction box.

Wall junction box mounting
The wall junction box must be attached to the wall in such a way that the cable opening is located on the wall, thus covered and the cables can be guided from the wall into the wall junction box.

When commissioning, first turn on the system switch on the wall junction box (Image 6). Thus, the unit HS-810 and the WJB have mains voltage. To activate the unit, turn on the main switch on the body (Image 5). After switching on the main switch (lights green), the unit is ready for operation.

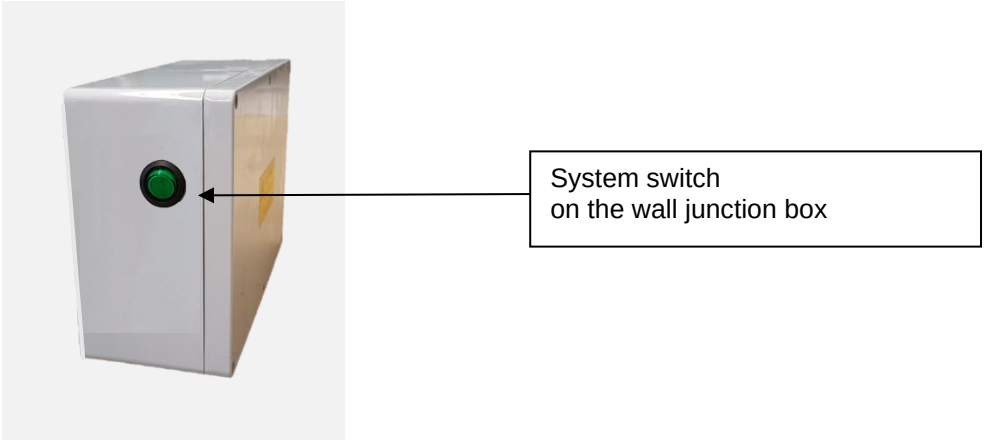


Image 6 System switch on wall junction box

10 Decommissioning

10.1 Unit without wall connection box

The unit is switched off with the “ON/OFF” main switch (Image 7).

If the main switch is in position “OFF”, all switches are not illuminated.

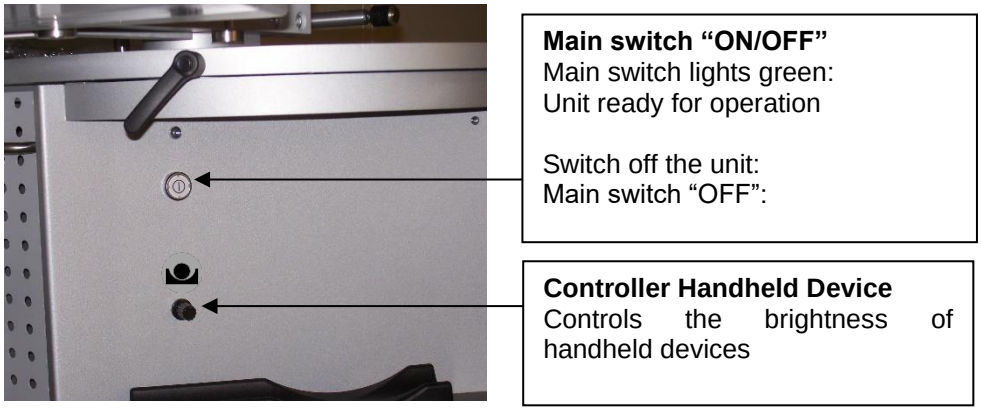


Image 7 Switch on front base unit

10.2 Unit with wall junction box (optional)

The examination unit HS-810 is optionally equipped with wall junction box. When decommissioning with wall junction box, the main switch on the body (Image 7) must first be switched off. After that, the main switch no longer lights. Then the system switch (Image 8) must be switched off on the wall junction box. The unit and WJB are switched off.

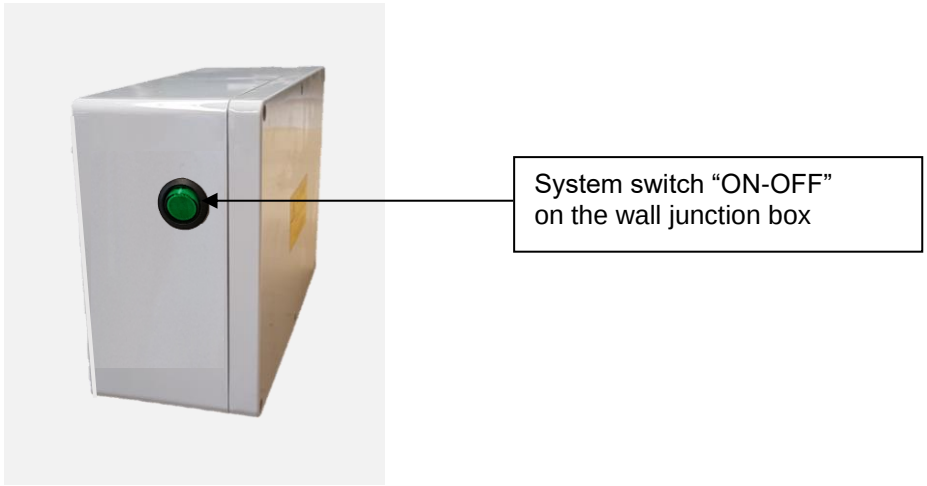


Image 8 Decommissioning Wall junction box

11 Operation of the components

11.1 instruments table

Bring the instruments table into working position 1 by swiveling it. The instruments table is locked in place by turning the table locking lever (Image 9) clockwise.
Option: Activate/deactivate an electromagnetic locking via a switch at the front side of the instruments table (Image 10).

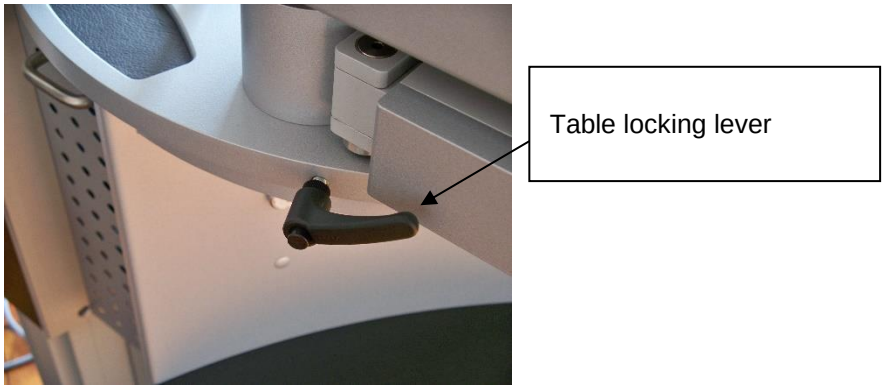


Image 9 Mechanical table locking

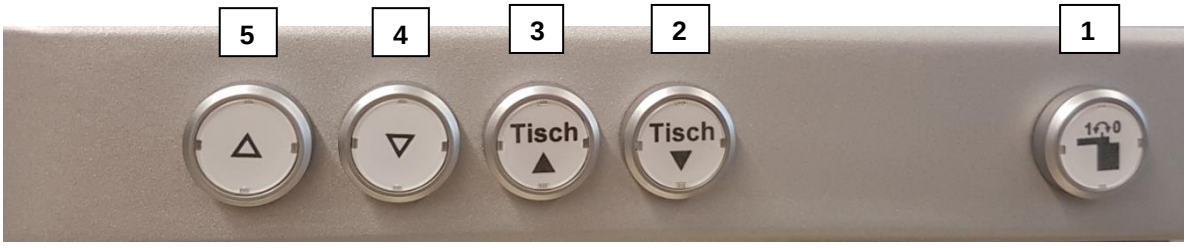


Image 10 Front unit table with control switches

Symbols Switch

1 = Electromagentic locking of instruments table (option)

2 = Table DOWN (option)

3 = Table UP (option)

4 = Patient chair DOWN

5 = Patient chair UP

6 = Chair Auto DOWN (option)

7 = Curtain UP/DOWN (option)

8 = Fixation light (option)

9 = ON/OFF switch (main switch)

10 = Spot light

11 = Room light ON/OFF

Icons Regulators

12 = controller handheld device

13 = low voltage control Table instruments

14 = room light control Pos.0

15 = room light control Pos.1

Table 4 Symbols Switches/Regulators

The instruments table is brought by a swiveling movement from the resting position into working position 1. By sliding movement, you switch from working position 1 to working position 2. In reverse sequence, put the device table back into rest position. The table instruments are automatically turned on and off. If a 230V device is connected to an IEC connector, it always remains “on” as long as the unit is in operation (ON). With the rotary knob 9 for voltage control (Image 11) the luminous intensity of the examination devices can be controlled.

Low voltage control
Control Luminous intensity of the examination equipment

Image 11 Voltage control

11.2 Storage for handheld devices

Overloading of the examination unit
To avoid overloading of the examination unit, a handheld instrument may only be removed from the storage if the instrument table is in its rest position. Furthermore, only one handheld device may be removed from the storage at the same time.

The storages for handheld device (5, Image 4) are self-switching (ON/OFF). Different kinds of storages/chargers for handhelds can be integrated. Follow the instructions for use of the handheld device installed in each case.

11.3 Phoropter arm

The phoropter arm is designed as a double telescope with linear guide. By a manual horizontal movement, you bring the phoropter arm in working position or back to the rest position. If an automatic phoropter is mounted, you can place cables into the cable chain.

11.4 Swivel drawer for trial lens

You can bring the drawer for trial lenses to working position and back to the resting position by a swiveling movement. The articulated joint increases the swivel range, which is limited by end stops. (Image 4)

11.5 Foot switch (optional)

Optionally, the patient chair can be operated via additional footswitches.

Image 12 Foot switch (e.g. 4 functions)

11.6 Led workplace lamp (optional)

Image 13 Button light head

11.6.1 Switching the workplace lamp on and off

You can switch the workplace lamp on or off with the switch  on the unit.

11.6.2 Dimming the workplace lamp

This function allows you to change the brightness of the lamp. Press the button (on the light head) and hold the button pressed. After about a second, the light changes its brightness.
To change the dimming direction, press the button again and hold this button. The set brightness is saved. The next time the lamp is turned on, the last saved brightness is set automatically.

Note!
The lamp can also be turned on and off by pressing the button on the lamp head. If the lamp is switched off via the button on the lamp head, it can only be switched on with the button on the lamp head.

If the lamp has been switched off via the button on the lamp head and then the switch is switched off at the unit, then the switch on the unit must first be switched “ON”.
After that, the lamp can be switched on and off again via the button on the lamp head.

The lighting duration of the workplace lamp is programmed to 4 hours (factory setting).
This setting can be changed (see the operating instructions supplied with the workplace lamp).

Recommendation: Switch on and off only with the switch on the unit!

11.7 Led Reading lamp (optional)

Switch the LED reading lamp “ON/OFF” with the switch  on the unit.

Image 14 Led Spot — Reading lamp

11.8 Dimming room light/automatic room light (optional)

The room light is switched via the switch on the button “ON/OFF”.
The room light brightness can be manually controlled in addition to the automatic room light via the two potentiometers on the control panel (corpus)

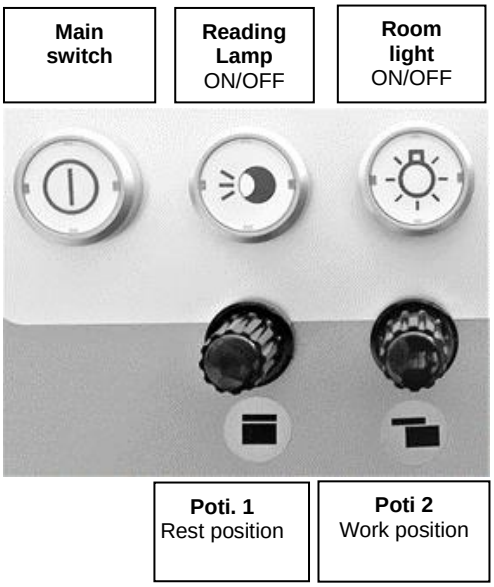


Image 15 Main, spot, room light switch with potentiometer 1+ 2

Potentiometer 1
Regulates when instruments table is swiveled back in rest position (position 0).

Potentiometer 2
Regulates when instruments table is in front of the patient.

11.9 Safety shut-off bar

HS-810 has a safety shut-off bar under the instruments table. If the device table is in front of the patient, accidental clamping the patient's thighs (due to the upward movement of the patient's chair) is prevented. The upward movement of the patient chair and the downward movement of the instruments table are stopped — only "patient chair DOWN" and device table "UP" is possible.

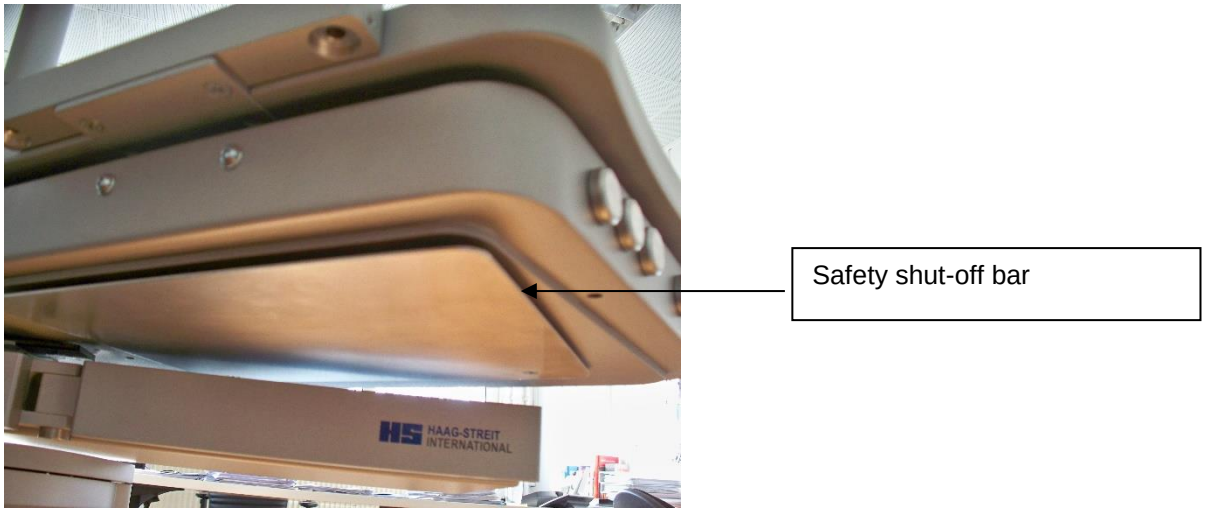


Image 16 Safety shut-off bar (on patient side)

11.10 Height adjustment instruments table and phoropter arm

Attention! Respect duty cycle
Operation of the height adjustment of instruments table and phoropter arm is allowed for a maximum of 1 minute, after which at least 37 minutes break must be observed. The height adjustment of the unit must not be used simultaneously with the height adjustment of the chair.

Control the height adjustment of the instruments table and phoropter arm by pressing the keys "TABLE DOWN" and "TABLE UP" (Image 10).

11.11 Height adjustment patient chair

Observe safety instructions
Observer the instructions in chapter 7 Safety instructions patient chair

Attention! Respect duty cycle
Operation of the height adjustment of the patient chair is allowed for maximum 1 minute then take a break of at least 9 minutes. The height adjustment of the unit must not be used simultaneously with the height adjustment of the chair.

The height adjustment of the patient chair will be performed by pressing the buttons "CHAIR DOWN" or "CHAIR UP" (Image 10). You can also use footswitches (option) to control the chair.

12 Cleaning, maintenance, disposal

12.1 Cleaning and Wipe Disinfection

Caution: when cleaning with liquids
During cleaning/wipe disinfection, no liquid may enter the examination unit or the control buttons. Before you start, turn off the HS-810. The unit must then be disconnected from the mains. Before you turn on the unit again, make sure that it is completely dried. The specified disinfection products must be used in accordance with the manufacturer's instructions for use.

A cloth dampened with a mild soap solution (not dripping wet!) is recommended for cleaning. The plastic-coated surfaces of the examination unit are suitable for wipe disinfection.

The following products have been approved by HS DOMS GMBH for wipe disinfection:

- Meliseptol rapid — Rapid disinfectant Ref. 18564
- Incidin liquid Ref. 3011340
  Manufacturer: Ecolab Deutschland GmbH, Ecolab-Allee 1,40789 Monheim am Rhein www.ecolab.com
- Aseptix SteriMax Wipes Ref. SMXWI100
- Aseptix SteriMax Spray Ref. SMX750
  Manufacturer: Aseptix BV 3632 AD Loenen aan de Vecht/Netherland www.aseptix.com

12.2 Maintenance

HS-810 requires little maintenance when used properly. Regular maintenance is not necessary. In case of malfunctions, please contact Haag-Streit Customer Service or the authorized technical service of the sales partners. To maintain the safety standard and the proper functioning of the HS-810, we recommend that **maintenance be carried out every 3 years**. HS DOMS GMBH stipulates repeat tests after the repair of medical electrical devices according to EN 62353 (IEC 62353) every **two years** (devices older than 10 years, annually). The test shall be carried out in accordance with the test instructions for testing in accordance with EN 62353. The local regulations of the individual country must be observed. Maintenance and maintenance may only be carried out by authorised and trained personnel. Maintenance and care of the installed devices according to the manufacturer's instructions for use.

12.3 Disposal

Electrical and electronic equipment must be disposed separately from household waste! This device was built after the August 13, 2005. Disposal via the local collection point or via your Haag-Streit sales partner.

13 Electrical fuses

Important note!
Do not open the HS-810 unit or wall junction box. The change of fuses and bulbs may only be performed by the technical customer service of Haag-Streit/Haag-Streit Distributors or authorised technical personnel.

13.1 Fuses (fuse-up machines)

No.	Description	Value	Error (if fuse broken)
F1	Control	T 2.0 AH (250 V)	Complete unit without function
F2*	Special functions		
F3	Power supply (dimmed)	T 6.3 AH (250 V)	Table instruments/handheld instruments (connected to brightness control of HS-810 unit) without function
F4	Power supply (undimmed)	T 4.0 AH (250 V)	Handheld devices — (not connected to brightness control in HS-810), without function
F5	Main fuse	T 6.3 AH (250 V)	

*depending on the respective equipment, other functions are also possible

Table 5 fuse information and malfunctions

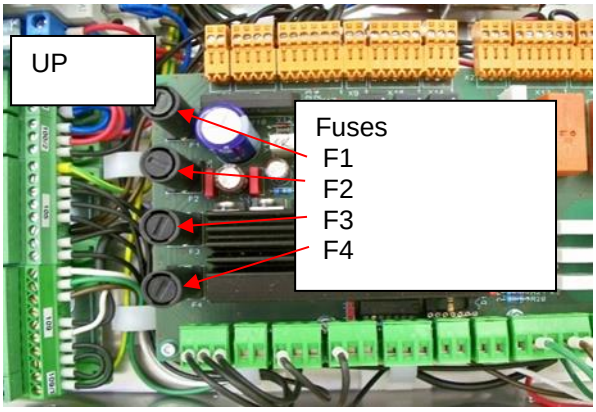


Image 18 Fuses F1 — F4

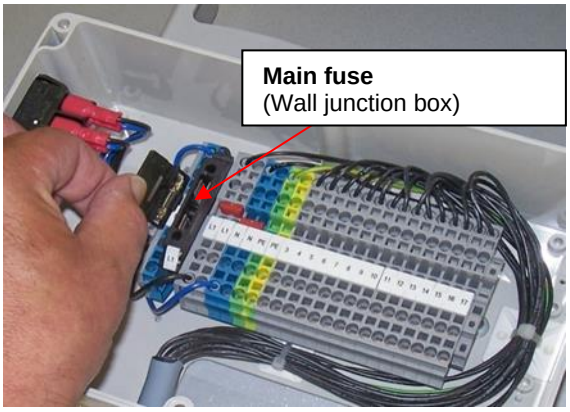


Image 17 Wall junction box

(in the unit behind the front cover HS-810)

Note:
Please make the fine adjustment of the individual electrical voltages for the examination equipment according to the electrical circuit diagram. It is included in the scope of delivery of the HS-810. (Caution! Incorrect settings can destroy lamps)

14 Technical data HS-810

Dimensions:	
Height:	1 590 mm (without projector)
Length:	1 340 mm
Length: (with max. chair shift)	1340 + 100 mm
Width:	1 085 mm
Width: (instruments table extended to pos.2)	1 405 mm
instruments table: (Height)	870 mm
maximum load of instruments table:	25 kg
Phoropter: (viewing height)	1 260 mm (typical)
Weight: (incl. patient chair)	200 kg (250 kg version with height adjustment)
Height adjustment Examination chair	
Seat height minimum:	500 mm
Seat Height Maximum:	700 mm
Stroke:	200 mm
lifting speed:	17-23 mm/s
lifting force:	1500 N
Seat load:	Max. 125 kg
Seat:	480 mm x 460 mm (D x W)
Instrument table Height adjustment (option)	
Minimum height:	720 mm
Maximum height:	920 mm
stroke:	200 mm
lifting speed:	11 mm/s
lifting force:	4000 N
Electrical system	
Supply voltage	230 V/50 Hz
Connection load	1500 VA
Length of power cable (permanent connection)	approx. 2 000 mm
Power supply of table instruments	6 V/12 V infinitely adjustable
Degree of protection	IP 20
Protection class	I
Spare parts (fuses/lights)	
Fuses:	(5 x 20 mm)
F1:	T 2.0 AH (250 V)
F2:	
F3:	T 6.3 AH (250 V)
F4:	T 4.0 AH (250 V)
F5:	T 6.3 AH (250 V)
Reading lamp: (LED spot)	Led bulb 12 V/4 W/GU5,3
Connection load diagnostic devices	
For diagnostic devices 6 V/12 V:	maximum 35 VA
For diagnostic devices 230 V:	maximum 150 VA
For diagnostic devices 3.5 V/6 V:	maximum 35 VA

*Stand: 13.03.2023 Design and form are subject to change without notice.

Table 6 Technical data HS-810

15 Device class

MD

Class I medical device

16 Electromagnetic compatibility

Observe the EMC information
Medical electrical devices and systems are subject to specific measures regarding EMC and must be installed in accordance with the EMC information contained in this accompanying document. Portable radio frequency devices such as mobile phones, or other RF phone accessories, including antennas, can affect the function of medical devices. Such devices must always have a minimum distance of 30 cm from each part of the instrument. Failure to observe this precaution may lead to an impairment of the proper functioning of the instrument.

Other accessories
The operation of cables or accessories other than those specified by HS DOMS may lead to increased emission or reduced immunity of the device.

Disturbances
In case of unusual behavior of the device, switch off the device.
Turn on again after approx. 1 minute.
If the problem persists, contact the customer service.

16.1 EMC in general

The examination unit meets the requirements of electromagnetic compatibility according to EN 60601-1-2. The examination unit is designed in such a way that the generation and transmission of electromagnetic interferences is limited to such an extent that other devices are not disturbed in their intended operation and have an adequate immunity to electromagnetic interference.

16.2 Emissions

(Standard table 1)

Guidelines and manufacturer's declaration — Electromagnetic emissions		
This product is intended for use in an environment as specified below. The customer or user of the product should ensure that it is used in such an environment.		
Interference measurement	**Match**	**Electromagnetic environment/Guide**
RF emissions according to CISPR11	Group 1	This product uses RF energy only for its internal function. Therefore, its RF emissions are very low, and it is unlikely that neighboring devices will be disturbed.
RF emissions according to CISPR11	Class B	This product is intended for use in all facilities including residential areas and those directly connected to a public power supply network that also supplies buildings that are used for residential purposes.
Emissions of harmonics according to EN 61000-3-2	Class A	
Voltage fluctuations and flicker according to EN 61000-3-3		Requirements are met

Table 7 Disturbances (standard table 1)

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