Dyna Scope 7000 Series

DS-7300 System

Input Box

IB-7300

Operation Manual

- Before using this device, read this operation manual thoroughly.
- Keep this manual near the device for future reference.

CE 0086

FUKUDA DENSHI

CE 0086

This module conforms with the provisions of Medical Device Directive 93/42/EEC in connecting with the Fukuda Denshi monitoring equipment, labeled "CE".

The above mark "CE" is applied to the product that operates on 230V, 50Hz.

THE PERSONS RESPONSIBLE FOR PLACING DEVICES ON THE EC MARKET UNDER MDD 93/42/EEC;

NAME : FUKUDA DENSHI UK
ADDRESS : 13 WESTMINSTER COURT, HIPLEY ROAD, OLD WOKING, SURREY GU22 9LG, U.K.

CAUTION: This device is for sale by or on the order of a physician.

* The company and product names used in this manual are trademarks or registered trademarks.
* If this manual has pages missing or out of order, contact Fukuda Denshi for replacement.
* Only a physician or persons instructed by physicians are allowed to use this device.
* The information contained in this document is subject to change without notice due to improvement in the device.

Printed in Japan

Safety Precautions

Thank you for purchasing this product.
Before using this product, read the following precautions carefully to ensure the product is used correctly and safely.

- Read the “Safety Precautions” thoroughly before use to ensure correct and safe use of the product.
- Be sure to follow the precautions indicated below, as these are important messages related to safety.

⚠WARNING	Failure to follow this message may result in death or serious injury, or complete failure of the equipment.

⚠CAUTION	Failure to follow this message may cause injury or failure to the equipment.

NOTE	A note is not related to product safety, but provides information about the correct use and operating procedures to prevent incorrect operation and malfunction of the equipment.

Precautions for Safe Operation of Medical Electrical Equipment

⚠CAUTION	Read the following precautions thoroughly to correctly operate the device. ● Users should have a thorough knowledge of the operation before using this system. ● Pay attention to the following when installing and storing the equipment. • Do not install or store in an area where the equipment will be subject to splashing water. • Do not install or store in an area where the environmental conditions, such as atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, sodium, sulfur, will adversely affect the system. • Place the equipment on a stable surface where there is no inclination, vibration, or shock (including during transportation). • Do not install or store in an area where there are chemical or gasses stored. ● Before operating the system, verify the following items. • Check the cable connection and polarity to ensure proper operation of the equipment. • Ensure that all cables are firmly and safely connected. • Pay special attention when the device is used in conjunction with other equipment as it may cause erroneous judgment and danger. • Ensure all patient connections are proper and secure. ● During operation of the system, verify the following items. • Always observe the system and patient to ensure safe operation of the equipment. • If any abnormality is found on the equipment or patient, take appropriate measures such as ceasing operation of the equipment in the safest way for the patient. • Do not allow the patient to come in contact with the device. ● After using the system, verify the following items. • When unplugging the cables, do not apply excessive force by pulling on the cord. Pull by the connector part of the cable. • Clean the accessories and cables, and keep them together in one place. • Keep the unit clean to ensure proper operation of the next use. ● If the equipment is damaged and in need of repair, user should not attempt service. Label the unit “OUT OF ORDER” and contact Fukuda Denshi. ● Do not remodel the equipment. ● Maintenance Check • Make sure to periodically check the equipment, accessories and cables. • Before reusing the device that has been left unused for a while, make sure that the device works normally and safely.

Precautions about this Device

⚠WARNING	● Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator. ● The power cable must be connected to AC 100~230V outlet. Do not use multi-tap. ● When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipment. Even a small potential difference may result in electric shock to the patient and the operator. ● Use the trolley only with the equipment specified by Fukuda Denshi. Otherwise, the monitor and trolley may fall down, resulting in injury or damage to the monitor. ● Be sure to lock both casters when using or storing the trolley. The trolley may move or fall down, resulting in injury or damage to the monitor. ● Do not use or store the trolley where it will be subject to inclination of 10 degrees or more. The trolley or equipment may fall resulting in injury or damage to the equipment. ● When the air filter is washed with neutral detergent, dry it completely before reattaching. If the moisture is remained on the air filter, it may damage the equipment. ● The air filter must be attached after cleaning / replacing. If the equipment is used with the air filter detached, it may damage the equipment.

⚠CAUTION	● The HR-500 Recorder Module can record only waveforms (Manual Rec., Alarm Rec., Periodic Rec.). Graphic recording and tabular recording cannot be performed. ● The internal switch setup will be performed by our service representative. Users should not open the maintenance cover. ● Do not insert unspecified modules into the Input Box. Otherwise, the equipment may be damaged, and safety cannot be ensured. ● If not using for a long period of time, turn OFF the power of the main unit, Super Module, and Input Box. ● As the Super Module and DSC-7300 communicates via Input Box, the power of the Input Box must be always turned ON even if the module is not inserted in the Input Box. ● Clean the equipment frequently so stains can be removed easily. ● To prevent injury, it is recommended to wear gloves when cleaning the equipment. ● Do not allow cleaning solution enter the connector part. ● Do not use organic solvents, thinner, toluene and benzene to avoid damaging the resin case. ● Do not polish with abrasive or chemical cleaner. ● When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the connectors. ● Use only neutral detergent to clean the housing. Do not use chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent and chemicals (cleanser, thinner, toluene, benzine, benzol, and synthetic detergent for house and furniture), or sharp-edged tools. The surface resin coating may be damaged, resulting in discoloration, scratches, and other problems. ● Do not open the housing. ● Do not allow alcohols or other liquids enter the equipment. ● Use only the accessories specified for this device. Otherwise, proper function cannot be executed. ● For quality improvement, specifications are subject to change without prior notice.

Electromagnetic Compatibility

The performance of this device under electromagnetic environment complies with IEC60601-1-2 (2001).

Precautions for Safe Operation under Electromagnetic Influence

⚠CAUTION	If any sorts of electromagnetic wave, magnetic field, or static electricity exist around the device, noise interference or malfunction of the device may occur. If any unintended malfunction or noise occurs during monitoring, check the magnetic influence and take appropriate countermeasures. The following are examples of the common cause and countermeasures. ● Cellular Phone The radio wave may cause malfunction to the device. Cellular phones and radio sets should be turned off in the room (building) where medical device is located. ● Static Electricity In a dry environment (room), static electricity is likely to occur. Take the following countermeasures. • Both operator and patient should remove any static electricity before entering the room. • Humidify the room. ● Lightning • A lightning nearby may induce excessive voltage to the equipment. If any danger is suspected, use the uninterruptible power supply system. ● High frequency noise interference from other device through the power outlet • Check where the noise is originated and remove it using filtering device, etc. • Stop using the device that is originating the noise. • Use other power outlet.

EMC Guidance

This equipment complies with IEC60601-1-2 (2001). However, if portable transmitter or wireless LAN equipment is used extremely nearby, the electromagnetic influence may largely exceed the compliance level and may cause unexpected phenomenon such as noise interference on the waveform, etc.
Therefore, this equipment should be used in a location specified by each medical institution.
If any unexpected noise interference on the waveform or failure to the peripheral device occurs, stop using the equipment and follow the instruction of the technician.

The following is the information relating to EMC (Electromagnetic Compatibility).
(When using this equipment, verify that it is used within the environment specified below.)

Compliance to the Electromagnetic Emissions

The DS-7300 system is intended for use in the electromagnetic environment specified below.

Emissions Test	*Compliance*	*Electromagnetic Environment - Guidance*
RF Emissions CISPR 11	Group 1	The equipment uses RF energy that is necessary for the internal functioning of the equipment itself. 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	This equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes.

Compliance to the Electromagnetic Immunity (1)

The DS-7300 system is intended for use in the electromagnetic environment specified below.
It should be assured that the DS-7300 system is used in such an environment.

Immunity Test	*IEC60601-1-2 Test Level*	*Compliance Level*	*Electromagnetic Environment - Guidance*
Electrostatic Discharge (ESD) IEC61000-4-2	±2, 4, 6kV contact ±2, 4, 8kV air	±2, 4, 6kV contact ±2, 4, 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 IEC61000-4-4	±2kV for power supply lines ±1kV for input/output lines	±2kV for power supply lines ±1kV input/output lines	Power supply quality should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Surge IEC61000-4-5	±0.5, 1kV： differential mode ±0.5, 1, 2kV： common mode	±0.5, 1kV： differential mode ±0.5, 1, 2kV： common mode	Power supply quality should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines. IEC61000-4-11	<5% U_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 5sec.	<5% U_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 5sec.	Power supply quality should be at levels characteristic of a typical location in a typical commercial or hospital environment. If it is required to continuously operate the DS-7300 system during power failure, it is recommended to operate on an uninterrupted power supply.
Power Frequency （50/60Hz） Magnetic Field IEC61000-4-8	3A/m	3A/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 AC mains voltage prior to application of the test level.

Compliance to the Electromagnetic Immunity (2)

The DS-7300 system is intended for use in the electromagnetic environment specified below.
It should be assured that the DS-7300 system is used in such an environment.

Immunity Test	*IEC60601-1-2 Test Level*	*Compliance Level*	*Electromagnetic Environment - Guidance*
Conducted RF IEC61000-4-6 Radiated RF IEC61000-4-3	3Vrms 150kHz ~ 80MHz 3V/m 80MHz ~ 2.5GHz	3Vrms 3V/m	Portable and mobile RF communications equipment should be used no closer to any part of the DS-7300, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended Separation Distance d = 1.2 $\sqrt{P}$ d = 1.2 $\sqrt{P}$ 80MHz~800MHz d = 2.3 $\sqrt{P}$ 800MHz~2.5GHz 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, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 

Note 1 : At 80Mhz and 800MHz, 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 can not 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 this monitor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating this monitor.

[b] Over the frequency range 150kHz to 80MHz, field strength should be less than 3V/m.

Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the DS-7300 System

The DS-7300 system is intended for use in an environment in which radiated RF disturbances are controlled. The electromagnetic interference can be prevented by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the DS-7300 system 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)***		
	150kHz～80MHz $d = 1.2\sqrt{P}$	80MHz～800MHz $d = 1.2\sqrt{P}$	800MHz～2.5GHz $d = 2.3\sqrt{P}$
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 determined 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 80MHz and 800MHz, 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.

⚠CAUTION
FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.

This page is only for the USA.

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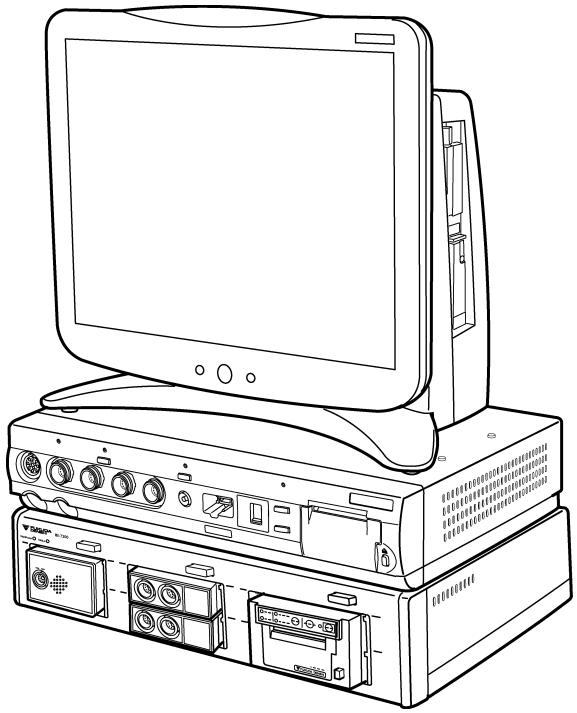
Contents

1. General Description

The IB-7300 Input Box is designed to be used with the DS-7000 series bedside monitor and allows to extend the monitoring parameters using the modules.

The parameter modules can be used in any combination by inserting to the input box.
One unit of IB-7300 can be used for each DS-7300 system.



Features

- Using various modules, any parameters can be combined for monitoring.
- There are 6 slots (2 x 3) to insert the modules. Depending on the module size, one slot or two slots will be required to insert the module. For one-slot size module, maximum of 6 modules can be inserted.
- Connects to Super Module with Ethernet (UDP/IP) and constructs a MODULE-LAN.
- It can be placed under the Super Module.
- The Input Box itself has a CPU and controls communication with the Super Module and serial communication with the external equipment.

Parameter Module Types

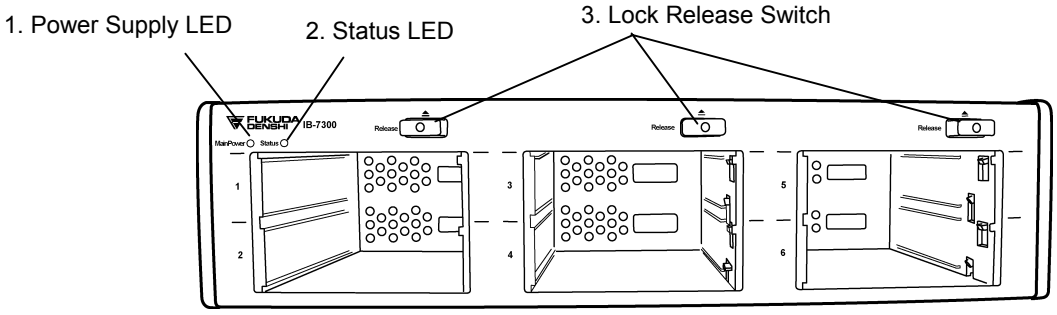
The following are the parameter modules that can be used with the IB-7300 Input Box.

Model Name	No. of Used Slots	Description
HB-500 Invasive Blood Pressure Module (2ch)	1	Up to four (4) HB-500 can be used. If the same BP channel is measured by the Super Module, the BP of the Super Module will take precedence.
HC-500 CO_2 Module	1	Measures $EtCO_2$ by mainstream method.
HC-530 $tcpO_2/pCO_2$ Module	2	Measures the $tcpO_2/pCO_2$ non-invasively.
HF-500 Cardiac Output Module	1	CO measurement by the Super Module will take precedence.
HR-500 Recorder Module	2	Only waveforms can be recorded. (Manual Rec., Alarm Rec., Periodic Rec.)

⚠CAUTION	The HR-500 Recorder Module can record only waveforms (Manual Rec., Alarm Rec., Periodic Rec.). Graphic recording and tabular recording cannot be performed.

Names of Parts and Their Functions

【Front Side】

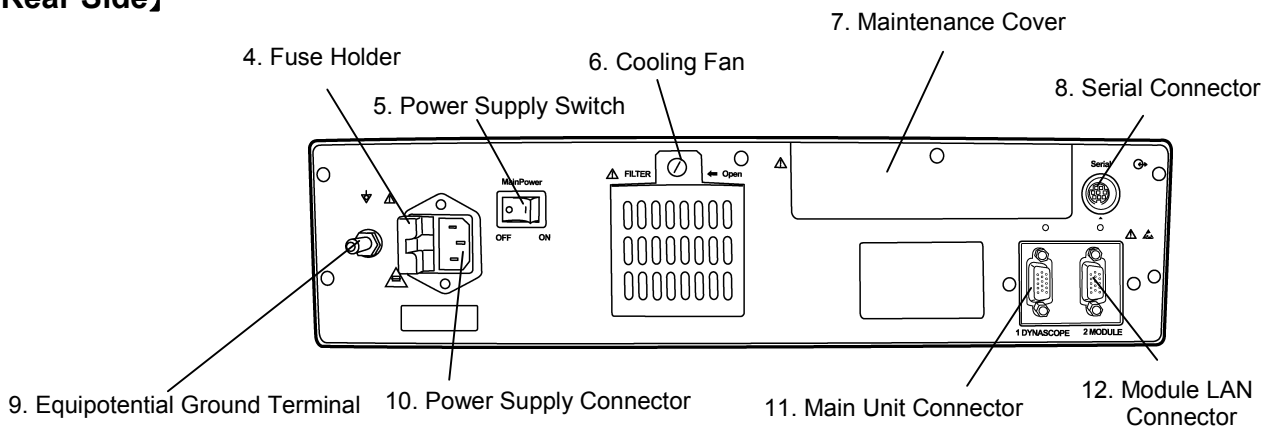


1. Power Supply LED : Indicates the power status.
   - When the Input Box is turned ON, and the LC-7315T Display Unit is turned OFF (in standby mode): Orange
   - When the Display Unit is turned ON (in operation) : Green

2. Status LED : Indicates the input box communication status.
   - Communicating with Super Module: red
   - Communicating with all equipments (DSC-7300, module, etc.): green
   - no connection to MODULE-LAN: no light

3. Lock Release Switch : Used when removing the parameter module from the input box.

【Rear Side】



4. Fuse Holder : Fuses are stored in here.
5. Power Supply Switch : Turns ON/OFF the power.
   Turning OFF the LC-7315T Display Unit will also turn OFF the IB-7300.
6. Cooling Fan : Inhale port for cooling fan.
7. Maintenance Cover : Used for maintenance.
8. Serial Connector : Connects the specified equipment.
9. Equipotential Ground Terminal : Used for equipotential ground connection.
10. Power Supply Connector : Power supply cable is connected here.
11. Main Unit Connector : Connects to the DSC-7300 Main Unit.
12. Module LAN Connector : Connects to the HS-700 series Super Module.

⚠CAUTION	The internal switch setup will be performed by our service representative. Users should not open the maintenance cover.

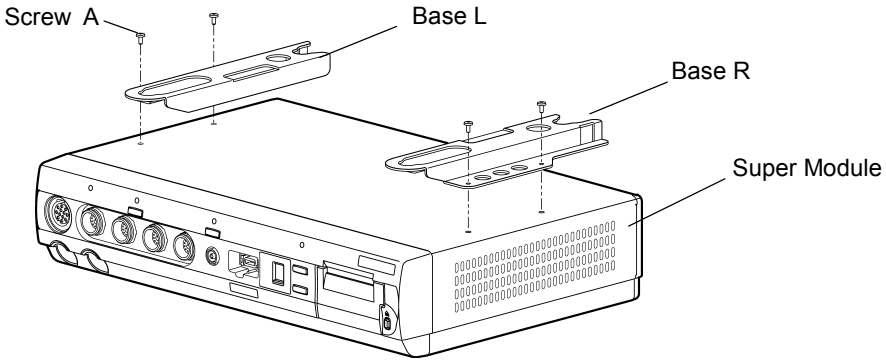
2. Connection of Each Part

Attaching the Super Module and Input Box

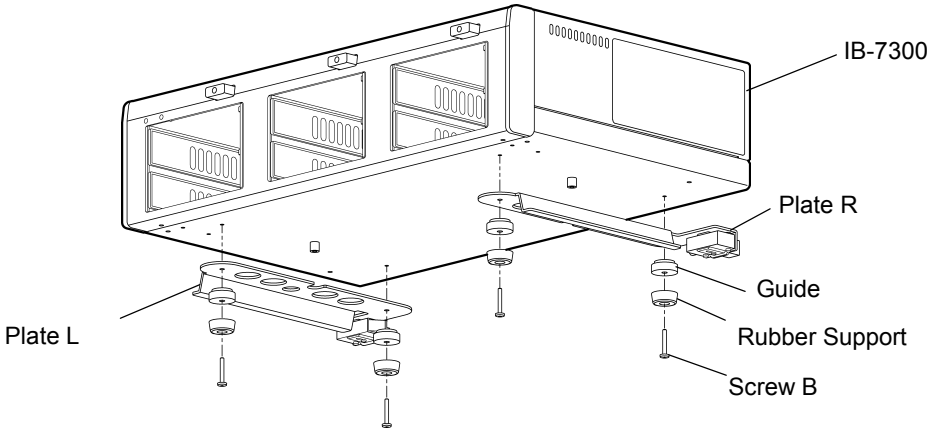
Using the mounting bracket (OAO-02A), the Input Box and Super Module can be fixed on together.

To Fix the IB-7300 on the Super Module

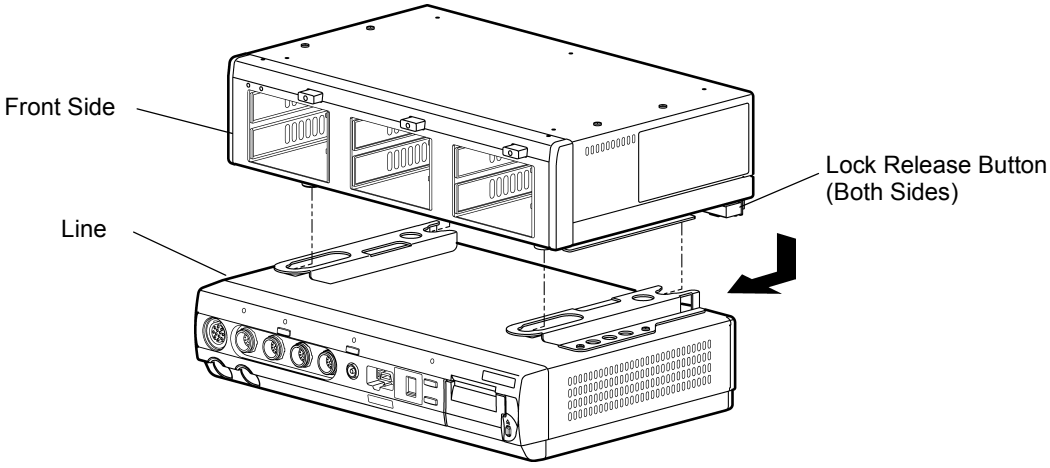
1 Remove the 4 screws on the top panel of the Super Module and fix on the Base R and L using the fixing screw A (M3×8L).



2 Remove the 4 screws on the rubber supports at the bottom of the IB-7300. Use the fixing screw B (M3×18L) to fix on the Plate R and L, rubber supports and guides.



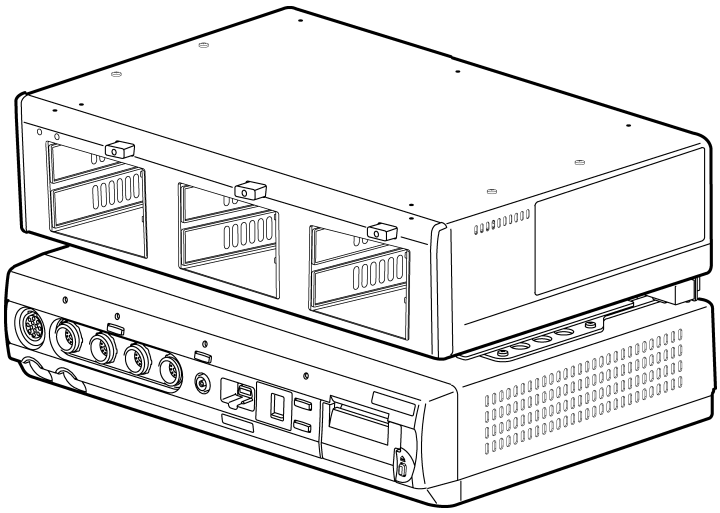
3 Align the front side of the IB-7300 to the line position on the Super Module and attach to the opening on the Base R and L. Push to the front until it locks.



When detaching, press the lock release buttons on Base R, L at the same time, and move the IB-7300 backward.

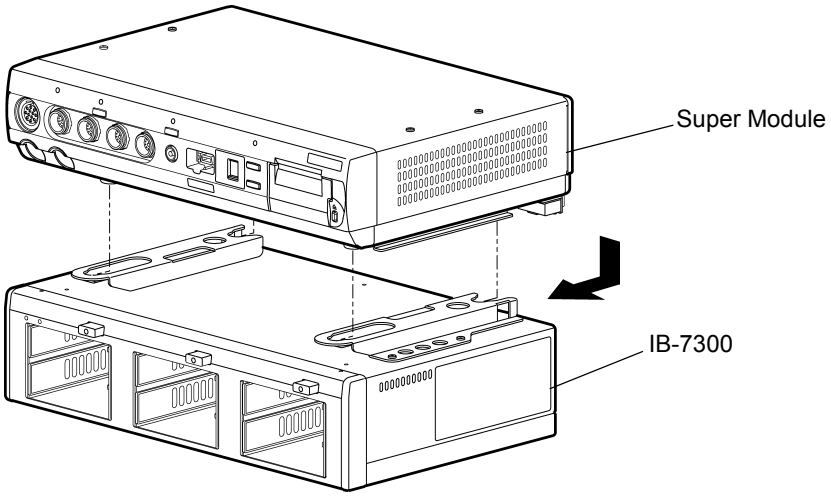
NOTE	To prevent the equipment from falling off, verify that it is securely locked.

【Final Drawing】



To Fix the Super Module on the IB-7300

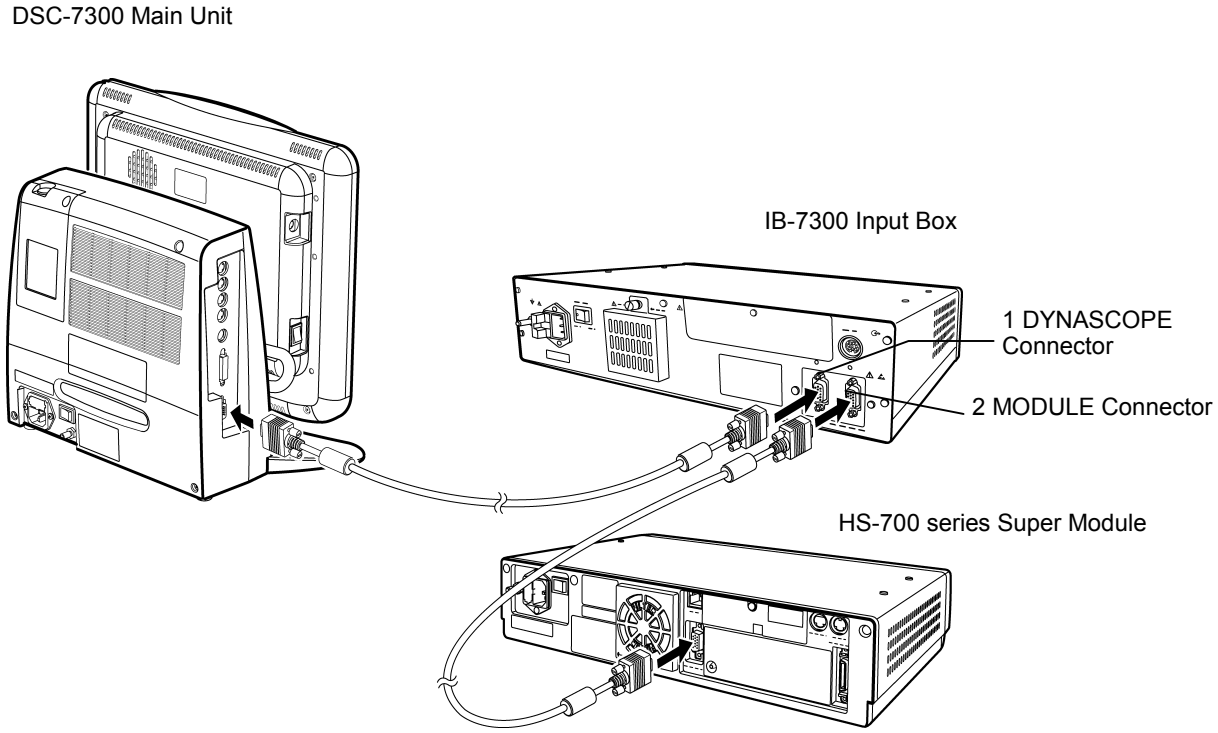
Using the same procedure as above, fix on the Plate R and L to the bottom of the Super Module, and Base R and L to the top of the IB-7300.



Connecting the Input Box, DSC-7300 Main Unit, and Super Module

1 **Using the CJ-732 Module Connection Cable, connect the "1 DYNASCOPE" connector on the Input Box and Module Communication Connector on the DSC-7300.**

2 **Using the CJ-732 Module Connection Cable, connect the "2 MODULE" connector on the Input Box and Main Unit Communication Connector on the Super Module.**

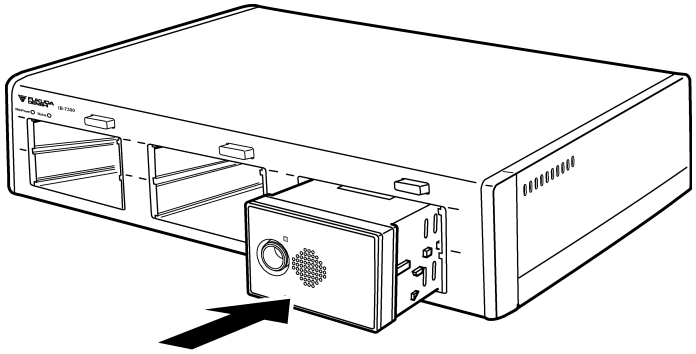


Installation / Removal of the Parameter Modules

Insert the parameter module into the slot.
Maximum of 6 parameter modules can be inserted to one input box.

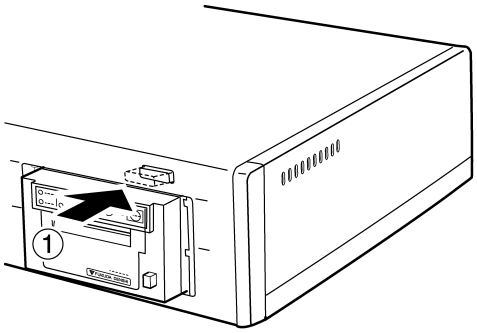
⚠CAUTION	Do not insert unspecified modules into the Input Box. Otherwise, the equipment may be damaged, and safety cannot be ensured.

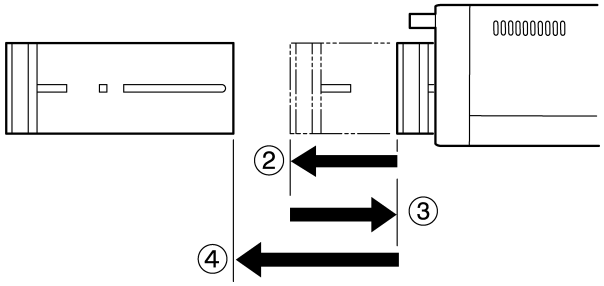
1 In the arrow direction, insert the parameter module into the input box. Push in until it "clicks" into the locked position.



2 To remove the parameter module, follow the procedure below.

1. Push the Lock Release Switch on the input box and release the module lock.
2. Pull out the parameter module slightly until it stops.
3. Push back in until it clicks.
4. Then, pull out the parameter module completely.

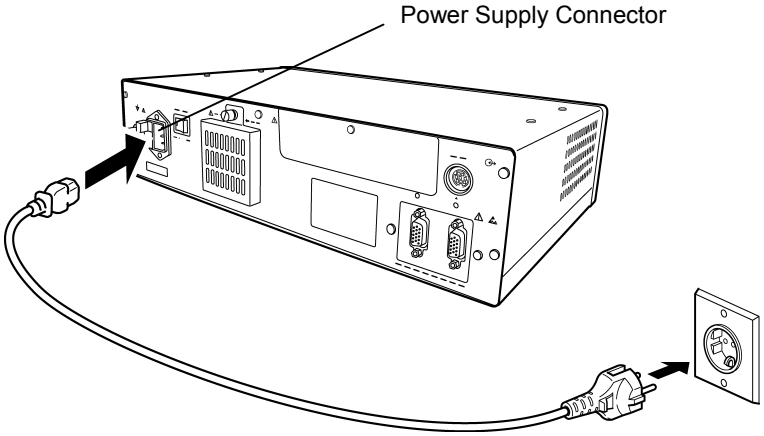




Connecting the Power Supply Cable

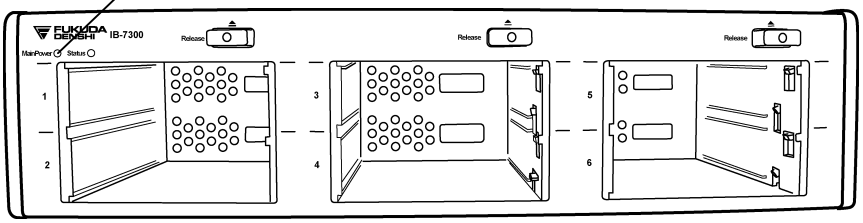
Connect the Input Box to the AC power source.

Connect the accessory power cable to the hospital grade outlet with ground terminal.



When the power cable is connected and the power supply switch is turned ON, the main power supply indicator on the front side will light to notify that the AC power is supplied.

Power Supply LED
Lights when the AC power is supplied.
When the Input Box is turned ON, and display unit is turned OFF: Orange
When the display unit is turned ON: Green
Extinguishes when the AC power is not supplied.

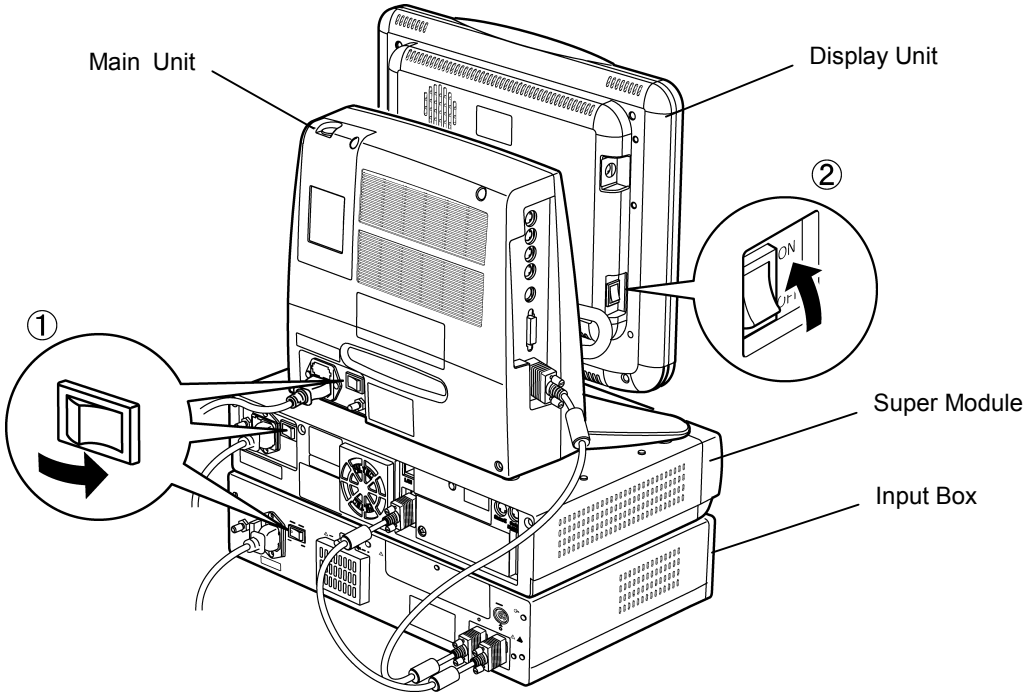


⚠WARNING	● Use only the accompanying 3-way AC power cable. Use of other cables may result in electric shock to the patient and the operator. ● The power cable must be connected to AC 100~230V outlet. Do not use multi-tap. ● When using multiple ME equipment simultaneously, perform equipotential grounding to prevent potential difference between the equipment. Even a small potential difference may result in electric shock to the patient and the operator.

NOTE	Equipotential Grounding When connecting multiple devices, electrical potential difference may be generated between the devices. This may result in electric shock to the patient connected to these devices. Pay special attention for use in the operating room, ICU, CCU, Cardiac Catheter Laboratory, and Cardiovascular X-ray room. To avoid such electrical potential difference, use the accessory ground cable to connect each device's equipotential terminal to the same ground terminal. This is called equipotential grounding.

Turning ON the Power

First, turn ON the power switch of the main unit, Super Module, and Input Box. Then, turn ON the power switch of the display unit. The screen will be displayed, and monitoring will start.
The power supply LED on the input box will light in green.



The power of the main unit, Super Module, and Input Box interlocks with the power switch (②) operation (ON/OFF) on the display unit. During normal usage, the power switch (①) of the main unit, Super Module, Input Box should be left ON.

⚠CAUTION	● If not using for a long period of time, turn OFF the power of the main unit, Super Module, and Input Box. ● As the Super Module and DSC-7300 communicates via Input Box, the power of the Input Box must be always turned ON even if the module is not inserted in the Input Box.

3. Maintenance

Handling After Use

- Do not apply excessive force when disconnecting the cables. Always pull on the connector housing and not on the cable.
- Clean the unit, accessories, and cables, and keep them together in one place for next use.

Storage

- Store in a place where the device will not be exposed to splashing water.
- Store in a place where the device will not be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust or atmosphere containing salt or sulfur.
- Store in a level area where the device is not exposed to vibration and shock (including during transportation).
- The following environmental conditions should be observed when storing the device.
  Storage Temperature : −10 ~ 60°C
  Storage Humidity : 10 ~ 95% (at 60°C)

Cleaning

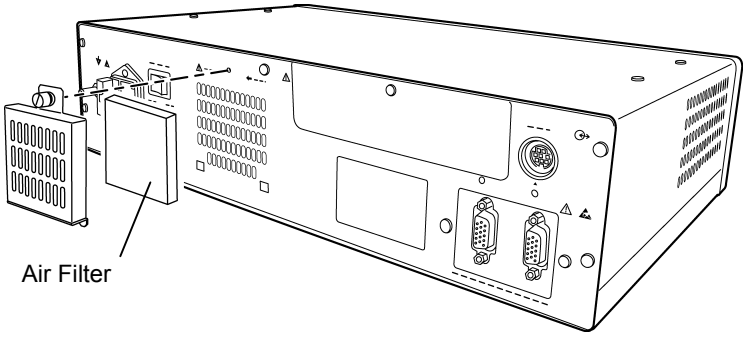
Clean the equipment and cables using tightly squeezed gauze or an absorbent cotton cloth dampened with alcohol or a neutral cleanser.

⚠CAUTION	● Clean the equipment frequently so stains can be removed easily. ● To prevent injury, it is recommended to wear gloves when cleaning the equipment. ● Do not allow liquids or cleaning solution to enter the monitor or connectors. ● Do not use organic solvents, thinner, toluene and benzene to avoid damaging the resin case. ● Do not polish the housing with abrasive or chemical cleaner. ● When sterilizing the entire room using a spray solution, pay close attention not to have liquids get into the monitor or connectors. ● Use only neutral detergent to clean the housing. Do not use chemical cloth, scrub brush, abrasive, polishing powder, hot water, volatile solvent and chemicals (cleanser, thinner, benzine, benzol, and synthetic detergent for house and furniture), or sharp-edged tools. The surface resin coating may be damaged, resulting in discoloration, scratches, and other problems.

Replacing the Air Filter

The cooling fan air filter located at the rear side of the Input Box is a consumable product.
Continuous use of the Input Box will cause the air filter to inhale unclean air inside the equipment, reduce the cooling effect, and may damage the inner parts.
Clean the air filter, or replace with a new air filter every 3 months.

1 Remove the cooling fan cover located at the rear side of the Input Box, and take out the air filter.

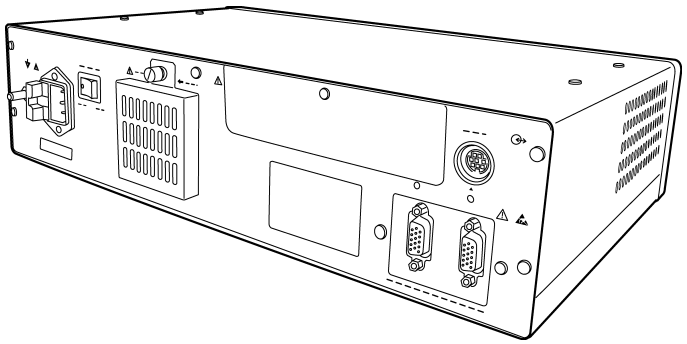


2 Clean or replace the air filter.

To clean the air filter, beat the dust off, or wash off with neutral detergent.

⚠WARNING	When the air filter is washed with neutral detergent, dry it completely before reattaching. If the moisture is remained on the air filter, it may damage the equipment.

3 Reattach the cooling fan cover.



⚠WARNING	The air filter must be attached after cleaning / replacing. If the equipment is used with the air filter detached, it may damage the equipment.

Maintenance Check

This section describes the maintenance check items to be performed for the input box.
To ensure safety, reliability, and high performance, a “Daily Check” and “Periodic Inspection” must be performed. We are not liable for any accident arising from lack of maintenance.

⚠CAUTION	● Do not open the housing. ● Do not allow alcohols or other liquids enter the equipment.

●Daily Check

Perform daily inspection using the “Daily Check List” on the next page.

●Periodic Check

Periodic inspection of medical electronic equipment is mandatory to prevent failures and accidents and to ensure safety and reliability.

Periodic maintenance may be performed by each medical institution or by a third party by concluding a “Maintenance Contract”.

For more details, contact your nearest service representative.

Daily Check List

No. _____

Inspected Date _____ Inspected by _____ Location _____

Device Name IB-7300 Input Box Serial No. _____ Date of Purchase _____

Item	***Details***	***Criteria***	***Judgment***
Appearance	Visually check the exterior for scratches, cracks, deformation, and rust.	No abnormality should be found.	OK / NG
Installation	Check whether the unit is installed on a level surface.	The installation area must be level and free from vibration and shock.	OK / NG
	Check whether the unit is installed in a place susceptible to adverse environment.	The environmental condition (ex. temperature, humidity) of the installed place should be as specified. The unit should not be subjected to splashing water.	OK / NG
Functions	Turn ON the DS-7300 system, and check whether it operates normally.	The data of the external equipment should be properly displayed with the interface cable connected.	OK / NG
Relay Cables	Visually check all cables for any damage.	No damage should be found.	OK / NG
Periodic Inspection	Check the date of previous periodic inspection.	Should be within 1 year.	OK / NG
Air Filter	Check the date, which the air filter of cooling fan was first used (cleaned, replaced). Used from: Day_____ Year_____ Month_____	Should be within 3 months.	OK / NG

Comment

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4. Troubleshooting

Other than the following, the trouble for the bedside monitor can be considered. Refer also to the operation manual for the bedside monitor.

IB-7300 Input Box

The input box data is not displayed on the monitor.
The "Check IB-7300 Connection" message is displayed on the monitor.

Cause : The input box is not selected for use.
Solution : On the DS-7300 system, select [Yes] for "Input Box (IB-7300)".
For procedures, refer to the operation manual for the DS-7300 Bedside Monitor.

The input box data is not displayed on the monitor.
The "IB-7300 not configured" message is displayed on the monitor.

Cause : The input box setup is not properly performed.
Solution : On the input box setup of the DS-7300 system, set the corresponded module for each slot. For procedures, refer to the operation manual for the DS-7300 Bedside Monitor.

The "Check IB-7300 cooling fan" message is displayed on the monitor.

Cause : The cooling fan is unclean reducing the cooling effect.
Solution : Clean or replace the air filter.

The "IB-7300 hardware error" message is displayed.

Cause : The Input Box hardware is malfunctioning.
Solution : Immediately turn off the power and stop using the device. Contact our service representative for service.

HB-500 Invasive Blood Pressure Module

The Zero lamp continuously flashes.

Cause : The zero balance procedure has failed.
Solution : Check if the stop cock is open to atmosphere and try the zero balance process again.

The waveform and numeric data does not appear on the monitor.

Cause : There is another HB-500 with the same channel number.
Solution : If the channel number is duplicated, change one of the channel number.

The BP value measured by the HB-500 is displayed as "– – –" on the monitor screen.

Cause 1 : The zero balance procedure has not been performed.
Solution : If "Not zero balanced" is displayed on the BP parameter setup menu, open the stop-cock to air and perform zero balance procedure.

Cause 2 : The BP label is set to "IAP" (IABP).
Solution : The IABP cannot be measured on the HB-500. Change the measurement location and label.

HC-500 CO_2 Module

The "MODULE CHECK" message is displayed on the monitor.

Cause : There is a failure in the HC-500 internal circuit.
Solution : Remove the HC-500 from the input box and do not use it. Contact our service representative for service.

⚠CAUTION	If the equipment is damaged and in need of repair, user should not attempt service. Label the unit "OUT OF ORDER" and contact Fukuda Denshi.

The "SENSOR CHECK" message is displayed on the monitor.

Cause 1 : The CO_2 sensor is not properly connected to the HC-500.
Solution : Securely connect the CO_2 sensor to the HC-500.

Cause 2 : The ambient temperature of the CO_2 sensor is too high.
Solution : Remove any heat generating source around the sensor.

Cause 3 : The sensor is defective.
Solution 1 : Replace the sensor.

Solution 2 : If error persists, internal circuit of the HC-500 may be damaged. Immediately remove the HC-500 from the Input Box and contact our service representative for service.

The "ZERO CAL" message is displayed on the monitor.

Cause : The zero balance procedure has failed.
Solution : Perform the calibration again in the order of zero calibration, reference calibration, and airway adapter calibration.

The "ADAPTER CAL?" message is displayed on the monitor.

Cause 1 : The airway adapter is unclean.
Solution : A clean airway adapter must be used. If reusing an airway adapter, clean and air-dry it. Then, wipe the window with swab, and sterilize (EOG, etc.) before use.

Cause 2 : The airway adapter is disconnected from the sensor.
Solution : Securely connect the airway adapter to the sensor.

Note : If the error persists, calibrate the airway adapter.
If the error still persists, perform the calibration again in the order of zero calibration, reference calibration, and airway adapter calibration.

The zero lamp is flashing.

Cause : The zero balance procedure has failed.
Solution : Perform the zero balance procedure again.

The airway lamp is flashing.

Cause : The airway adapter calibration has failed.
Solution : Recalibrate the airway adapter.

HC-530 $tcpO_2$ / $tcpCO_2$ Module

●Unit

When electrodes are applied to the patient, readings drift constantly without any physiological cause.

Cause : The electrodes are not attached properly.
Solution : Detach the electrodes, and securely reapply to the patient.

Readings are not stable or out of alarm limit range for 20 minutes after application.

Cause 1 : The patient's condition is unstable.
Solution : Check the patient's condition.

Cause 2 : The vasodilatation is inadequate.
Solution : Check the patient's condition.

Cause 3 : The electrodes are not attached properly.
Solution : Reattach the electrodes.

The reading suddenly changes without any physiological cause.

Cause : The patient is moving.
Solution : Perform calibration again, and reattach the electrodes. If possible, apply to different site.

A noise appears on the reading.

Cause : There is an interference from nearby equipment.
Solution : Move the HC-530 away from the interfering equipment.

The monitor is not operating. There is no display.

Cause 1 : The monitor is defective.
Solution : Contact our service representative for service.

Cause 2 : The electrodes are not properly attached.
Solution : Check the electrode application.

pO_2 or pCO_2 readings are not displayed.

Cause : The calibration for pO_2 or pCO_2 has been rejected.
Solution 1 : Check calibration value and perform calibration again.
Solution 2 : Check gas flow and perform calibration again.
Solution 3 : Reattach the membrane and perform calibration again.
Solution 4 : Replace electrodes and perform calibration again.

The "WARM UP ERROR" message is displayed on the monitor.

Cause 1 : The electrode temperature has not reached the preset value within 3 minutes.
Solution : Perform calibration again. If the error occurs again, replace with new electrodes.

Cause 2 : The electrodes are defective.
Solution : Replace the electrodes.

The "SIGNAL RANGE ERROR" message is displayed on the monitor.

Cause 1 : The electrode signal is out of range.
Solution : Perform calibration again. If the error occurs again, reattach the membrane and recalibrate.

Cause 2 : The calibration value is incorrect.
Solution : Check the value and recalibrate.

Cause 3 : The membrane has not been replaced periodically.
Solution : Replace the membrane and recalibrate.

Cause 4 : The membrane is not attached properly.
Solution : Reattach the membrane.

Cause 5 : The calibration gas is poorly supplied.
Solution : Check the gas flow and connection.

Cause 6 : The electrodes are defective.
Solution : Replace the electrodes.

The "STABILITY ERROR" message is displayed on the monitor.

Cause 1 : The electrode signals are unstable.
Solution : Calibrate again. If error persists, replace the membrane and recalibrate.

Cause 2 : The membrane has not been replaced periodically.
Solution : Replace the membrane and recalibrate.

Cause 3 : The membrane is not attached properly.
Solution : Reattach the membrane.

Cause 4 : The calibration gas is not supplied properly.
Solution : Check the gas flow and connection.

Cause 5 : The electrode is defective.
Solution : Replace the electrode.

The "pO_2/pCO_2 Membrane Error" message is displayed on the monitor.

Cause : When the electrode is removed from the socket after calibration, change in CO_2 signal is not detected.
Solution : Calibrate again. Or, replace the electrodes.

The "pO_2/pCO_2 Power Error" message is displayed on the monitor.

Cause 1 : Due to the low ambient temperature, the electrode power consumption has exceeded 600mW for more than 2 minutes.
Solution : Increase the ambient temperature, and calibrate again.

Cause 2 : The electrode is defective.
Solution : Replace the electrode.

The "pO_2/pCO_2 Temp Hardware Error" message is displayed on the monitor.

Cause : The electrode is defective.
Solution : Replace the electrode.

The "pO_2/pCO_2 Temp Range Error" message is displayed on the monitor.

Cause 1 : The ambient temperature is too low, and electrode temperature is below 5°C.
Solution : Increase the ambient temperature and recalibrate.

Cause 2 : The electrode is defective.
Solution : Replace the electrodes.

The "pO_2/pCO_2 Heat Error" message is displayed on the monitor.

Cause : The module is defective.
Solution : Contact our service representative for service.

The "pO_2/pCO_2 Temp Diff Error" message is displayed on the monitor.

Cause : The electrode is defective.
Solution : Replace the electrodes.

●TCC3 Calibration Unit

The red lamp flashes, and beep sound generates.

Cause : The remaining battery is low.
Solution : Calibration process is still possible, but replace the battery.

The red lamp lights for 3 seconds, and beep sound generates.

Cause : The battery is depleted.
Solution : Replace the battery.

The lamp does not light although the ▶ button is pressed.

Cause : The batteries are not installed.
Solution : Install the battery.

HF-500 Cardiac Output Module

When continuously measured, the CO measurement fluctuates for more than ±10%.

Cause 1 : The injection method is improper.
Solution : Inject within 1~3 seconds.

Cause 2 : The injection temperature is improper.
Solution : When using iced injectate, pay attention not to warm the injector with hands.

Cause 3 : The thermistor location is not appropriate.
Solution : Reposition the thermistor by moving the catheter.

Cause 4 : Arrhythmia event has occurred during the measurement.
Solution : Wait until the patient has stable heart rhythm.

Cause 5 : There was patient body movement during measurement.
Solution : Have the patient stay still during the measurement.

Cause 6 : The patient's hemodynamics has changed during measurement.
Solution : Wait until the patient has stable hemodynamics.

Abnormal measurement value is displayed.

Cause : The catheter size, injectate volume, catheter constant (CC) is not correct.
Solution : Set the proper condition, CC value for the used catheter.

The blood temperature (Tb), injectate temperature (Ti) is not displayed on the monitor.

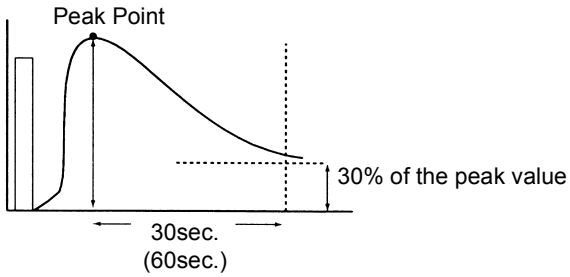
Cause : The catheter is not properly connected.
Solution : Securely connect the catheter.

The thermodilution curve is deformed.

Cause : The injection is not smooth, steady motion.
Solution : Injection should be performed within 1~3 seconds.

The baseline of the thermodilution curve is displaced to the minus side. The "LOWER FAULT" message is displayed on the monitor.

Cause : The blood temperature has not returned to stable condition after the measurement.

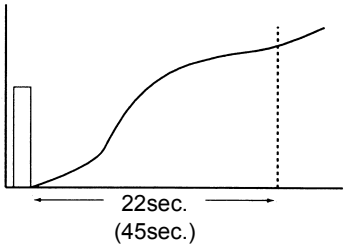


The thermodilution curve did not return to the cut off point soon enough. The temperature must return to a point that is 30% of the peak value within 30 seconds (or 60 seconds depending on the setup).

Solution : If performing continuous measurement, wait for 30~60 seconds and check the "Ready" display before performing the next measurement.

The thermodilution curve is low. The "PEAK FAULT" message is displayed on the monitor.

Cause : The peak of the thermodilution curve can not be detected.

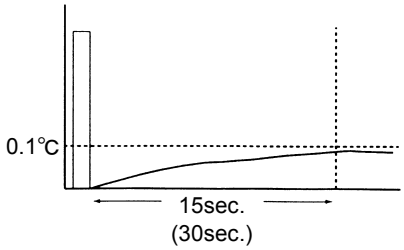


After injection, the peak of the thermodilution curve is not determined within 22 seconds (when the time scale is "30 sec") or 45 seconds (when the time scale is "60 sec").

Solution : The thermistor may be contacting the pulmonary artery wall. Reposition the thermistor and measure again.

The "UPPER FAULT" message is displayed on the monitor.

Cause : After the injection, the blood temperature is out of the measurement range.



After injection, the blood temperature is out of the measurement range. The thermodilution curve did not rise above 0.1°C within 15 seconds (when the time scale is "30 sec") or 30 seconds (when the time scale is "60 sec").

Solution : Use the iced injectate, and measure again.

The "OVER RANGE" message is displayed on the monitor.

Cause : The CO value is out of the calculation range.

Solution : The area of the thermodilution curve is too large to calculate. Perform the measurement again.

The measurement is interrupted, and the error message, "UPPER_FAULT", "PEAK_FAULT", "LOWER_FAULT", "SENSOR_ERROR" is displayed on the monitor.

Cause 1 : The thermistor connector and relay cable is not securely connected.

Solution : Correct measurement cannot be performed unless the thermistor connector and relay cable is securely connected. Check the connection and perform the measurement again.

Cause 2 : The sensor or relay cable is defective.
Solution : If the sensor or cable is defective, measurement can not be performed. Replace the sensor or cable and perform the measurement again.

HR-500 Recorder Module

No recording is performed. The “Paper Out” indicator lights.

Cause : There is no recording paper in the paper magazine.
Solution : Install a new pad of paper into the paper magazine.

No recording is performed. The “Magazine” indicator lights.

Cause 1 : The paper magazine is open.
Solution : Close the magazine firmly.

Cause 2 : The paper is jammed inside the paper magazine.
Solution : Open the magazine, and install the paper properly.

Recording cannot be performed although the “Paper Out” or “Magazine” indicator is not lit.

Cause : The recording paper is not correctly installed. The front and backside of the paper is set oppositely.
Solution : The “END” printed side of the paper should be facing down in the magazine.

The second waveform and third waveform are not recorded for manual recording or alarm recording.

Cause : The second waveform and third waveform are not set on the recording setup menu.
Solution : Set the second waveform and the third waveform on each recording setup menu.

5. Specification / Performance

IB-7300 Input Box

Specification

Size

380 (W) ± 10mm x 230 (D) ± 10mm x 90 (H) ± 5mm (not including the protrusion)

Weight

4.5 ± 0.5kg (not including the accessory)

Environmental Condition

Operating Temperature	: 10 ~ 40°C
Operating Humidity	: 30 ~ 85% (without condensation)
Transport / Storage Temperature	: –10 ~ 60°C
Transport / Storage Humidity	: 10 ~ 95% (at 60°C)

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995

EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety –
2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock	: Class I
The type of protection against electric shock	: Depends on the used module.
Waterproof Level	: IPX0 (no protection)
Disinfection Method	: Cleaning only

Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.

Operation Mode : Continuous Operating Equipment

Power Requirements

Voltage	: AC 100 – 240V
Frequency	: 50Hz or 60Hz
Power Consumption	: 100 VA

Usable Life

6 years : According to self-certification

Performance

Number of Modules

Maximum 6 modules

Connector

Module LAN Connector : Connects to DSC-7300 Main Unit or to HS-700 Series Super Module.
Serial Connector : Connects to specified equipment.

IB-7300 ↔ Super Module Communication

Communication System : Ethernet
Communication Rate : 100Mbps

IB-7300 ↔ DSC-7300 Communication

Communication System : Ethernet
Communication Rate : 100Mbps

Parameter Module Communication

Transmission Format : HDLC
Transmission Error Detection : CRC – CCITT
Transmission Code : FM1
Transmission Speed : 1Mbps

Serial Port

Communication System : RS-232C
Communication Rate : 110bps ~ 31250bps
Data Length : 7 bit or 8 bit
Stop Bit Length : 1 bit or 2 bit
Parity : Even, Odd, or None
Protocol : for future expansion (currently not used)

HB-500 Invasive Blood Pressure Module

Size

90.0(W) × 150.0(D) × 30.0(H) mm (approximate)

Weight

300 g

Module slot

1 slot（when inserted into IB-7300 the input box）

Environmental Conditions

Operating Temperature : 10 ~ 40°C
Operating Humidity : 30 ~ 85% (No Dew Condensation)
Storage Temperature : –10 ~ 60°C
Storage Humidity : 10 ~ 95% (at 60°C temperature, No Dew Condensation)

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995
EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock : Class I (with the DS-7300 system)
The type of protection against electric shock : type CF
Waterproof Level : IPX0 (no protection)
Disinfection Method : Cleaning only
Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.
Operation Mode : Continuous Operating Equipment

Input Box Interface

Cable : CJ-581
Voltage : 24 VDC ± 10%
Power Consumption : 6.0 VA (max.)

Measured Parameters

Invasive Blood Pressure (2 Channels)

Operation Keys and Indicators

BP_A Zero key（BP_A Zero Balance）, BP_A Zero Lamp
BP_B Zero key（BP_B Zero Balance）, BP_B Zero Lamp

Functions

Host Program Boot Function (From Monitor to Flash Memory)

Invasive Blood Pressure

Transducer Sensitivity：5μV/V/mmHg
Measurement Range ：–50~300mmHg
Frequency Response ：DC~ 6Hz
DC~ 8Hz
DC~12Hz
DC~40Hz
Accuracy ：±2% of full scale, or within±1mmHg
Zero Balance Range ：±150mmHg（auto zero adjustment is done with key switch）
Number of Channels ：2

HC-500 CO_2 Module

Size

90.0(W) × 150.0(D) × 30.0(H) mm (approximate)

Weight

300 g

Module slot

1 slot（when inserted into IB-7300 the input box）

Environmental Conditions

Operating Temperature ：10 ~ 40°C (HC-500)
15 ~ 38°C (Capnostat sensor)
Operating Humidity ：30 ~ 85% (No Dew Condensation)
Storage Temperature ：–10 ~ 60°C
Storage Humidity ：10 ~ 95% (at 60°C temperature, No Dew Condensation)

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995
EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock : Class I (with the DS-7300 system)
The type of protection against electric shock : type CF
Waterproof Level : IPX0 (no protection)
Disinfection Method : Cleaning only
Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.
Operation Mode : Continuous Operating Equipment

Input Box Interface

Cable ：CJ-581
Voltage ：24VDC± 10%
Power Consumption ：15 VA（max.）

Measured Parameters

CO_2 Concentration

Operation Key

CAL key (Airway adapter calibration)

Functions

Host Program Boot Function (From Monitor to Flash Memory)

CO_2

Method	: Infrared solid state sensor
Sensor Model	: Respironics Novametrix® Capnostat III
Measured Parameters	: End-tidal CO_2 （$EtCO_2$）, Inspired CO_2（$InspCO_2$）, Respiration
Measurement Range	: CO_2 : 0 ~ 99mmHg
	Respiration : 0 ~ 150Bpm
Measurement Accuracy	: CO_2 : 0 ~ 40 mmHg, ±2mmHg
	41 ~ 99 mmHg, ±5%
	Respiration : ±1Bpm
Display Units	: mmHg, %, kPa
Averaging	: 1 breath(OFF), 10 seconds, or 20 seconds
Compensation	: O_2 : Manually selected when oxygen levels are >60%.
	N_2O : Manually selected when using N_2O.
	Pressure : Manually selected for barometric pressure above sea level.
Warm Up	: Within 5 minute for measurements.
	Within 20minutes for maximum accuracy.

HC-530 $tcpO_2$ / $tcpCO_2$ Module

Unit

Size

90.0(W) × 150.0(D) × 60.0(H) mm * Protruding parts of the device are not included.

Weight

300 g

Module Slot

2 slots (when inserted into the IB-7300 input box)

Environmental Requirements

Operating Temperature : 10 ~ 40°C
Operating Humidity : 30 ~ 85% (No Dew Condensation)
Storage Temperature : –10 ~ 60°C
Storage Humidity : 10 ~ 95% (at 60°C)

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995
EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock : Class I (with the DS-7300 system)
The type of protection against electric shock : type CF
Waterproof Level : IPX0 (no protection)
Disinfection Method : Cleaning only
Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.
Operation Mode : Continuous Operating Equipment

Input Box Interface

Cable : CJ-581
Communication : Baud Rate 1Mbps
Protocol HDLC
Voltage : DC24V ±10%
Power Consumption : 30VA (max.)

Monitor pO_2 Channel

Measurement Range : 0 ~ 800mmHg (0 ~ 100kPa)
Precision : ±2mmHg (±0.3kPa) (0 ~ 200mmHg, except electrode)
Polarization Voltage : －680mV

Monitor pCO_2 Channel

Measurement Range : 5 ~ 200mmHg (0.7 ~ 26kPa)
Precision : ±2mmHg (±0.3kPa) (5 ~ 100mmHg, except electrode)

Electrode Heat

Range : 0 ~ 650mW
Accuracy : ±10% of reading

Electrode Temperature

Setting : 37.0°C, 41.0°C ~ 45.0°C (0.5°C intervals)
Accuracy : ±0.1°C
Wearing Time Range : 30 minutes ~ 8 hours (30 minutes intervals)

TCC3 Calibration Unit

Manufactured by RADIOMETER MEDICAL A/S
Pressure of gas source : max. 2000kPa
Gas outflow : 8.0 ± 2.0ml/min
Automatic shut-off : Selectable between 5, 10, 15, 20 and 50 minutes.
For modification contact your nearest Fukuda Denshi representative.
Size(mm) : 120.0(W) × 230.0(D) × 80.0(H)

E5280 Combined $tcpO_2/pCO_2$ Electrode

Manufactured by RADIOMETER MEDICAL A/S
Height : 11.3mm
Diameter : 15mm
Electrode cable : 2.3m
Weight : 3.8g

pO_2 Part:

Zero current : typically less than the equivalent of 2mmHg
Drift in calibration value : typically less than 1mmHg per hour
Response time : approx. 20 sec. for 90% response

pCO_2 Part:

Drift in calibration value : typically less than 1mmHg per hour
Response time : approx. 50sec. for 90% response

Patent

British Pat. No. 2021773
Danish Pat. No. 139895； 143246
European Pat. No. 100463
German Pat. No. 2724461； 2911343； 3374029
Italian Pat. No. 1192771
Japanese Pat. No. 139286/1979
Swiss Pat. No. 616329； 639205
US Pat. No. 4274418； 4324256
Other Patents Pending

HF-500 Cardiac Output Module

Size

90.0(W) × 150.0(D) × 30.0(H) mm (approximate)

Weight

300 g

Module slot

1 slot（when inserted into IB-7300 input box）

Environmental Conditions

Operating Temperature ：10 ~ 40°C
Operating Humidity ：30 ~ 85% (No Dew Condensation)
Storage Temperature ：—10 ~ 60°C
Storage Humidity ：10 ~ 95% (at 60°C temperature, no Dew Condensation)

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995
EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock : Class I (with the DS-7300 system)
The type of protection against electric shock : type CF
Waterproof Level : IPX0 (no protection)
Disinfection Method : Cleaning only
Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.
Operation Mode : Continuous Operating Equipment

Input Box Interface

Cable : CJ-581
Voltage : 24 VDC ± 10%
Power Consumption : 7.2 VA (max.)

Measured Parameters

Cardiac Output, Cardiac Index, Blood Temperature (Tb), Injectate Temperature (Ti)

Operation Keys and Indicator

Display : Initiates the measurement display on the patient monitor.
Start : Starts the measurement process.
Ready Lamp : Indicates the module is ready to start measurement.

Functions

Host Program Boot Function（ From Monitor to Flash Memory）

Cardiac Output

Method : Thermodilution method

Tb measurement : Measured via thermodilution catheter.

Ti measurement : Measured via separate injectate probe, or through In-line sensor in catheter system.
If not measured, calculations are performed assuming 0°C for iced and 24°C for room temperatures.

Measurement Range : CO : 0.1 ~ 20 l/min

Tb : 17 ~ 45°C ±0.3°C

Ti : −1 ~ 35°C ±0.5°C

HR-500 Recorder Module

Size

90.0(W) × 150.0(D) × 60.5(H) mm

Weight

650 g

Module slot

2 slot（when inserted into IB-7300 the input box）

Environmental Characteristics

Operating Temp	:	10 ~ 40 °C
Operating Humidity	:	30 ~ 85 %, no dew condensation
Storage Temperature	:	-10 ~ 60 °C
Storage Humidity	:	10 ~ 95 %, at 60 °C

Safety

General Standard : EN60601-1:1990
(Medical electrical equipment – Part 1: General requirements for safety)
Amendment A1 to EN 60601-1:1993
Amendment A2 to EN 60601-1:1995

EMC Standard : IEC60601-1-2：2001
(Medical electrical equipment – Part 1: General requirements for safety – 2. Collateral standard: Electromagnetic compatibility – Requirements and tests)

Classification

The class of protection against electric shock : Class I (with the DS-7300 system)
The type of protection against electric shock : type B
Waterproof Level : IPX0 (no protection)
Disinfection Method : Cleaning only
Degree of safety in the presence of flammable anesthetic mixture:
not suitable for use in the presence of flammable anesthetics mixture with air or with oxygen or nitrous oxide.
Operation Mode : Continuous Operating Equipment

Recording

Recording method	:	Dot Matrix Thermal Head Method
Effective Record Width	:	48 mm
Speed	:	25 mm/s ±5%, 50 mm/s ±5%
Paper Size	:	50 mm × 20 m, 75mm perf.
Number of Waveforms	:	3 traces
Paper Feed	:	Continuous, Perforation Feed
Recording Density	:	Vertical Axis: 8 dot/mm Horizontal Axis: 20 lines/mm

Recording Modes

Manual Recording, Alarm Recording, Periodic Recording, Freeze Recording

Detection Mechanisms

Paper Empty, Paper Magazine Open, Paper Jam, and Cue Mark

Operational Switches

Speed, **Feed/Mark**, **Rec/Stop**

6. Accessories and Optional Accessories

⚠CAUTION	● Use only the accessories specified for this device. Otherwise, proper function cannot be executed. ● For quality improvement, specifications are subject to change without prior notice.

IB-7300 Input Box

【Accessories】

- CS-18 Power Supply Cable: Qty.1 (CS-24 for USA)
- CJ-732A Module Connection Cable (0.3m): Qty. 1
- This Operation Manual: Qty. 1
- Usable Module Software Version for the IB-7300): Qty. 1

【Optional Accessories】

Item	*Model Type*	*Description*
Ground Cable	CE-01A	
Module Connection Cable	CJ-732A	0.3m
Module Connection Cable	CJ-732B	0.7m
Module Connection Cable	CJ-732C	5m
Module Connection Cable	CJ-732D	10m
Module Connection Cable	CJ-732E	20m
Air Filter	OA-485	For cooling fan. 10 in one pack.

HB-500 Invasive Blood Pressure Module

【Accessories】

- Blood Pressure Channel Identification Label: Qty. 1
- CJ-369 Interface Cable (COBE): Qty. 2
- Operation Manual

【Optional Accessories】

Item	*Model Type*	*Description*
Interface Cable	CJ-369	COBE
BP Disposable Transducer Kit (COBE)		
Arm Mount Type Microdrip	041-573-504	10/one box
Pole Mount Type Microdrip	041-575-504	10/one box
Double Type Microdrip	041-580-504	10/one box
Mounting Bracket	41-520-000	
Simulator	041-550-100	
Interface Cable	CJ-410	Ohmeda
Interface Cable	CJ-428	Baxter
Channel Identification Label		

HC-500 CO_2 Module

【Accessories】

- Operation Manual

【Optional Accessories】

Item	*Model Type*	*Description*
CAPNOSTAT® III	6467-00	
Airway Adapter (for adult)	6383-01	
Airway Adapter (for neonate)	6384-01	
Disposable Airway Adapter (for adult)	6663-01	
Airway Adapter (for adult)	6383-00	Qty. 10
Airway Adapter (for neonate)	6384-00	Qty. 10
Disposable Airway Adapter (for adult)	6663-00	Qty. 10
Cable Holder	6241-01	Qty. 5

HC-530 $tcpO_2$ / $tcpCO_2$ Module

【Accessories】

- Operation Manual

【Optional Accessories】

Item	*Model Type*	*Description*
Combined $tcpO_2$/pCO_2 Electrode	E5280	
Electrode Membraning Kit	D280	
Electrode Fixation Kit	D282	
Calibration Unit	TCC3	
Calibration Gas (20.9% O_2, 5% CO_2)		

HF-500 Cardiac Output Module

【Accessories】

- CJ-382 Catheter Interface Cable: Qty. 1
- Operation Manual

【Optional Accessories】

Item	*Model Type*	*Description*
Injectate Probe Relay Cable	CJ-411	
Ohmeda® In-line Sensor Relay Cable	CJ-412	
Baxter® Flow-through Sensor Relay Cable	CJ-413	

HR-500 Recorder Module

【Accessories】

- OP-124TE Recording Paper: 1 box
- Operation Manual

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Printed in Japan **4L3684 200603**