

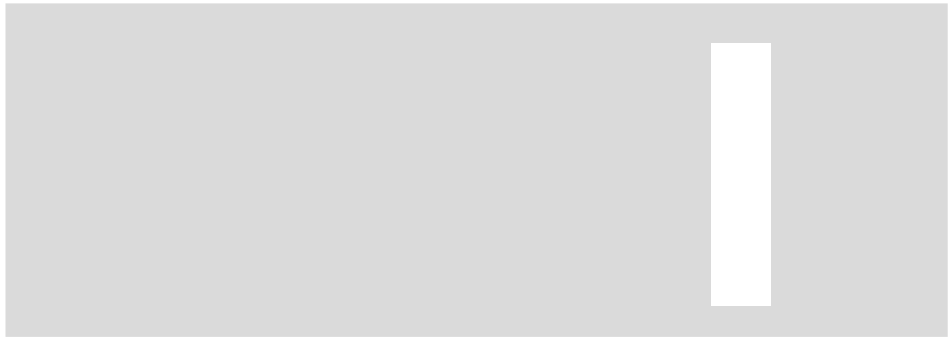
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PLANER

BT37 IFU

MA101414-ML

 0088



1. Introduction

This manual only applies to the following models: BT37; software version 1.0.25 and above.

This guide includes important information concerning the safe use of the equipment. It is important that you familiarise yourself with this document before attempting to use the product.

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1.2 Notices

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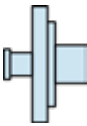




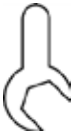


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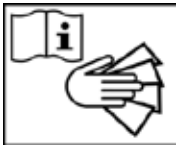
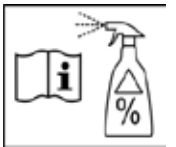

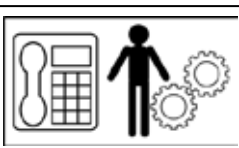

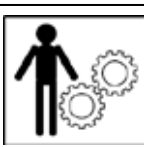

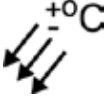


1.3 Indications for use






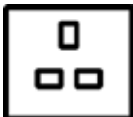



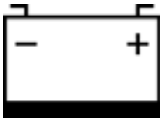
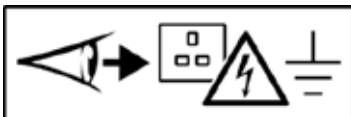

The Planer BT37 Incubator is intended to be used to provide an environment with controlled temperature at or near body temperature, CO₂, O₂ and N₂ gases, and elevated humidity for the development of gametes and embryos during in vitro fertilization (IVF) / assisted reproductive technology (ART) treatments.

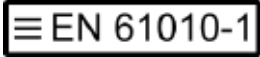








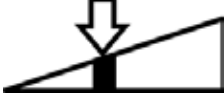
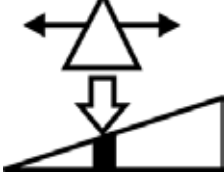
1.4 Symbols in the manual

	Safety information. Failure to follow these instructions may result in personal or third-party injury.
	Important information. Failure to follow these instructions may result in damage to equipment, samples or data.
	Hints.





	Use aseptic technique.
STERILE DIST. H ₂ O	Sterile, distilled water.
	Inline gas filter.
	Visual check.
	Soapy water.
	Impermeable to gas.
MED. CO₂/O₂/N₂	Medical grade premixed gas.
HIGH PURITY REGULATOR.	High-purity gas regulator.
	By hand.
	Use spanner.
	Do not over-tighten.
	Wipe clean.










	Clean according to these instructions.
	Clean and disinfect according to these instructions.
	Call your distributor.
	Call service.
	Competent / trained person.
	Service engineer.
	Source of electromagnetic interference such as large transformers or motors etc.
	Source of heat or cold such as heaters, air conditioning units etc.
	Weight.
	Uneven load.

	Repeat every 30 days.
	Repeat every 365 days.
	Repeat an additional 3 times.
	Wait for time t.
	Wait until dry.
	Mains power outlet.
	Connect mains power.
	Disconnect mains power.
	Fully charged battery.
	Low battery.
	Check electrical installation, equipment and mains leads.
	Toxic. Consult material safety data sheets before use.

	Equipment meeting EN 61010-1 or its equivalent.
	Audible alarm.
	Orange indicator.
	Green indicator.
	Red indicator.
	Flashing red indicator.
	Screened cable.
	Do not resterilize.
	Room temperature.
	Set-point.
	Set-point change.

1.5 Symbols on equipment

	Refer to these instructions. Failure to follow these instructions may result in personal or third-party injury.
	Alternating current (AC).
	Ethernet connection.
RST	Reset switch. This button will reset the controller. It should only be pressed if the system fails to respond.
	Alarm output connector.

	Premixed gas inlet.
	Premixed gas outlet.
Rx only	USA: Caution: Federal law restricts this device to sale by or on the order of a physician or a practitioner trained in its use.
	Sterilized using irradiation.
	Do not reuse.
	Do not use if package is damaged.
	Batch code.
	Use by date.
	Refer to these instructions.
	Do not dispose of with general waste.

1.6 Safety



- Operating the equipment in a manner not specified within this manual or under conditions outside of the equipment specifications, may result in the protection offered by the equipment being impaired.
- CO₂ gas is an asphyxiant.
- Use in well ventilated areas.
- Consider CO₂ alarms in confined spaces.
- The release of gas could result in oxygen depletion: a risk assessment should be undertaken to determine whether oxygen depletion alarms should be installed.
- Using default settings, the supplied gas is released to the room at the following rates.

Operating condition	Gases released.
Normal	Gas mix. 30 mL/min.
After lid closure	Gas mix. 360 mL/min for 3 minutes.
After bottle change	Gas mix. 360 mL/min for 9 minutes.

- Additional ventilation may be required.
- Equipment must be earthed. Class 1.
- Ensure that the equipment and mains cords are regularly checked by a competent person, using a Portable Appliance Tester or similar equipment, to ensure adequate earth bonding.
- Ensure that the earth continuity of the mains installation is regularly inspected by a competent person.
- Supply power via a residual current circuit breaker (RCCB) operating at a differential of 30 mA.
- Check that the rating label matches the local mains supply voltage.
- Mains lead to the power supply is the main disconnect device. If power needs to be disconnected immediately, disconnect the mains lead from the power supply or switch off at the mains power outlet.
- Ensure that the equipment is positioned so that the mains lead can be easily disconnected.
- Connected devices must comply with EN60950 or its equivalent.
- Any circuit connected to the alarm output must meet the requirements for an accessible part as defined in EN 61010-1 or its equivalent.
- Do not connect to Ethernet local area networks (LAN) external to the building.
- User servicing limited to cleaning and calibration.
- To avoid risk of fire, fuses must always be replaced with the same type and rating.
- Fuses should only be replaced by suitably trained service personnel.
- Fuses should only be replaced after the cause of the original failure has been determined and corrected as appropriate.
- Samples may present other biological hazards. Refer to the person responsible for the equipment.

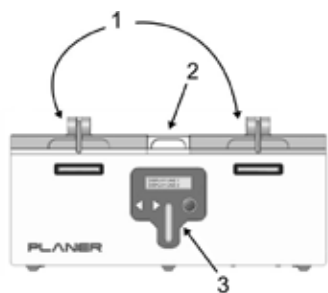
- Contains a sealed lead acid battery. Weight: 4 kg. Composition w/w: Pb 57%, PbO₂ 22%, H₂SO₄ 14%

Operating conditions	Gases released
Normal	None
Over charging	SO ₂ , SO ₃ , H ₂ , CO, H ₂ SO ₄ mist
Excessive temperatures	

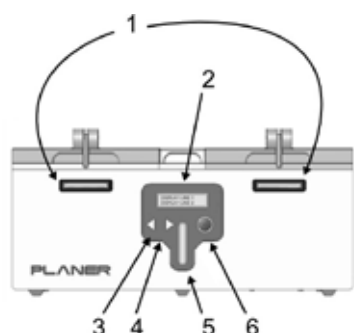
- The internal battery is not user-replaceable and may only be replaced by persons trained in the servicing of this equipment.
- The battery must only be replaced with a battery of the same type and rating.
- Ensure cables do not cause a trip hazard.
- Take care when lifting. Uneven load. 15.5 kg.
- The alarm output must not be used in safety-critical applications.

1.7 About the equipment

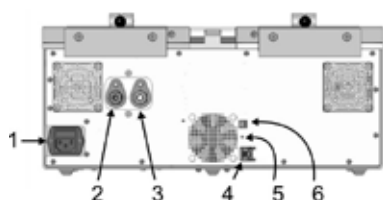
The BT37 and accessories are intended for use by embryologists and appropriately qualified biomedical assistants.



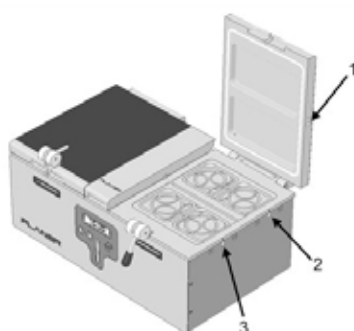
1. Chamber lids 2. Humidifier access cover 3. User interface



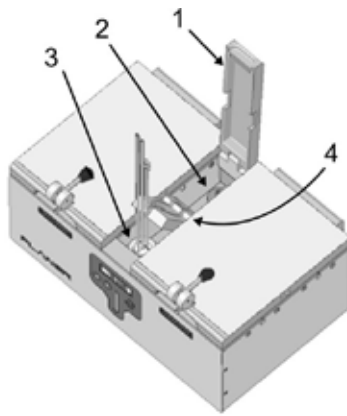
1. Status indicators 2. Main display 3. Left cursor key 4. Right cursor key 5. Liquid level indicator 6. Enter key



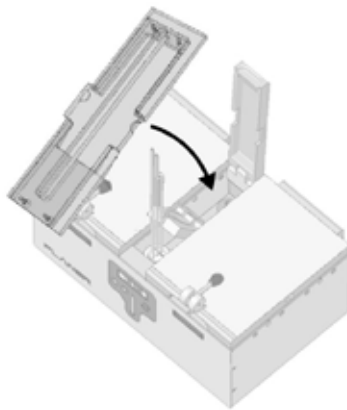
1. IEC mains power inlet 2. Premixed gas inlet 3. Daisy-chain gas outlet 4. Ethernet output 5. Reset switch 6. Alarm output



1. Lid monitoring port 2. Base rear monitoring port 3. Base front monitoring port

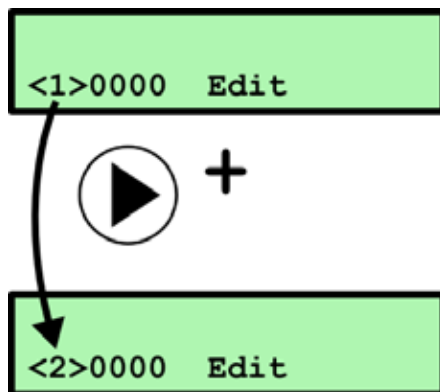


1. Humidifier lid 2. Gas inlet 3. Bottle 4. Tube guide



Clear cover

1.7.1 Editing numbers



Right arrow increments selected digit.

<2>0000 Edit



-

<1>0000 Edit

Left arrow decrements selected digit.

<1>0000 Edit



1<0>000 Edit

1<0>000 Edit



x4

10000 <Edit>

Enter key moves to the right.

1<0>000 Edit



<1>0000 Edit

Keep pressing Enter key to go back.

10000 <Edit>



10000 <OK>



To accept value, select OK and press Enter.

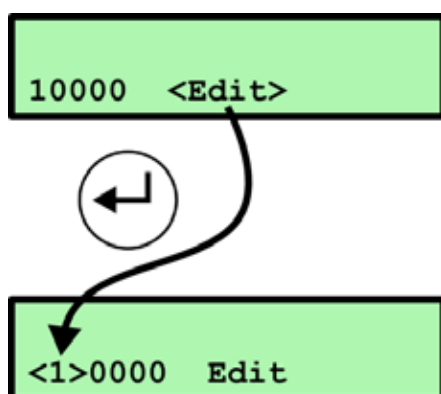
10000 <Edit>



10000 <Cancel>

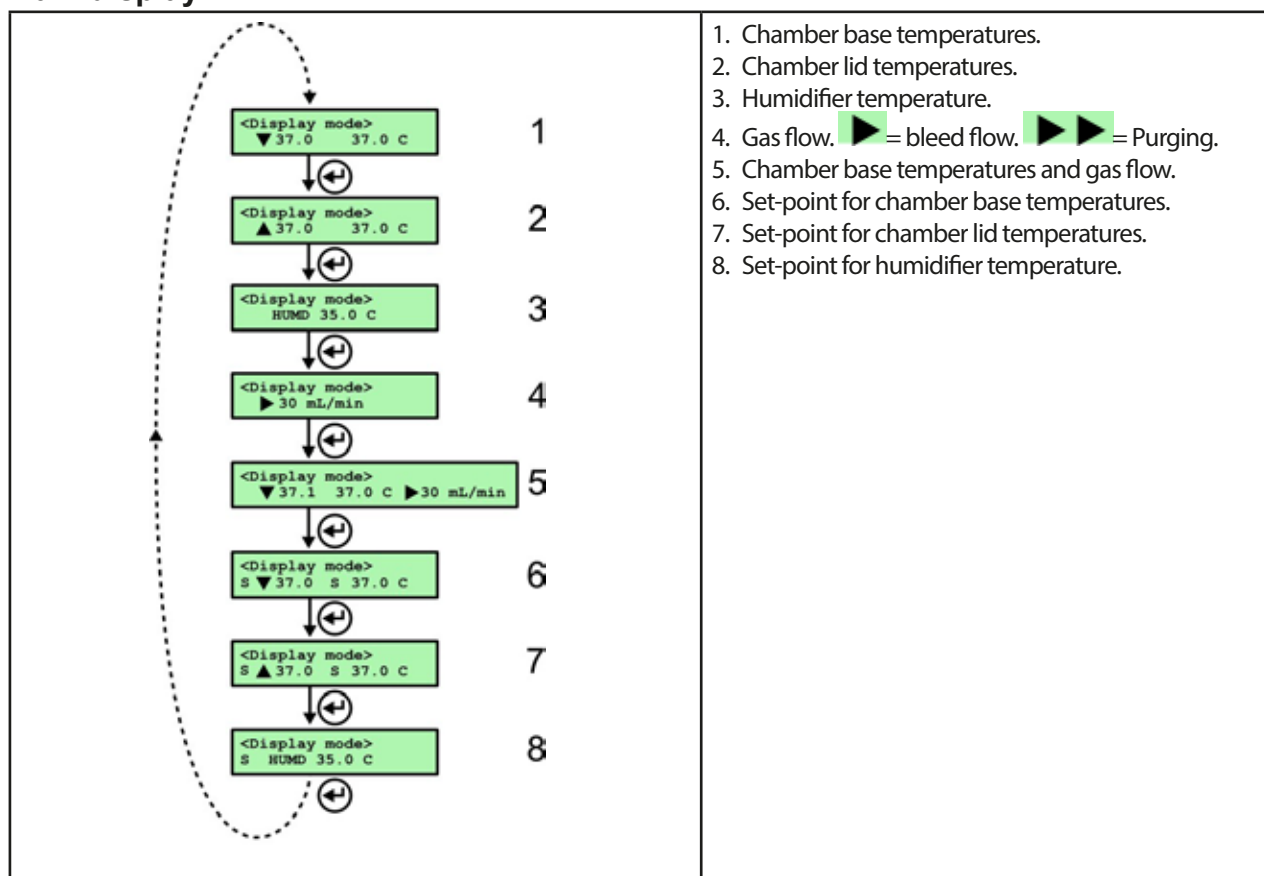


To discard value, select Cancel and press Enter.

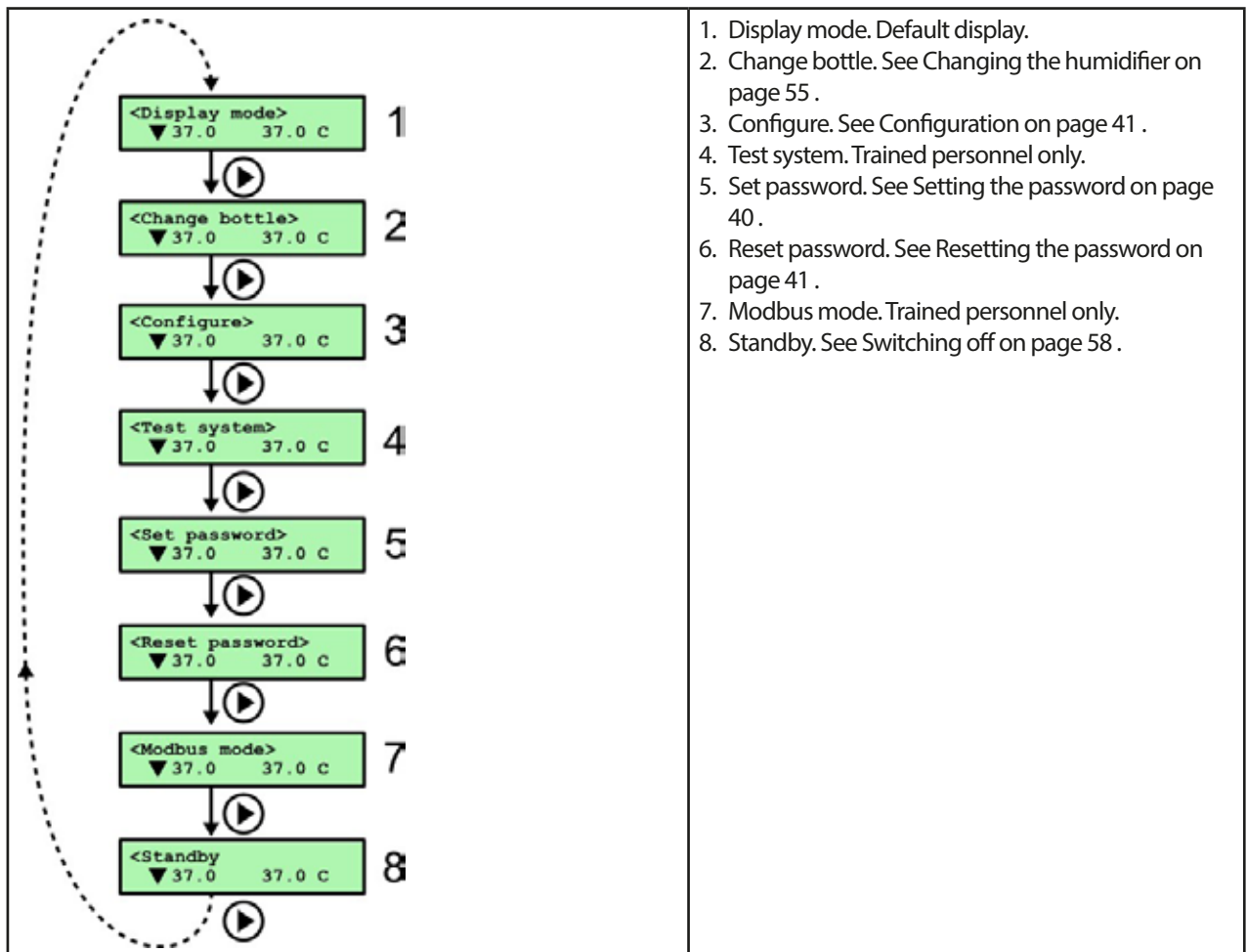


To continue editing, select Edit and press Enter.

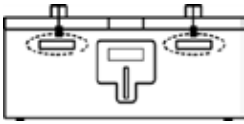


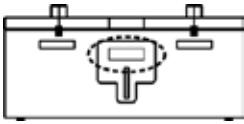

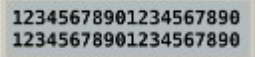

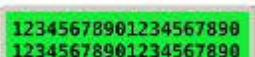

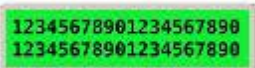

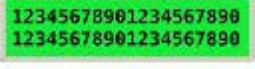

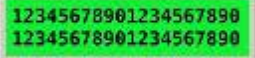

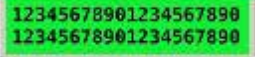
1.7.2 Main display



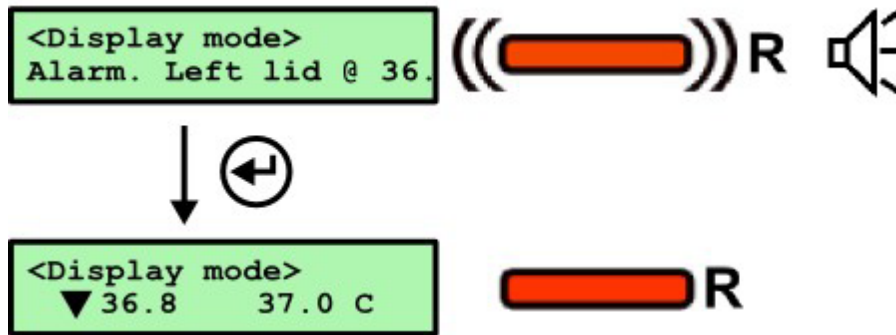
1.7.3 Menus



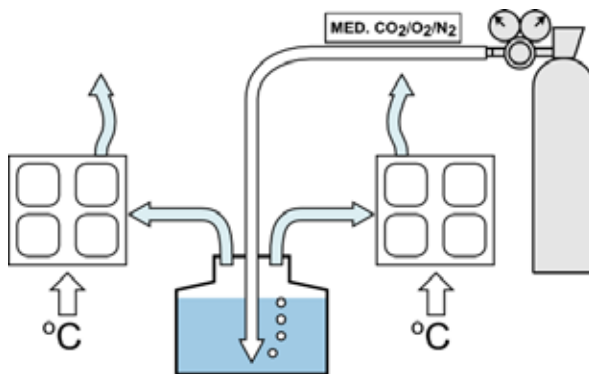
1.7.4 Status and alarm indicators

				
Standby	 O	X	X	
Normal	 G	X	X	
Unacknowledged alarm	 R	✓	X	
Unacknowledged alarm > 5 min	 R	✓	✓	
Acknowledged alarm	 R	X	X	
Temperatures not ready	 O	X	X	

1.7.4.1 Acknowledge alarms



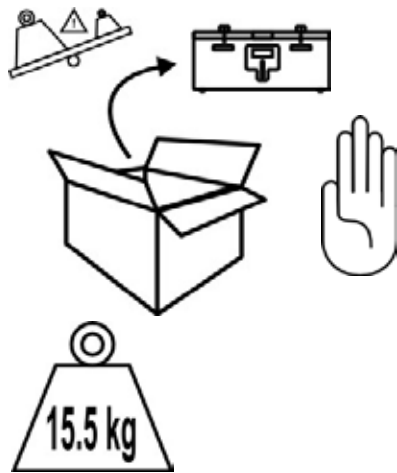
1.7.5 Principle of operation



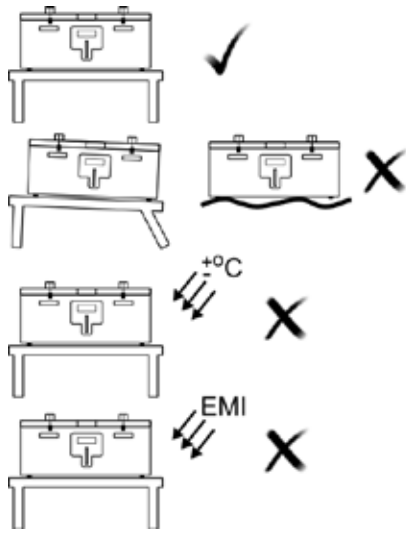
Gas fed from cylinder. Bubbled through humidifier into left and right chambers. Temperature of chambers maintained at required temperature.



2. Installation



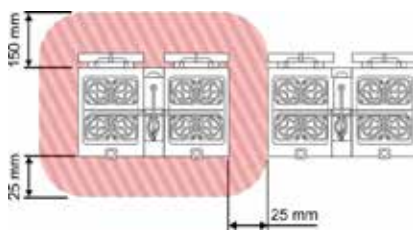
Uneven load.



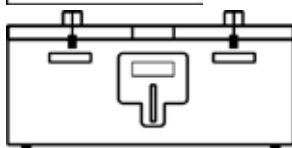
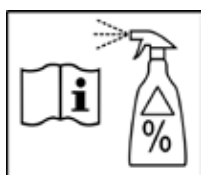
Install on flat, level and stable surface.

Keep away from hot or cold temperature sources such as heaters or air-conditioning units.

Keep away from sources of electromagnetic interference such as large transformers.

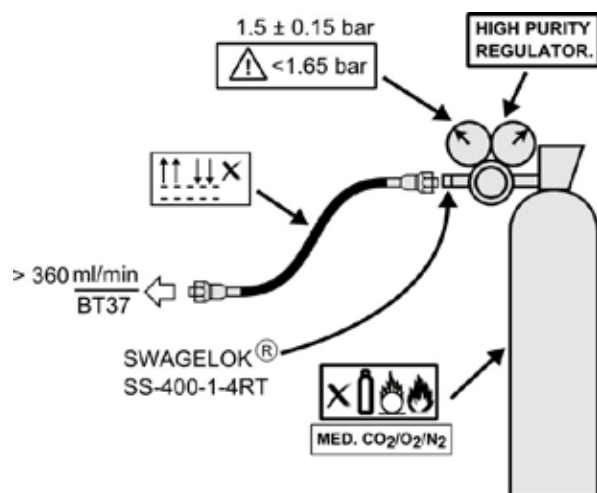


Maintain clear space around the equipment.

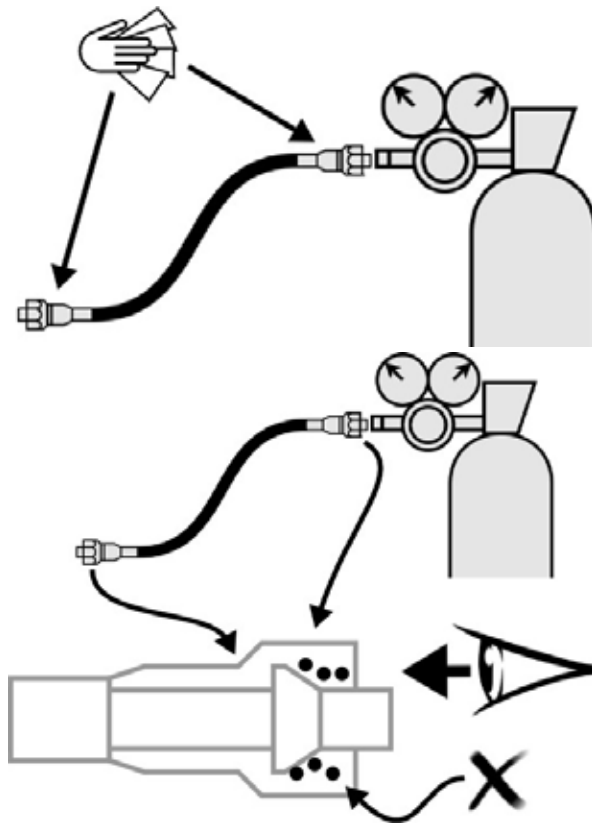


Clean and disinfect (see page 63) before use.

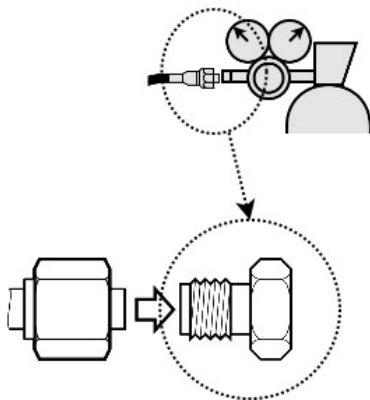
2.1 Connecting the gas

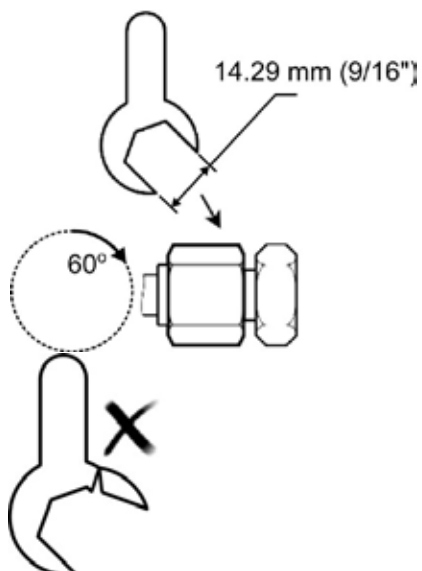
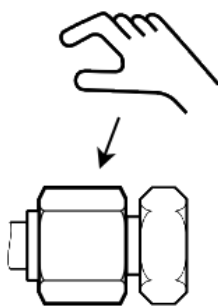


Consult media supplier for appropriate gas concentrations. Concentration may need adjustment for local air pressure.

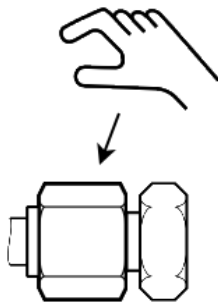
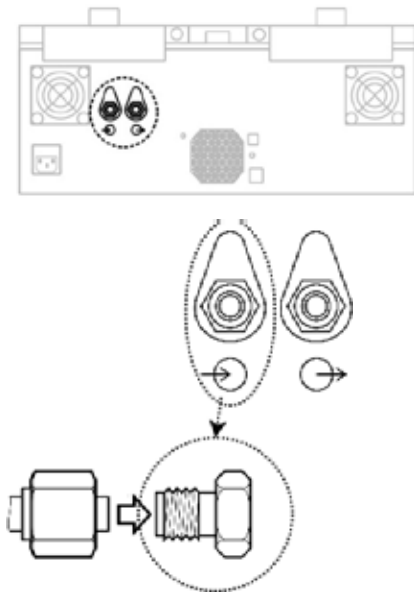


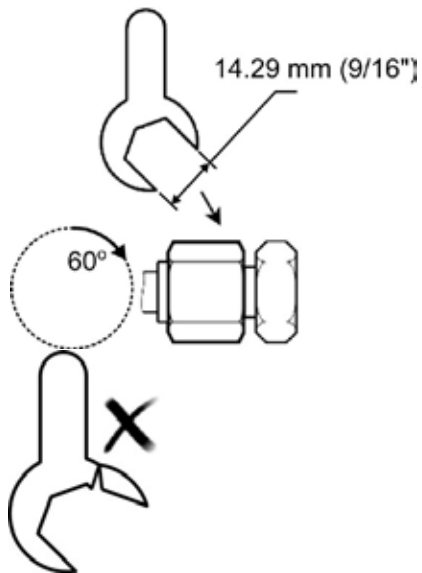
Blow through pipes with medical grade gas to clear any foreign bodies.



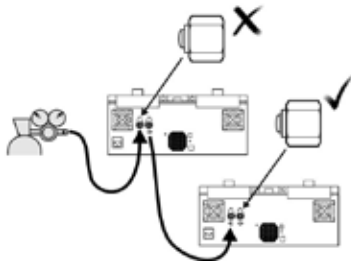


Do not over-tighten.

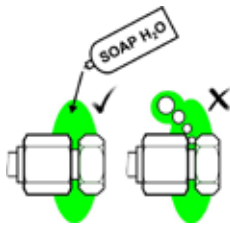




Do not over-tighten.



Connect up to 10 incubators in series.

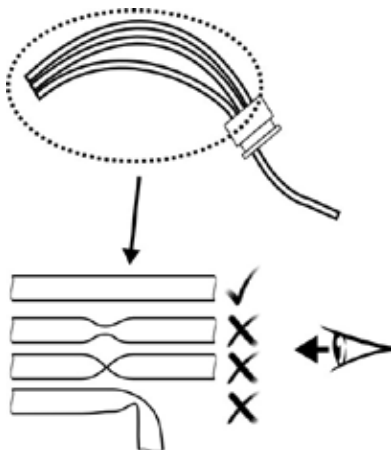


Check for leaks.

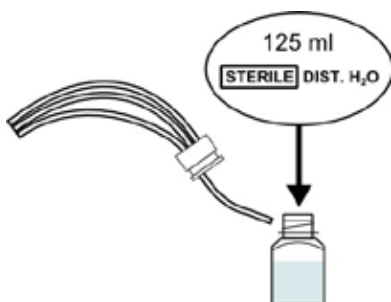
2.2 Installing the humidifier



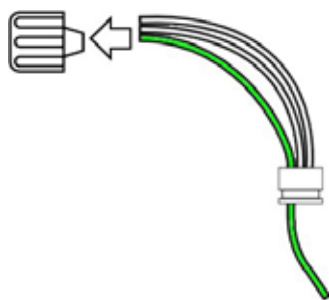
Use aseptic technique.



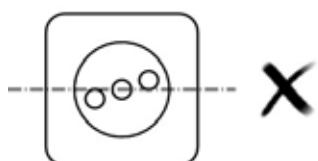
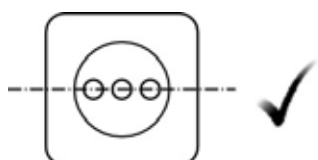
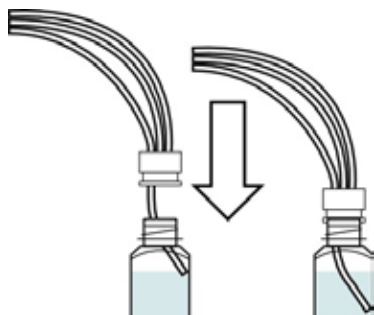
Do not use if tubing kinked or damaged.



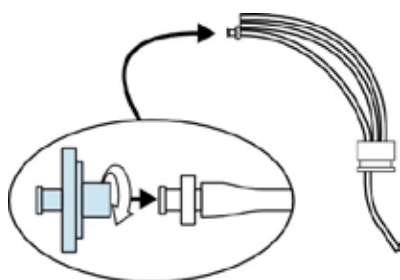
Fill with 125 ml sterile, distilled water.



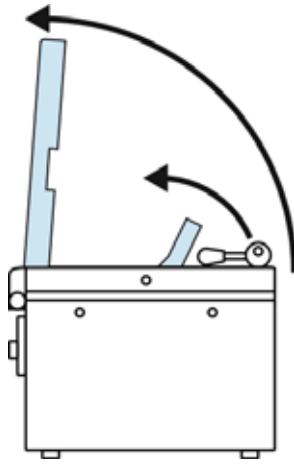
Remove cap.



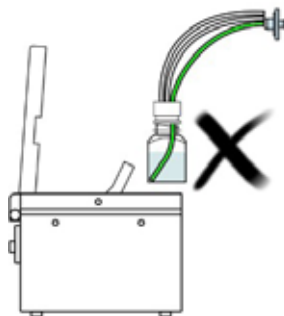
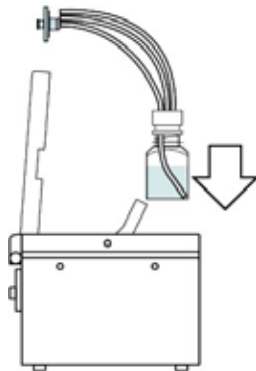
Refit cap. Ensure tubes aligned correctly.



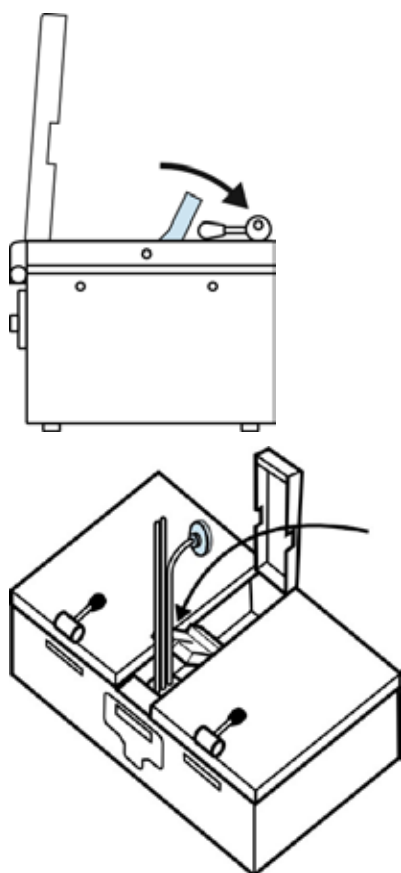
Fit filter.



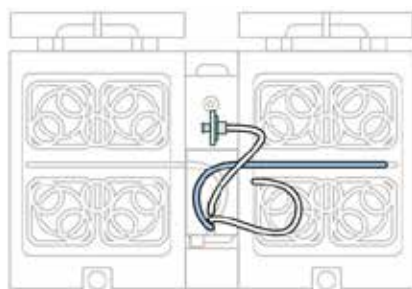
Open humidifier lid. Rotate tube guide to back position.



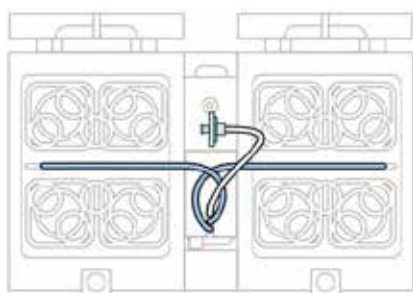
Fit bottle. Press in firmly. Ensure orientation correct.



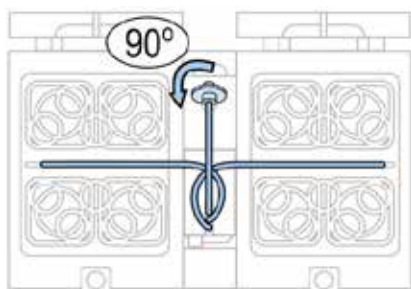
Close tube guide. Tubes pass through slot in guide.



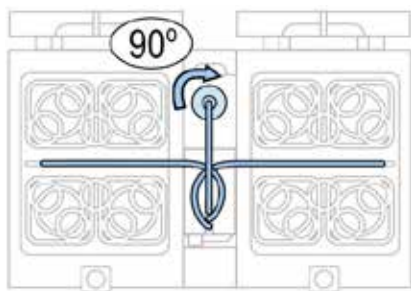
Route rear tube to right-hand chamber.



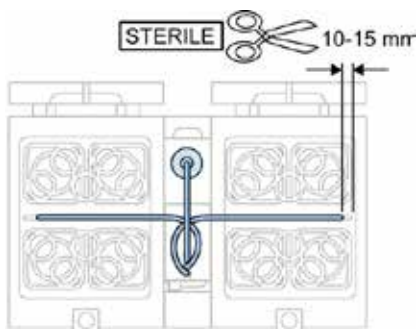
Route middle tube to left-hand chamber.



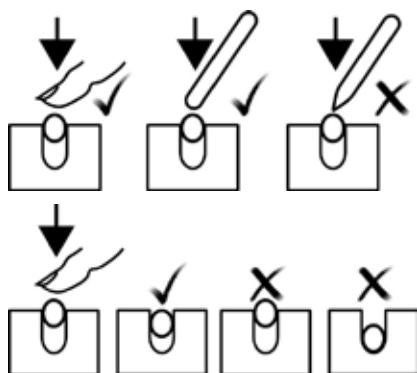
Rotate front tube and filter 90° anticlockwise.



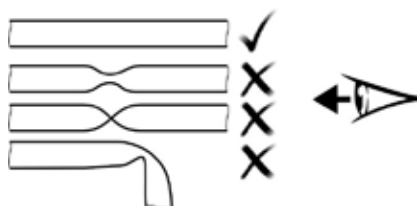
Fit the filter to the gas inlet.



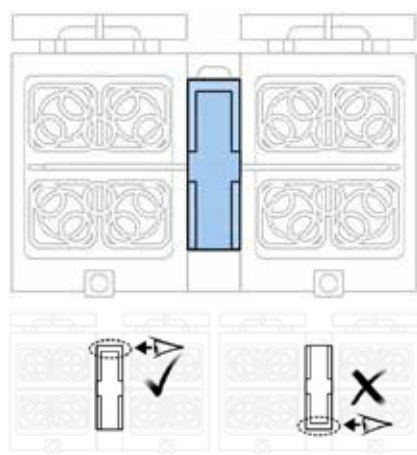
Trim tubes if necessary.



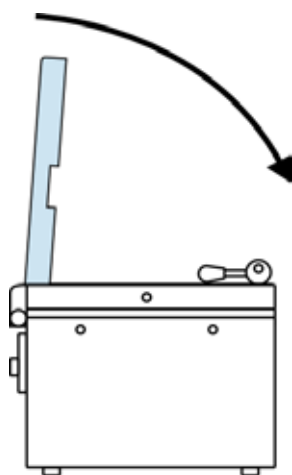
Press tube into grooves. Do not use sharp objects.



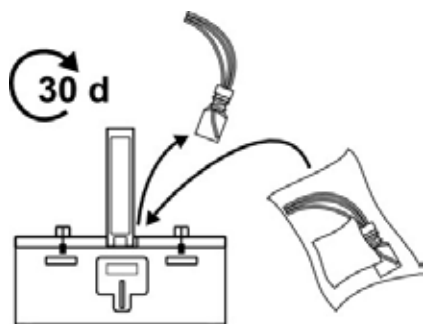
Ensure there are no kinks



Lay clear cover gently over tubes. Cover does not clip in place.



Close humidifier lid.

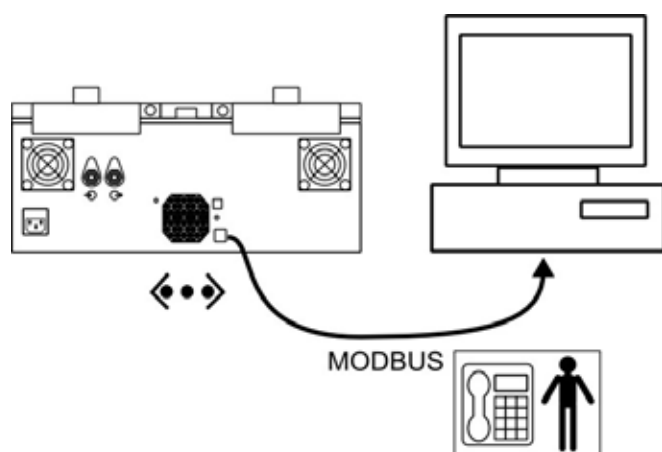


Replace bottle and filter every 30 days. Do not refill the bottle.

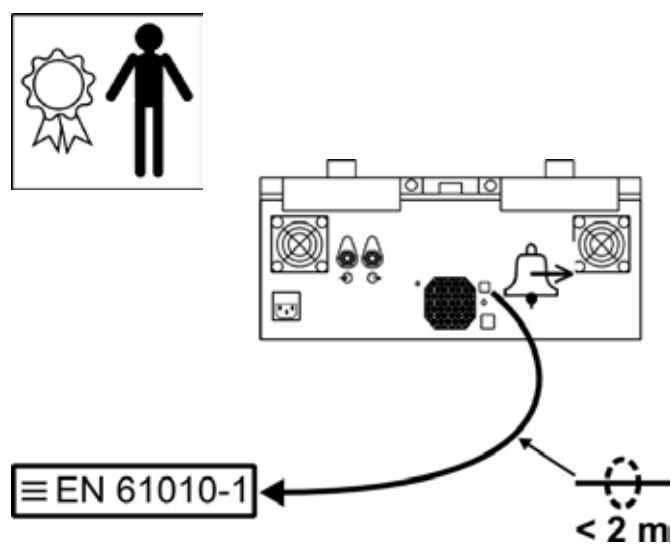


Keep the humidifier lid shut during normal operation.

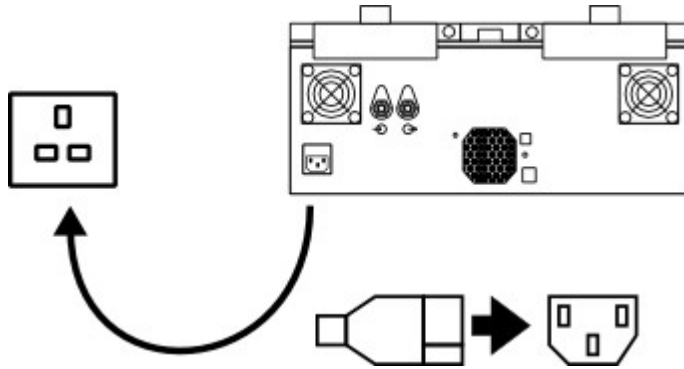
2.3 External data collection



2.4 Alarm connection



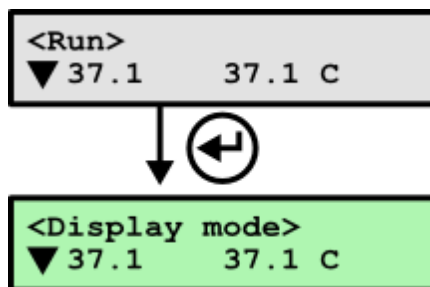
2.5 Connecting to the mains supply





3. Operation

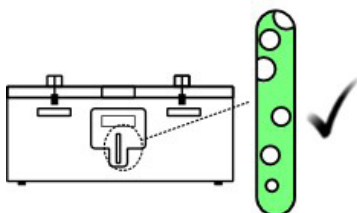
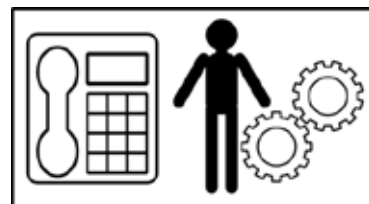
3.1 Switching on



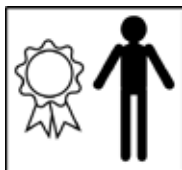
Memory failure: Calibration lost:
Check

Diagnostics ADC error

Call service ...

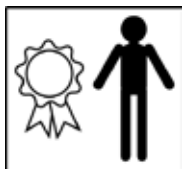


Visually check the tubing every 24 hours, and when samples are added or removed, to ensure there is no build-up of condensation. Do not remove the clear cover during this check. If condensation appears to be forming, refer to the Troubleshooting section.



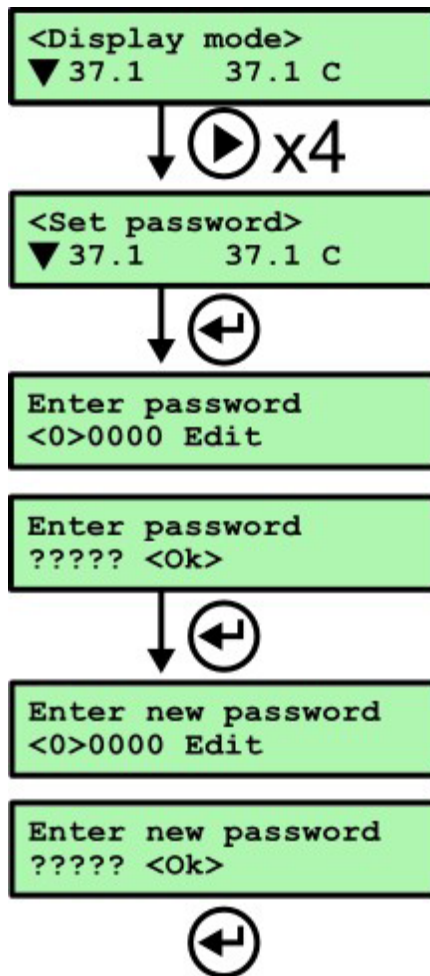
In normal run mode, disconnect power, and confirm unit can run from battery for 30 minutes.
Reconnect power.

Note that the available hold-up time following the test will have been reduced, and it may take up to 24 hours for full capacity to be restored.



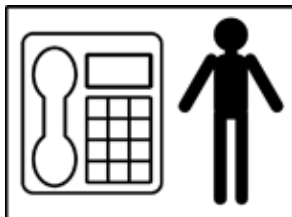
Check each chamber by using culture medium containing phenol red indicator.

3.2 Setting the password



Set passwords to prevent unauthorised access.

3.2.1 Resetting the password

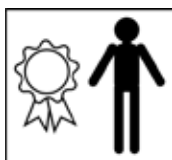


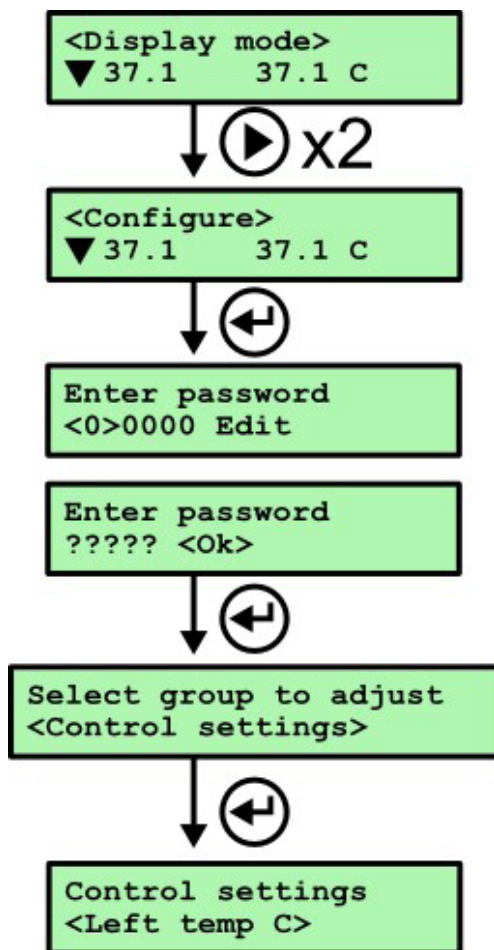
3.3 Configuration



Do not attempt to change values unless you understand how to edit numbers; see Editing numbers on page 14.

3.3.1 Changing the control settings





Select Control settings option.



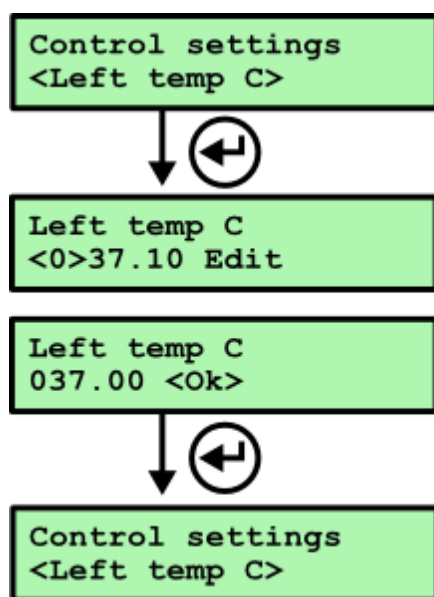
After changing any parameters, use the main display to check that the set-points are correct.
See Main display on page 17.

3.3.1.1 Changing the temperatures

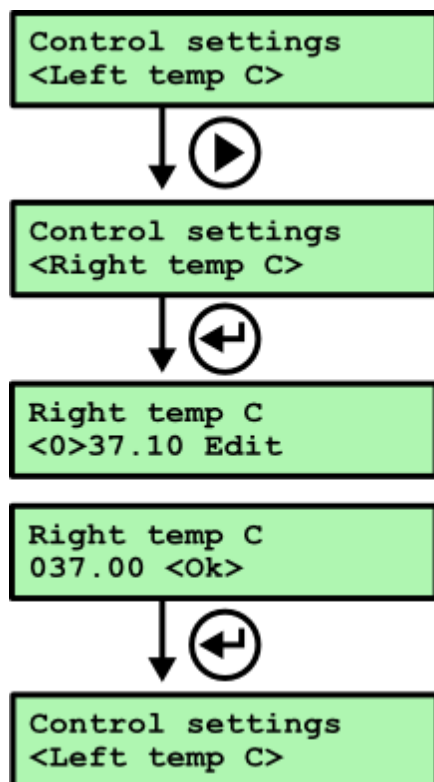


System is factory set for 37.0 °C.

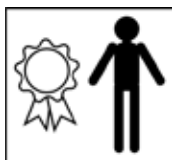
3.3.1.1.1 Changing the left-hand chamber temperature



3.3.1.1.2 Changing the right-hand chamber temperature



3.3.1.2 Changing the flow



System is factory set for 30 mL/min gas flow. The gas flow does not normally need to be adjusted.

3.3.1.2.1 Normal gas flow

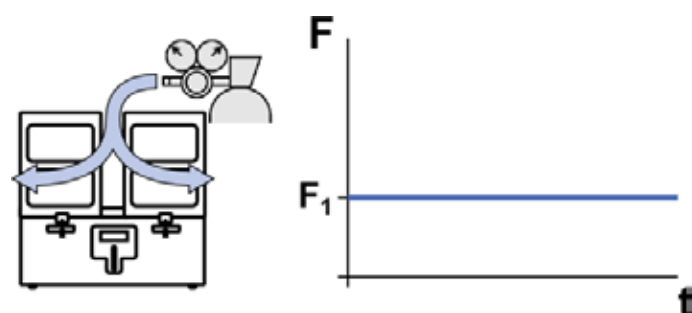
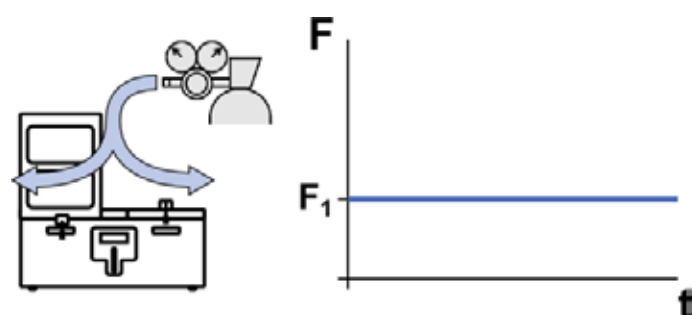
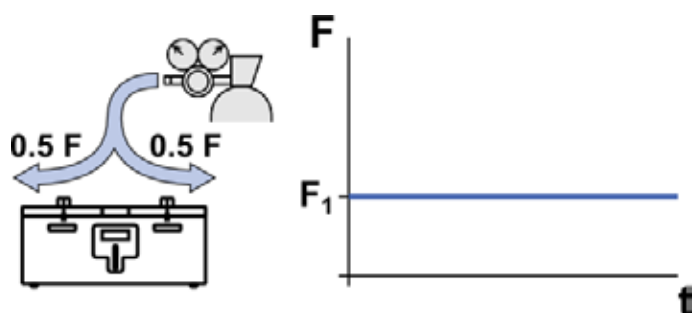
Default flow mode from version 1.0.25

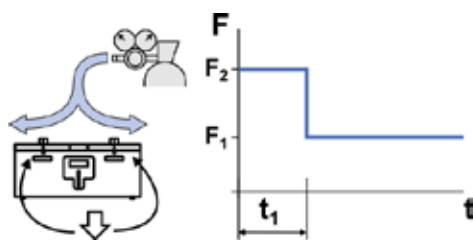
F1: Non-pulsed flow rate. Default 30 mL/min

F2: Purge flow rate. Factory set 360 mL/min

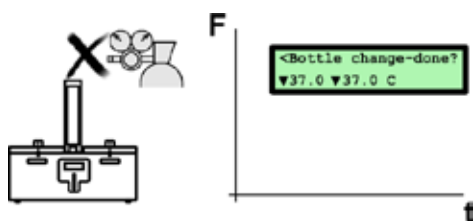
t1: Purge duration. Default 180 s

t2: Bottle change purge duration. Default 540 s

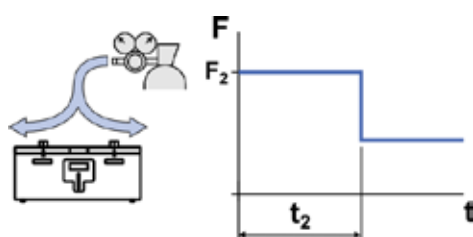




Flow increased for purge duration after lids are shut.



No flow during bottle-change.



Flow increased for bottle-change purge duration when bottle change complete.

3.3.1.2.2 Pulsed gas flow

From version 1.0.25, if bleed off-time = 0, non-pulsed flow is used.

F1: Bleed low flow rate. Factory set 20 mL/min

F2: Bleed high flow rate. Factory set 60 mL/min

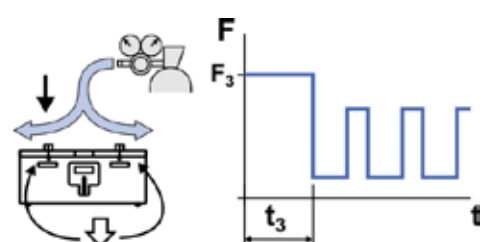
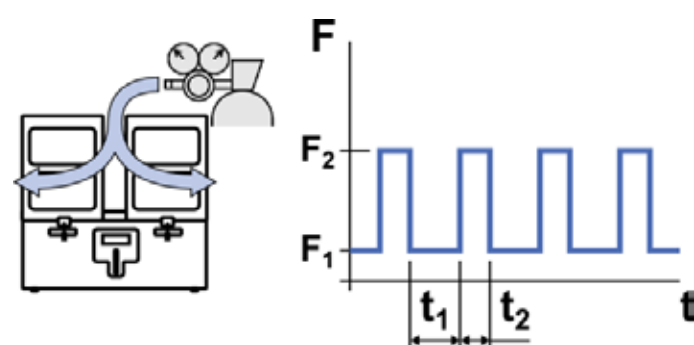
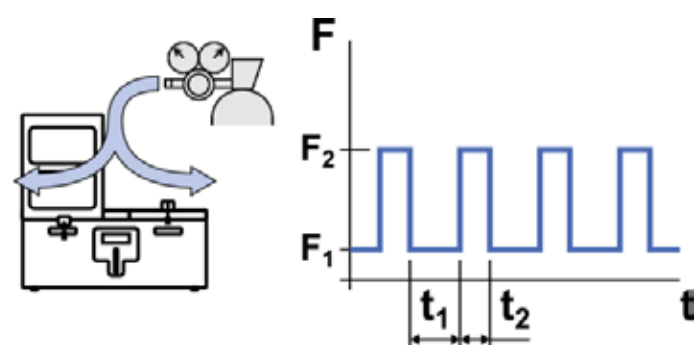
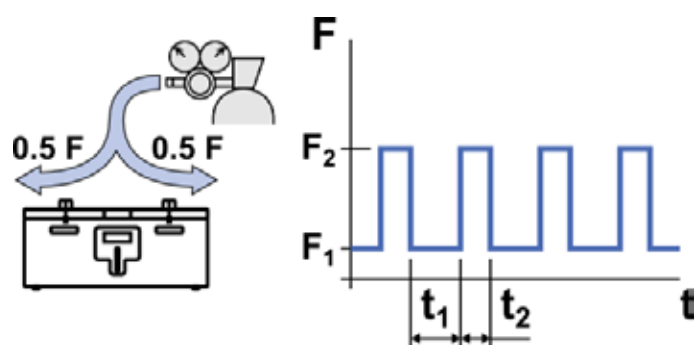
F3: Purge flow rate. Factory set 360 mL/min

t1: Bleed off-time. Default 0 s

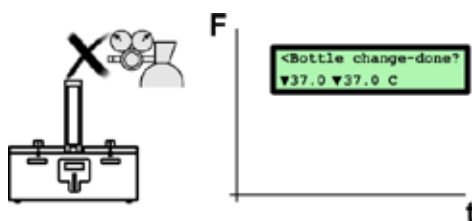
t2: Bleed on-time. Default 300 s

t3: Purge duration. Default 180s

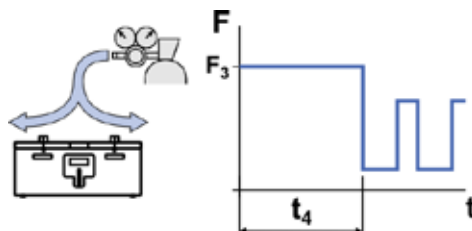
t4: Bottle change purge duration. Default 540 s



Flow increased for purge duration after lids are shut.

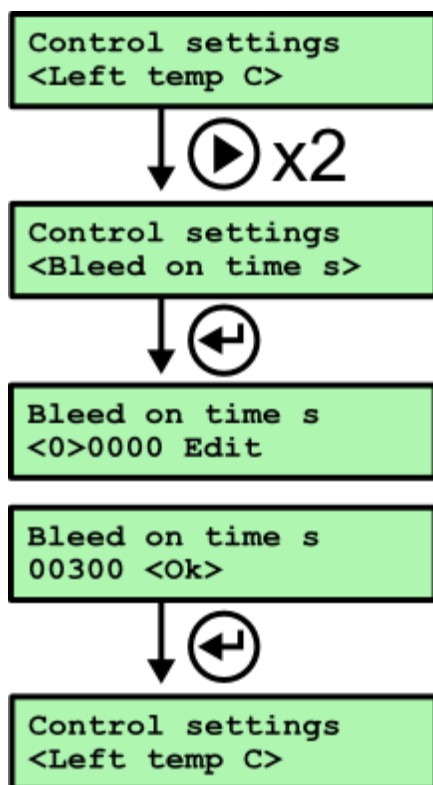


No flow during bottle-change.



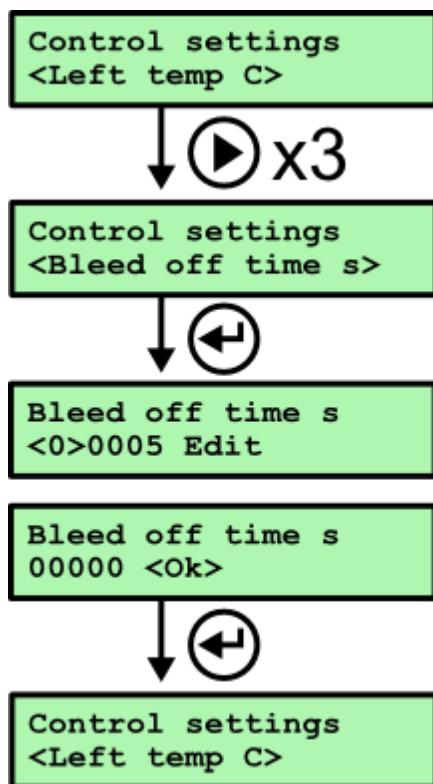
Flow increased for bottle-change purge duration when bottle change complete.

3.3.1.2.3 Changing the bleed on-time



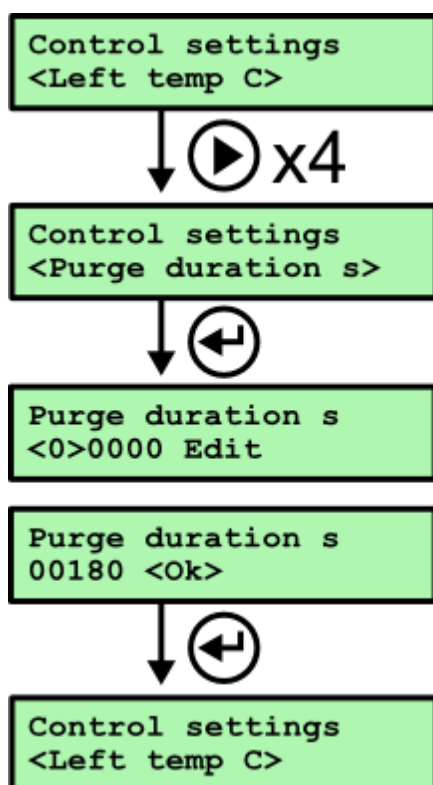
Recommended 300 s. See Pulsed gas flow on page 46.

3.3.1.2.4 Changing the bleed off-time



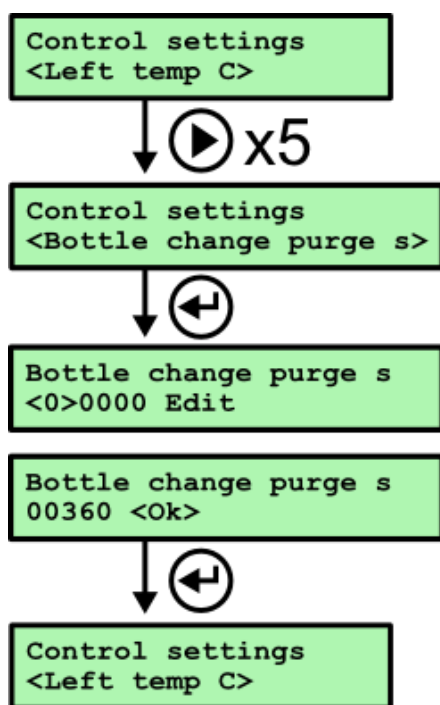
Recommended 0 s for normal gas flow (non-pulsed). See Pulsed gas flow on page 46 .

3.3.1.2.5 Changing the purge duration after lids closed



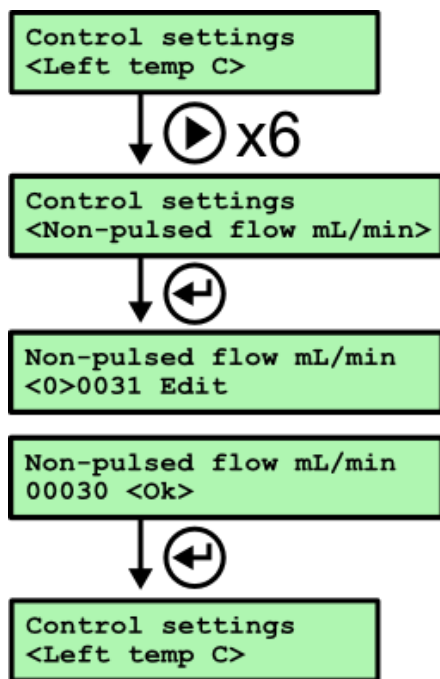
Default 180 s. If you open the lids regularly, increase to 300 s.
See Normal gas flow on page 45 and Pulsed gas flow on page 46 .

3.3.1.2.6 Changing the bottle change purge



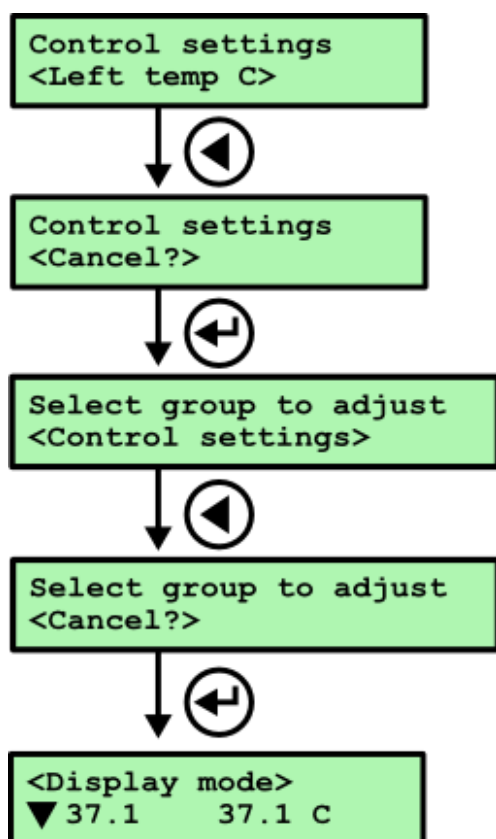
Recommended 540 s. See Normal gas flow on page 45 and Pulsed gas flow on page 46.

3.3.1.2.7 Changing the non-pulsed flow rate



Recommended 30 mL/min. See Normal gas flow on page 45 and Pulsed gas flow on page 46 .

3.3.1.2.8 Returning to the main display



Returning to the main display.



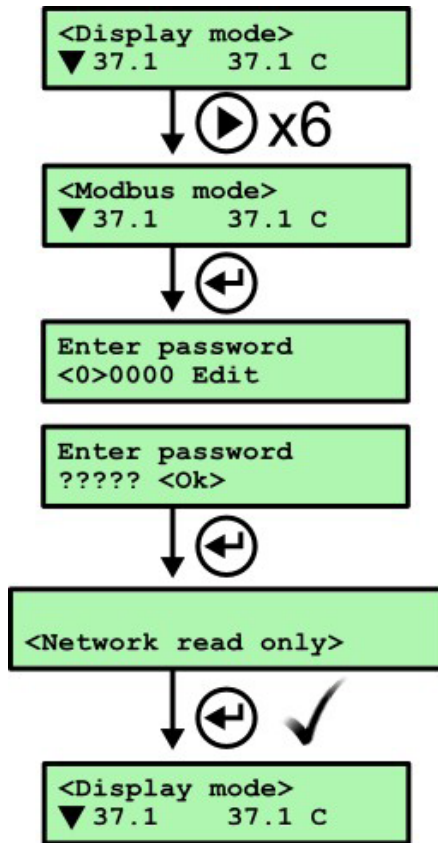
After changing any parameters, use the main display to check that the set-points are correct. See Main display on page 17 .

3.3.2 Securing the network

3.3.2.1 Setting the network to read-only



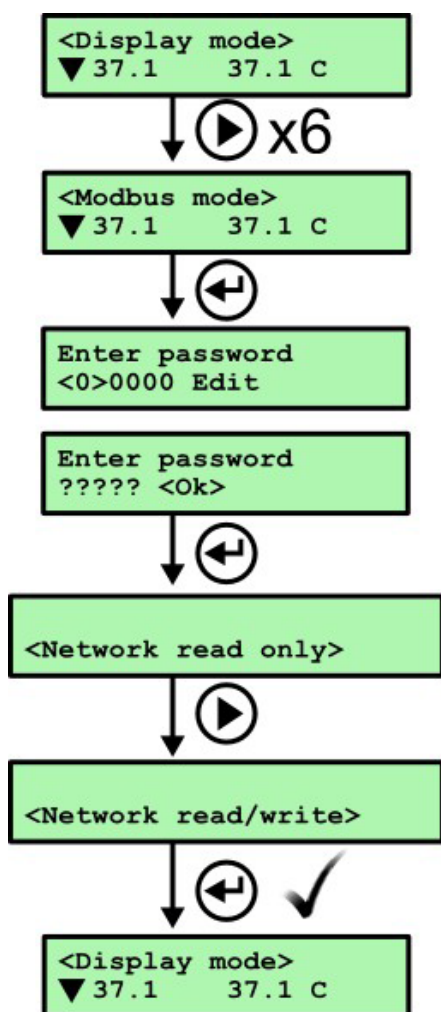
The network should normally be set to read-only.



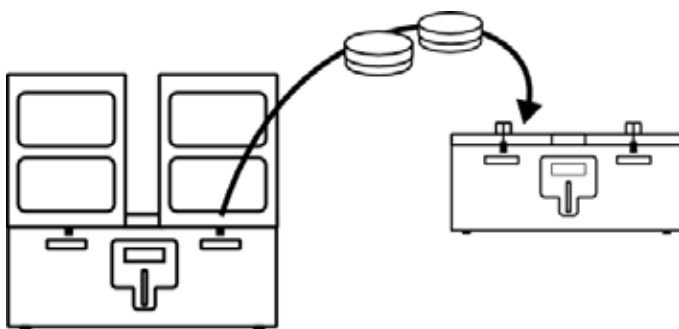
3.3.2.2 Allowing network writes

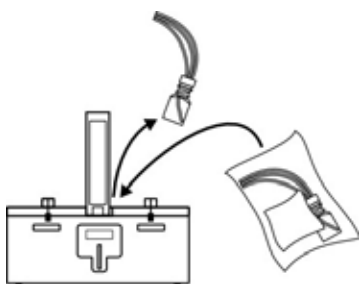
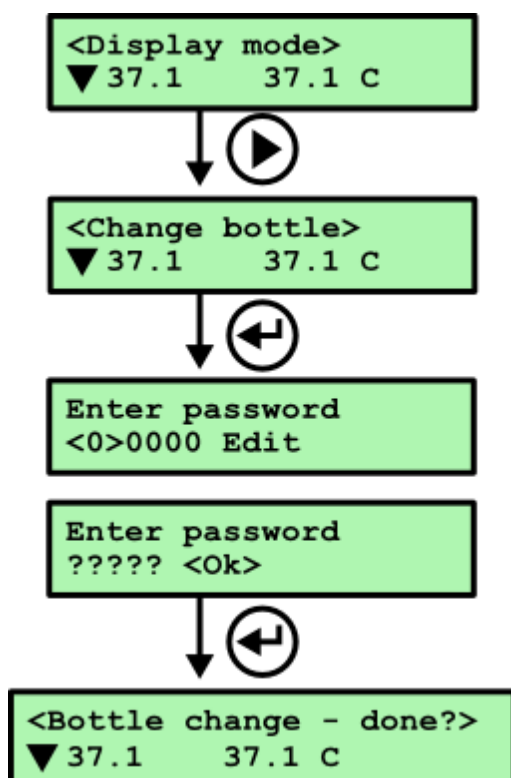


The network should normally be set to read-only.

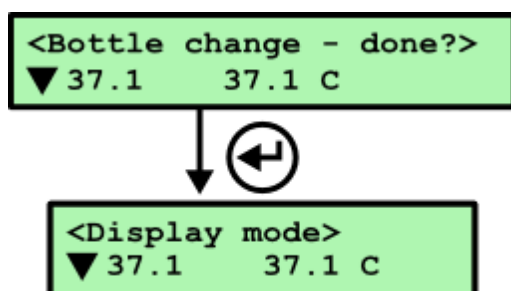


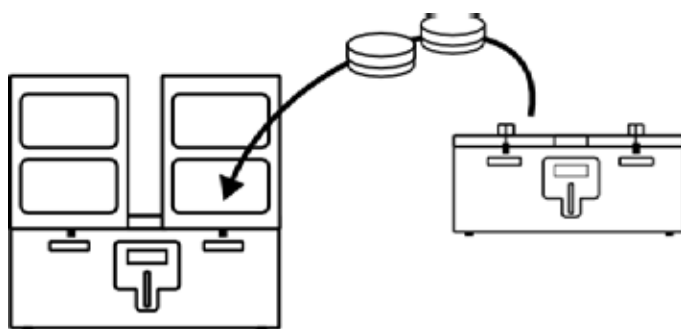
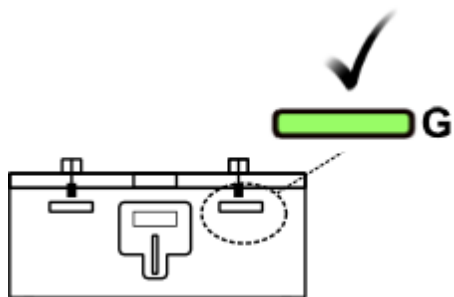
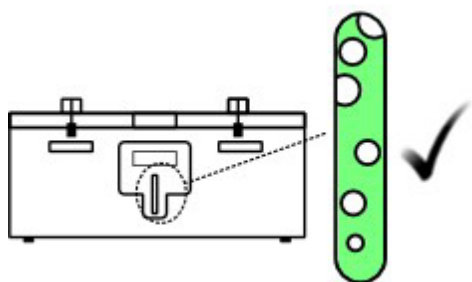
3.4 Changing the humidifier



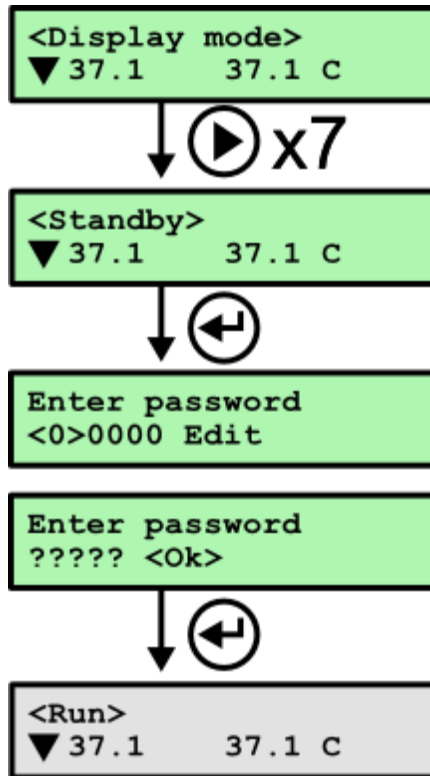


See Installing the humidifier on page 28 .



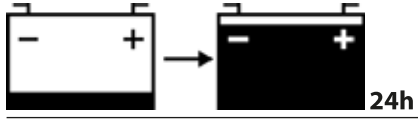
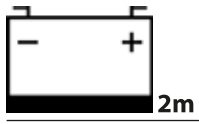


3.5 Switching off



3.6 Battery backup







IV

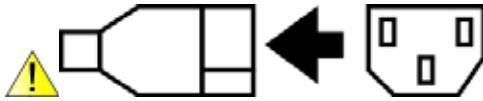
4. Routine maintenance and troubleshooting



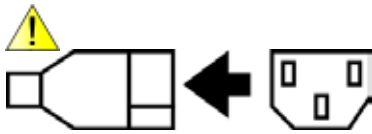
<Standby>
▼ 37.1 37.1 C



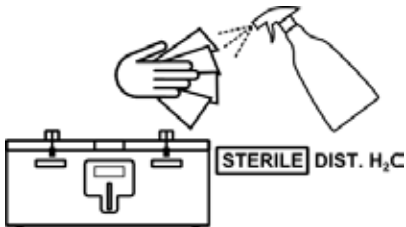
<Run>
▼ 37.1 37.1 C



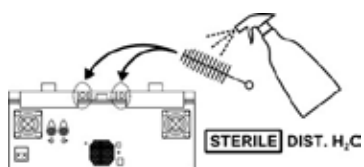
4.1 General cleaning



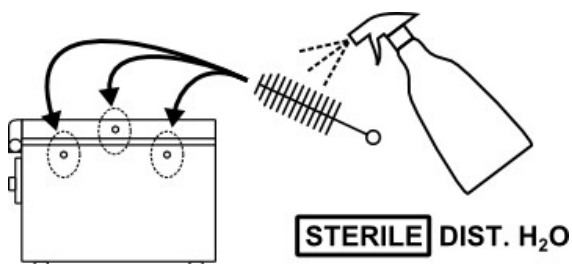
Disconnect mains power.



Clean periodically with a damp cloth and sterile water.



Push the brush or 'pipe-cleaner' from the inside of the chamber through to the exterior to avoid introducing contamination into the chambers.



Wait until dry.

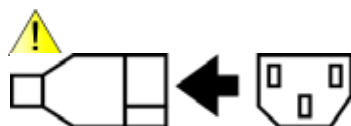


Reconnect mains power.

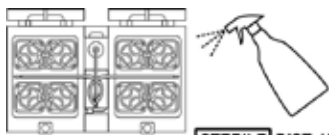
4.2 Cleaning and disinfecting the chambers

4.2.1 Cleaning

These instructions are for the exterior of the device only.



Disconnect mains power.



Spray surfaces with sterile, distilled water.

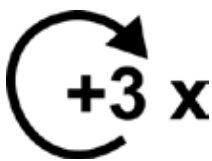


2 min

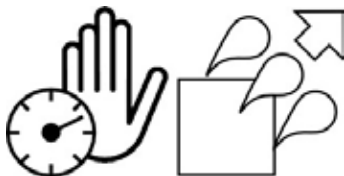
Wait 2 min.



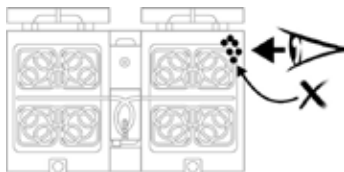
Remove water with clean non-linting cloth (gauze). Use cotton buds or swabs to get into grooves and corners.



Repeat 3 more times.



Wait until dry.

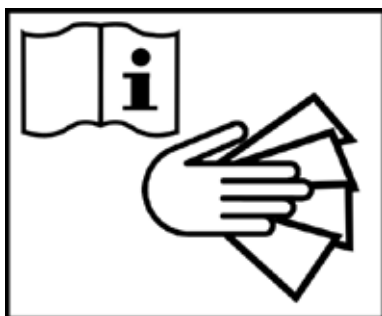


Inspect the equipment to ensure it is visibly clean.



Reconnect mains power.

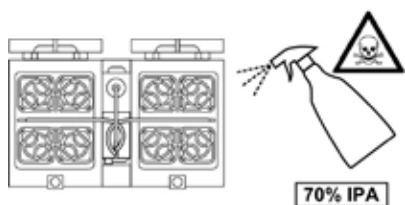
4.2.2 Disinfecting



Clean first (see page 63).



Disconnect mains power.



Spray surfaces with 70% IPA.

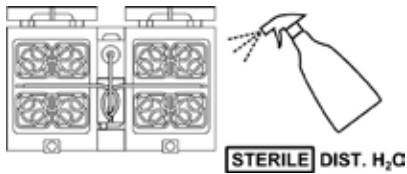


15 min

Wait 15 min.



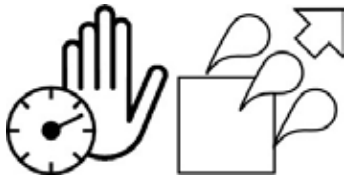
Remove disinfectant with clean non-linting cloth (gauze). Use cotton buds or swabs to get into grooves and corners.



Spray surfaces with sterile, distilled water.



Remove water with clean non-linting cloth (gauze). Use cotton buds or swabs to get into grooves and corners.

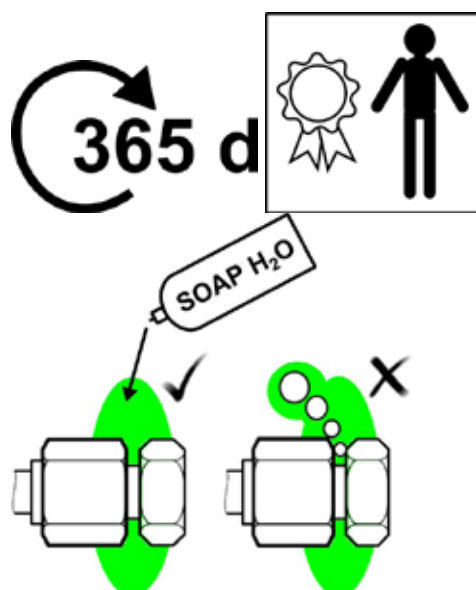


Wait until dry.

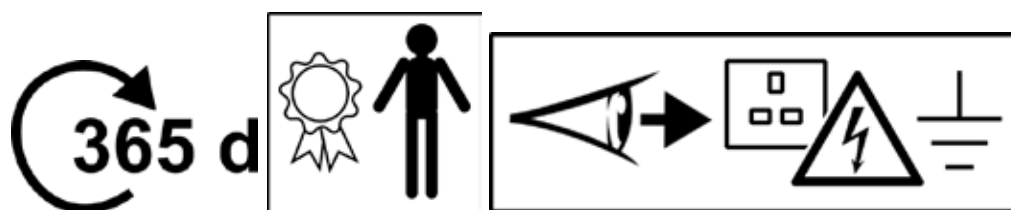


Reconnect mains power.

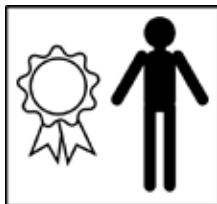
4.3 Safety testing



Check for leaks.



4.4 Battery testing

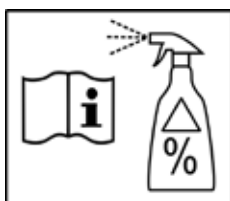


In normal run mode, disconnect power, and confirm unit can run from battery for 30 minutes.

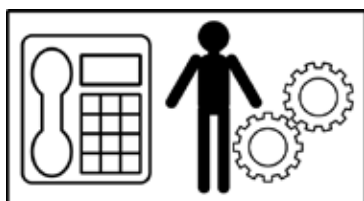
Reconnect power.

Note that the available hold-up time following the test will have been reduced, and it may take up to 24 hours for full capacity to be restored.


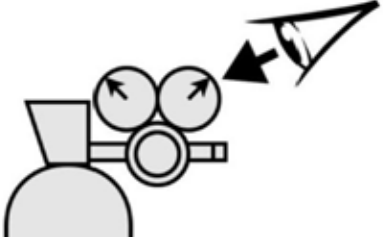
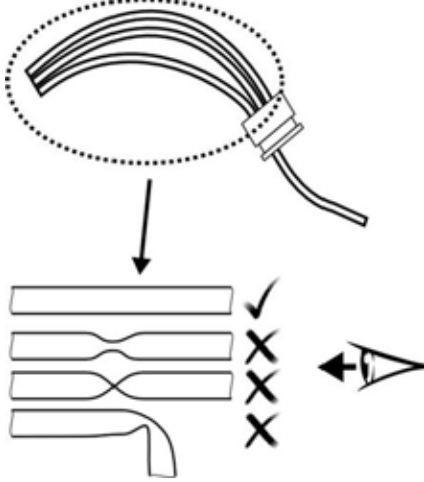
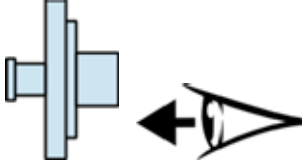
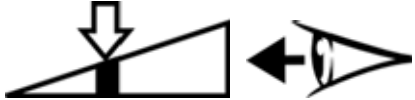
4.5 Calibration and servicing

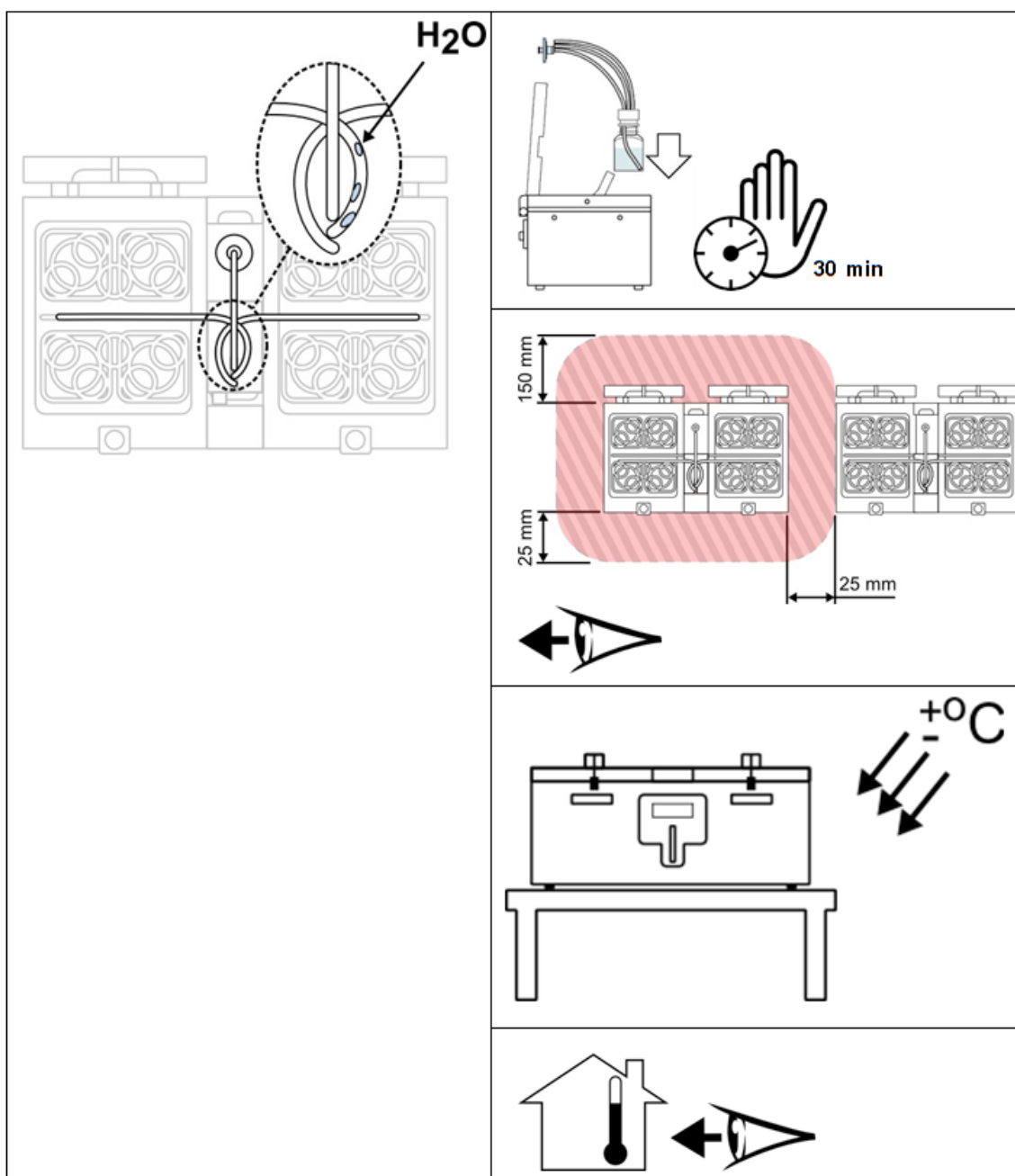


<http://www.planer.com/support/service/decontamination-certificate.html>

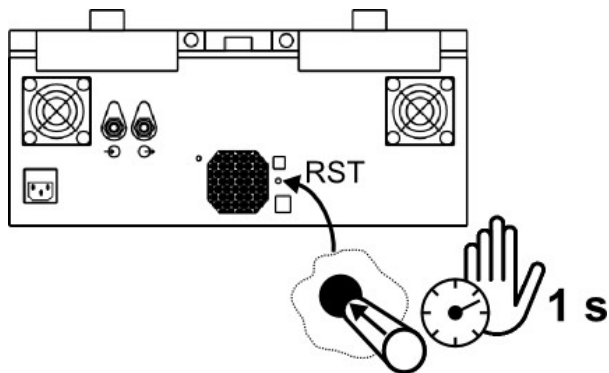


4.6 Troubleshooting

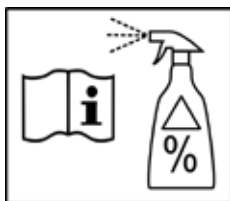
	
	
	
	



4.7 Resetting the system



4.8 Returning for service

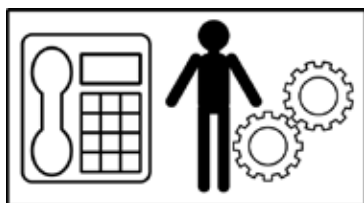


Clean and disinfect first (see page 63).



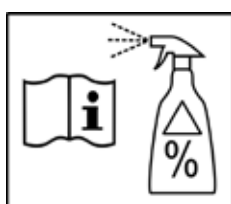
<http://www.planer.com/support/service/decontamination-certificate.html>



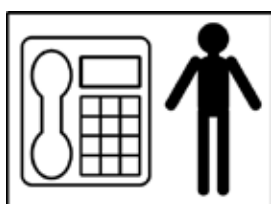


4.9 Disposal

Do not dispose of with general waste.



Clean and disinfect first (see page 63).



A large, bold, white capital letter 'V' is centered within a solid gray rectangular box. The box is positioned in the lower-middle section of the page.

5. Specifications

5.1 System specifications

Dimensions	420 mm wide x 270 mm deep x 210 mm high.
Weight	15.5 kg
Storage temperature	-10 °C to +50 °C
Storage humidity	5% to 95% relative humidity non-condensing
Storage special instructions	Recharge every 4 months by connecting to the mains power supply for 24 hours.
Operating environment	For indoor use only
Operating temperature	+5 °C to +40 °C for safe operation See the table Control on page 77 for control limitations..
Operating humidity	5% to 90% relative humidity non-condensing
Altitude	Up to 2000 m
Pollution degree	Pollution degree 2 (BS EN61010-1)
IP rating	IP31
Electromagnetic environment	The equipment is intended for use in a basic electromagnetic environment, characterized by being supplied directly at low voltage from the public mains network.

5.2 Control

Temperature control range	(ambient + 5 °C) to (ambient + 20 °C) 40 °C max.
Temperature measurement accuracy	± 0.2 °C
Temperature control accuracy	± 0.1 °C measured after any transient effects due to set- point changes have subsided.
Flow control range	0 ml/minute to 900 ml/minute. Normalised to 0 C , 50% RH and 1 bar.
Flow accuracy	The greater of ± 10% or ± 3 ml/minute.
Flow control accuracy	The greater of ± 5% or ± 2 ml/minute measured after any transient effects due to set-point changes have subsided.
Accuracies apply at the calibration points. The system is factory calibrated for an operating temperature of 37°C, nominal bleed flow of 30 ml/min and a purge at 360ml/min.	

5.3 Capacity

Dishes per chamber	4 x NUNC 4 well dishes 4 x NUNC 60 mm Petri dishes 10 x NUNC 30 mm Petri dishes 4 x MINITUB 5 well dishes 4 x FALCON 60 mm Petri dishes
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5.4 Power

Power requirements	100 - 240 V~ 50/60Hz 2 A
Inrush current (typical)	80 A / 230 V~
Internal battery backup	Gelled sealed lead acid battery 12 V x 12 A.h

Note. The BT37 system is designed to be plug connected to the normal building wiring.

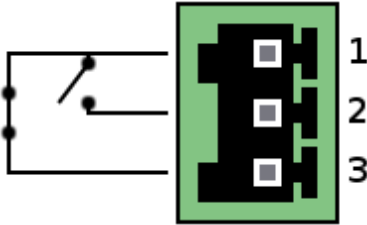
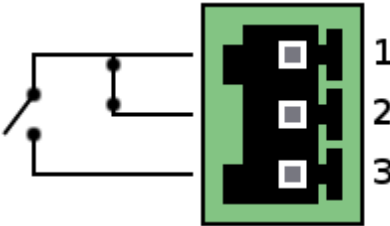
5.5 Humidifier bottle and filter

Item	Description	Manufacturer
Bottle Part number: CN101568-1	Sterilized bottle assembly	Planer plc
Filter Part number: HP4642	Syringe filter. 0.2 µm, Supor membrane, 32 mm	PALL Corporation

5.6 Gas supply

Gas supply	Premixed gas. Typically 6% CO ₂ , 5% O ₂ , 89% N ₂
Supply pressure	1.5 ± 0.15 bar
Connectors	SWAGELOK 1/4" tube fitting

5.7 External alarm connections

Output	Volt free
Connector type	PHOENIX 3 way horizontal PCB header. # 1181451
Maximum voltage	30 V DC
Maximum current	1 A
Normal operating mode	
Alarm mode & power disconnected	

5.8 Monitoring

Feature	Controller
LAN	10 Base T Ethernet - RJ45 shielded. Modbus-TCP-IP protocol.
Remote PT100 sensors	PT100 Class A to EN60751. Ø 2.51 mm max. Length 100 mm min. Sensing region should be within 15 mm of the tip.

5.9 Fuses

Fuse	Location	Type
F1, F2	Mains inlet	T 3.15A L 250V 5 x 20 mm

Manufacturer:

Planer plc, 110 Windmill Rd, Sunbury, Middlesex TW16 7HD, UK.

Distributor:**ORIGIO a/s**

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