M523-E021AA
PN: 566-14164-02
Nov. 2022

Catheterization Table

KS-70

Operation Manual

Read the instruction manual thoroughly before you use the product.
Keep this instruction manual for future reference.

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Introduction

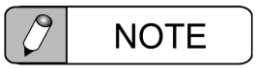
This operation manual describes how to operate Catheterization Table KS-70 (abbreviate to KS-70). Please read this manual thoroughly before using this equipment.
This manual should be kept available for future reference.

Disclaimer

About the symbols appearing in this operation manual

Thank you for purchasing a SHIMADZU medical system. Before using the system, please read this manual thoroughly and use the system correctly.

The precautions and prohibitions seen through the manual are classified as follows:

Mark	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in serious injury or death.
	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or possibly death.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury or equipment damage.
	Emphasizes additional information that is provided to ensure the proper use of this product.

Copyright

Original version is approved in English.

"Operating Precautions (for Both the Safety and the Prevention of Danger) in the Use of Electric Medical Equipment"

1. Only a technician who takes training for operating the equipment should operate the equipment.
2. When installing the equipment, pay attention to the following items:
   (1) Do not install it near water faucet or similar equipment.
   (2) Install it away from potential sources of problems such as abnormal pressure, temperature or humidity, drafts, direct sunlight, dust, chlorine or sulphur gas.
   (3) During transportation and operation of the equipment, avoid tilting, vibration and sharp impact against it.
   (4) Keep the equipment away from the areas where chemicals or gases are stored.
   (5) Use only the correct electrical power source with matching frequency, voltage and current (or wattage).
   (6) Check the condition of the battery power source (power and polarity) before operating the equipment.
   (7) Properly ground the equipment.
3. Before operating the equipment, pay attention to the following items:
   (1) Check the conditions of switch contacts, polarity, dial settings, and meters, and make sure the equipment performs correctly.
   (2) Confirm that the ground is connected properly.
   (3) Check all wiring for proper and correct connections.
   (4) Pay attention when using more than one unit at a time, because it may lead to an incorrect diagnosis and cause danger.
   (5) Check the condition of the external electric circuit, which will be directly connected to a patient.
   (6) Check the condition of the battery power source.
4. While operating the equipment, pay attention to the following items:
   (1) Do not over-exceed time or the amount of equipment use needed for diagnosis or therapy.
   (2) Observe the equipment and patient continuously for early detection of problems.
   (3) When a problem is detected with the equipment or patient, take proper action to stop the equipment without harming the patient.
   (4) Do not let the equipment touch the patient.

5. After operating the equipment, pay attention to the following items:
   (1) Turn off the switches and return the dial to their original before use in the prescribed order. Then, turn off the main power switch.
   (2) Do not pull the power cable forcibly from the outlet.
   (3) When storing the equipment, pay attention to the following factors:
      (i) Keep it away from the water.
      (ii) Store it away from the potential causes of problems such as abnormal pressure, temperature or humidity, draft, direct sunlight, dust, chlorine or sulphur gas.
      (iii) During transportation and storage of the equipment, avoid tilting, vibration and sharp impact against it.
      (iv) Store the equipment away from areas where chemicals and gases are stored.
   (4) Clean all attachments, cables and contacts, and store them in one place.
   (5) Keep the equipment clean to avoid problems during the next use.
6. When the equipment is found to be out of order, do not try to repair it. Display an appropriate sign to indicate that the equipment is out of order, and call a certified repair technician for repair.
7. Do not modify any part of the equipment.
8. Preventive maintenance
   (1) The equipment and its parts should be periodically checked.
   (2) If the equipment has not been in operation for an extended period of time, test it prior to actual operation to make sure it works correctly and safely.
9. Concerning other items, operate properly according to the operating manual.

WARNING

The responsibility for management of use and maintenance of medical equipment lies in a user.

This device is restricted to use by, or on the order of, a diagnostic radiology technician or a person with a certificate indicating equal proficiency.

Repair and inspection of the inside of the equipment is dangerous. Make sure to contact our service agency for repair and inspection.

WARNING

NEVER MODIFY THE EQUIPMENT!

In general, almost all of the modifications are strictly prohibited by the Regulatory requirements of the law of the country where device is installed.

Please contact our service agency if it is needed to modify the device.

WARNING

PERFORM PERIODIC INSPECTION!

Preventive maintenance is required to maintain safety and performance of this system for a long time.

This manual gives detailed description of occasional and periodic maintenance and inspection that a user should perform.

As to the maintenance and inspection that specially trained specialists exclusively can perform, utilize the maintenance agreement offered by our company.

CAUTION

Federal law restricts this device to sale by or on the order of physician.

(This caution is the prescription language required by Federal Regulations in U.S.A.)

Precautions in Use

When using this equipment, please observe the following precautions for the safety of the operator and patient.

WARNING

Considerations against exposure to X-rays

Improper use of the X-ray equipment might cause the operator or patient to be accidentally exposed to X-ray radiation. During X-ray radiation, any person other than the subject patient should not stay in the irradiation room. If circumstances compel any non-subject person to stay in the room, enough protection should be provided for that person. Only radio therapeutic or other qualified personal should handle the equipment.

WARNING

Considerations for mechanical safety

The operator should be very careful when moving the catheterization table and the C-arm support so that his (or her) or the patient's hand, limb, etc. does not get caught between the table and the C-arm support.

WARNING

Emergency procedures

To stop the equipment in an emergency, press the stop switch ▽. This will turn off the power supply to the equipment. There is a stop switch (round red switch) ▽ which is provided on the side of the tabletop.

WARNING

CPR should be attempted only when the tabletop has been fully retracted to the rearmost side.

WARNING

Never splash water to the equipment because you could get an electric shock. When cleaning the equipment, use cloth moistened with an antiseptic solution (Medical Alcohol) to wipe its surface.

WARNING

Do not bring cellular telephones or related devices into the examination room

Do not bring mobile devices that emit electromagnetic waves (e.g. cellular telephones) into the examination room. Such devices can exceed the EMC electromagnetic wave standards, and under some conditions this can impair the proper functioning of the system. In the worst case, this can cause serious injuries or clinical errors.

WARNING

Check that the electromagnetic fields are compatible.

All peripheral devices must satisfy the EMC standards regarding emission of electromagnetic waves and sensitivity to emitted electromagnetic waves. Devices that do not satisfy these standards may disturb the correct functioning of the system. In the worst case, this can cause serious injuries or clinical errors.

WARNING

Do not allow operation of this apparatus by any person other than qualified personnel (physicians, radiotherapy engineers and clinical X-ray engineers) or under observation by them.

CAUTION

If the operator has no experience in operating the equipment, be sure that he or she receives instruction on how to operate it from our engineers or someone who has enough experience to use the equipment.

In order to operate the equipment safely, an explanation of the operation needs to be lectured. When installing the equipment, our engineers explain the operating procedure. Follow their directions and operate the equipment correctly.

CAUTION

For California, USA Only

This product contains a battery that contains perchlorate material.

Perchlorate Material – special handling may apply.

See www.dtsc.ca.gov/hazardouswaste/perchlorate

WARNING

Do NOT perform any maintenance work on any part of the equipment during clinical use.

It may cause injury to patient.

N.B.: This manual does not cover instructions for the high voltage X-ray generator, the X-ray tube unit, the Image Intensifier, the Flat Panel Detector and X-ray TV unit.

Product Warranty

The guarantee period of this system is one year from the date of purchase. Our company is not responsible for the following failures and damages.

1. Failure/damage caused by installation, movement, maintenance and repair performed by anyone other than our company and companies specified by our company.
2. Failure/damage in a product of our company caused by a product of other company which is not delivered by our company.
3. Failure/damage based on maintenance, repair, etc. using a spare part other than the genuine parts specified by our company.
4. Failure/damage based on a result caused by disobedience to the cautions and operating procedures described in this instruction manual.
5. Failure/damage caused by the ambient condition beyond the service condition of this system such as the power supply and installation requirements described in this instruction manual.
6. Failure/damage caused by natural disaster such as fire, earthquake, flood damage and thunderbolt.

The servicing after expiration of the guarantee period will be offered with charge. Contact our service agency nearest to you.

Product-Life Cycle

The unit-life cycle is approximately ten years.

For your safety, “Full Check” is required for continuously using it over the unit-life cycle.

It is not allowed to use this unit pass over the life cycle without the full check, so please contact our officer before pass over the unit-life cycle.

Disposing the Product or Parts

To all user of Shimadzu equipment in the European Union:

Equipment marked with this symbol indicates that it was sold on or after 13th August 2005, which means it should not be disposed of with general household waste. Note that our equipment is for industrial/professional use only.

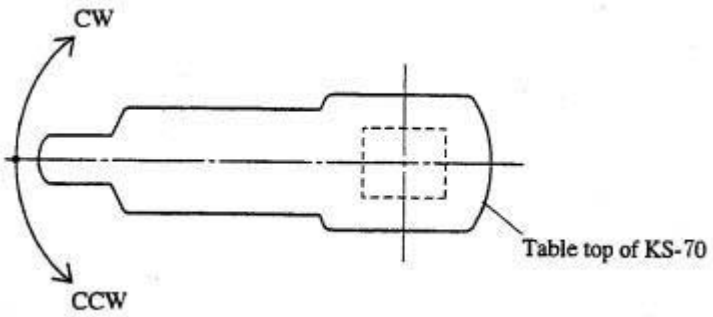
Contact Shimadzu service representative when the equipment has reached the end of its life. They will advise you regarding the equipment take-back.

With your co-operation we are aiming to reduce contamination from waste electronic and electrical equipment and preserve natural resource through re-use and recycling.

Do not hesitate to ask Shimadzu service representative, if you require further information.

Glossary

LED	Light-emitting diode
CPR	Cardiopulmonary resuscitation
CW	Clockwise
CCW	Counter clockwise



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Contents

Revision History

Revision	Date	Contents
Original	Feb. 2006	First Edition
A	May 2006	Foot switches (Fig.7-2) are added. The name of authorized representative company is changed from Shimadzu Deutschland GmbH to Shimadzu Europe GmbH.
B	Apr. 2007	Name plate is changed.
C	Dec. 2007	Change the document style. Add warning about EMC. Change the name plate. Add EMC information.
D	Feb. 2009	Add Radial arm support and Full mattress for option. (2.2, 4.8 and Appendix)
E	June 2009	Change EMC information. (2.9) Add caution about operation explanation. (Precautions) Add warning about allowing operation. (Precautions) Add operator profile. (2.4.5) Add description about Mushroom grip. (2.2, 4.2, 4.3, 4.4, 4.7.7 and Appendix) Change standard list (IEC/EN 60601-1-6, ISO/EN ISO14971:2007, EN 980:2008, IEC/EN62366). (2.8) Add symbol of Keep dry. (2.6.1) Add description about table console. Add specifications of the Accessory mounting rail. (3.2) Delete Map Fluoroscopy label of the Foot Switch.(4.5) Change Arm support. (4.7.5) Change Catheterization table KS-70. (Fig.3) (Fig.5) Change Foot Switch. (Fig.7-1) (Fig.7-2) Change Arm support. (Fig.10)
F	Feb. 2011	Change standard list. (2.8) Change EMC information. (2.9)
G	Aug. 2012	Change standard list. (2.8) Change EMC information. (2.9) Change Drip stand. (4.7.4 and Appendix) Add sub rail, type B. (4.8.2 and Appendix) Add slide rail. (2.2, 4.8.6 and Appendix)

Revision	Date	Contents
H	2014/04/18	Change note for Class I and Type B. (2.3) Add IPX8 classification. (2.3) Change atmospheric pressure in operation condition. (2.4.1) Change labels. (2.6.2) Change standard list to reference system. (2.8) Add fuse information. (5.1.4) Change EMC information. (2.9) Change statement of compliance [For Europe]. (2.10) Change Periodic replacement parts. (5.3) Change Arm support (carbon) and Sub rail. (4.7.3, 4.8.2, Appendix)
J	2015/05/26	Change Arm support (carbon). (2.6.2, 4.7.3 and Appendix)
K	2017/04/19	Change EMC information. (2.9)
L	2017/05/12	Change EMC information. (2.9) Change description. (2.10)
M	2018/02/15	Change warning about cleaning equipment. (Precautions) Delete description about driving unit for peripheral angiography and peri console. (2.2, 2.6.2, 2.9, 3.1, 4.9, 4.10.2, 5.1.3, Appendix) Delete description about side control panel. (4.3, 4.4, Appendix)
N	2019/07/05	Add caution about Arm rest to 4.7.3.
P	2019/09/12	Compatible with IEC Ed3.1.
R	2019/10/18	Revise the reference standard.
T	2021/1/20	Add description about click stop angle 22 degree for table rotation. (4.4) Add description about tabletop mattress. (4.7.3) Add cautions for accessories. (4.7.4, 4.7.5,4.7.6, 4.8.1, 4.8.2, 4.8.3) Add daily inspection for accessories. (5.1.5)
U	2021/10/04	Add Drip stand as an optional item. (2.2, 3.1) Add 3phase-220VAC as required power supply. (2.4.3, 3.1) Add name plate. (2.6.2) Add caution about operation. (4) Change chapters about positioning and add description about operation with the console for MH-500/600 system. (4.2, Appendix) Add four hook Drip stand. (4.6.7 and Appendix)
V	2021/12/6	Add Table Control Module as a standard accessory. (2.2, 2.6, 3.1, 4.5.2) Add description about EMC information for MH-500/600 system. (2.9.2)
W	2022/3/17	Add Protective Sheet as an optional item. (2.2, 3.1, 4.6.8, Appendix) Change caution label. (2.6.2)
Y	2022/11/17	Update the Labels. Add label without PMDA related description. (2.6.2) Change description about disinfection. (5.4)

Revision	Date	Contents
AA	2022/12/22	Add Sub Rail (for MH-500/600 system) as an optional item.(2.2, 2.6.2, 4.6.3, Appendix) Add warning about EMC.(2.9.2)

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1

Preface

This Operation Manual explains how to use the Catheterization Table Type KS-70.
This Catheterization Table is an equipment developed to be applicable in fields, including cardiovascular angiography and cerebral angiography.
Please understand well the contents of this manual prior to your use of this table so that you can make the most of the KS-70's performance and functions to the fullest measure.

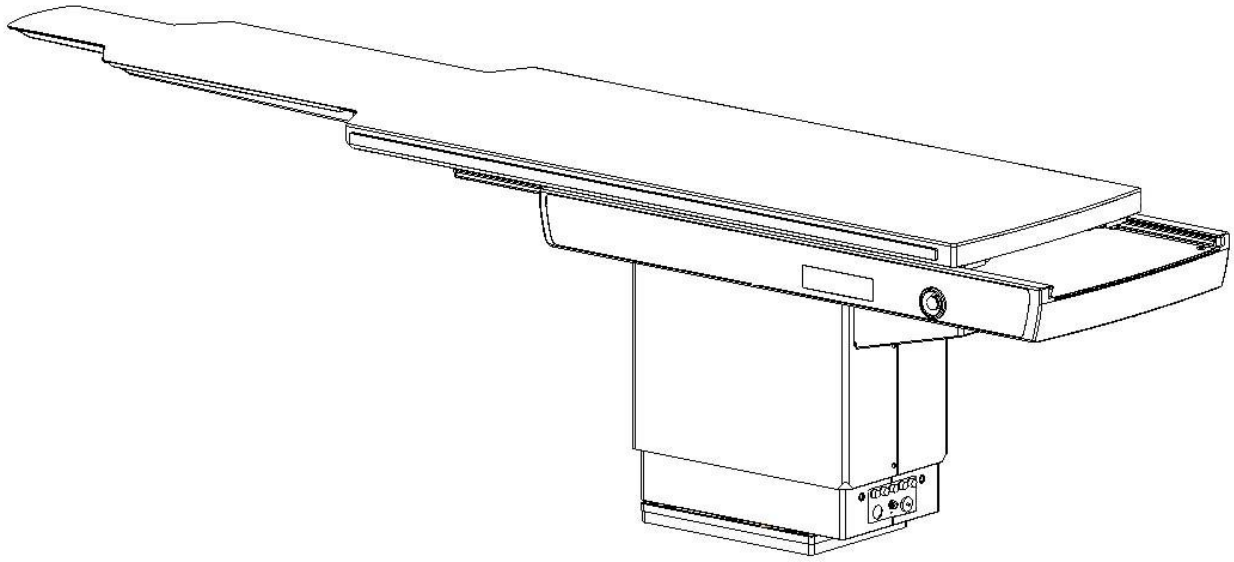


Fig. 1 Catheterization Table Type KS-70

2

General Description

2.1 Application

Catheterization Table KS-70, which is combined with X-ray high voltage generator, X-ray tube assembly, X-ray image system (Image Intensifier, Flat Panel Detector, X-ray TV camera), and contrast medium injector, etc. in a cardiovascular examination system, is a diagnostic table to perform X-ray fluoroscopy and radiography on the object in horizontal position.

The KS-70 can be applied to the following application fields.

(1) Cerebral angiography
(2) Cardiovascular angiography
(3) Abdominal angiography
(4) Peripheral angiography

2.2 Constitution

The KS-70 consists of the following components. (Refer to figures in the end of this manual.)

(1) Column ..... 1 set

Holding the tabletop to permit its vertical and rotational movements, this unit is equipped with driving part and control part for the said movements.

(2) Tabletop unit ..... 1 set

This unit holds the tabletop to permit its longitudinal slide and transversal slide and is provided with a rail for mounting of various accessories on each side of tabletop. And the magnet lock brake mechanism is provided to fix the tabletop.

(3) Standard accessories

- Table Console (for MH-200S/300 system) ..... 1 set
- Table Control Module (for MH-500/600 system) ..... 1 set
- Foot switch ..... 1 set

  It is provided with foot switches for fluoroscopy and radiography.
- Tabletop mattress ..... 1 piece
- Arm support (Carbon) ..... 1 set
- Arm support ..... 1 pair
- Drip stand (two hook type, for MH-200S/300 system) ..... 1 set
- Cable hook ..... 6 pieces

(4) Optional accessories

The following accessories are offered by separate contract.

- Injector head mount (for catheterization table mounting MARK-V) ..... 1 set
- Base plate (to reinforce the floor) ..... 1 set
- Arm grip ..... 1 set
- Sub rail (for MH-200S/300 system) ..... 1 set
- Sub rail (for MH-500/600 system) ..... 1 set
- Radial arm support ..... 1 set
- Full mattress ..... 1 piece
- Grip switch ..... 1 set
- Slide rail ..... 1 set
- Drip stand (two or four hook type, for MH-500/600 system) ..... 1 set
- Protective sheet ..... 1 set

2.3 Classification of equipment

The class of protection against electric shock

→Class I equipment

NOTE

It means that CLASS I EQUIPMENT, that is, electrical equipment in which protection against electric shock does not rely on BASIC INSULATION only, but which includes an additional safety precaution in that means are provided for ACCESSIBLE PARTS of metal or internal parts of metal to be PROTECTIVELY EARTHED. (International standard IEC 60601-1:2005+A1:2012).

The degree of protection against electric shock

→Equipment including Type B Applied Part

NOTE

It means TYPE B Applied Part, that is, APPLIED PART complying with the specified requirements of the following IEC standard to provide protection against electric shock, particularly regarding allowable PATIENT LEAKAGE CURRENT and PATIENT AUXILIARY CURRENT. (International standard IEC 60601-1:2005+A1:2012).

The degree of protection against harmful ingress of water

→Ordinary equipment: Main body of this equipment

WARNING

The main body of this unit is not protected against immersion of liquid. Never use this unit in a place in which immersion of liquid may occur. Never spill liquid on the surface or in the inside of this unit. Otherwise, electrical shock may occur. When liquid is spilt, contact our office or representative described on the back cover of the operation manual.

→ IPX3: Table Control Module

NOTE

It means IPX3, that is, equipment is protected against spraying water. Equipment is suitable for water sprayed at an angle up to 60° on either side of the vertical. (International standard IEC 60529)

→ IPX8: Foot switch for examination room

NOTE

It means IPX8, that is, equipment is protected against water submersion. Equipment is suitable for continual submersion in water under conditions as specified by manufacturer. (International standard IEC 60529)

The degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide

DANGER

Risk of explosion if used in the presence of flammable anesthetics.

The mode of operation

Continuous operation with intermittent loading (Rated continuous load time: 5 min.)

2.4 Operating condition

2.4.1 Environmental condition (Operation)

This system is designed under the premise that is used in the following operation environment. When installing this unit, make sure that the required condition is satisfied in the installation place.

Ambient temperature	: + 10 to 40 °C
Relative humidity	: 30 to 85 %
Atmospheric pressure	: 800 to 1060 hPa

2.4.2 Environmental condition (transport and storage)

Transport and store this system in the environment in which the following conditions is satisfied.

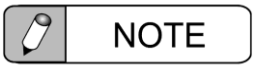
Ambient temperature	: - 10 to 60 °C
Relative humidity	: 10 to 95 %
Atmospheric pressure	: 700 to 1060 hPa

Rust and corrosion may be generated caused by dew inside this unit. The internal circuits may be damaged by frozen dew caused by low temperature. Pay rigid attention when this unit is stored in a place with drastic difference in temperature and humidity such as warehouse.

2.4.3 Power Supply

Single-phase	100 VAC,	0.5 kVA,	50/60 Hz
Three-phase	200/220 VAC,	1 kVA,	50/60 Hz

Power should be supplied from the reinforced insulation transformer.



- When isolating the equipment from the power supply, open the circuit breaker or knife switch of the switchboard that the equipment is connected to.
- Prepare some locking mechanism to keep an OFF position of the circuit breaker and knife switch.

2.4.4 Grounding

Ground to the ground resistance of less than 100 Ω with annealed copper wire 1.6 mm in diameter.

2.4.5 Operator Profile

Item	Details
Age	Age that person can obtain the license of Radiological Technologist or a license equal to it.
Sex	No limitation
Nationality	No limitation
Education	Radiological Technologist or person who has a license equal to it.
Knowledge	Radiological Technologist or person who has a license equal to it.
Language	Can read and understand English.
Experience	Every operator needs to take training for operating the equipment before using the equipment.
Permissible impairments	Corrected visibility is over 0.7 in the decimal number.

2.5 Product safety

Do not operate this unit if there is any uncertainty as to the proper functioning of the system. Refer all servicing to qualified service personnel.

This instrument must be grounded! To minimize the shock hazard, make sure of performing the ground work according to Installation Manual (M512-E303).

2.6 Symbols and labels

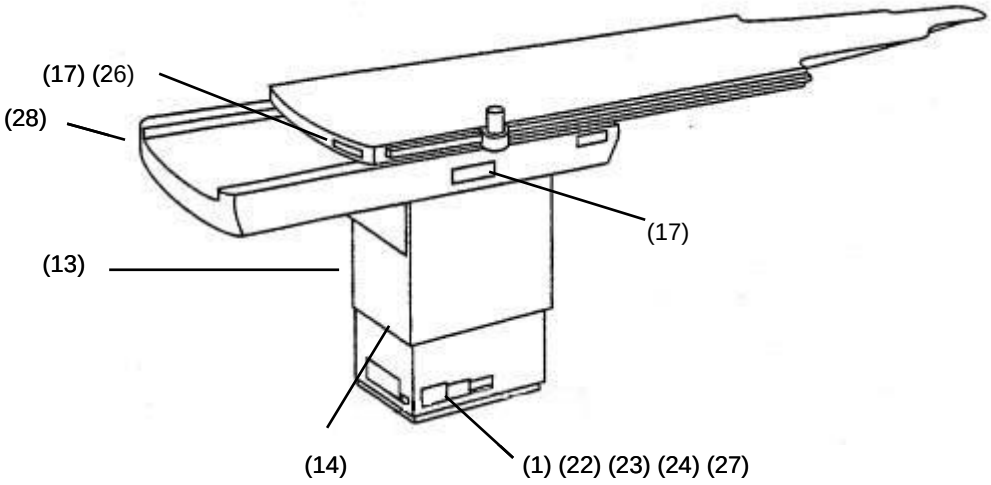
2.6.1 Symbols

Symbols used on this system are shown and described as follows.

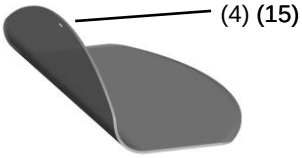
Symbol	Location	Meaning
	In name plate on covers	Alternating current
	Lower part of the instrument, where potential equalization conductor is connected	Equipotentiality
	where protective earth conductor in power cord is connected	Protection earth ground
	Tabletop on foot side	Safety classification: Type B applied Part
	On console for high voltage generator	Power on
	On console for high voltage generator	Power off
	On warning/caution labels	Attention: Refer to Operation Manual
	In name plate on covers	Refer to Operation Manual
	In name plate on covers	Manufactured date
	In name plate on covers	Manufacturer
	In name plate on covers	Serial number
	On package	Keep dry

2.6.2 Label (Name plate)

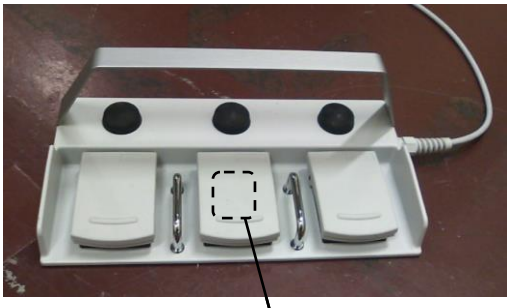
Locations where the labels are attached are shown as follows.



Arm support

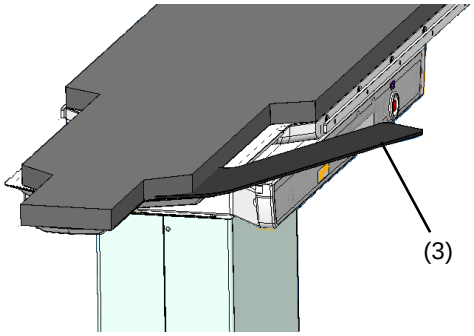


Foot switch (Type B-1/B-2/B-3)



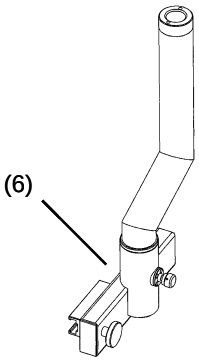
Foot switch (Type A-2)

Arm rest

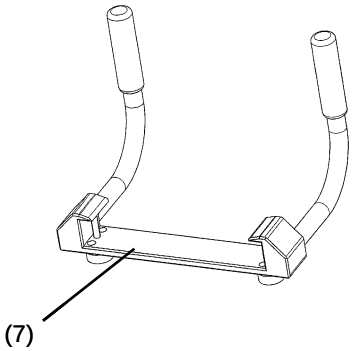


Drip stand

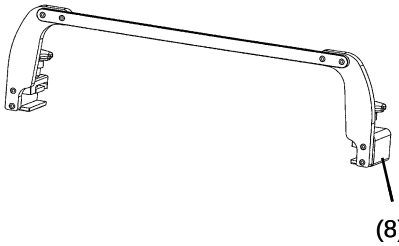
Injector head mount

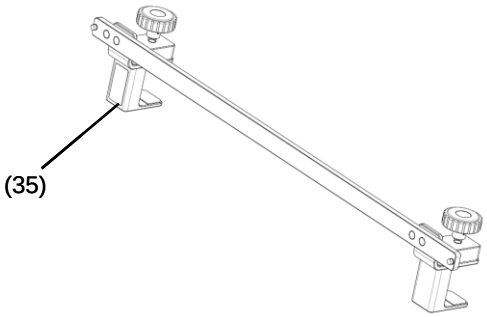


Arm grip

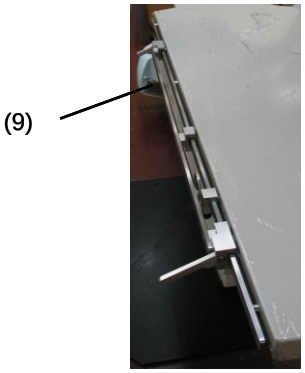


Sub rail

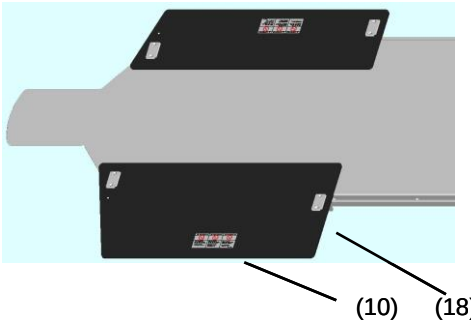




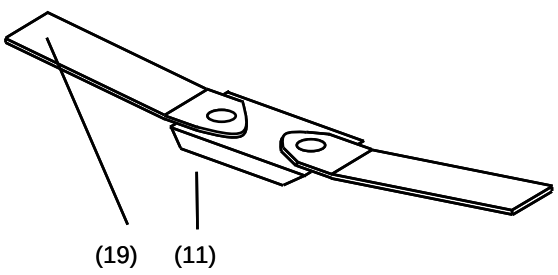
Slide rail



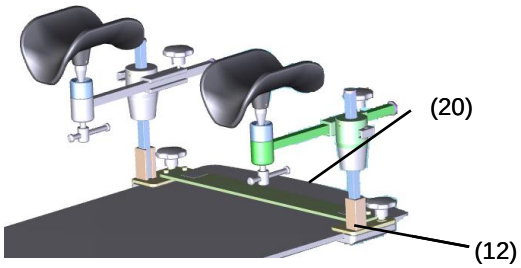
Arm rest



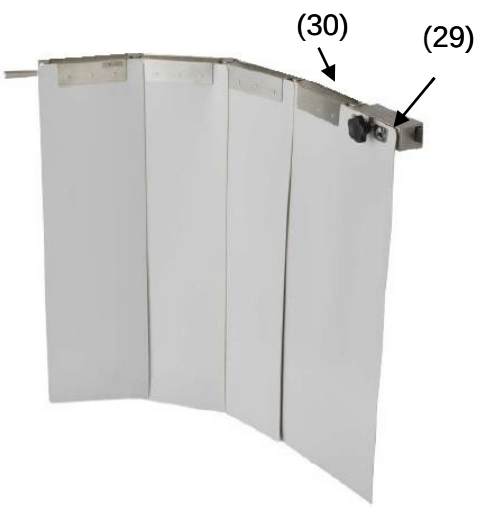
Arm rest



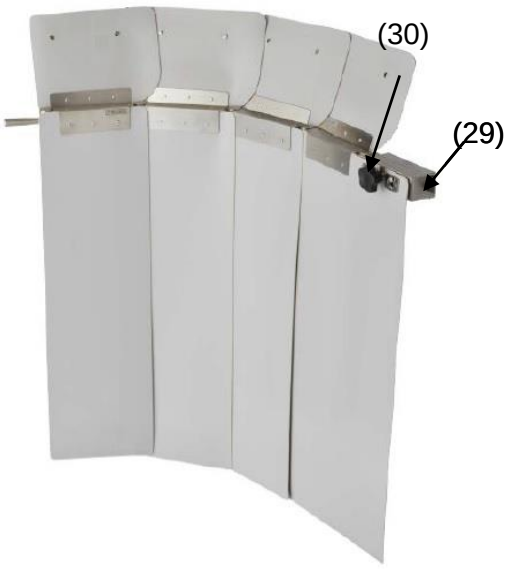
Leg support



Protective Sheet

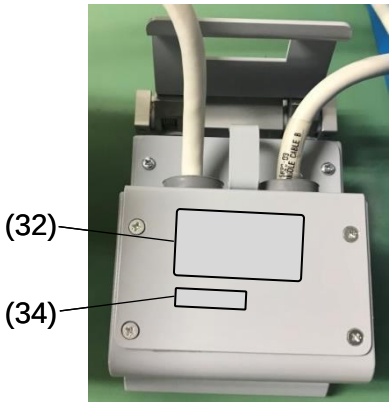


<Type A>



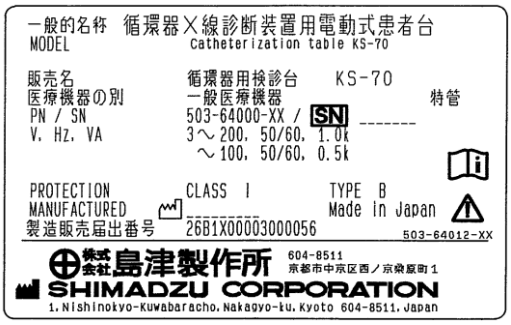
<Type B>

Table Control Module

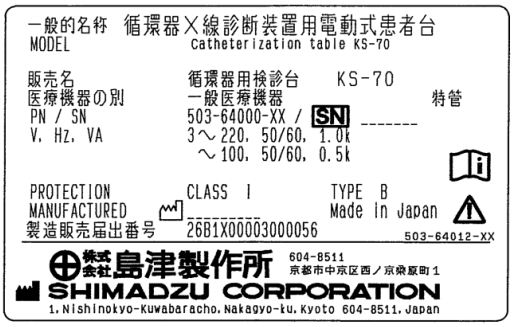


(Base)

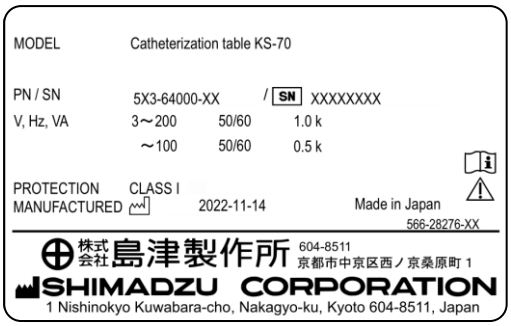
(1) Name plate of KS-70



or



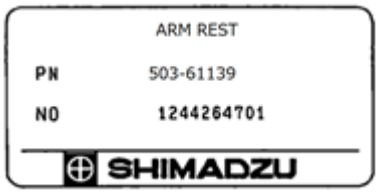
or



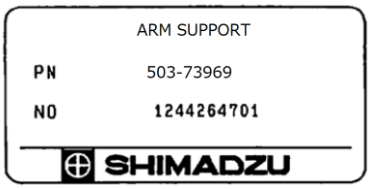
(2) Name plate of Foot switch (Type B-1/B-2/B-3)

or

(3) Name plate of Arm rest



(4) Name Plate of Arm support



(5) Name Plate of Drip stand

(6) Name Plate of Injector head mount

(7) Name Plate of Arm grip

(8) Name Plate of Sub rail

(9) Name Plate of Slide rail

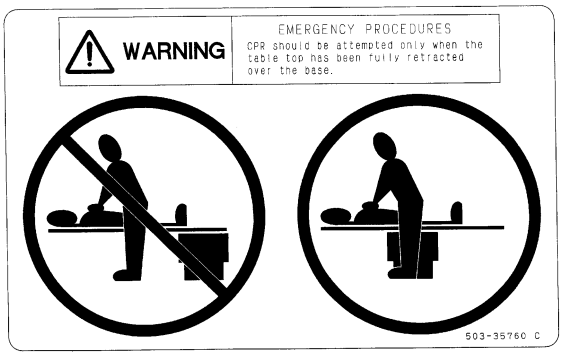
(10) Name Plate of Arm rest

(11) Name Plate of Arm rest

(12) Name Plate of Leg support

(35) Name Plate of Sub rail, KS-70

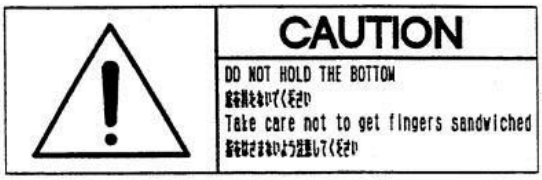
(13) Warning label



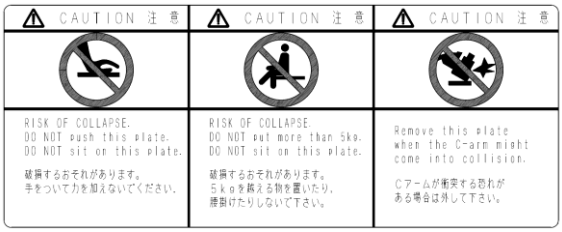
(14) Warning label

(15) Warning label

(17) Caution label



(18) Caution label

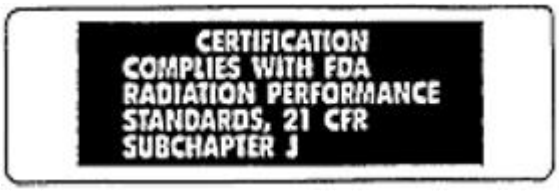


(19) Caution label

(20) Caution label

(21) Transport label

(22) FDA Certification



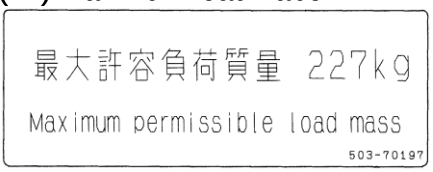
(23) WEEE

(24) EMC

(25) Keep DRY

(26) Type B applied part Symbol

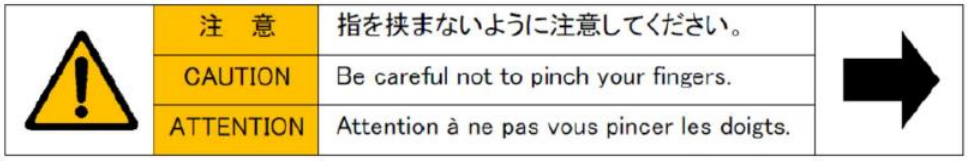
(27) Maximum load Label



(28) STOP Label

(29) Name Plate of Protective Sheet

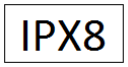
(30) Caution Label



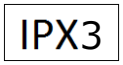
(31) Name Plate of Foot Switch (Type A-2)

(32) Name Plate of Table Control Module

(33) IPX8 Label



(34) IPX3 Label



2.7 Disposal of equipment

This unit contains substances which may pollute the environment if disposed carelessly. Please contact our office or representative described on the back cover of the operation manual.

2.8 Conformity of equipment

For the international standards which KS-70 conforms to, refer to the operation manual of the system combined with KS-70.

2.9 EMC (Electro Magnetic Compatibility) Information

2.9.1 EMC information (MH-200S/300 system)

Operating condition

This system belongs to Group 1 and Class A equipment in accordance to IEC60601-1-2: 2007.

The system uses radio-frequency energy only for its internal function and is not intended to deliver energy to the patient. But little leakage radio-frequency energy does harm to high-sensitive equipment.

The system main power line in the clinical site should be connected to the domestic power sources which are separated from the public main network.

KS-70 needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the ACCOMPANYING DOCUMENTS.

Portable and mobile RF communications equipment can affect the KS-70.

Cable List

Note) S: Shielded, U: Unshielded

No.	Cable Type	Manufacturer	Cable Length [m]	Shield
1	Power Cable A	SHIMADZU	22	S
2	Earth Cable	SHIMADZU	22	U
3	Power Cable B	SHIMADZU	22	U
4	Grip Switch Cable	SHIMADZU	0.8	S
5	Foot Switch Cable	SHIMADZU	3	U
6	Peri Console Cable	SHIMADZU	4	S
7	KS Cable	SHIMADZU	20	S
8	Foot Switch Cable	SHIMADZU	3	U
9	Mushroom Switch Cable	SHIMADZU	0.8	S
10	Foot Switch Cable	SHIMADZU	20	U
11	KS Potentio Cable	SHIMADZU	20	S
12	KS Encoder Cable	SHIMADZU	25	S
13	KS Cable	SHIMADZU	20	S
14	KS backup cable	SHIMADZU	22	U

Guidance and manufacturer's declaration - electromagnetic emissions

Guidance and manufacturer's declaration - electromagnetic emissions		
The KS-70 is intended for use in the electromagnetic environment specified below. The customer or the user of the KS-70 should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The KS-70 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The KS-70 is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not applicable (Combined total system's RATED input current exceeds 16 A par phase)	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not applicable (Combined total system's RATED input current exceeds 16 A par phase)	

Guidance and manufacturer's declaration - electromagnetic immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The KS-70 is intended for use in the electromagnetic environment specified below. The customer or the user of the KS-70 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6kV contact ± 8kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line (s) to line (s) ± 2 kV line (s) to earth	± 1 kV line (s) to line (s) ± 2 kV line (s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T T(>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Not applicable (Combined total system is not LIFE SUPPORTING and it's RATED input current exceeds 16A per phase) <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the KS-70 requires continued operation during power mains interruptions, it is recommended that the KS-70 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE) U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity

Guidance and manufacturer's declaration - electromagnetic immunity			
The KS-70 is intended for use in the electromagnetic environment specified below. The customer or the user of the KS-70 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment- guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the KS-70, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 1000 MHz	$d= 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 351.2 MHz 1980 MHz 2412 MHz	$d= 1.2\sqrt{P}$ 80 MHz to 800 MHz $d= 2.3\sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, a should be less than the compliance level in each frequency range. b Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1) At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the KS-70 is used exceeds the applicable RF compliance level above, the KS-70 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the KS-70. b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

WARNING

An exemption has been used and KS-70 has not been tested for radiated RF IMMUNITY over the entire frequency range 80 MHz to 2.5 GHz.

KS-70 has been tested for radiated RF IMMUNITY only at selected frequencies.

List of the transmitters or equipment used as RF test sources and the frequency and modulation characteristics of each source.				
Kind of equipment	**Type**	**Manufacturer**	**Spot check frequencies**	**Modulation**
For Radiated Immunity				
Digital Transceiver	IC-DPR5	ICOM	351.2 MHz	FSK (frequency shift keying)
Cellular Telephone	812SH	Sharp	1980 MHz	PM (Phase modulation)
Wireless LAN Station	WHR-HP-G	BUFFALO	2412 MHz	OFDM (Orthogonal Frequency-Division Multiplexing)

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM

Recommended separation distances between portable and mobile RF communications equipment and the KS-70			
The KS-70 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the KS-70 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the KS-70 as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter m**		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	**80 MHz to 800 MHz $d = 1.2\sqrt{P}$**	**800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$**
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1) At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

WARNING

The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the Shimadzu of KS-70 as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of KS-70.

WARNING

KS-70 should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, KS-70 should be observed to verify normal operation in the configuration in which it will be used.

Accessory List

The accessory list which conforms to EMC is shown below.

Item	Model	Manufacturer	Connection to
Table lock free switch	Grip switch	SHIMADZU	KS-70
Foot switch for X-ray	Foot switch	SHIMADZU	KS-70, MH-200S, MH-300

Essential Performance

The essential performance is shown below.

- Movement of Table

2.9.2 EMC information (MH-500/600 system)

The system satisfies the EMC (Electromagnetic Compatibility) standard below:
IEC60601-1-2:2014

CAUTION

Pay attention to the electromagnetic environments at the installation site.
The system is suitable for installing at a professional healthcare facility environment except below:

- Medical treatment areas with high-powered medical electrical equipment (High frequency surgical equipment, short-wave therapy equipment)
- Inside the radio frequency shielded room of an MRI.

Classification of EMI in Accordance with IEC 60601-1-2:2014

Group 1, Class A

The system uses radio-frequency energy only for its internal function and is not intended to deliver energy to the patient. However, even a small amount of radio-frequency energy leakage does harm to high-sensitive equipment.
The system main power line in the clinical site should be connected to the domestic power sources which are separated from the public main network.

NOTE

The emissions characteristics of the system make it suitable for use in industrial areas and hospitals (CISPR 11 class A).
If it is used in a residential environment (for which CISPR 11 class B is normally required) the system might not offer adequate protection to radio-frequency communication services.
The user might need to take mitigation measures, such as relocating or re-orienting the system.

Cable List

Note) S: Shielded, U: Unshielded

No.	Cable Type	Manufacturer	Cable Length [m]	Shield
60	KS-70 Power Cable	SHIMADZU	25	S
61	Earth Cable	SHIMADZU	25	U
65	MH KS Cable	SHIMADZU	25	S
30	MH Console Cable A	SHIMADZU	2.8	S
31	MH Console Cable B	SHIMADZU	1	S
33	Grip Switch Cable	SHIMADZU	4	S
40	Foot Switch Cable	SHIMADZU	3	U
41	Foot Switch Cable	SHIMADZU	3	U

Accessory List

Item	Model	Manufacturer
Remote Main body controller	Table Console	SHIMADZU
Local Main body controller	Table Console	SHIMADZU
Table lock free switch	Grip switch	SHIMADZU
Foot Switch for X-ray	Foot Switch	SHIMADZU

Performance to be EMC Immunity Tested (Essential Performance)

The essential performance is shown below.

- Movement of table

Electromagnetic Immunity Test Level

Immunity test	IEC 60601 test level	Compliance level
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2,±4,±8,±15 kV air	±8 kV contact ±2,±4,±8,±15 kV air
Electrical fast transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines
Surge IEC 61000-4-5	± 1 kV line (s) to line (s) ± 2 kV line (s) to earth	± 1 kV line (s) to line (s) ± 2 kV line (s) to earth
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% U_T :0.5 cycle at 0°,45°,90°,135°, 180°, 270°,315° 0% U_T :1 cycle at 0° 70 % U_T :25(50Hz)/30(60Hz) cycles at 0° 0 % U_T :250(50Hz) /300(60Hz) cycles	Not applicable (The system is not LIFE SUPPORTING and its RATED input current exceeds 16 A per phase) 0 % U_T :250(50Hz) /300(60Hz) cycles
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m
Note) U_T is the A.C. mains voltage prior to application of the test level.		

Immunity test	IEC 60601 test level	Compliance level
Conducted RF IEC 61000-4-6	150kHz – 80MHz 3Vrms outside ISM bands, 6Vrms inside ISM bands (80% AM at 1kHz)	150kHz – 80MHz 3Vrms outside ISM bands, 6Vrms in ISM bands (80% AM at 1kHz)
Radiated RF IEC 61000-4-3	80MHz – 2,7GMHz 3V/m (80% AM at 1kHz) (Refer to IEC 60601-1-2:2014 table 9)	80MHz – 6GMHz 3V/m (80% AM at 1kHz) (See Table 1-10)
Note) The ISM bands between 150 kHz and 80 MHz are 6.765 - 6.795 MHz, 13.553 MHz - 13.567 MHz, 26.957 - 27.283 MHz, and 40.66 - 40.70 MHz.		

Test Specifications for ENCLOSURE PORT IMMUNITY to RF Wireless Communications Equipment		
Test Frequency [MHz]	**Modulation**	**Test Level**
385	Pulse modulation: 18 Hz *1	27 V/m
450	FM ±5 kHz deviation: 1 kHz sine	28 V/m
710	Pulse modulation: 217 Hz *1	9 V/m
745		
780		
810	Pulse modulation: 18 Hz *1	28 V/m
870		
930		
1462	Pulse modulation: 217 Hz *1	10 V/m
1720	Pulse modulation: 18 Hz *1	28 V/m
1845		
1970		
2450	Pulse modulation: 217 Hz *1	28 V/m
5240	Pulse modulation: 217 Hz *1	9 V/m
5500		
5785		
*1: The carrier shall be modulated using a 50% duty cycle square wave signal.		

WARNING

The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the Shimadzu of KS-70 as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of KS-70.

WARNING

KS-70 should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, KS-70 should be observed to verify normal operation in the configuration in which it will be used.

WARNING

Portable RF communications devices (including peripherals such as antennas and external antennas) using Bluetooth, wireless LAN (2.4 GHz), RFID, and LTE (Band 7) should not be used within 30 cm of any part (including cables specified by the manufacturer) of the KS-70.
The performance of equipment may be degraded.

2.10 Statement of compliance [For Europe]

Regulatory Information

For Europe:

The product complies with the requirement of the Medical Device Directive 93/42/EEC and RoHS Directive 2011/65/EU.

Product name : Catheterization Table
Model Name : KS-70
Parts Number : 563-64000-25/-30
Manufacturer : SHIMADZU CORPORATION
Medical Systems Division
Address : 1, NISHINOKYO-KUWABARACHO,
NAKAGYO-KU, KYOTO, 604-8511, JAPAN
Authorized Representative in EU: SHIMADZU EUROPA GmbH
Address : Albert-Hahn-Strasse 6-10, D-47269
Duisburg, F.R.Germany

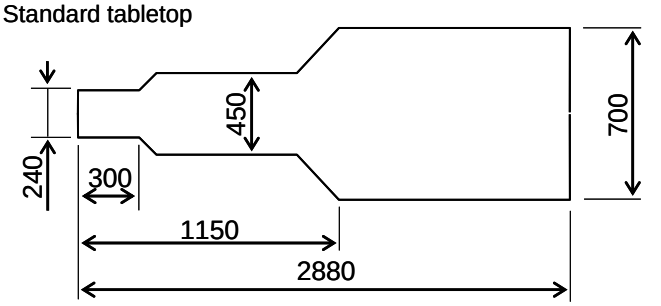
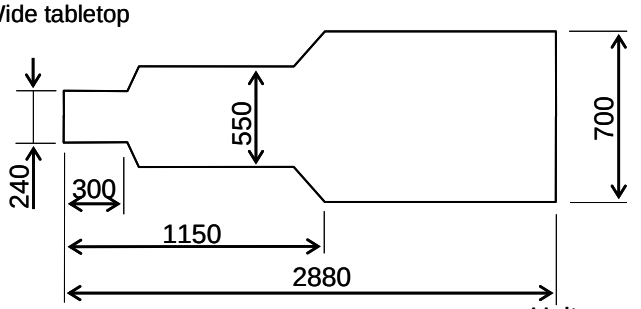
Company's Quality System

The company's quality management system complies with the requirements of Annex II, excluding Section 4 of the MDD 93/42/EEC, which is certified by TUV Rheinland LGA Products GmbH (Notified underNo.0197)

3

Specifications

3.1 Equipment Specification

System configuration		
Item		**Description**
Tabletop size		Standard tabletop  Unit :mm Wide tabletop  Unit :mm
Attenuation equivalent for table		0.7 mm Al. Eq. (150 mm inside from the tip of the table) 0.8 mm Al. Eq. (800 mm inside from the tip of the table)
Distance between tabletop surface and floor		79 to 115 cm, continuously variable (81.5 to 117.5 cm when the pit is not provided on the floor)
Longitudinal slide of tabletop	Full stroke	135 cm
	Control	Manual
	Locking system	OFF brake (magnet locking system)
Transversal slide of tabletop	Stroke	±15 cm
	Control	Manual
	Locking system	OFF brake (magnet locking system)
Vertical movement of tabletop	Stroke	36 cm
	Control	Motor-driven
	Speed	13.2 mm/s (50Hz), 15.8 mm/s (60 Hz)
Rotation of column	Stroke	CW 90° / CCW 180°
	Control	Manual
	Locking system	OFF brake (solenoid locking system)
Allowance load mass (Based on IEC60601-2-43)		2270N (227 kgf) (Patient must lay on the tabletop) +1000N (100 kgf) (for CPR, at CPR position)

System configuration		
Item		**Description**
Standard accessories		Table console (for MH-200S/300 system) 1 set Table control module (for MH-500/600 system) 1 set Foot switch 1 set Tabletop mattress 1 piece Arm support (Carbon) 1 set Arm support 1 pair Drip stand (for MH-200S/300 system) 1 set Cable hook 6 pieces
Optional accessories (option)		Injector head mount (for catheterization table mounting MARK-V) Base plate Arm grip Sub rail Radial arm support Full mattress Grip switch Slide rail Drin stand (for MH-500/600 system) Protective sheet
Installation related	Outline dimensions	4230 mm×1200 mm×1250 mm (Depth×Width×Height) (KS-70 only)
	Mass	Approx. 3500N (350 kgf)
	Power requirements	Single phase 100 V, 0.5 kVA, 50/60 Hz Three-phase 200 V/220V, 1 kVA, 50/60 Hz Note) Power should be supplied from the reinforced insulation transformer.
Class/degree of protection against electric shock		Class I, Type B equipment

Note: The aforementioned specifications are subject to change for further improvement without prior notice.

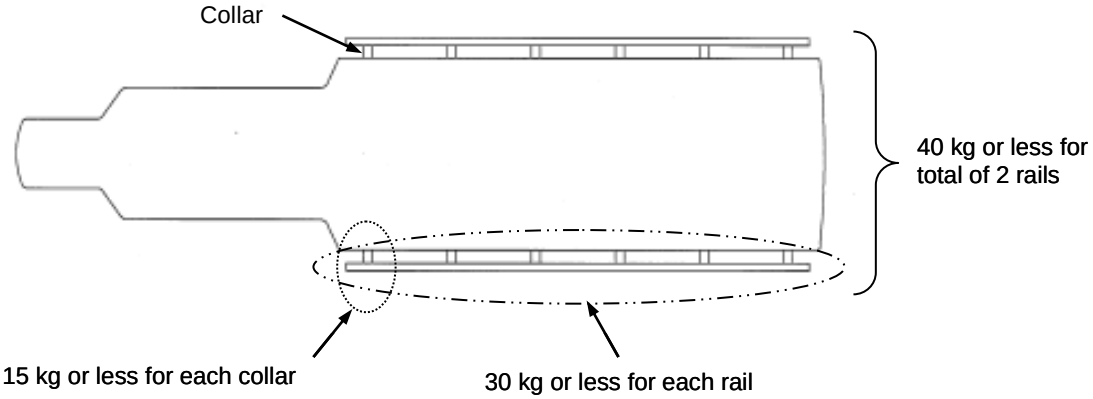
3.2 Accessory mounting rail specification

Specifications of the accessory mounting rail are as follows.

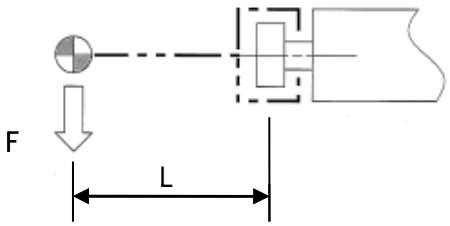
> CAUTION
>
> Applying excessive force to the accessory mounting rail may cause looseness or damage.
> Be careful about the following points.

1. Ensure that the accessory mass mounted on the accessory mounting rail satisfies all the conditions below. (See the diagram below.)
   1) Set mounting mass to 15 kg or less for each accessory mounting rail collar.
   2) Set mounting mass to 30 kg or less for each accessory mounting rail.
   3) Set the total mass for the two accessory mounting rails (left and right) to 40 kg or less. Mass exceeding 40 kg will cause the allowance load mass specification to decrease.

   Note) The collar is the part that links the accessory mounting rail and the table top.



2. The maximum moment load for the accessory mounting rail is 40 N·m. Set so that the rail will not be subjected to any greater moment load. Applying a load of 8 kgf to a position 50 cm from the rail is equivalent to a moment load of 40 N·m.



Moment load M = L × F
L: Distance from rail to center of gravity
F: Load

3. Do not lean on accessories (lower body protection, etc.) mounted on the accessory mounting rail.
4. Operate the C arm with caution to avoid interference with accessories (lower body protection, etc.).

4

Usage

Operate the KS-70 using the grip switch or table console (for MH-200S/300 system) or table control module (for MH-500/600 system) provided on the accessory mounting rail and foot switch.
All movements are performed manually except for the vertical movement of the tabletop (motor driven).

Pay rigid attention so that the table does not touch the C-arm unit and/or around staffs and/or the peripheral devices when operating the KS-70.

4.1 Turning on the power

To turn on the power of the KS-70, set the power switch “LINE” of the X-ray high voltage generator and control unit combined with the KS-70 to ON (“⊙”).

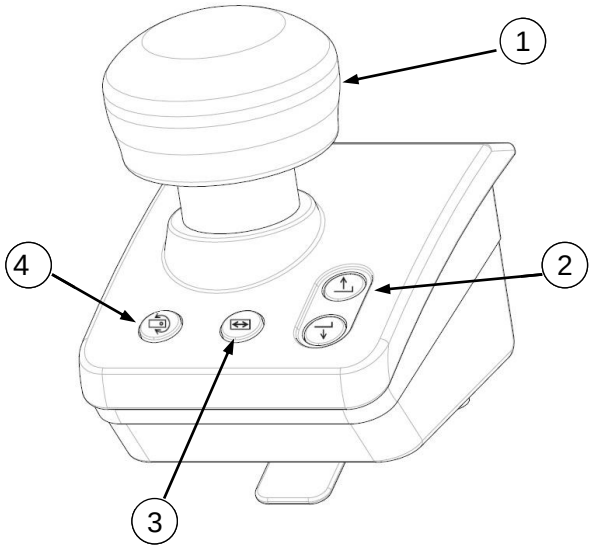
NOTE

Follow the instruction manual for the X-ray high voltage generator provided separately.

4.2 Positioning

4.2.1 Operation Panel (for MH-200S/300 system)

Operate KS-70 by using the operation panel on the table console.



(1) Grip
(2) Table Up/Down switch
(3) Manual lateral movement disable switch
(4) Rotation lock release switch

4.2.2 Operation Panel (for MH-500/600 system)

Operate KS-70 by using the operation panel on the table control module.

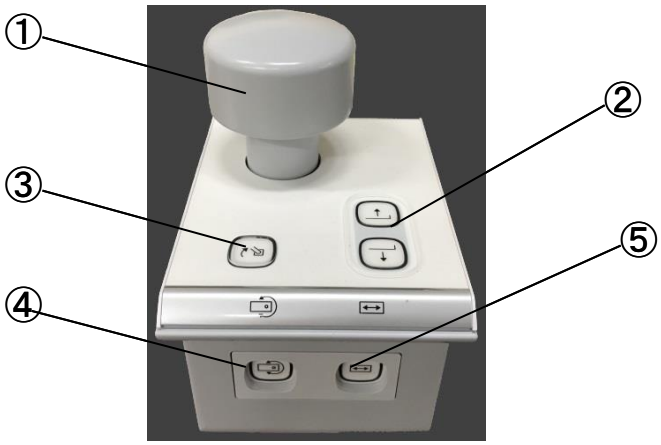
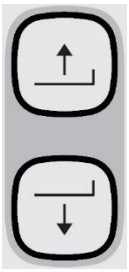


Table control module

(1) Table control grip

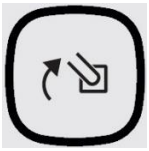
Manually move the tabletop the catheterization table. Brake on the tabletop is released while pressing the grip, and you can manually move the tabletop horizontally.

(2) Table up/down key



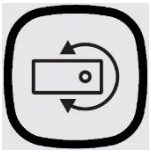
Move the tabletop up/down. Operates only while the key is pressed.

(3) Femoral approach mode switch



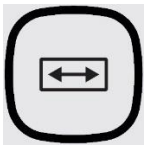
Enters the Femoral approach mode.
Refer to C-arm support MH-500/600 operation manual about the operation.

(4) Swivel unlocking switch



A switch to unlock the swivel lock of the catheterization table. Press this switch, you can manually swivel the catheterization table.

(5) Manual lateral movement disable switch



Stop manual operation of lateral direction of the tabletop of the catheterization table. Press this switch, manual operation of lateral direction of the tabletop is stopped.

4.2.3 Moving the tabletop vertically

Vertical movement of the tabletop is operated by the table console, table control module or the console of combined C-arm unit. Refer to the instruction manual for the combined C-arm unit.

 : Up

 : Down

WARNING

Make sure to confirm always the safety of the patient when moving up the tabletop. Otherwise, the patient may be caught between the tabletop and the image receiving unit.

CAUTION

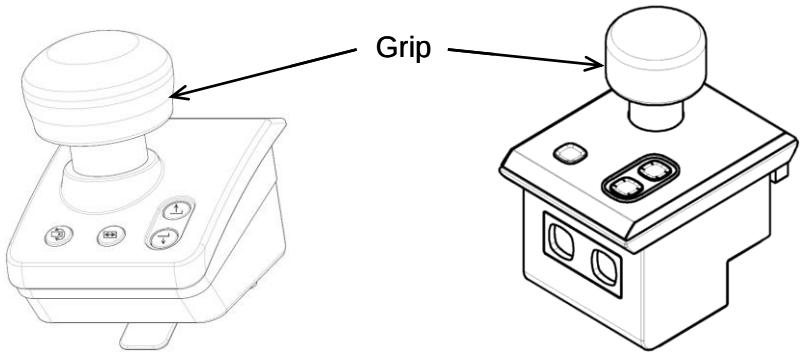
At the emergency in which the tabletop does not stop its vertical movement, press the stop switch ▽ provided on the side of the tabletop or turn off ("○") the "LINE" switch provided on the X-ray high voltage generator. The vertical movement will be stopped.

CAUTION

Pay rigid attention so that the patient and/or the table does not touch the peripheral devices when moving the table up and down.

4.2.4 Moving the tabletop horizontally

When you move the tabletop manually, use the grip switch or the table console or the table control module. While pressing the [Grip] on the table console or the table control module, or the [Table lock free switch] on the Grip Switch (option), the tabletop can move manually.
Press the [Manual lateral movement disable switch] of the table console or the table control module to light/extinguish the LED indicator to release the lock or not.

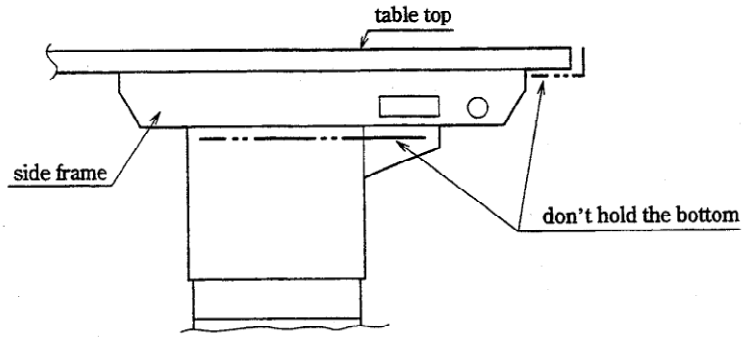


In case of MH-200S/300 system In case of MH-500/600 system

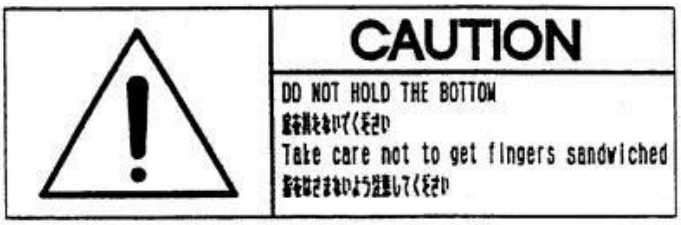
Manual lateral movement disable switch 	While lit	Tabletop can be moved in only longitudinal direction by manual.
	While extinguished	Tabletop can be moved in both longitudinal and lateral directions by manual.

WARNING

Do not hold the side frame or the bottom of the tabletop. When the tabletop is moved, fingers may be pinched.



The following WARNING label is adhered at the side frame and end of the tabletop.



WARNING

CPR should be attempted only when the tabletop has been fully retracted to the rearmost side.

The following WARNING label is adhered at the side of the column.

4.2.5 Rotating the tabletop

When the tabletop rotating lock release switch  provided on the table console or the table control module is pressed to light the LED on it, the lock is released and the tabletop can be rotated manually.
The click stop is provided at each of 0°, ±22°(used for MH-600 system only), ±90° and 180° positions. When the tabletop comes to such position, the tabletop is automatically stopped and locked. (However, when the tabletop passes through the click stop quickly, the lock is not valid.)
Even while the lock is released, the tabletop is locked again when the lock release switch  is pressed or approximately 25 seconds have passed after the lock is released.

Pay rigid attention so that the patient and/or the table does not touch the peripheral devices when rotating the tabletop.

Pay rigid attention so that the foot switch cable is not caught by the peripheral devices when rotating the tabletop. Otherwise, the cable may be disconnected.

Reduce the rotational speed of the tabletop near the end of rotation (CW 90° and CCW 180°).

Otherwise, the patient may be moved by the shock of the mechanical stop.

4.3 X-ray fluoroscopy

The X-ray fluoroscopy of the fluoroscopy system combined with the KS-70 can be performed from the tableside.
When the fluoroscopy switch of foot switch is pressed, fluoroscopy is performed.

Symbols of Foot Switch	Function
	Fluoroscopy

When KS-70 is combined with the bi-plane C-arm support (MH-300/MH-400), following fluoroscopy foot switches are equipped.

Symbols of Foot Switch	Function
	Frontal C-arm Fluoroscopy
	Lateral C-arm Fluoroscopy

The X-ray is emitted exclusively while the fluoroscopy switch is pressed, and stops when fluoroscopy switch is released.
For setting of the fluoroscopy tube voltage and fluoroscopy tube current, refer to the operation manual for the X-ray high voltage generator attached. For adjustment of the luminance of fluoroscopy image, refer to the operation manual for the X-ray TV unit attached.

Pay rigid attention so that any object is not placed upon the foot switch or the foot switch is not pressed by mistake. Otherwise, the X-ray may be generated unexpectedly.

4.4 X-ray radiography

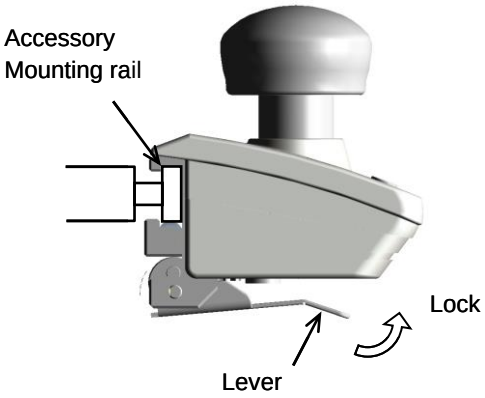
The X-ray radiography of the radiography system combined with the KS-70 can be performed from the tableside.
When the hand switch on the X-ray high voltage generator or  the foot switch is pressed, radiography is performed.
For setting of the radiography tube voltage and radiography tube current, refer to the operation manual for the X-ray high voltage generator attached.

Pay rigid attention so that any object is not placed upon the foot switch or the foot switch is not pressed by mistake. Otherwise, the X-ray may be generated unexpectedly.

4.5 Standard accessories

4.5.1 Table console (for MH-200S/300 system)

Hang the table console on the accessory mounting rail and pull up the lever to fix.



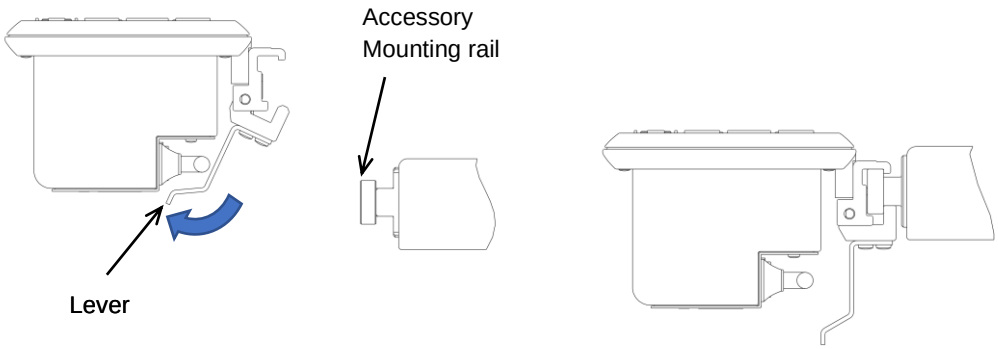
CAUTION

Table console has not been protected against any penetration of liquids. Please use a sterilized cover in order to prevent any liquid from being sprayed over the console. Do not use the equipment when the surfaces of table console, etc. is wet, because immersion of liquid may be caused and damage the equipment. Wipe off the table console with dry cloth for cleaning.

If any liquid has been spilled over the table console, please give notice to Shimadzu Service Representative.

4.5.2 Table control module (for MH-500/600 system)

Pull the lever at the bottom of the control module in the direction of arrow as the following figure and hook on the rail. Release the lever to fix the control module. And remove from the rail as pulling the lever in the direction of arrow.



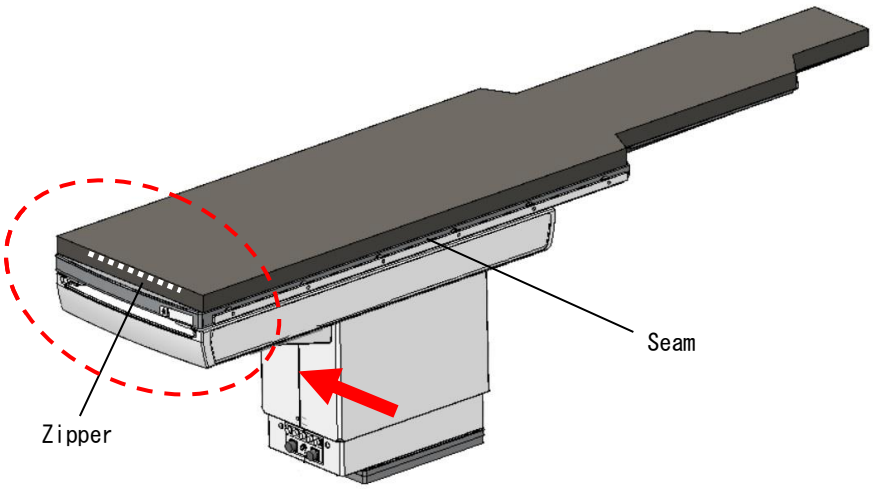
4.5.3 Foot switch

Placed on the floor.

Pay rigid attention so that the foot switch cable is not caught by the peripheral devices when rotating the tabletop. Otherwise, the cable may be disconnected.

Pay rigid attention so that any object is not placed upon the foot switch or the foot switch is not pressed by mistake. Otherwise, the X-ray may be generated unexpectedly.

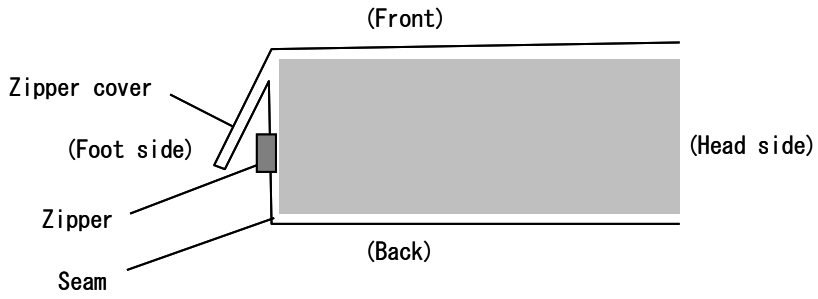
4.5.4 Tabletop mattress



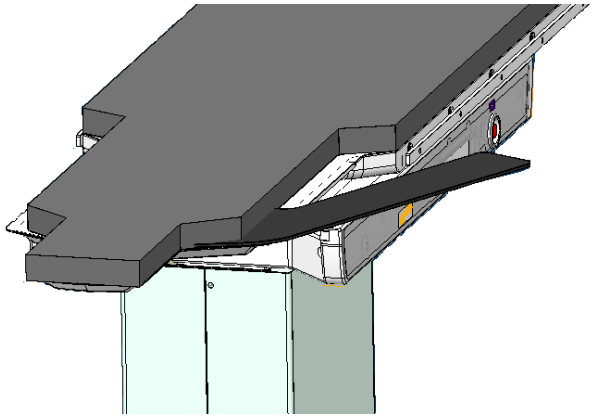
This mattress is used by placing on the tabletop.

CAUTION

There is a distinction between the front and back. Place the mattress seam-side down on the tabletop and the zipper cover on the foot side covering the zipper from above.



4.5.5 Arm support (Carbon)



This Arm support is used by inserting between tabletop and mattress.

CAUTION

Pay attention not to drop or hit the Arm rest against anything hard. If the Arm rest is damaged, frayed carbon fibers may cause injury.

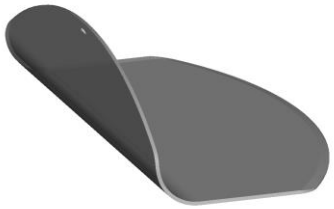
CAUTION

When inserting the Arm support between the tabletop and the mattress, lift the edge of the mattress and be careful not to apply excessive force to the outer skin of the mattress as much as possible. The seam joint of the top plate mat may be damaged.

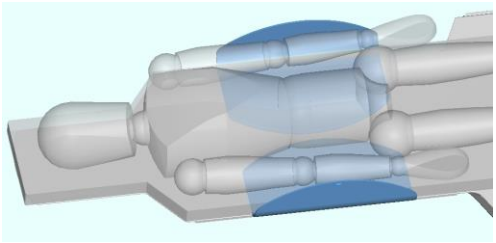
NOTE

Circumference of Arm support (Carbon) may appear by fluoroscopy and radiography, because the side of Arm support (Carbon) is painted. Max. loadage of Arm support (Carbon) is 50N (5 kgf).

4.5.6 Arm support



This is a pair of L-shaped plates to prevent the arm or hand of the patient from hanging out of the tabletop. This is used inserting between tabletop and patient (under the mattress). Make sure to follow the instructions below.



CAUTION

The arm support is separated into two portions so that they can be inserted under the patient (mattress) from the left and right sides. When using the arm support, insert it under the patient securely and pay rigid attention so that the arm and hand of the patient are not protruded from the arm support as mentioned in the WARNING label adhered on the arm support. Also be careful that the arm support is not placed diagonally when the table is moved. When the table is moved considerably (at the end of examination, for example), make sure that the arm and hand are not protruded from the arm support before operation.

CAUTION

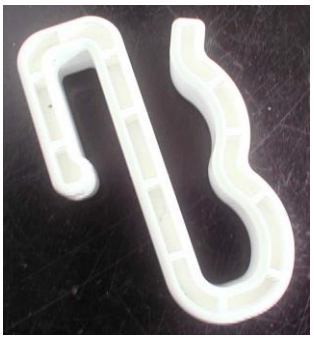
When inserting the Arm support between the tabletop and the mattress, lift the edge of the mattress and be careful not to apply excessive force to the outer skin of the mattress as much as possible. The seam joint of the top plate mat may be damaged.

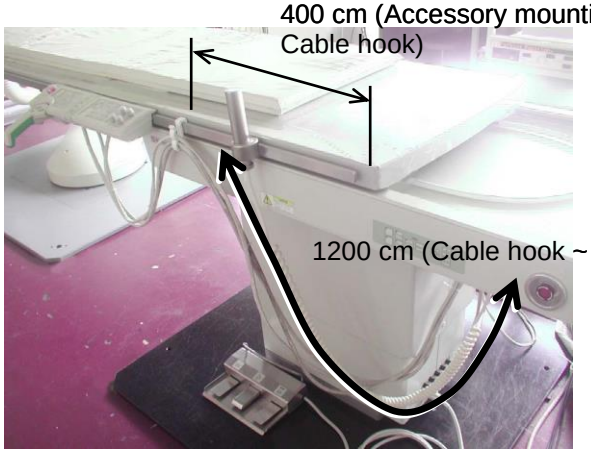
The following WARNING label is adhered on the arm support to prevent the fingers from being pinched.

4.5.7 Cable hook

This cable hook is used for hanging cables of the consoles on the accessory mounting rail. Adjust setting position not to catch the cables on the column by moving table.
6 cable hooks are included in the delivery of the equipment, if you need additional cable hook, please consulting with our service representative. (Onerousness)

Cable hook (part number : 503-59819)





Example (Cable hook setting position and cable length)

4.6 Optional accessories

4.6.1 Arm grip

The arm grip is the accessories in order to cross and grip hands over the head in heart examination. The patient can take examination in the easy posture with this grip.

WARNING

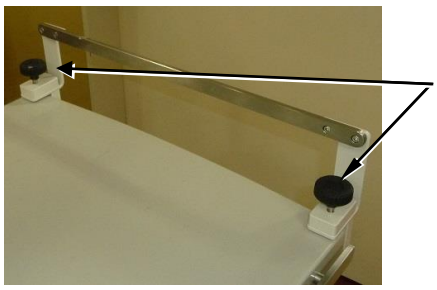
Make sure that the patient and grip does not come in contact with the C-arm. There is a risk that the patient can be injured or the unit can be damaged.

CAUTION

Make sure the thumbscrews are tight. If the screws are loose, arm grip may fall off.

4.6.2 Sub rail (for MH-200S/300 system)

Accessories such as local console, etc. can be attached.
Sub rail can be attached to the foot side of the table top.



Example

CAUTION

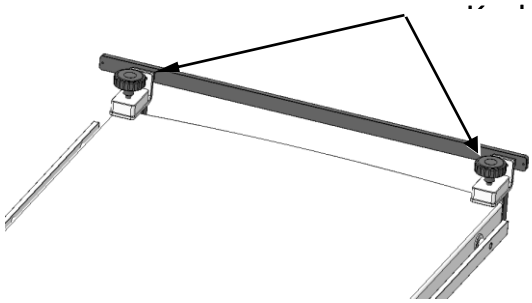
Sub rail can load 150 N (15.3 kgf) maximum. Make sure the total load of accessories to be within 150 N (the load capacity decreases with increasing distance between the center of gravity of the load and the sub rail). Otherwise, there is a risk of sub rail and/or KS-70 tabletop being damaged.

CAUTION

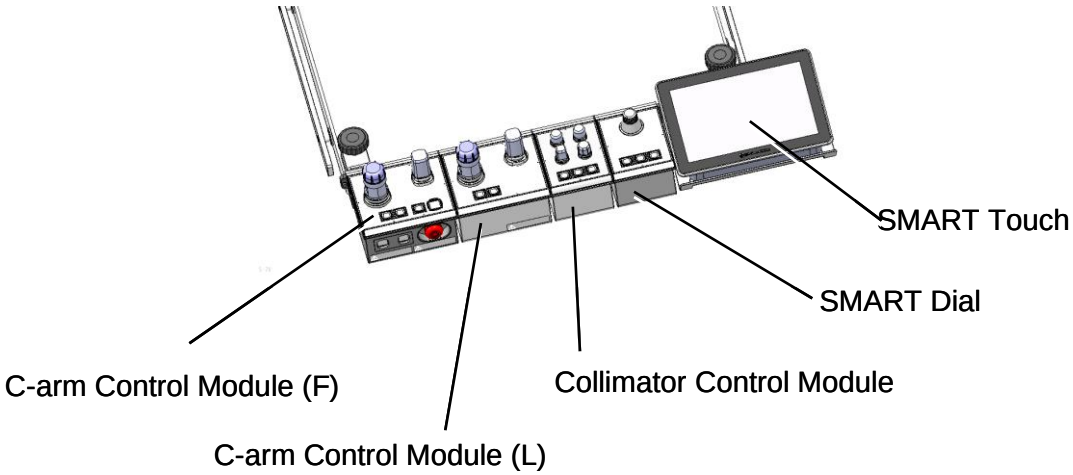
Make sure the thumbscrews are tight. If the screws are loose, sub rail may fall off.

4.6.3 Sub rail (for MH-500/600 system)

Accessories such as C-arm Control Module , etc. can be attached.
Sub rail can be attached to the foot side of the table top.
When using Subrail (for MH-500/600 system), Slide rail (see 4.8.7) can only be used on the right hand side.



Example



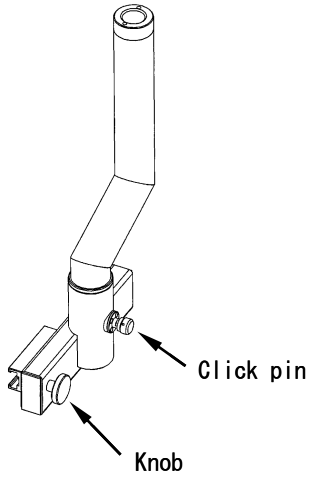
CAUTION

Sub rail can load 150 N (15.3 kgf) maximum. Make sure the total load of accessories to be within 150 N (the load capacity decreases with increasing distance between the center of gravity of the load and the sub rail). Otherwise, there is a risk of sub rail and/or KS-70 tabletop being damaged.

CAUTION

Make sure the thumbscrews are tight. If the screws are loose, sub rail may fall off.

4.6.4 Injector head mount



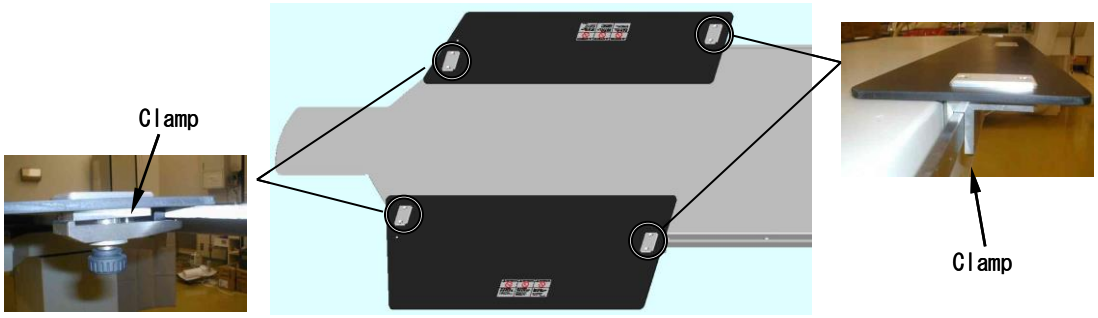
Injector head can be mounted at the tip.
Insert it to accessory mounting rail and knob is turned. Also, it rotates freely when pulling a click pin and can be fixed at every 90°.

CAUTION

Make sure the thumbscrew is tight. If the screw is loose, injector head mount may fall off.

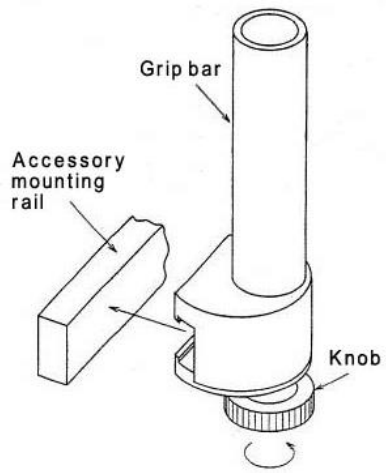
4.6.5 Radial arm support

This arm support is used mounting on the right and left side of tabletop. The wide one is for a right hand and narrow one for a left hand. For leg side, fit a clamp into accessory mounting rail on the side of tabletop. For head side, fix a knob binding the tabletop edge, with a clamp.



The following WARNING label is adhered on the arm support.

4.6.6 Grip switch



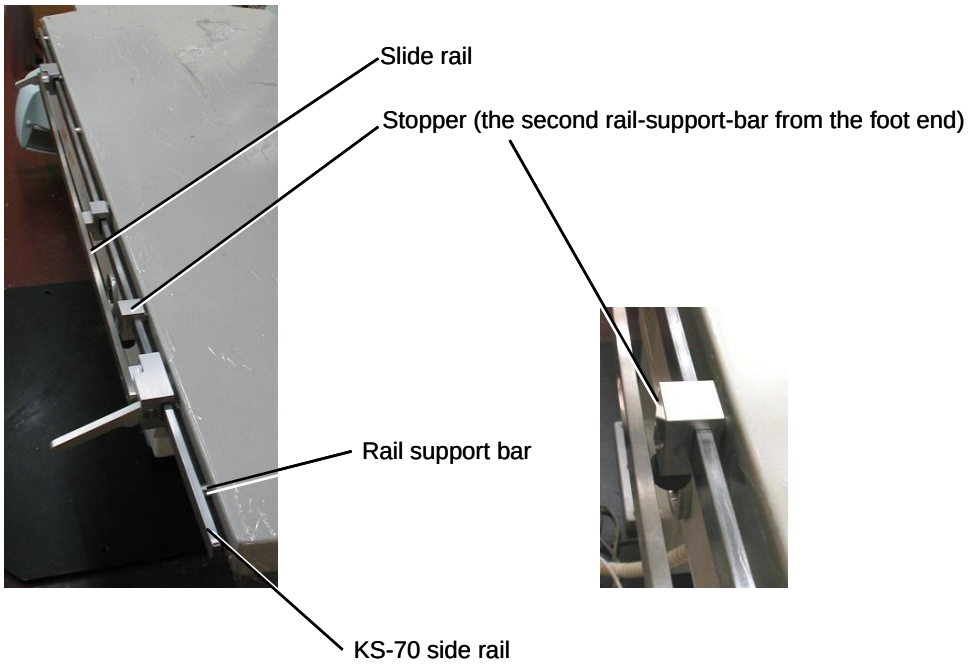
This switch is locked when it is fitted onto the accessory mounting rail provided on the side of the tabletop and knob is turned counterclockwise.
The grip bar can be removed and sterilized, when being turned counterclockwise.

4.6.7 Slide rail

The slide rail assembly is designed to mount the MH series consoles, the IVR-NEO (for BRANSIST safire / DIGITEX safire SP) and the Bed Side Console (for HEARTSPEED10). By moving the slide rail assembly, the consoles can be put to foot side of the tabletop during a patient getting up on or down from the KS-70 tabletop.

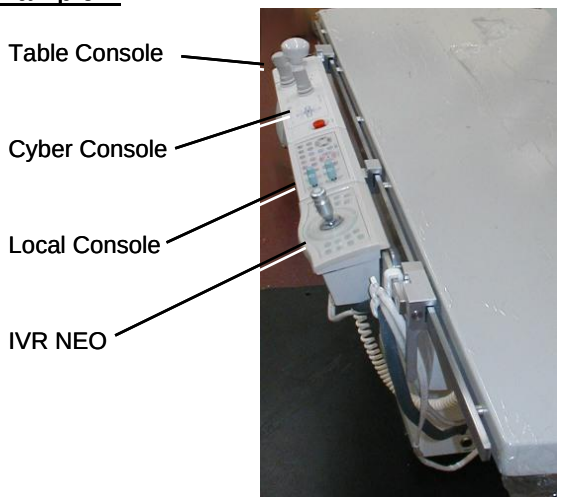
The sub rail type B (4.8.2) must be chosen to use the slide rail.
Attach the slide rail to the KS-70 side rail.

Attach the stopper to the second rail-support-bar from the foot end to the KS-70 side rail. Tighten the screw to fix the stopper.

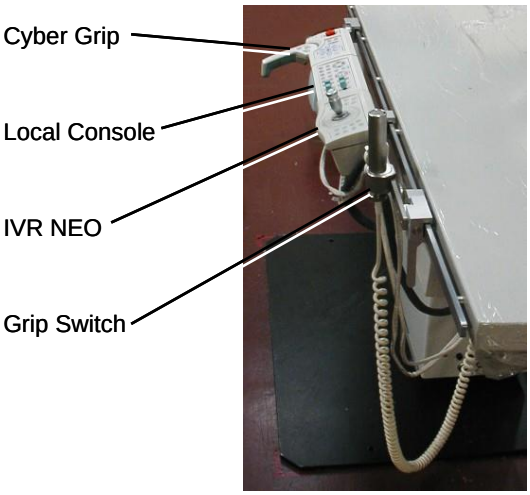


Attach consoles to the slide rail as with KS-70 side rail.

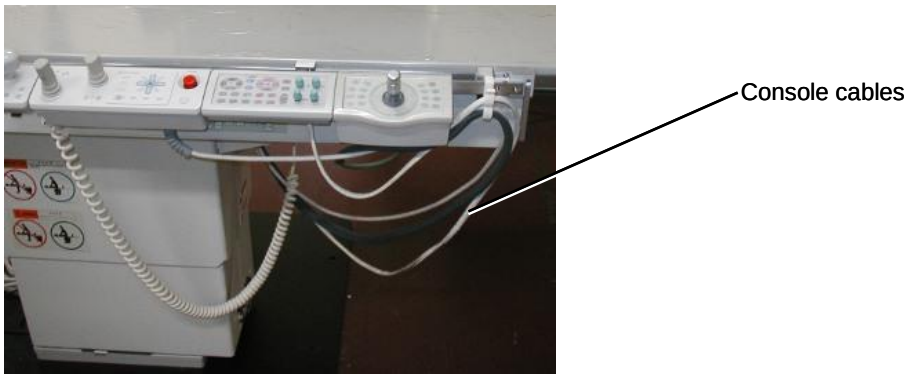
Example 1



Example 2



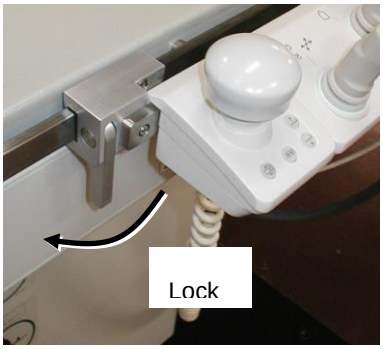
Adjust console cable length so as not to apply tension to the cables while moving the slide rail.

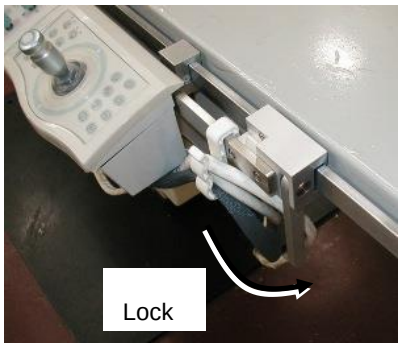


CAUTION

Do not attach other than MH series consoles or IVR-NEO to the slide rail.
The slide rail can load 150 N (15.3 kgf) maximum (the load capacity decreases with increasing distance between the center of gravity of the load and the slide rail). Applying excessive load on the slide rail may cause damage to the slide rail and/or the KS-70 tabletop.

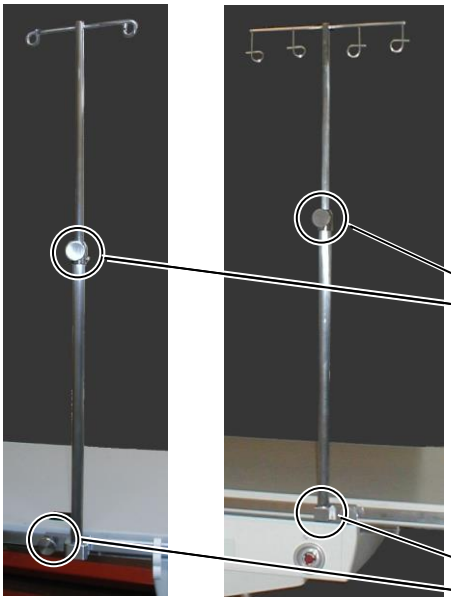
Lock the slide rail with levers at both ends. Pull both levers down to lock the rail except when the slide rail is moved.





When moving the slide rail, pull the levers up to release. Lift up the slide rail with the levers and slide the assembly to the foot side.

4.6.8 Drip stand



Two hook type Four hook type

The drip stand is fixed when it is inserted into the accessory mounting rail and the knob is turned. Adjust the height of the stand step by loosening the knob on the bar.

CAUTION

Make sure the thumbscrew is tight. If the screw is loose, drip stand may fall off.

4.6.9 Protective sheet

The protective sheet is to be mounted on the accessory mounting rail provided on the side of the tabletop. Refer to the instruction manual attached to the product for detailed information.

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4.7 Turning off the power (“LINE”)

To turn off the power of the KS-70, set “LINE” of the X-ray high voltage generator combined with the KS-70 to “OFF” (“◯”).

NOTE

Make sure to read the operation manual of the X-ray high voltage generator attached and understand it completely before turning on/off the power switch.

4.8 Action against emergency

4.8.1 Emergency stop

When an emergency has occurred in which the vertical movement of the KS-70 cannot be stopped due to failure in switches, etc., press the stop switch ▽ provided on the side of the tabletop or turn off the “LINE” switch provided on the X-ray high voltage generator. The vertical movement will be stopped.
Even when the stop switch ▽ is pressed, the tabletop can be moved horizontally or rotated as usual.

4.8.2 Recovery from emergency stop

When the cause of emergency stop is removed, turn the stop switch ▽ clockwise or turn on the “LINE” switch provided on the X-ray high voltage generator. The KS-70 will recover to the usual operation status.

WARNING

Make sure that the unit does not move abnormally when the stop switch ▽ is turned clockwise or the ”LINE” switch provided on the X-ray high voltage generator is turned on to recover from the emergency stop.

If the unit moves abnormally again, stop the unit immediately using the emergency stop procedure.

Stop switch

4.8.3 Action against power interruption

In case of installing Table power failure measure kit option

The table slide function is protected from power interruption with UPS (uninterruptible power supply system). The table slide operation is possible normally. However, the table cannot move to up/down.

NOTE

The table is connected to UPS (uninterruptible power supply system), so it is enable to move to such as CPR position during a power failure. Only the table console, table control module and grip switch are available console during a power failure. (Other consoles are not available)

It does not operate when interruptible power supply is turned OFF.

in case of not installing above option

When the power is interrupted, the tabletop cannot be moved vertically. However, it can be moved horizontally or rotated regardless of the brake when a force of 150 N to 200 N (15 kgf to 20 kgf) is applied.

When the power is interrupted, make sure the safety of the patient by horizontal and rotational movements.

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5

Maintenance Service and Check

In order to maintain the performance of the KS-70 over a long period of time, you are asked to carry out the respective check items as follows.
If there is something abnormal or questions, please contact our service staff.

5.1 Daily inspection

5.1.1 Inspection for vertical movement of the tabletop

Check if there is any abnormal sound or jolt when the tabletop is moved vertically.

5.1.2 Inspection for horizontal movement of the tabletop

Check if there is any abnormal sound or jolt and brakes work normally when the tabletop is moved horizontally.
Next, check if there is foreign matter sticking on the longitudinal slide rails. If waste yarn, dust etc. are remaining, wipe them away with a clean cloth.
Furthermore wipe the slide rails with dry cloth soaked in lubricating oil to maintain the stable performance extending over a long period of time.
After the oil cleaning, check if waste yarn, dust and others are remaining on the slide rails.

5.1.3 Inspection for rotational movement

Check if there is an abnormal sound or jolt and brakes work normally when the tabletop is rotated.
Next, the reflecting plate adhered on the base appears when the tabletop is rotated (Fig.2). Clean the reflecting plate with clothes if it is dirty.

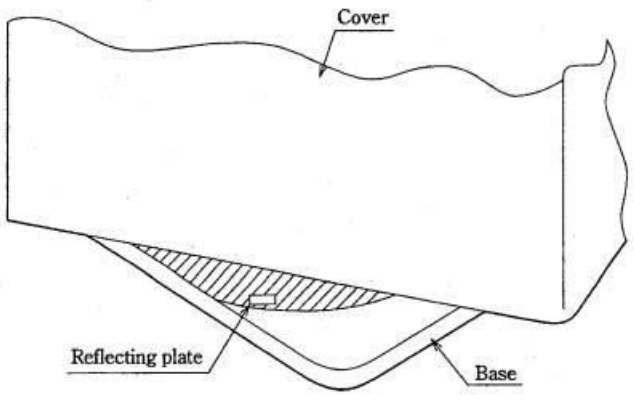
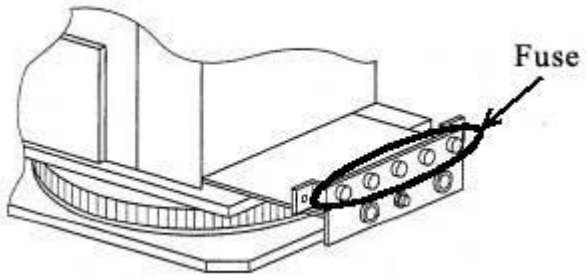


Fig. 2 Reflecting Plate on base

5.1.4 Inspection for fuse

Check fuses at the lower back of the column if the tabletop is not moved vertically or horizontally with turning on the power.

For three-phase 200 V { F1, F2, F3 } For single phase 100 V { F4, F5 }



CAUTION

There is a risk of fire if a fuse other than our specified parts are used.
If a fuse is needed to be replaced by the user in urgent cases etc., replace only with the following fuse.

Parts name	Part number	Used in
Fuse, 313 005 (Rating 250 V, 5 A fuse characteristic: slow blow Interrupting rating: 200 A @ 250 VAC)	072-01664-33	lower back of the column

The following WARNING label is adhered at the rear of the column.

CAUTION

For protection against electric shock, press ○ of the X-ray high voltage generator and turn off the power supply to KS-70 when exchanging the fuses.

5.1.5 Inspection for Accessories

Check if the thumbscrews of the accessories are not loose.

Make sure the thumbscrews of the accessories are tight. If the screws are loose, accessories may fall off.

5.2 Periodic Inspection

The periodic inspection is carried out by the Shimadzu Service Representative.
The periodic inspection requires sufficient knowledge of the internal mechanism and is hazardous. Inspection is carried out every 6 months and will be charged after the guarantee expires.

5.3 Periodic replacement parts

Some of the parts must be replaced after a certain period of time, in order to maintain performance of the system.
Periodic replacement parts must be replaced by a Shimadzu Representative. For periodic exchange, please contact with our service representative. The periodic replacement parts are changed.
The parts that require periodic replacement are shown below.

Part name	Part number	Used in	Quantity	Frequency
V-BELT, 2-5MS650	032-21301-30	Column Up/Down	1	5 years
FUSE, 313 005P	072-01664-33	Lower back of the column	5	2 years
SW, MICRO Z-15GQ55	064-30153-03	Foot switch	3	3 years

5.4 Disinfection

CAUTION

Use the following disinfectants.

- Chlorinous disinfectant
  Sodium dichloroisocyanurate solution (up to 1%)
  Sodium hypochlorite solution (up to 1%)
- Alcohol-based disinfectant (Use with sufficient ventilation.)
  Commercial Isopropyl alcohol solution (up to 99wt%)
  Rubbing alcohol (Ethanol: 76.9~81.4vol%, Additive: Isopropyl alcohol)

CAUTION

Be sure to observe the restrictions on the use of disinfectants in the following parts.

- Unpainted metal parts
  Do not use chlorine disinfectant. It may corrode, so please wipe it off immediately if it adheres.

WARNING

Do not splash or spray any disinfectant onto the system.

When soaking disinfectant into a cloth, wring it out so that it does not drip.

・Any disinfectants that leak into this system may cause failure or trouble with the system.

Turn off the power during disinfection.

Ventilate the installation room when turning on power after disinfection.

・Residual inflammable disinfectants can lead to fire, explosion, or electric shock.

CAUTION

Keep disinfection at minimum

- Repeated disinfection over a long period of time may lead to discoloring, cracking and deterioration of rubber and plastic. If any change of the product is noticed after disinfection, discontinue using the product. Any disinfectants that leak into this system may cause failure or trouble with the system.

CAUTION

Do not use the following disinfectants.

Performance and safety of the product cannot be guaranteed, if any of the following disinfectants are applied.

- Disinfectants that corrode metals, plastics, rubbers, or coatings
- Disinfectants inadequate for metals, plastics, rubbers and coatings
- Gas-spray type adhesives
- Volatile adhesives
- Disinfectants that can leak into the product

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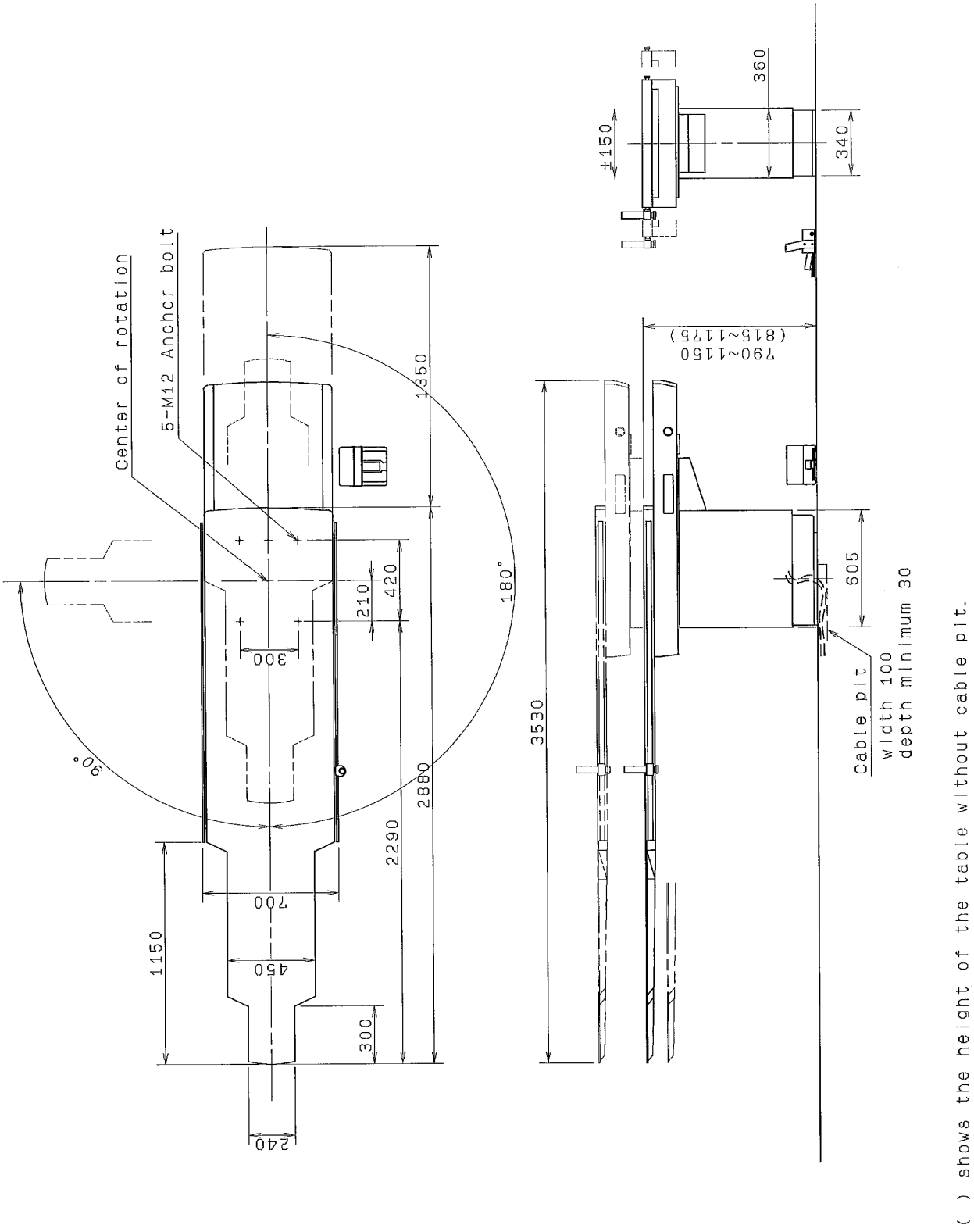
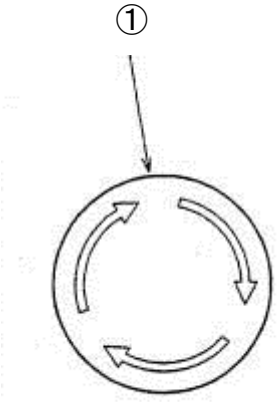
Appendix



(Unit: mm)

Fig. 3 Catheterization table KS-70



(1) Stop switch

Fig. 4 KS-70 Control panel

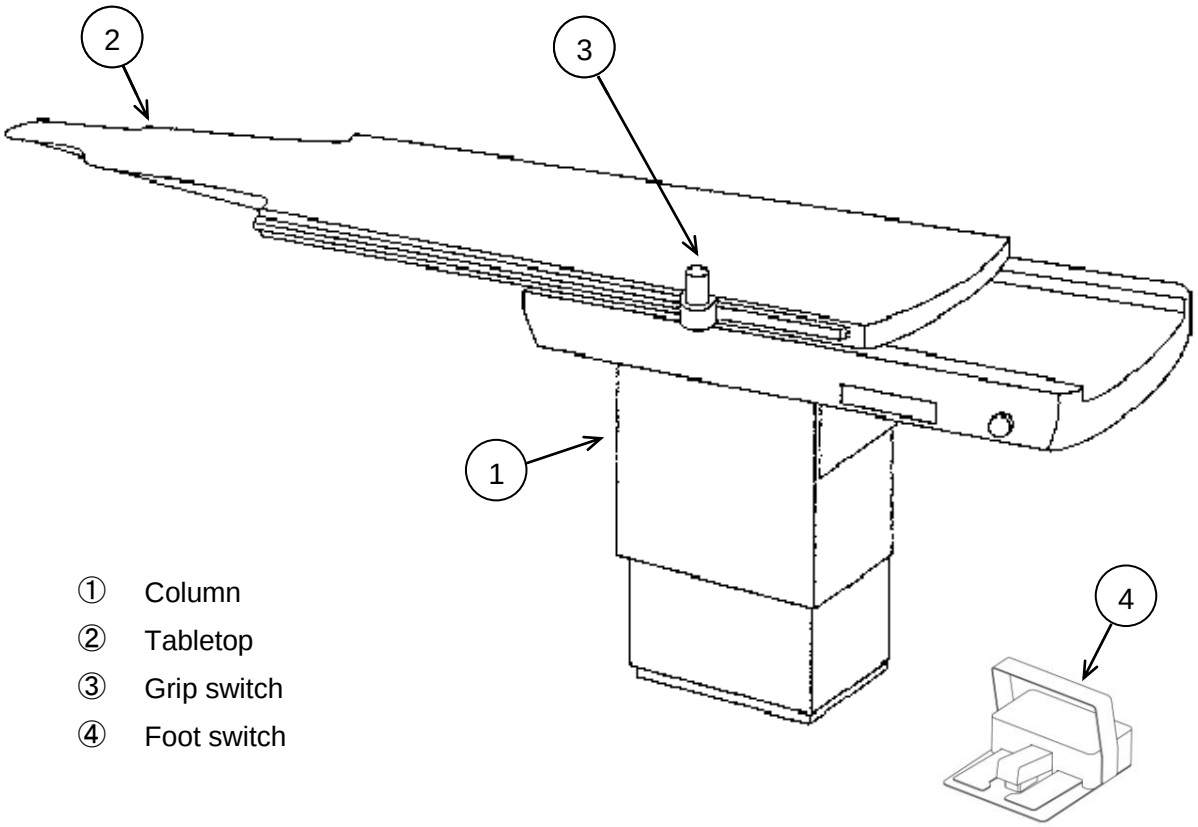


Fig. 5 Catheterization table KS-70

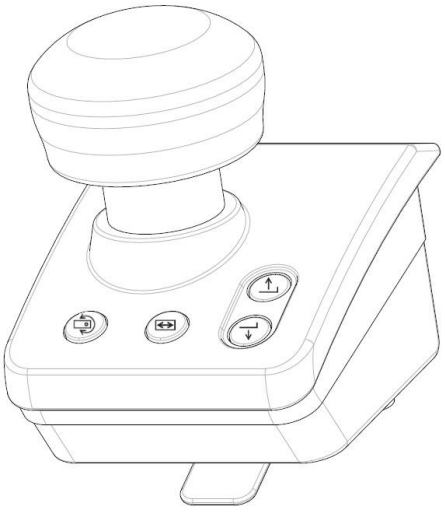


Fig. 6 Table console

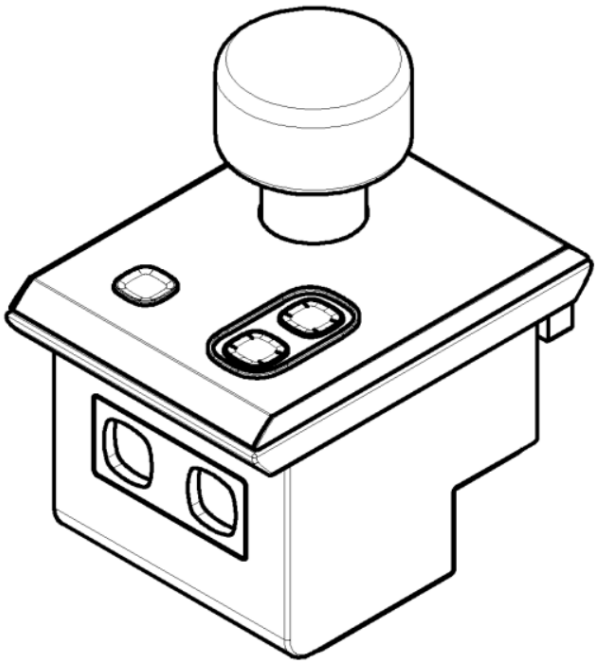
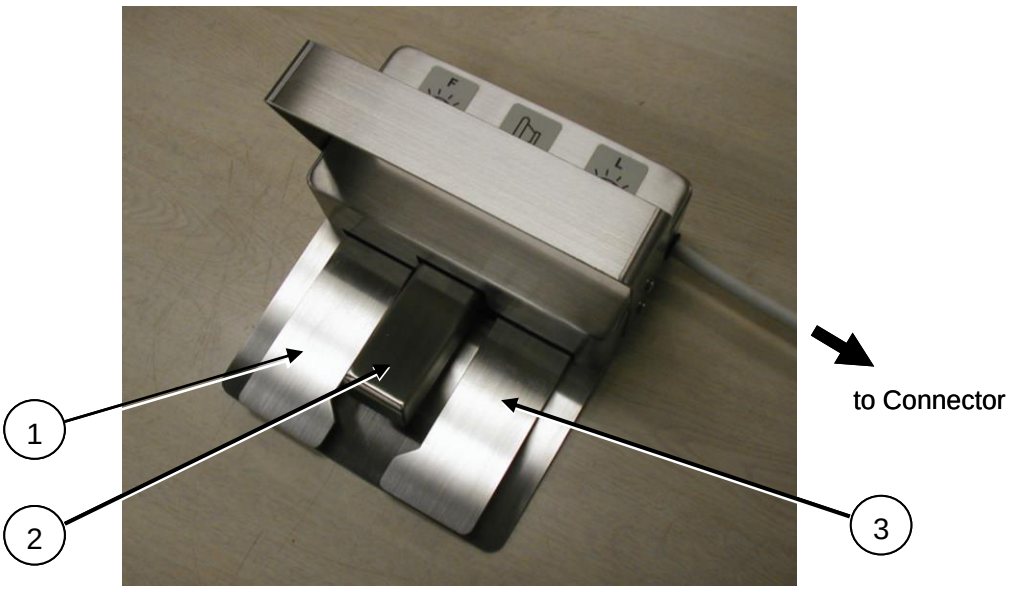


Fig. 7 Table control module



In case of combination with BRANSIST single-plane C-arm.

① Fluoroscopy switch（ ）
② Exposure switch（ ）
③ Reserved switch

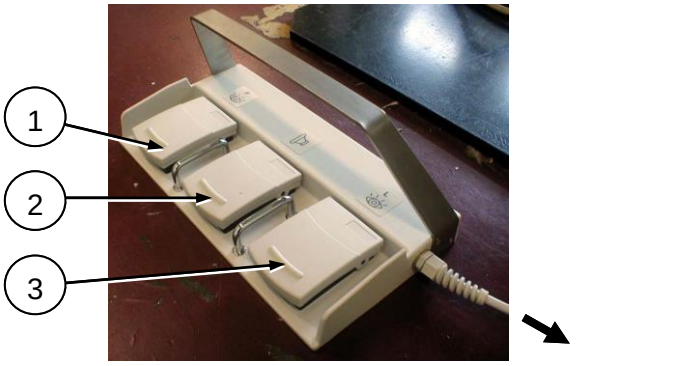
In case of combination with HEART SPEED 10 single-plane C-arm.

① Fluoroscopy switch（ ）
② Exposure switch（ ）
③ Fluoro record switch（ ）

In case of combination with bi-plane C-arm.

① Frontal C-arm fluoroscopy switch（ ）
② Exposure switch（ ）
③ Lateral C-arm fluoroscopy switch（ ）

Fig. 8-1　Foot Switch



Foot switch A

In case of combination with BRANSIST single-plane C-arm. (Foot switch A is used.)

① Fluoroscopy switch （ ）
② Exposure switch （ ）
③ Reserved switch

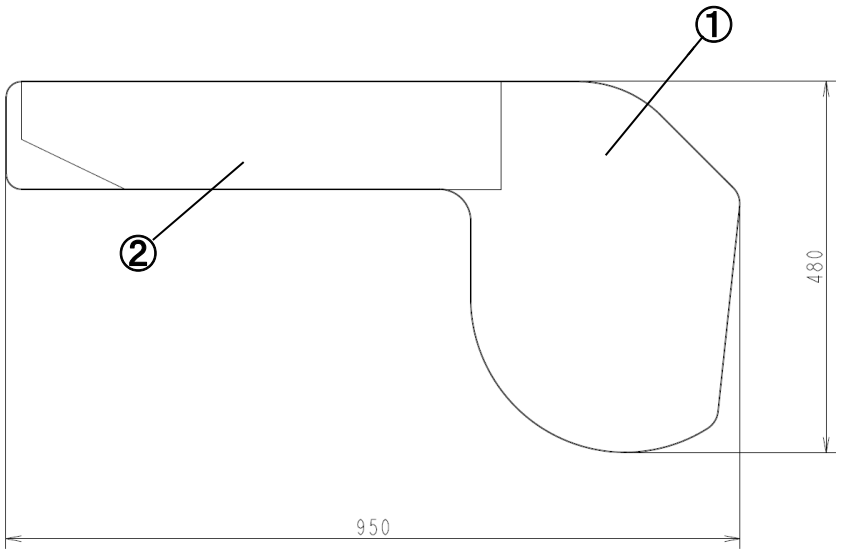
In case of combination with HEART SPEED 10 single-plane C-arm. (Foot switch A is used.)

① Fluoroscopy switch （ ）
② Exposure switch （ ）
③ Fluoro record switch （ ）

In case of combination with bi-plane C-arm. (Foot switch A is used.)

① Frontal C-arm fluoroscopy switch （ F ）
② Exposure switch （ ）
③ Lateral C-arm fluoroscopy switch （ L ）

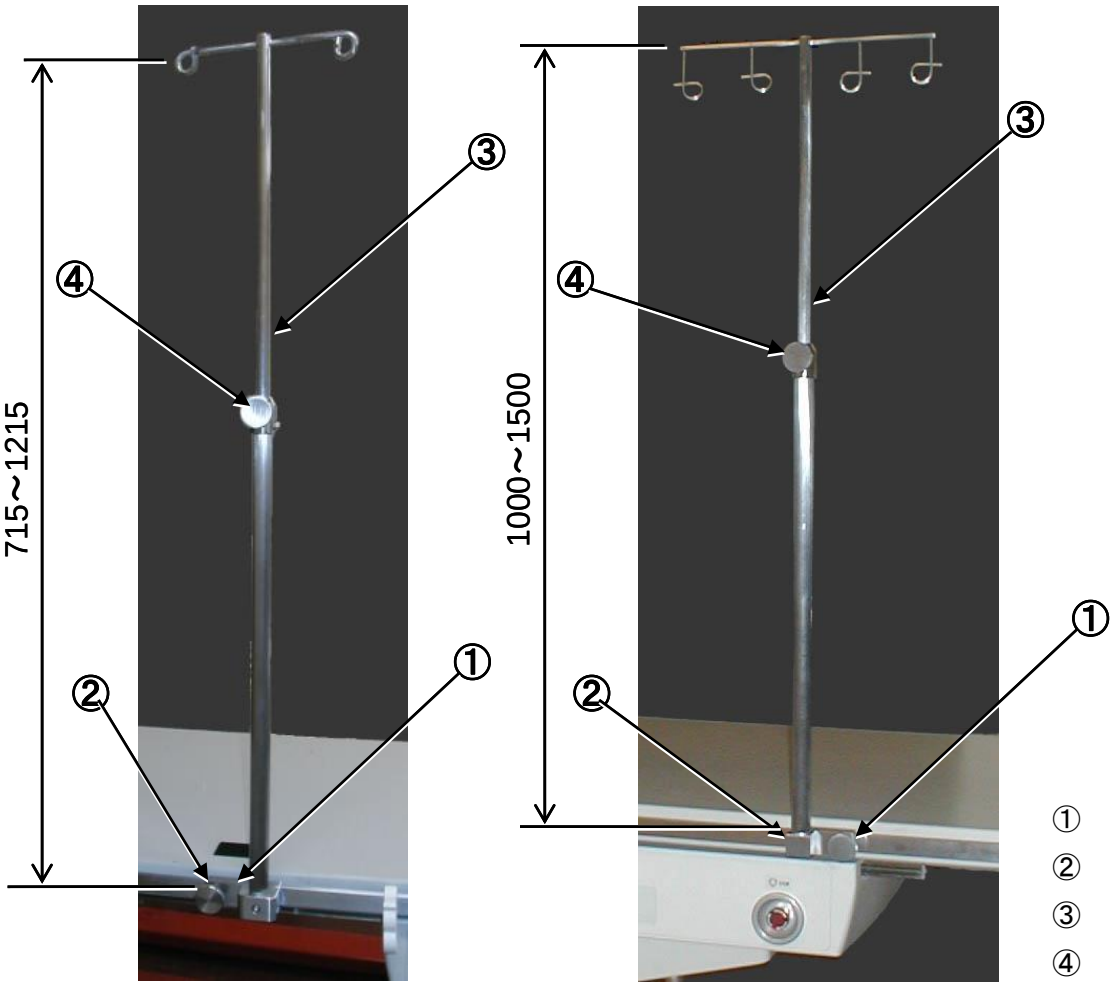
Fig. 7-2　Foot Switch



① Carbon Plate
② Mattress

(Unit: mm)

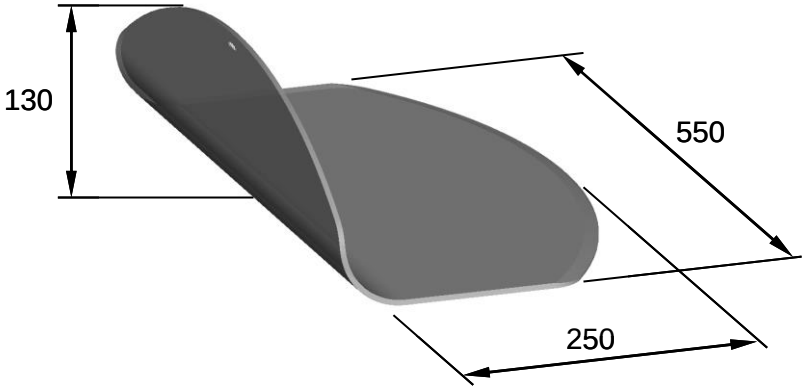
Fig. 9 Arm support (carbon) (Option)



① Slider
② Knob
③ Holder
④ Knob

(Unit: mm)

Fig. 10 Drip stand



(Unit: mm)

Fig. 11 Arm supports

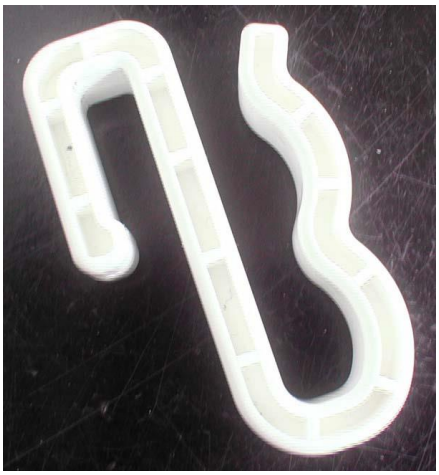
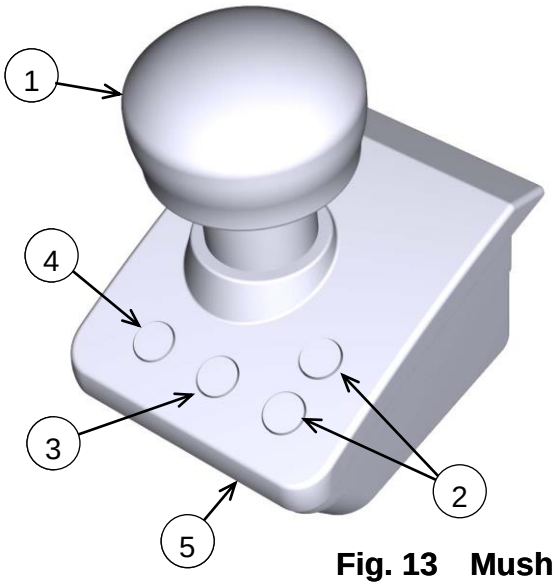
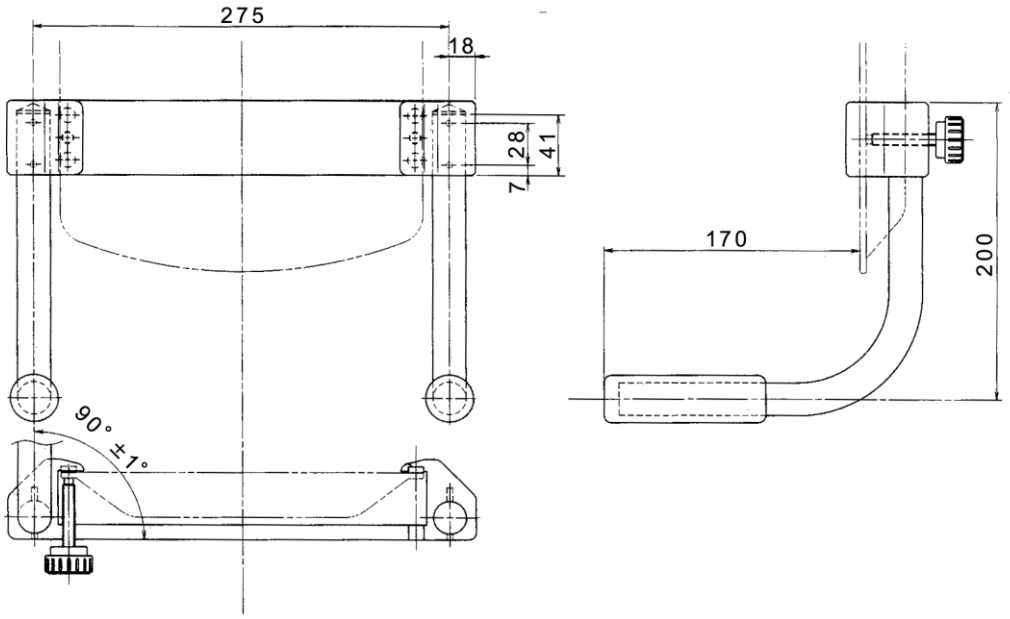


Fig. 12 Cable hook



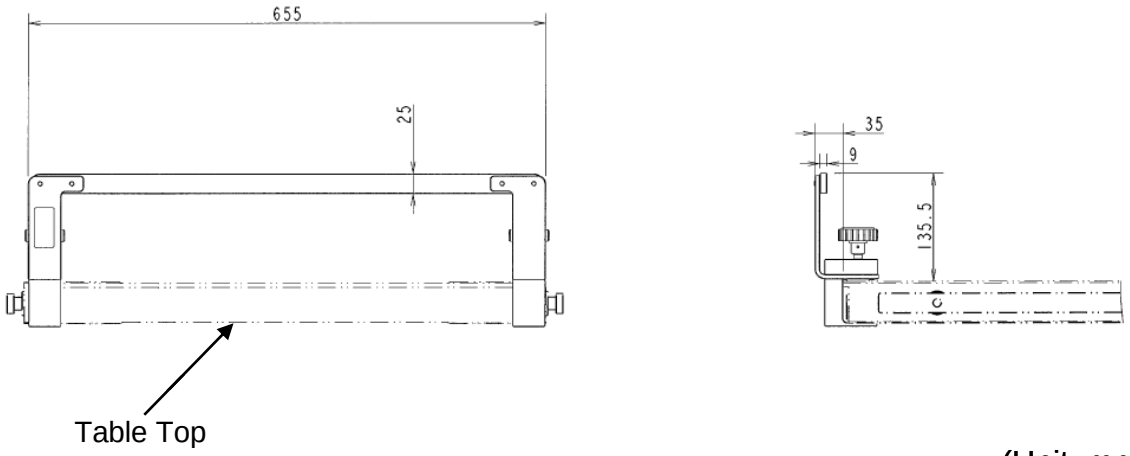
① Lock release switch
② Up down switch
③ Tabletop longitudinal travel lock release selection switch
④ Tabletop rotating lock release switch
⑤ Lever

Fig. 13 Mushroom grip



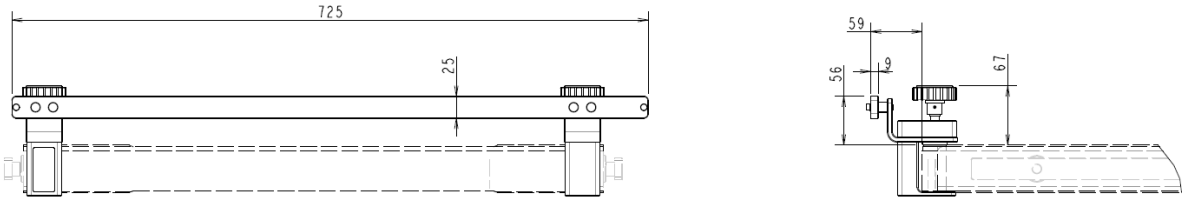
(Unit: mm)

Fig. 14 Arm grip (Option)



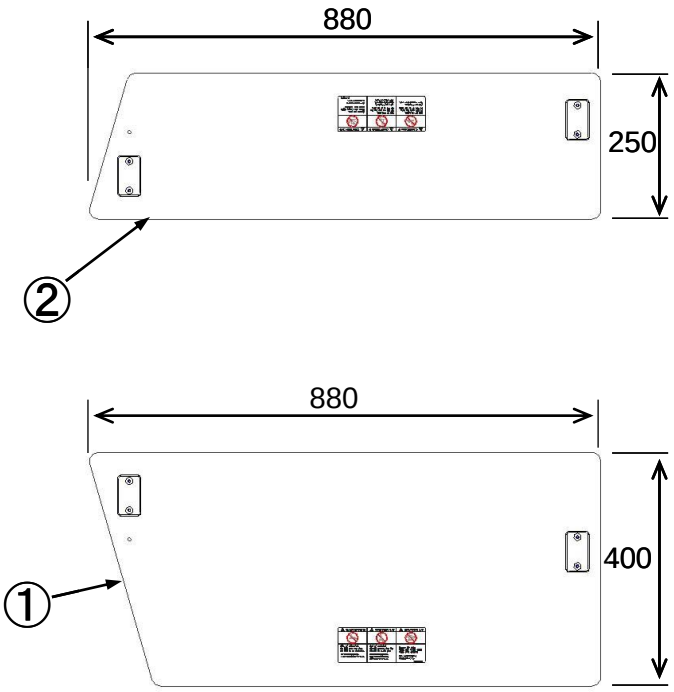
(Unit: mm)

Fig. 15 Sub-rail (for MH-200S/300 system) (Option)



(Unit: mm)

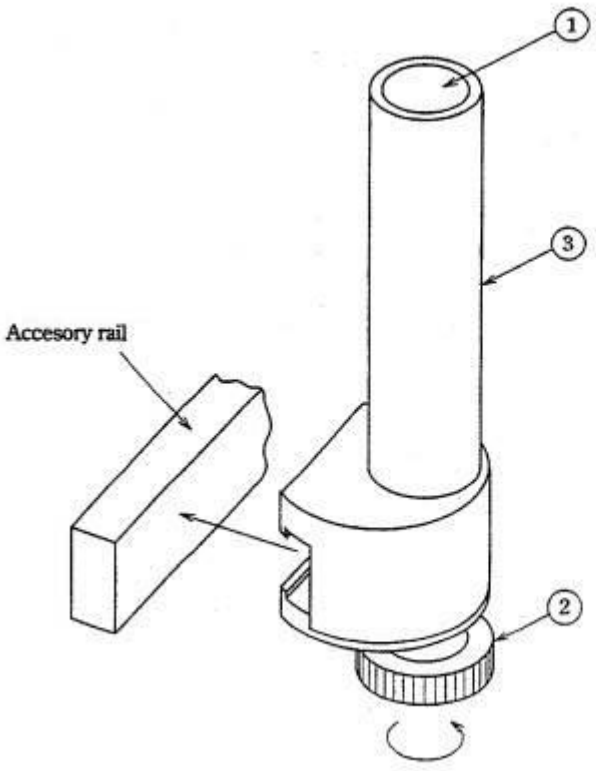
Fig. 16 Sub-rail (for MH-500/600 system) (Option)



① Arm support for right hand
② Arm support for left hand
③ Mattress for right hand
④ Mattress for left hand

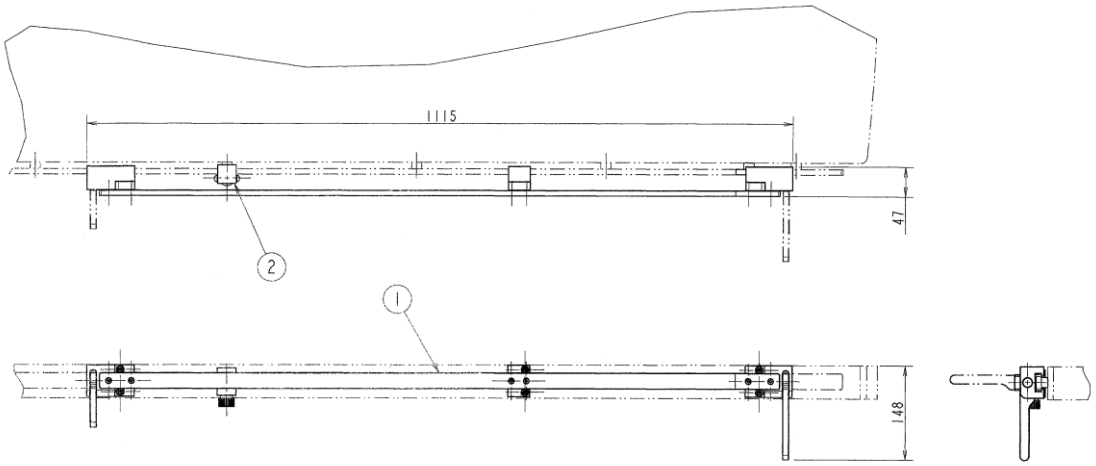
(Unit: mm)

Fig. 17 Radial arm support (Option)



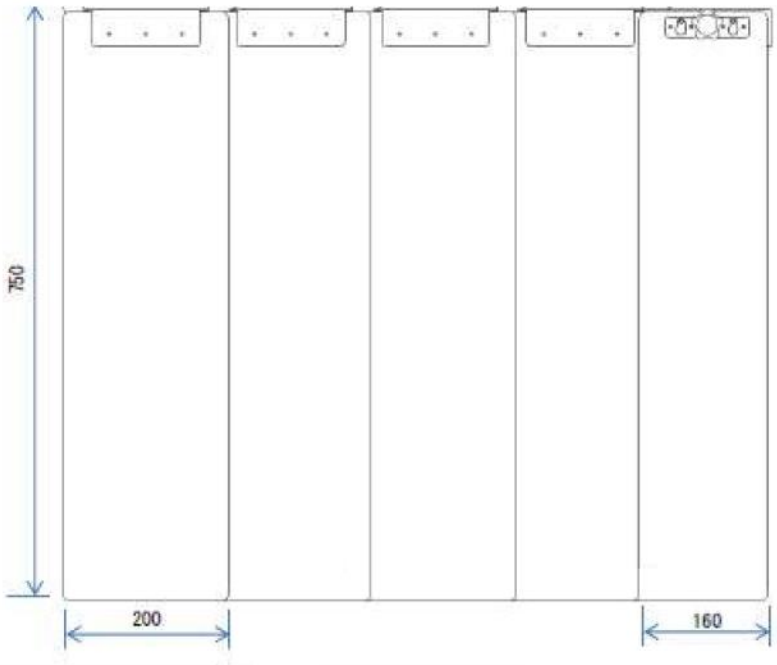
① Lock release switch
② Knob
③ Grip

Fig. 18 Grip switch (Option)



①Slide rail
②stopper

Fig. 19　Slide rail (option)



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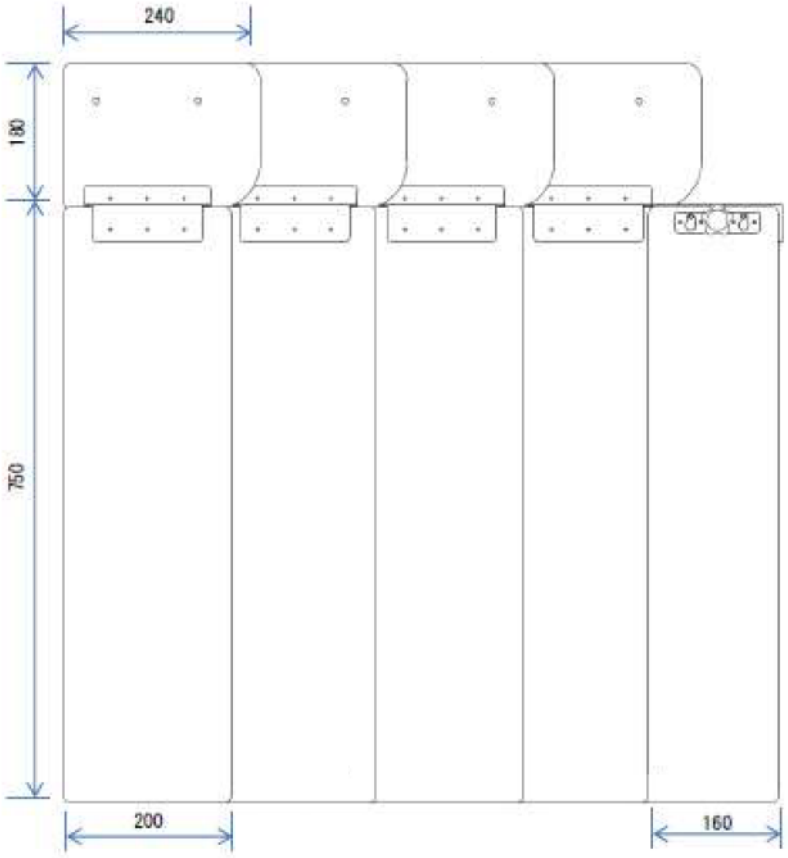

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Fig. 20 Slide rail (option)

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