

Endoscopic CO₂ Regulation Unit

User Manual

JSQB-P1

CATALOGUE

STATEMENTS	1
IMPORTANT SAFETY STATEMENT	3
WARNINGS & CAUTION & ATTENTION	5
CHAPTER INTRODUCTION	11
CHAPTER 1: GENERAL INFORMATION.....	12
INTRODUCTION	12
OPERATING PRINCIPLE OF THE REGULATION UNIT	12
COMPONENTS	12
FEATURES OF PRODUCT	16
INDICATIONS AND CONTRAINDICATIONS	16
DESCRIPTION OF ACCESSORIES MATCHING WITH THE UNIT	16
CHAPTER 2: INSTALLATION AND COMMISSIONING OF THE UNIT	18
STANDARD CONFIGURATION	18
PREPARATION BEFORE INSTALLATION	19
SYSTEM CONNECTION DIAGRAM	19
CONNECTION OF THE GAS REGULATION UNIT WITH GAS SUPPLY	20
CONNECTION BETWEEN GAS REGULATION UNIT AND WATER/GAS BOTTLE	22
POWER CONNECTION OF GAS REGULATION UNIT	25
CHECK BEFORE STARTUP	25
CHAPTER 3: OPERATING METHODS OF GAS REGULATION UNIT	27
PURPOSE	27
DEVICE STARTUP/SHUTDOWN	27
OPERATION METHOD	27
CHAPTER 4: COMMON FAULTS AND TROUBLESHOOTING.....	29
DEVICE FAULT	29
ERROR CODE AND TREATMENT	30
CHAPTER 5: CO ₂ REGULATION UNIT MAINTENANCE	31
GAS REGULATION UNIT CLEANING	31
WATER PROOFING OF UNIT	31
DAILY INSPECTION	31
MATTERS NEED ATTENTION FOR MAINTENANCE	32
FUSE REPLACEMENT	33
REPLACEABLE PARTS AND MATERIALS	33

VALIDITY	33
APPENDIX A: TECHNICAL PARAMETERS	34
APPENDIX B: LABELS.....	36
APPENDIX C: ELECTRO MAGNETIC COMPATIBILITY.....	38

Statements

Copyright

The manual is protected by copyright of Chongqing Jinshan Science & Technology (Group) Co., Ltd. None of its contents may be changed, interpreted and copied in any form without consent of the company.

Trademark

ENDOLINQ is the registered trademark applied for by and is proprietary to Chongqing Jinshan Science & Technology (Group) Co., Ltd.

Authorization

Chongqing Jinshan Science & Technology (Group) Co., Ltd. implements the authorization protection for every part of all reasonable design and production of the **endoscopic CO₂ regulation unit**

- a. Any unit and personnel are not allowed to lend, transfer and transact the product in any form without authorization of the company.
- b. The company assumes no responsibility for any consequence incurred by unauthorized use of the product.
- c. The company assumes no responsibility for artificial damages due to direct or indirect use of the endoscopic CO₂ regulation unit and consequences caused by improper operation.
- d. The company has the rights to adjust design and production of the system at any time within authorization protection range, without prior notification.
- e. Any authorization termination shall be deemed as “unauthorized” and all materials within the term of authorization must be destroyed without delay, otherwise it will be deemed as infringement.

Certification

CE₀₁₉₇

Environmental Protection

- a. For scrap disposal of the endoscopic CO₂ regulation unit, please refer to local medical device product scrap regulations for corresponding disposal.
- b. You may also contact our company to obtain the recommendations on scrap disposal.

The manual is the product operation instructions and technical instructions of the endoscopic CO₂ regulation unit (JSQB-P1) (“**the CO₂ regulation unit**” or “**the product**” for short) and is subject to change without prior notice. For the latest relevant information on this manual, please contact the manufacturer.




Important Safety Statement

Purpose of Use

This manual only applies to the endoscopic CO₂ regulation unit. The product is used for injecting CO₂ gas, with gas regulation only for the upper and lower gastrointestinal tracts and other kinds of gases are not allowed.

Safety Signs about this Manual

This manual contains all the information to safely and effectively use this product. Please read carefully before proceeding. Pay attention to the safety signs illustrated prior to this section. A comprehensive understanding of these signs is required.

Text symbols	Description
 Warning	It indicates the potential hazards, if not avoided, may result in personal injury
 Caution	It indicates the potential hazards, if not avoided, may result in equipment damage
 Attention	It indicates the matters requiring special attention

Clinical Operation

The product must only be used by professional physicians who have received training on the **endoscopic CO₂ regulation unit**. This manual doesn't include clinical operation technology; please make a judgment from physician's own professional perspective for the clinical operation technology.

Combination of Equipment

The product should be used with peripheral equipment. To avoid electric shock accident, special socket for peripheral equipment shall be used for power supply connection when using peripheral equipment except for medical equipment such as digestive endoscope.

Classification of product

- Classified by the type of electric shock prevention: belong to class I equipment with an external power supply
- Classified by the degree of electric shock prevention: Type BF
- Classified by the degree of liquid ingress prevention: IPX0
- It is not allowed to use the equipment in the presence of any inflammable anesthetic gas mixed with air or with oxygen or nitrous oxide
- The equipment operates continuously
- The equipment is not installed permanently

Classification of Safety Instructions

The safety instructions are classified according to the following dangers (See section Warning & Caution & Attention for detail).

- Wrong operation by a person without any training
- Hazard caused by environment
- Electric shock danger
- Improper connection to the gas inlet/outlet lines
- Wrong category of inlet gas supply
- Inlet gas supply pressure exceeds the allowed range
- Unit damaged

Warnings & Caution & Attention

Wrong operation by a person without any training



Warning

A person without any training may incorrectly operate the product, which would result in danger to patients and healthcare providers, even danger to life or damage to property.

- The product can be only used by the person who has received professional training and knows how to correctly operate it
- Only the person who knows the product well and has practical operation experience on it can be a trainer

Harm caused by environment

1. Interference to the product induced by any portable and mobile high-frequency communication equipment (e.g., mobile phone, wireless equipment).



Caution

- The electromagnetic wave emitted by the portable and mobile high-frequency communication equipment may lead to product failure or improper working.
 - The product can operate in the electromagnetic environment where the high-frequency radiation interference can be controlled. When in use, the product shall be kept from any communication equipment (radio transmitter) at a recommended protecting distance. The minimum value of recommended protecting distance is related to the maximum output power and transmitting frequency.
 - For recommended protecting distance between the communication equipment and the product, please refer to Appendix C.
2. Inappropriate used temperature or gas humidity



Caution

If the product is used under the inappropriate temperature or gas humidity, damage, failure or improper working may occur.



Attention

Please operate the product under the appropriate temperature and gas humidity. Refer to Appendix A.

3. Inappropriate temperature or gas humidity during transportation and storage



Caution

If the product is transported and stored under inappropriate temperature or gas humidity, damage or fail may occur.



Attention

Please transport and store the product under the appropriate temperature and gas humidity. Refer to Appendix A.

4. Temperature Recovery Time



Caution

If the product is transported and stored outside the preferred temperature range, a period of time and temperature are required for adaptive adjustment. Otherwise, it may be damaged or fail as a result.



Attention

For the recovery time, please refer to Appendix A.

5. Unit overheating resulting from insufficient ventilation



Caution

Product overheating, damage or failure may be induced by insufficient ventilation.



Attention

Please ensure that there is sufficient space around the product for ventilation. Do not use or place the product in a confined space.

6. Liquid penetration



Caution

The product is not absolutely sealed, liquid penetration may cause damage and failure.



Attention

- Don't allow any liquid to penetrate into the product
- Don't place a container with liquid on the product

Electric shock danger

1. Damaged electric shock protection power socket, cable of poor quality, extension cable, wrong power voltage, etc.



Warning

Damaged electric shock protection power socket, cable of poor quality, extension cable, wrong power voltage, and so on may induce electric shock danger and other hazards to patients and healthcare providers or damage to property!



Attention

- Please connect the product to a correctly installed electric shock protection power socket.
- Please use the power cable accompanied by the equipment provided by our company, or use the cable with the certification mark recognized by your country.
- The power supply voltage used must conform with the description on product nameplate.

2. Change fuse



Warning

Damage to the fuse would result in electric shock danger to patients and healthcare providers or damage to property!



Attention

- The fuse can be only changed by a professional electrical technician. Only the fuse complying with information on the product nameplate can be used.

- After changing the fuse, a function test must be conducted on the product. If the product works improperly or there are any questions during operation, please consult the manufacturer.

3. The product is live during cleaning and disinfection



Warning

If the product is live during cleaning and disinfection, it may result in electric shock danger to healthcare providers.



Attention

Please turn off the product during cleaning and disinfection. Cuff off the power supply.

Improper connection to the gas inlet/outlet lines



Warning

Improper connection to gas inlet/outlet lines may result in danger to patients and healthcare providers, even to their lives, or induce damage to property!



Attention

- Ensure that gas lines are connected correctly and nuts are tightened.
- Regularly inspect gas inlet/outlet lines for safety and confirm if there are any damages or cracks, connections for good seal. If any problems are found, please stop using it immediately.

Wrong category of inlet gas supply



Warning

Wrong category of inlet gas supply may result in danger to patients and healthcare providers, even to their lives, or damage to property!



Attention

- The inlet gas supply for the product must be CO₂ gas and it is not allowed to use other gases as its gas supply!

- The medical CO₂ gas must be used and the use of industrial CO₂ gas is strictly forbidden!

The inlet gas supply pressure exceeds the allowed range



Warning

If the inlet gas supply pressure exceeds the allowed range, danger to patients and healthcare providers, even to their lives, or damage to property may occur!



Attention

- The inlet gas supply pressure must be within the allowed gas inlet pressure range for the product. If it exceeds such range, the product may work improperly, or even be permanently damaged.
- When supplying gas by high-pressure gas cylinder, the cylinder must be equipped with pressure reducer and valve unit, and directly connecting the high-pressure gas supply to the product is strictly prohibited.

Unit damaged

1. The gas line pipes and elements are obstructed or invalid



Warning

Obstructed or invalid gas line pipes and elements may endanger patients and healthcare providers, even to their lives or property!



Attention

- Please use clean and dry gas supply to avoid any foreign matters entering into gas inlet connector.
- Please blow the gas lines regularly by removing the outlet gas tubing, setting the flow to maximum and turning on the gas outlet for at least 10 seconds.
- If a high-pressure gas cylinder is used as the gas supply, blow the gas lines once in the same method above after changing the cylinder.

2. Failure to check the product and accessories for safety regularly



Warning

If the product and accessories are not checked for safety regularly, it can result in danger to patients and healthcare providers, even to their lives, or damage to property!



Attention

- Check the product for safety at least once a year.
- Before using each time, check the accessories for completeness, as well as whether a gas leakage exists.

Others



Attention

If necessary, connect the product's ground pole to the operating room's ground lead through the isoelectric line.

Chapter Introduction

This manual is the product operation instructions and technical instructions of endoscopic CO₂ regulation unit and consists of 6 chapters.

Chapter 1: Overview, introducing functions and features, operating principle, operating environment, composition, parameters and description of the unit.

Chapter 2: Installation and Commissioning of the Unit

Chapter 3: Operating Methods of Gas Regulation Unit

Chapter 4: Common Fault and Troubleshooting

Chapter 5: CO₂ Regulation Unit Maintenance

Appendix A: Technical Parameters

Appendix B: Labels

Appendix C: Electro Magnetic Compatibility

Chapter 1: General Information

Introduction

The Endoscopic CO₂ Regulation Unit ("the regulation unit" **for short**) developed and produced by Chongqing Jinshan Science & Technology (Group) Co., Ltd. is a gas regulation unit for gastrointestinal tract endoscopy and surgery, which is intended for injecting carbon dioxide gas ("CO₂" for short) during the gastrointestinal tract endoscopy or surgery to allow the tract to be shown more clearly. The product has functions such as timer, flow level selection, pressure alarm, etc.

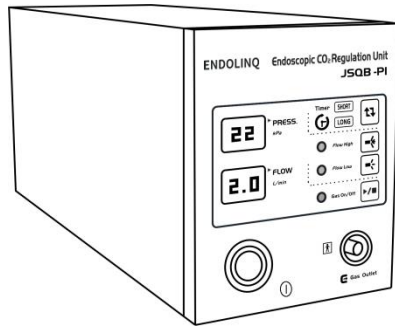
Operating principle of the regulation unit

The regulation unit's front panel and flow control panel accept inputs and displays information entered. CO₂ flows through the pressure reducer where it is adjusted to appropriate pressure, and then it is transported to such parts as the electromagnetic valve and so on. Outlet flow control, pressure monitoring and other functions can be conducted through the flow control panel.

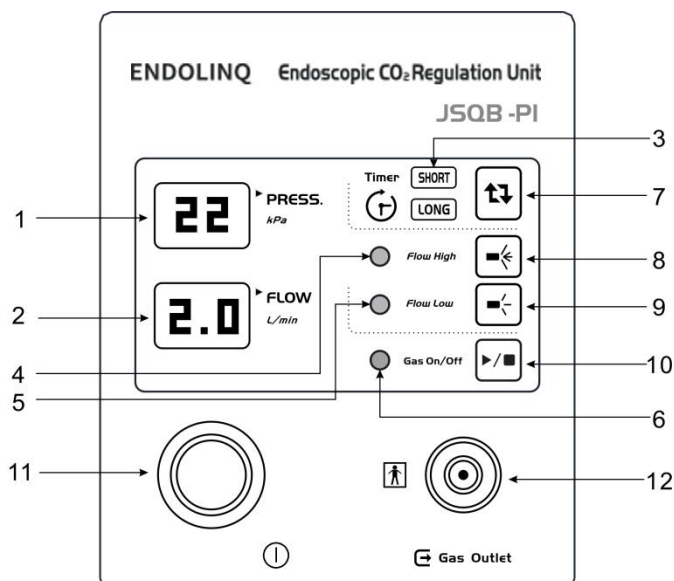
Components



The **regulation unit** is composed of **the flow control panel, the display panel, the power supply module, the gas inlet/outlet connector and the internal pipe-lines**, and all of these parts are placed within a closed case.












- There are such elements as the pressure reducer, the electromagnetic valve, the pressure sensor on the flow control panel, which allow the pressure adjustment and flow control for CO₂ outlet.
- The regulation unit's front panel displays the main setup information and receives the information entered by user. The whole machine is designed without a fan and can be used in laminar flow operation room.
- The regulation unit appearance illustrated as follows:



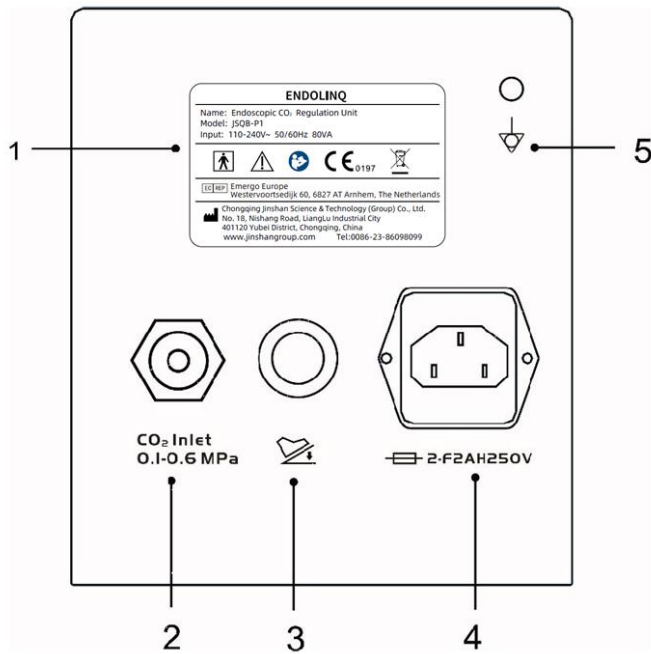
1. The front panel is illustrated as follows:

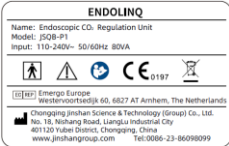






No.	Part	Identifier	Description
1	Pressure display		<ul style="list-style-type: none"> Displays gas pressure at the outlet connector Normal value: 0~45kPa When inlet pressure is abnormal, displays alarm information When the system detects an error, displays the error code
2	Flow display		Displays gas outlet flow

No.	Part	Identifier	Description
3	Timer indicator	 	<ul style="list-style-type: none"> When the timer SHORT function is selected, the SHORT indicator is on, duration 15min When the timer LONG function is selected, the LONG indicator is on, duration 30min When the timer function is deactivated, both indicators are off
4	Flow High indicator		<ul style="list-style-type: none"> When the Flow High is selected, the green indicator is on when the flow deviation is $\geq 0.9L/min$ during the operation process, the red indicator is on when the flow level is not selected, the indicator is off
5	Flow low indicator		<ul style="list-style-type: none"> When the Flow Low is selected, the green indicator is on when the flow deviation is $\geq 0.8L/min$ during the operation process, the red indicator is on; when the flow level is not selected, the indicator is off
6	Gas outlet indicator		<ul style="list-style-type: none"> When the gas flow starts, the green indicator is on; when the gas flow stops, the indicator is off
7	Timer function button		Press this button and circulate to the next timer function in the order of Short→Long→Off.
8	Flow High button		Press this button and the Flow High is selected
9	Flow Low button		Press this button and the Flow Low is selected
10	Gas outlet button		Press this button and the Gas outlet is switched On/Off
11	Power On/Off		Depress to power on Depress again to power off
12	Gas Outlet connector	 Gas Outlet	CO ₂ Outlet connector

2. The rear panel is illustrated as follows



No.	Part	Identifier	Description
1	Nameplate		It indicates the unit's model, input, EC-REP and manufacturer information.
2	Gas Inlet connector	 CO ₂ Inlet 0.1-0.6 MPa	Connected to the external gas supply.
3	Foot Switch Socket		Connect to the foot Switch
4	Power socket		Power socket with the fuse base.
5	Ground pole		Equipotential grounding terminal.

Features of product

- Flow display
- Flow alarm
- Flow level selection function
- Outlet pressure monitoring function
- Inlet pressure monitoring function
- Timer function

Indications and Contraindications

Indications



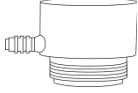
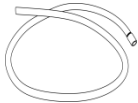
It is used for injecting CO₂ gas, with gas regulation only for the upper and lower gastrointestinal tracts and the other gases regulation is not allowed.

Contraindications

- Patients with chronic obstructive pulmonary disease requiring oxygen inhalation treatment
- Patients with known CO₂ retention
- Patients on any opioid sedatives within 45 days
- Pregnant woman

Description of accessories matching with the unit

The regulation unit's accessories include pressure reducer, CO₂ high-pressure hose, adapter for water/gas bottle, and gas outlet hose. For their appearance figures, see following table:

Name	Appearance
Pressure reducer	
CO ₂ high-pressure hose	
Adapter for water/gas bottle	
Gas outlet hose	

Chapter 2: Installation and Commissioning of the Unit

Standard configuration

Name	Unit	Quantity
Endoscopic CO ₂ Regulation Unit	Set	1
Power Cable	Piece	1
Outlet connector unit	Piece	1
CO ₂ high-pressure hose	Piece	1
Pressure reducer	Piece	1
Fuse (F2AH250V)	Piece	2
User Manual	Piece	1
JSQB-OP2 In-line tubing set	Piece	1
Foot Switch unit	Piece	1

Optional configuration:

- Central gas supply Unit
- JSQB-PT1 In-line tubing set
- JSQB-FJ1 In-line tubing set
- JSQB-JS1 In-line tubing set
- JSQB-OP1 In-line tubing set
- JSQB-FJ2 In-line tubing set



Attention

Please check and confirm all the parts for completeness according to the product packing list after the package is opened.

Preparation before installation

1. When positioning, the equipment must be placed stably, and any necessary measures shall be taken to prevent it from falling down.
2. When placing the product, please ensure there is sufficient space around it for free ventilation, and it is not placed in a confined space.
3. Don't drag the equipment power cable on the ground. Make sure the power plug is firmly in the power socket.
4. Please place the equipment gas inlet and outlet pipes appropriately to prevent healthcare providers from stumbling or causing the equipment damaged.

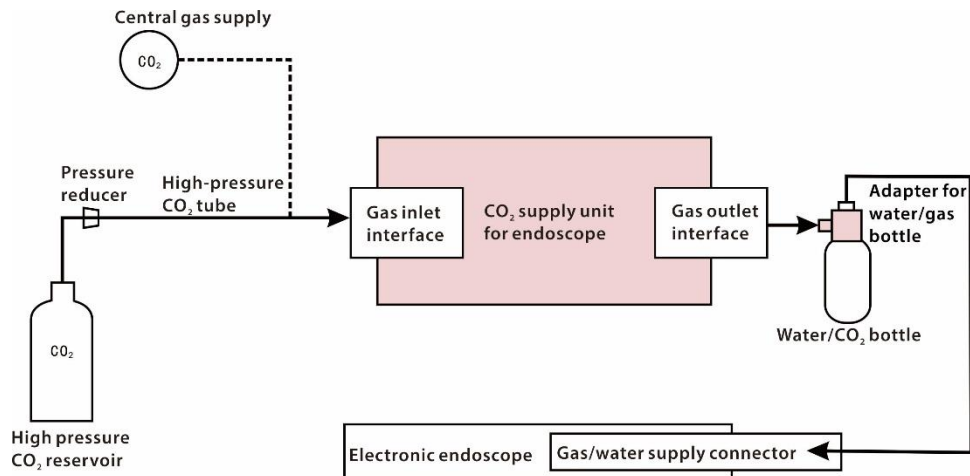


Warning

- The use of power supply voltage beyond specifications may cause fire or electric shock. Please use the power supply AC 110~240V and 50/60 Hz.
- For safety, please make sure to use the three-hole socket with ground cable. A 3-pin/2-pin changeover plug cannot ensure the safety setup, and may result in electric shock and shall not be used.
- To prevent the product from falling over and becoming damaged, please place it on a firm, flat surface without vibration or movement.

System connection diagram

For use with digestive endoscopy, the system connection diagram is illustrated as follows:



CO₂ supply (central gas supply or CO₂ high-pressure cylinder, connection to both simultaneously unavailable) is connected through the inlet hose and the gas inlet connector of regulation unit. The outlet connector of regulation unit is connected to the water/gas bottle through the gas outlet hose and the water/gas bottle is connected to the gas/water regulation connector of the endoscope.

Connection of the gas regulation unit with gas supply

a. Connection with high pressure CO₂ cylinder.

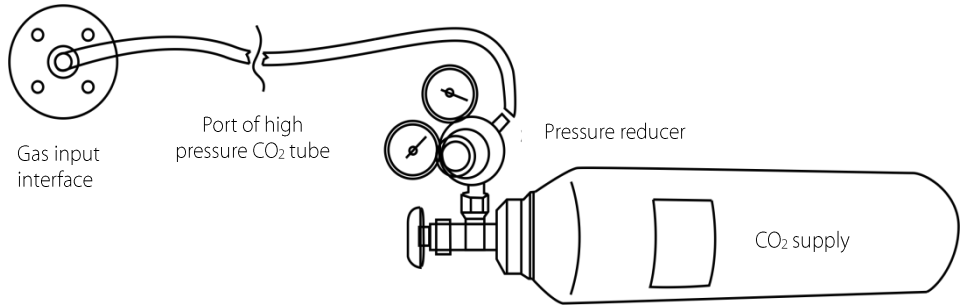


Warning

- Make sure gas cylinder has been completely turned off before connecting and disconnecting of gas supply, otherwise it may endanger the operator's safety or even life!
- Must use medical carbon dioxide as input gas supply, other gases are strictly prohibited!

When high pressure CO₂ cylinder is used as gas supply, the connection method is as follows:

1. Firstly, make sure that the CO₂ cylinder pressure regulator is adjusted to appropriate position which enables the gas pressure input to equipment in allowable range. Make sure the gas cylinder valve is turned off when equipment not in service.
2. When gas cylinder valve is completely turned off, connect the high pressure CO₂ hose with gas inlet connector of the gas regulation unit and the pressure reducer which is on the CO₂ cylinder as shown in follow figure. Verify the attachments after connection is completed.

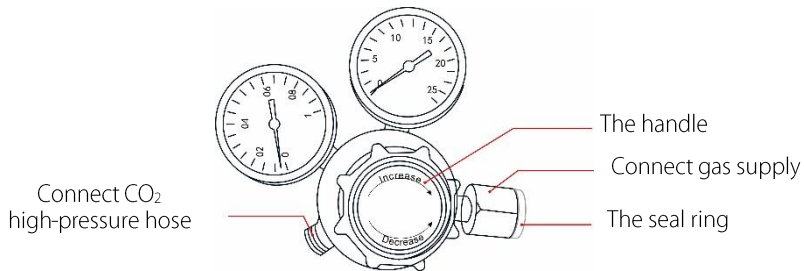


b. Connection with central gas supply

When central gas supply is used as gas supply, connect the CO₂ connector of central gas supply with one end of high-pressure CO₂ hose and gas inlet connector of gas regulation unit with the other end. Make sure the central gas supply is in the allowable range.



Attention



- Before installing the pressure reducer, the gas supply switch must be off
- If the pressure reducer is not properly installed, the following faults may be caused
 - ✓ Gas leakage: the CO₂ regulation unit display **PL** and the equipment cannot work properly
 - ✓ The pressure is too low: the CO₂ regulation unit display **PL** and the equipment cannot work properly
 - ✓ The pressure is too high: the CO₂ regulation unit display **PH** and the equipment can't work properly or the CO₂ regulation unit is not prompt and the equipment is damaged or the hose rupture
- How to install the pressure reducer, as follows:
 1. Counterclockwise rotate the handle to non-rotation
 2. Connect CO₂ high-pressure hose
 3. Connect gas supply, use the wrench to fix the connection

- ✓ Before connecting the gas supply, check whether the sealing ring is placed properly (The position of the sealing ring is shown above)
 - ✓ The pressure reducer of the US standards , the UK standards and the GER standards need to check the seal ring
 - ✓ The pressure reducer of the FR standards does not have the seal ring
4. Open the gas supply switch
 5. Slowly clockwise rotate the handle to $344 \text{ kPa} \pm 50 \text{ kPa}$ (observe the pressure gauge of the pressure reducer)

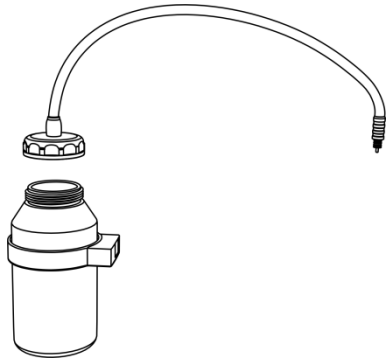
Connection between gas regulation unit and water/gas bottle

Select the corresponding adapter according to water/gas bottles of different models as shown in the following Table:

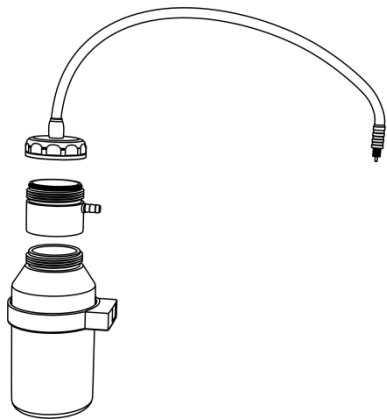
S/n	Model	Adapter and Manufacturer
1	JSQB-JS1	Jinshan Science & Technology
2	JSQB-PT1	Pentax
3	JSQB-OP1	Model OLYMPUS-30
4	JSQB-OP2	Model OLYMPUS-40
5	JSQB-FJ1	FUJIFILM
6	JSQB-FJ2	FUJIFILM

Gas outlet hose is connected with water/gas bottle through **adapter of water/gas bottle according to the following steps:**

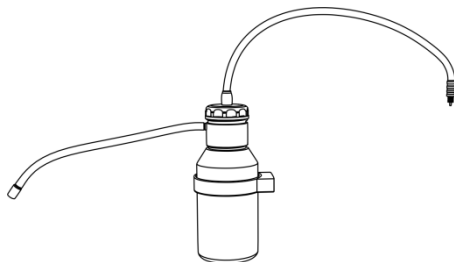
First step: **take off water/gas bottle cover as shown in the following figure:**



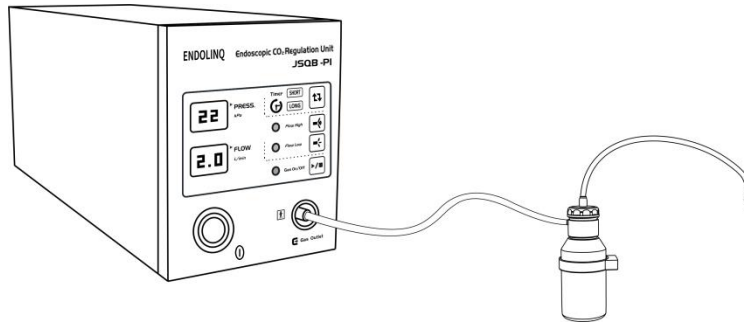
Second step: fit on appropriate adapter of water/gas bottle as shown in the following figure:



Third step: fit the gas outlet hose on inlet connector on the adapter of water/gas bottle directly as shown in the following figure:



Fourth step: connect the gas outlet hose and gas regulation unit as shown in the following figure:



 **Warning**

Before connecting the product, please check the gas outlet hose, for any reverse water or foreign matter inside, and clean it before connection, Otherwise the product may not work properly!

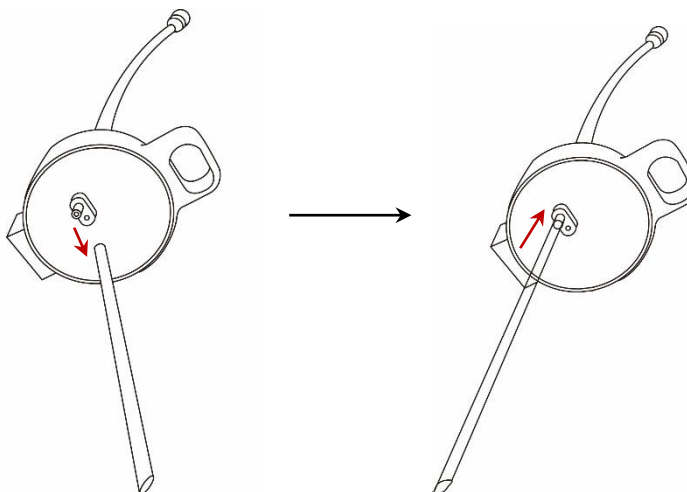
 **Attention**

When using the adapter of water/gas bottle to connect the water/gas bottle, check whether the sealing ring of the adapter is in good condition and whether it is properly placed.

When using the adapter of water/gas bottle to connect the water/gas bottle the hose in the water/gas bottle may not reach the bottom of the water/gas bottle, which can be solved by the following method:

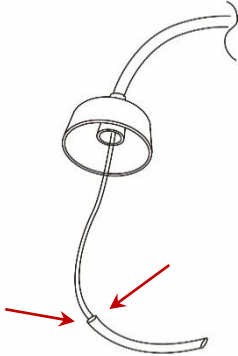
- The Model of JSQB-PT1, JSQB-OP2, JSQB- FJ2

Remove the hose from the water/gas bottle and instead plug in the hose which is supplied by the adapter of water/gas bottle, as shown:



- The Model of JSQB-FJ1, JSQB-JS1, JSQB-OP1

On the original water/gas bottle hose, directly connect the hose which is supplied by the adapter of water/gas bottle, as shown:



Power connection of gas regulation unit


Make sure the gas regulation unit power is off. Connect one end of flexible power line with regulation unit power input connector and another end with the power socket. Please do not connect with portable socket to avoid unexpected interruption of power supply during operation.

Check before startup

Before using the product, please check it and its ancillary equipment carefully; gas regulation unit cannot be used if any abnormalities have been found. Please refer to "Common Fault and Troubleshooting" for eliminating any abnormality. If abnormality cannot be eliminated, please contact with the manufacturer to guarantee the safety of patient and operator and avoid equipment damage.

1. Power-on check for gas regulation unit

Description of normal power-on is as follows:

Switch on the device, the switch is in , the front panel indicator and digitron will light up with a startup sound; the equipment begins the self-check process. After self-check process is completed, the equipment will automatically recover default parameters, the corresponding indicator lights up.

2. Fault detection

If any hardware faults are detected in the startup process, an acousto-optic signal will show, and the fault code will be displayed on digitron for users to find out possible reason of fault; refer to "Common fault and

troubleshooting" for details.



Warning




Please make sure that power specification can meet requirements!

Chapter 3: Operating Methods of Gas Regulation Unit

Purpose

1. Users shall read this manual carefully to know this product and its operation instruction.
2. When users want to review some operation instruction or feel puzzled at a given operation, this chapter may be used as conference.

Device startup/shutdown

1. Press the power switch , indicator will light up  and system begins self-check process. If there is no abnormality in self-check, the device will load default parameters and startup is completed.
2. Press power switch to shut down device. Power indicator lights off .







Attention

Reboot after shutdown for over 10s.

Operation method

Users may switch functions of the device with buttons on front panel. Pay attention to acousto-optic alerts during operation. Flash code or number, brief and repeated buzz and red LED lamp all indicate alarm and users shall pay attention to or treat it in time.

After startup, operate according to the following steps:

- Select timing function through timing function button  (if necessary)
- Select flow rate level through flow option button  or  (if necessary)
- Start or stop gas output through gas output start/stop buttons 

1. Timing function

If timing function is enabled, timer begins to count time when gas is output. When set time is reached, gas output stops with voice prompt.



Attention

When timing level is selected, timing is valid only for gas output; if gas output is stopped manually or gas output resumes after counting time has stopped, counted time will be added up previous time. By that analogy, when total counted time has reached the set value, gas output will stop automatically.

2. Selection function of flow rate level

When high-flow level button is pressed, output flow is 3L/min, and the corresponding indicator for such level is green. When low-flow level button is pressed, output flow is 2L/min, and the corresponding indicator for such level is green.

3. Gas output start/stop function

Users may start or stop gas output through gas output start/stop buttons. When gas output starts, the corresponding indicator is green.

Chapter 4: Common Faults and Troubleshooting

If the gas regulation unit breaks down during operation, users may try to solve the problem according to the following method at first. If the problem still cannot be solved, please contact with the manufacturer.

Device fault

Fault phenomenon	Possible reason	Solution
Power indicator does not illuminate after having pressed power switch	Power line is loose	Plug in again
	Power line is damaged	Replace with new power line in same specification
	No fuse or fuse damaged	Fit a replacement fuse according to the specification and operation method specified in these instructions.
Indicator illuminates without display on panel after having pressed power switch	Power module in unit damaged	Contact with manufacturer for repair
	Control panel in unit damaged	Contact with manufacturer for repair
	Display panel in unit damaged	Contact with manufacturer for repair
	Connection cable in unit damaged	Contact with manufacturer for repair
Indicator of flow rate level is red---for a long time	Hose is blocked	Clean the blockage or contact with manufacturer for repair
	Control panel in unit damaged	Contact with manufacturer for repair
The flow display is normal, but the	Gas leakage at the connection of the water cylinder	Check air sealing of the water/gas bottle and the

Fault phenomenon	Possible reason	Solution
insufflation is not detectable		hose connection. Check air sealing of the water/gas bottle and the adapter connection, whether placed a sealing ring and the sealing ring is in good condition. Checks air sealing of the electronic gastro-scope.
	The gas button is not plugged with finger	Plug the air button with your finger

Error code and treatment

This machine has recognition function for error code; users may treat according to the recommendations in follow table:

Error code	Possible reason	Solution
E1	Inner pressure sensor for low pressure fault	Reboot or contact with manufacturer
E2	Inner pressure sensor for high pressure fault	Reboot or contact with manufacturer
E3	Inner flow rate sensor fault	Reboot or contact with manufacturer
E4	Press buttons during startup process	Reboot and not touch button
	Button fault	Contact with manufacturer
PL	Gas input pressure too low	Adjust the gas input pressure to 0.3MPa - 0.4MPa or contact with manufacturer
	Gas supply is not correctly connected	Reconnect gas supply
PH	Gas input pressure too high	Adjust the gas input pressure to 0.3MPa - 0.4MPa, or contact with manufacturer

Chapter 5: CO₂ Regulation Unit Maintenance

Gas regulation unit cleaning

1. Use soft cloth such as gauze to gently wipe away dust and stains on unit.
2. If stain is serious and not easily to be wiped out, please use dilution of water (5-6 times) and neutral detergent to wet gauze and wipe.



Warning

- Please clean the unit with specified method, otherwise unit fault may arise and negatively affect the safety performance of unit.
- Liquid in unit may cause fault.
- Please do not spill water or disinfectant on unit, or clean it by water or dip it in disinfectant.

Water proofing of unit

1. This unit is not waterproof; please do not spill liquid on unit.
2. Please do not allow liquid flow into unit through gas outlet hose.
3. If the unit has any signs of water penetration, please stop operation immediately and contact with the manufacturer.

Daily inspection

It is recommended that users shall carry out at least one safety inspection per year. Product with potential fault or defect which may harm patient, medical staff or the third party according to inspection is prohibited to be used unless fault or defect is eliminated.



Warning

- In order to prevent personal injury or product damage, please do not try to repair the product by yourself.
- Any after-sale service or repair must be done by qualified serviceman.



Caution

Safety inspection items include but not limited to the following content:

- Label and User's Manual
- Visual check for damage of product and accessories
- Grounding protection inspection
- Electric leakage inspection
- Function inspection of all operations and control elements
- DC impedance test



Attention

If users have no relevant inspection tools to carry out safety inspection items above mentioned, assistant from manufacturer is available.

Matters need attention for maintenance

Please store the product under the following conditions:

- Environment temperature range: -20°C ~ +50°C
- Relative humidity range: ≤95%
- Atmospheric pressure range: 700hPa~1060hPa

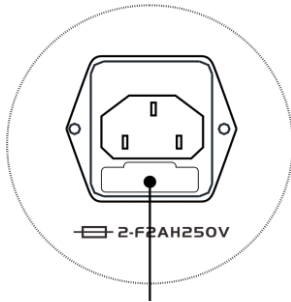


Warning

- In order to prevent faults, please store the product in an appropriate place.
- In order to prevent faults, please do not over-bend, drag, twist or squeeze cable.
- Please store cable without bearing external force.

Fuse replacement

1. Power off the unit and unplug power plug.
2. Power socket is shown in follow figure; use a small-size slotted head screw driver to open the fuse box and replace fuse (rated value of fuse: F2AH250V), then push the fuse box into power socket.



Fuse box



Warning

- Using different fuse may cause fire or electric shock.
- Do not use other fuses instead of specified and rated fuse.
- Replacing fuse when power plug in socket may cause electric shock. Please unplug power plug from socket when replacement fuse.

Replaceable parts and materials

1. No spare parts or repair materials for replacement are contained in the chassis.
2. If the unit breaks down, professional staff is required for repair. Please inquire the manufacturer for information of required parts and materials.

Validity

Expected service life of the endoscopic CO₂ regulation unit is 5 years.

Appendix A: Technical Parameters

The model: JSQB-P1

Gas inlet/outlet

Type of gas: medical CO₂

Inlet pressure: 0.10MPa~0.60MPa

Outlet pressure: maximum 45kPa±5kPa

Outlet flow: 2L/min (low), 3L/min (high)

Equipment power input

Rated voltage: 110~240V AC

Power frequency: 50/60Hz

Maximum power: 80VA

Fuse: F2AH250V (2 pieces)

Normal operation conditions

Operation temperature: +5°C~+40°C

Operation humidity: ≤85% (not condensed)

Operation voltage: 110~240V, 50/60Hz AC

Atmospheric pressure: 700hPa~1060hPa

Transportation and storage

Temperature: -20°C~+50°C

Humidity: ≤95% (not condensed)

Atmospheric pressure: 700hPa~1060hPa

Recovery time

Before using the equipment, if its temperature or humidity during transportation and storage exceeds its normal operation conditions, it shall be placed in normal operation conditions for at least 3 hours, and then it can operate normally.

Dimensions

Dimensions of equipment: 330mm×128mm×155mm (length × width × height), without any mats, and deviation of ±10% is allowed.

Compatibility with accessories from other manufacturers

Please use the accessories accompanied with the unit.

Default parameters

Parameter Name	Default Value	Description
Gas On/Off	Off	By default, the gas outlet is off. To activate the gas outlet, press the Gas On/Off button to allow it to be in the on state
Short/Long	Short	By default, the Timer Short is selected
High/Low	Low	By default, it is Flow Low





















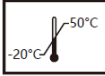
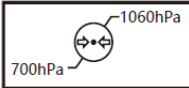
Warning

When using with accessories from other manufacturers, due to incompatibility, it may have its performance reduced or cannot work normally, even may endanger healthcare providers!

Appendix B: Labels

Signs in the Packaging and Product

Sign	Description
	Serial number
	Batch code
	Date of manufacture
	Manufacturer
	Use-by date
	CE Certificated
	Authorized representative in the European union
	Refer to Instruction Manual/Booklet (for critical safety instruction)
	Don't put into garbage bin
	Type BF
	Isopotential
	Before use, please read the instructions carefully
	This Side Up
	Fragile

Sign	Description
	Keep dry
	Stacking layers limit: 3
	No Tumbling
	Humidity: $\leq 95\%$ (not condensed)
	Temperature: $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$
	Atmospheric pressure: 700hPa \sim 1060hPa

Appendix C: Electro Magnetic Compatibility

The Endoscopic CO₂ Regulation Unit needs special precautions regarding EMC (Electro Magnetic Compatibility) and needs to be installed and put into service according to the EMC information provided in this manual.

Table 1 : Guidance and manufacturer’s declaration-electromagnetic emissions

The Endoscopic CO₂ Regulation Unit is intended for use in the electromagnetic environment specified below. The customer or the user should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR11	Group1	The Endoscopic CO ₂ Regulation Unit 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. The Endoscopic CO ₂ Regulation Unit 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.
RF emissions CISPR11	Class [A]	
Harmonic emissions IEC61000-3-2	NA	
Voltage fluctuations/ Flicker emissions IEC61000-3-3	NA	



When the Endoscopic CO₂ Regulation Unit is used adjacent to or stacked with other equipment its normal operation should be verified.

Table 2: Guidance and manufacturer's declaration-electromagnetic immunity


The Endoscopic CO₂ Regulation Unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Endoscopic CO₂ Regulation Unit should assure that it is used in such an environment.

Immunity test	IEC60601 Test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge(ESD) IEC61000-4-2	±6KV contact ±8KV 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 IEC61000-4-4	±2KV for power Supply lines	±2KV for power Supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	±1KV line(s) to line(s) ±2KV line(s) to earth	±1KV line(s) to line(s) ±2KV 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 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 5 sec	<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 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Endoscopic CO ₂ Regulation Unit requires continued operation during power mains interruptions, it is recommended that the Endoscopic CO ₂ Regulation Unit be powered from an uninterruptible power supply or a battery
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 1: UT is the a.c mains voltage prior to application of the test level.

Table 3: Guidance and manufacture’s declaration – electromagnetic immunity

The Endoscopic CO₂ Regulation Unit is intended for use in the electromagnetic environment specified below. The customer or the use of the Endoscopic CO₂ Regulation Unit should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 KHz to 80 MHz	3Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the Endoscopic CO ₂ Regulation Unit. 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 to 800 MHz $d = 2.3\sqrt{P}$ 800MHz 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).
Radiated RF IEC61000-4--3	3 V/m 80 MHz to 2.5 GHz	3V/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.

Note2 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 Endoscopic CO₂ Regulation Unit is used exceeds the applicable RF compliance level above, the Endoscopic CO₂ Regulation Unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Endoscopic CO₂ Regulation Unit.

b Over the frequency range 150 KHz to 80 MHz, field strengths should be less than [V₁]V/m.

Table 4: Recommended separation distances between portable and mobile RF communications equipment and the Endoscopic CO₂ Regulation Unit

The Endoscopic CO₂ Regulation Unit is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Endoscopic CO₂ Regulation Unit can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Endoscopic CO₂ Regulation Unit 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 2.5GHz $d = [2.3]\sqrt{P}$
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 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.



Chongqing Jinshan Science & Technology (Group) Co., Ltd.

Address	No.18, Nishang Road, LiangLu Industrial City, 401120 Yubei District, Chongqing, China.
Tel	0086-23-86098099
Website	www.jinshangroup.com
E-mail	international@jinshangroup.com
	Emergo Europe Westervoortsedijk 60, 6827 AT Arnhem, The Netherlands