MUNRO
INSTRUMENTS

# ANAEROBIC WORKSTATION

## AW800TGRF4P STANDARD TWO GAS VERSION

## MANUAL


**PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION**

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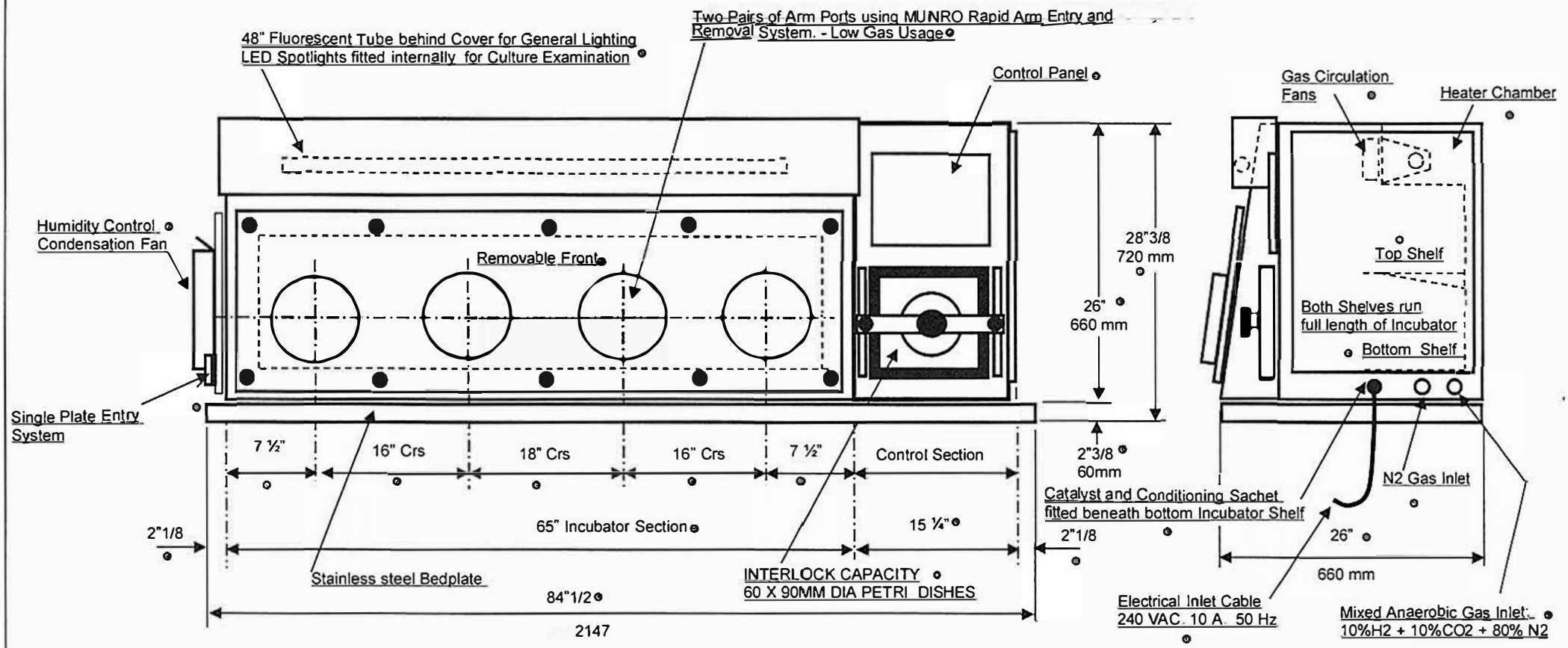
MUNRO.6.22

## CONTENTS

3rd ANGLE PROJECTION

Incubator operating temperature:
5° C above ambient to 45° C

2 off Internal IEC Electrical Mains Sockets fitted for powering Laboratory Equipment




THIS WORKSTATION IS BASED ON THE MUNRO AW500TG WITH AN EXTENDED INCUBATOR SECTION TO ACCOMADATE 4 OFF GLOVE PORTS AND A REMOVABLE FRONT

Estimated Incubation capacity = 800 Petri dishes
With ample working room

| | | | | |
|---|---|---|---|---|
| | | | | All dimensions can be modified in final design |
| No Off | Description | Item No | Material | Remarks |
| Issue A | Issue B | Bedp late Adde | **Title** | **Drawing No.** |
| 22/08/16 | 06 10 21 | | **General Arrangement of AW800TG with Removable Front and 4 Glove Ports** | **AW800TGRF4GP/ 0001 STD** |

## GENERAL SPECIFICATION

| | | | |
|---|---|---|---|
| MODEL | AW800TGRF4P STD | | |
| LOCK CAPACITY | 60 Petri Dishes | | |
| MAIN CHAMBER INCUBATION CAPACITY | 800 Petri Dishes | | |
| DOOR SEALING | Manual | | |
| GASES | 1) Mixed Gas (10% $H_2$ + 10% $CO_2$ + 80% $N_2$)<br>2) Oxygen free Nitrogen $N_2$ | | |
| OXYGEN REMOVAL FROM AIRLOCK | Positive Pressure flushing with catalyst | | |
| FABRICATION MATERIAL | Acrylic | | |
| OVERALL DIMENSIONS | Length | 84 ½" | 2147 mm |
| | Depth | 26" | 660 mm |
| | Height | 28 3/8" | 720 mm |
| ELECTRICAL SUPPLY | 220/240 VAC 50Hz | | |

## GAS SUPPLIES

This Anaerobic Cabinet requires two gas cylinders, each fitted with a two stage regulator. The output sides of the regulators should have a range of 0 - 50 p.s.i. (3.3 bar).

One gas cylinder should contain:

10% Hydrogen + 10% Carbon Dioxide + 80% Nitrogen

The other gas cylinder should contain:

Oxygen free Nitrogen

**CAUTION: GAS CONTAINING MORE THAN 10% HYDROGEN SHOULD NOT BE USED UNDER ANY CIRCUMSTANCES**

The gas pressures at the inlets to the cabinet should be approximately 30 psi (2.0 bar) and the gas flows are as follows:

| | |
|---|---|
| MIXED GAS | 25L/min |
| $N_2$ | 25L/min |

The diameter of the pipes connecting the cylinders to the cabinet should be selected according to the length of run to give a minimum pressure drop, this will give maximum gas utilisation.

The cabinet is fitted with 6mm diameter "push in connectors" for the gases.

## ELECTRICAL SUPPLIES

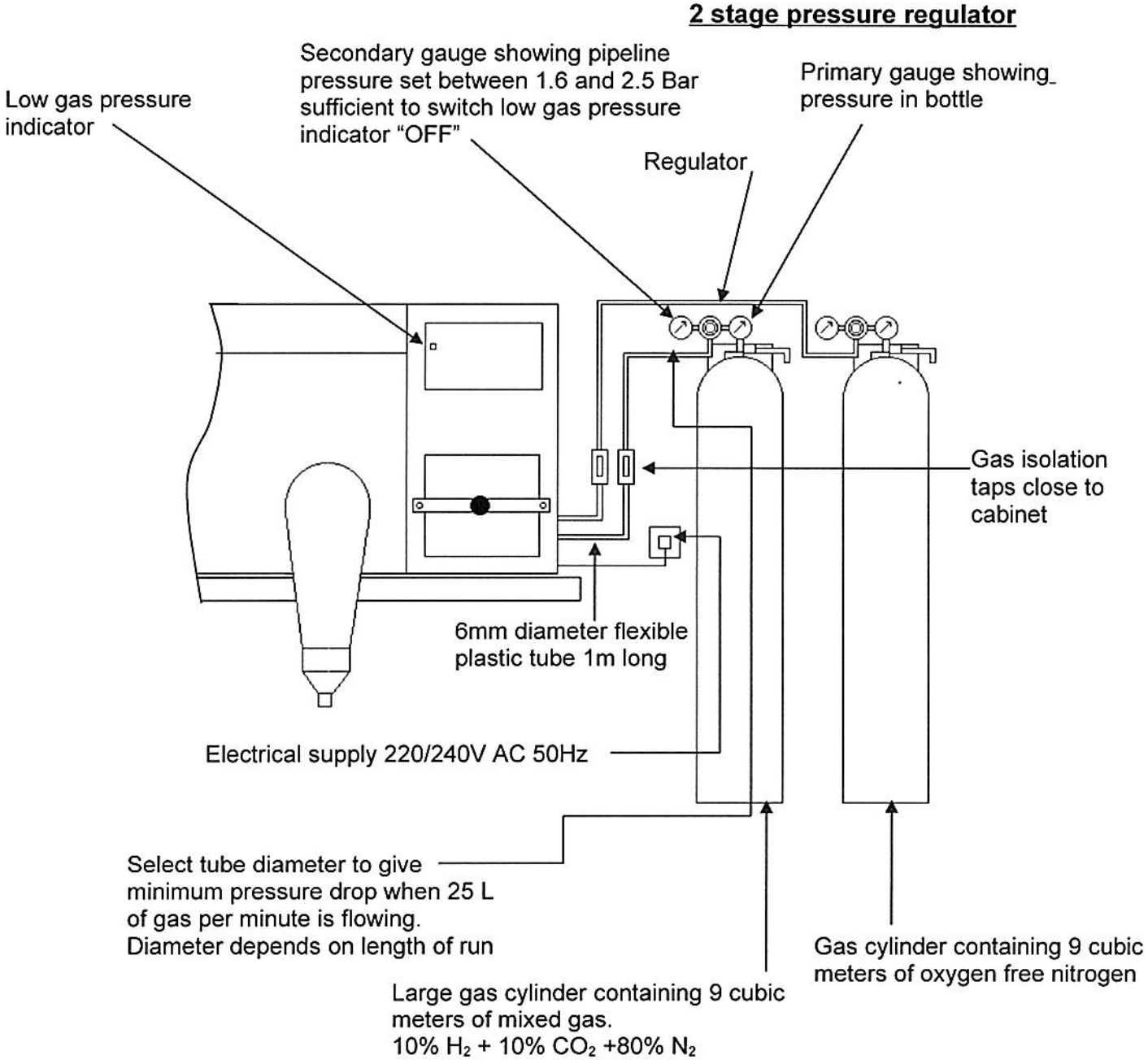
| | |
|---|---|
| VOLTAGE: | 220/240 V.A.C. |
| CURRENT: | 12.5 AMPS |
| FREQUENCY: | 50 Hz |

## CAUTION

**Switching the Anaerobic workstation "OFF" before it has reached its working temperature can cause the "THERMAL FUSE" protecting the heater to rupture.**

**We recommend switching the heaters "Off" with the Temperature Controller and letting the heaters cool down for 3 minutes before switching the workstation "Off" completely.**
**This will prevent any possibility of a thermal fuse being ruptured.**

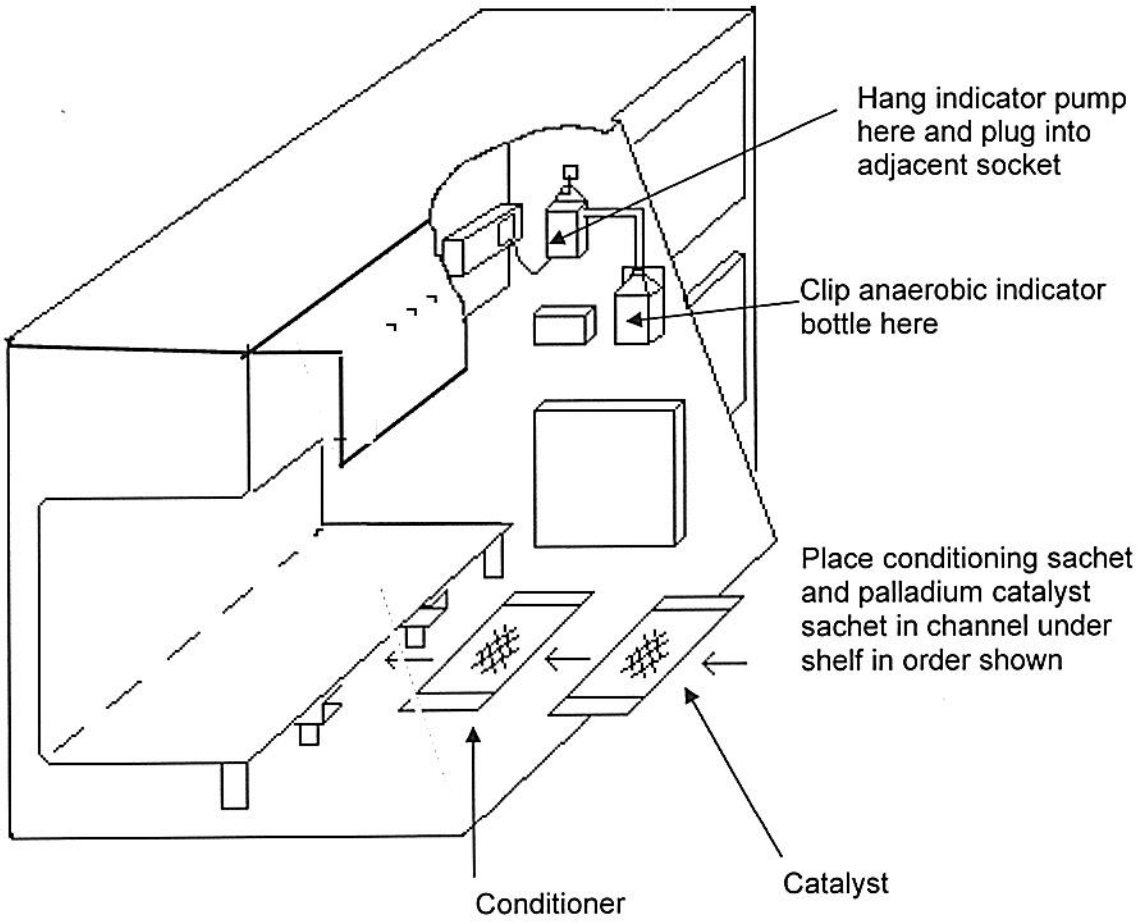
## INSTALLING THE GAS AND ELECTRICAL SUPPLY TO THE AW800TGRF4P STD WORKSTATION

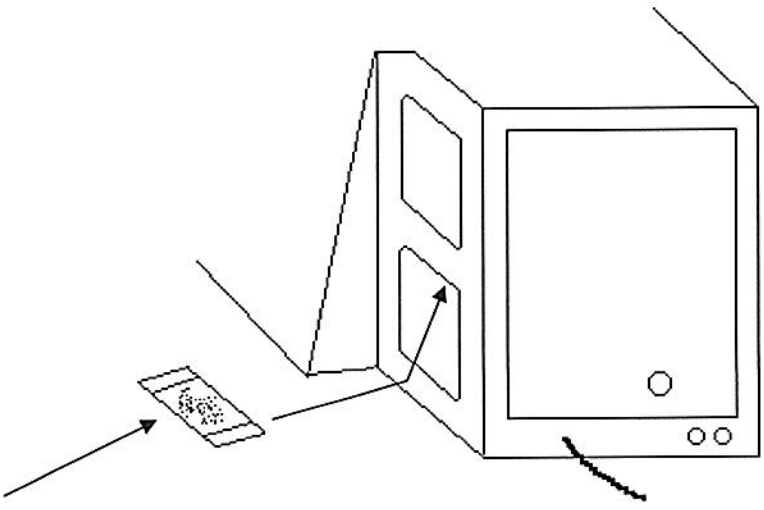



**CAUTION:-** **GAS CONTAINING MORE THAN 10% HYDROGEN MUST NOT BE USED UNDER ANY CIRCUMSTANCES**

Select tube diameter to give maximum pressure drop when 20L of gas per minute is flowing. Diameter depends on length of run

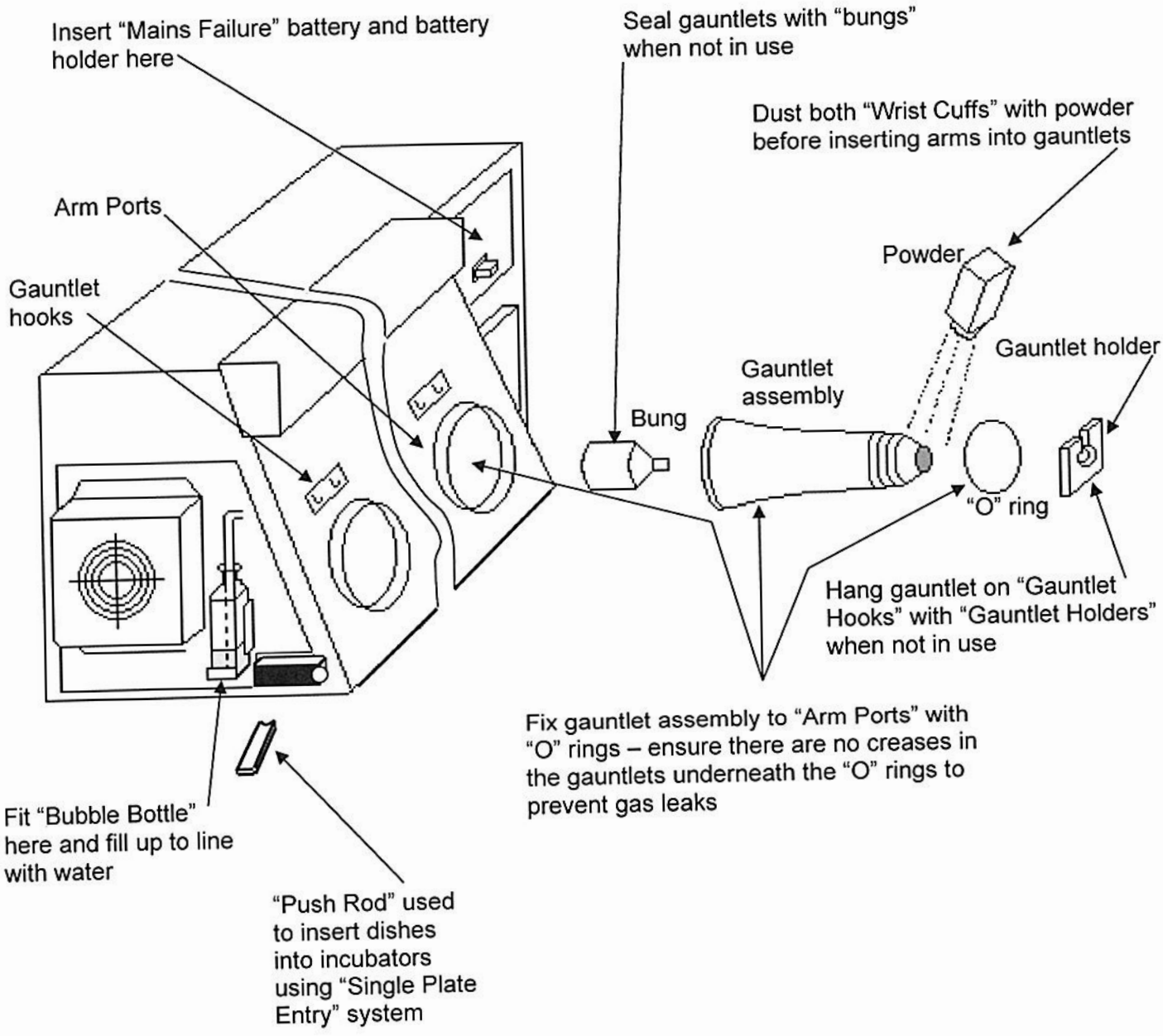
## AW800TGRF4P STD ASSEMBLY INSTRUCTIONS NO. 1 DRAWING



Fit small sachet of catalyst inside roof of lock

## AW800TGRF4P STANDARD ASSEMBLY INSTRUCTIONS NO. 2 DRAWING



## THE MUNRO AW800TGRF4P STANDARD ANAEROBIC WORKSTATION SPECIAL FEATURES

Many special features have been designed into the MUNRO Anaerobic Workstation that cannot be found on any other cabinet. All these have been built in for safety, economy of operation and to make it easier and more comfortable for the operator to use.

## MINIMUM BENCH AREA

Although the cabinet will incubate 800 dishes there is still ample room within the unit for the operator to manipulate the cultures.

## OPERATOR COMFORT

Quite often the operator has to spend long periods of time working with their arms inside the unit and for this reason the cabinet has been designed so that the operator can work sitting down thereby minimising fatigue. The openings of the glove ports are large, facilitating easy movement of the arms. The viewing area is large, unobstructed by bends in the material which cause the operator to be constantly moving their position. The doors are easily sealed by first closing, then turning the tightening knob. If the unit fails to function because one of the doors has been left open or perhaps a gas bottle has run out of gas then this is indicated clearly on the Control Panel. The unique bare hand working facility allows the operator to get their hands in and out of the cabinet without any fuss. In fact the cabinet has been designed to be very user friendly.

## SINGLE PLATE ENTRY LOCK

This lock is used when only a small number of dishes need placing in the incubator. It saves both time and gas. The front door is opened by unscrewing the hinge pin and the dish is placed in the cabinet by pushing it with the bar provided. The dish lid travels up a ramp allowing the escaping gas from the cabinet to flush the air out of the dish before the lid is replaced by the back door. Once the dish is in the incubator the outer door is re-closed by tightening the screw.

## CHECKING THE INCUBATOR ATMOSPHERE FOR OXYGEN

The Anaerobic Indicator Solution will indicate traces of Oxygen in the incubator atmosphere by changing colour from being clear when the atmosphere is anaerobic to being blue when oxygen is present. The Indicator Solution is held in a small bottle located at the front of the incubator in the top right hand corner and held in position by a plastic spring clip. The atmosphere from the cabinet is bubbled through the solution by a small aquatic pump. The pump is plugged permanently into an electrical socket and the atmosphere of the incubator can be checked for oxygen content by simply switching the socket "ON" It is usually sufficient to check the atmosphere perhaps once a day allowing the pump to run for about 1 minute.

## PREPARING THE ANEROBIC INDICATOR SOLUTION

Make up the Anaerobic Indicator Solution from the two ingredients provided, sufficient to fill the bottle about 1/2 full using nine parts of solution "A" and one part of solution "B"

Now place a cap lightly on the neck of the bottle and place it in a bath of water and bring it to the boil. The solution will change from being blue to colourless. Tighten up the cap and remove the bottle from the water allow it to cool and pass it into the cabinet. The cap can now be removed and the outlet pipe from the pump connected to the bottle. The bottle can now be placed in position inside the bottle holder where it will be in full view.

**We recommend replacing the solution on a weekly basis.**

## COMMISSIONING THE CABINET

Check all the following points before starting to commission the workstation.

1. Switch "OFF" the cabinet at the Mains ELCB switch

2. Open both the Mixed Gas and the $N_2$ regulators, set the secondary gauges to give a maximum pressure of 30 psi at the inlets to the unit with the gases flowing

3. Ensure that the Gas Trap Bubble Bottle is filled up to the water level line and the gauntlets and bungs are both fitted to the cabinet. (Page 7)

4. Hang the Indicator Pump on the hook adjacent to the electrical socket, plug the pump into the socket and switch "ON". Place the Anaerobic Indicator Bottle in position, filled to the appropriate level with Indicator Solution and connected to the pump with the flexible tubing. (See Instructions regarding preparation of the solution on (Page 9)

5. Check that the Atmospheric Conditioning Sachets and the Palladium Conditioning Sachets are in position underneath the shelf. The Atmospheric Conditioning Sachets should be put in first to the rear of the cabinet. Place the small Palladium Catalyst in the roof of the Lock.
(See Sketch on Page 17)

6. Now switch on the cabinet at the ELCB. If either of the "Low Gas Pressure" neons is illuminated, increase the appropriate gas pressure until the neon goes out.

7. Switch the light "ON"

8. Check that the heater fans are working and that the heater light is illuminated.
(see WARNING NOTE regarding Thermal Fuse).

9. Switch the Socket "ON" and the Anaerobic Indicator Solution should turn blue.

10. Set the humidistat to 70% RH. (Relative Humidity)

11. After closing all the doors, remove the clip from the Commissioning Switch and switch "ON". Press the "Lock Flush" button and gas will start to flow in pulses into the Cabinet.

12. Although the gas flow has been set to 25 litres per minute at the Factory, check that this setting is correct by inserting a Gas Flow Meter and a Pressure Gauge into the inlet pipe line.
(See Page 11)

13. Leave the Commissioning Switch in this position for two hours or until the Anaerobic Indicator turns colourless.

14. At this stage the cabinet is anaerobic. Switch the Commissioning Switch "OFF" and replace the clip to prevent switching it on accidentally.

15. The temperature of the unit will take several hours to settle down.

16. Now check all the functions are working.

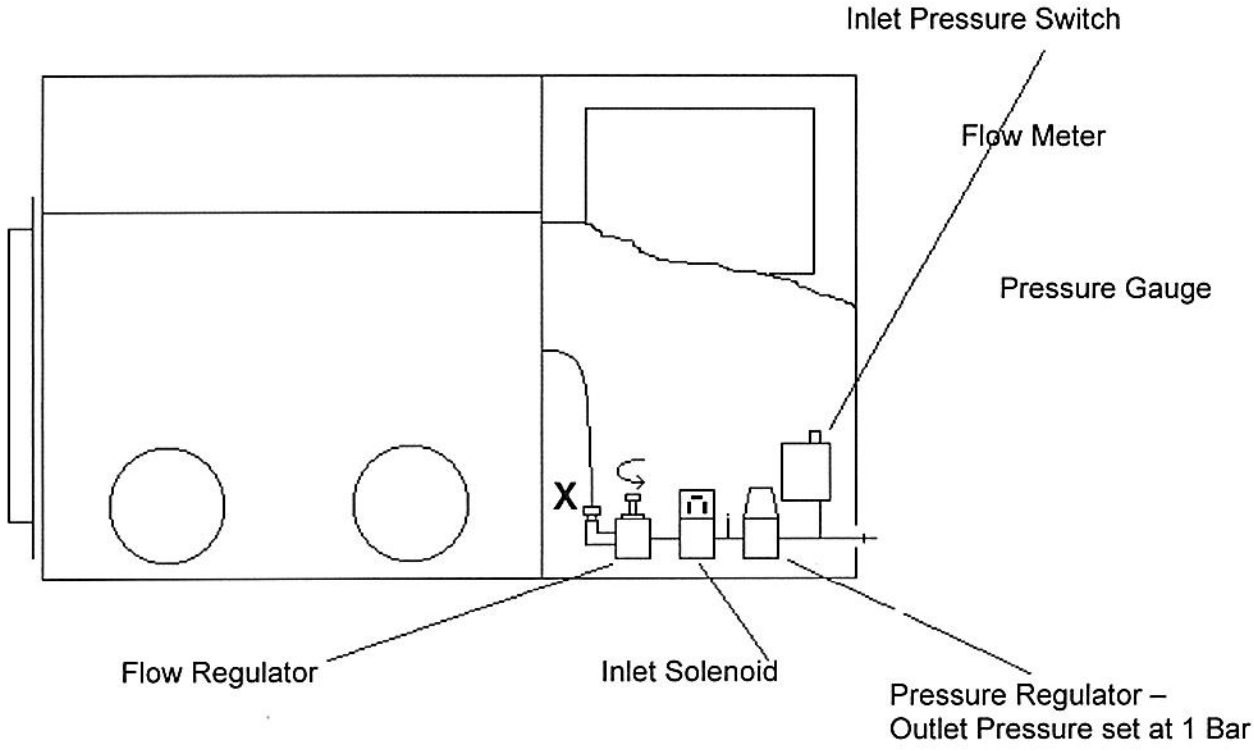
## CHECKING THE GAS FLOW

To check the Gas Flow into the Workstation the following equipment is required:

1. Gas Flow Meter (0 – 30 Litres per minute)
2. Pressure Gauge (0 – 3.3 Bar)

Connect up the equipment as shown and start the "Lock Flush"

Disconnect the gas supply to the cabinet at point 'X' and insert a flow meter. The meter should vent to the atmosphere.




Any adjustment to the gas flow should be made using the "Flow Regulator" situated at the end of the gas train.

## TRANSFERRING ARTICLES IN AND OUT OF THE CABINET

## TRANSFERRING ITEMS INTO THE INCUBATOR

The Workstation is supplied with Petri Dish Holders, each capable of holding Petri Dishes. These are used for transferring dishes into and out of the cabinet and stacking them whilst they are being incubated.

To get dishes into the incubator simply load up the Holders and open the 0uter Door by turning the knob and placing the holder inside the lock. When the door is re-closed, the atmosphere inside the lock is made Anaerobic by pressing the "Start Lock Flush" button.

The atmosphere within the lock is automatically replaced several times until the oxygen content is sufficiently low to allow the Inner Door to be opened. At the end of the flushing operation which takes five minutes, the "Lock Anaerobic" Indicator on the Control Panel will become illuminated.

At this point place the hands inside the incubator using the glove ports (see Working inside the cabinet with bare hands Page 15). Open the Inner Door and transfer the contents of the "Lock" into the incubator section of the unit.

## TRANSFERRING ITEMS OUT OF THE INCUBATOR

To unload the contents of the incubator check that the Neon Indicator inside the cabinet is not illuminated then open the Inner Door, place the items into the Lock and re-close the Door. Withdraw the arms from the glove ports and seal them. The items can now be removed from the cabinet by opening the Outer Door.

## SINGLE PLATE ENTRY

Single dishes can be placed into the incubator by opening the small door situated between the two glove ports and pushing them into the cabinet with the bar provided. The positive pressure within the cabinet ensures that no oxygen enters the unit during this operation.

**CAUTION: TAKE CARE NOT TO DAMAGE THE DOOR SEAL WITH ANY SHARP OBJECTS WHILST CARRYING OUT THE ABOVE OPERATIONS.**

## THE REMOVAL OF CONDENSATION FROM INSIDE THE INCUBATOR

Water vapour accumulates inside the incubator atmosphere from two sources, firstly from the evaporation of the media in the Petri dishes and secondly by the hydrogen and the traces of oxygen being linked together by the palladium catalysts. If this water vapour is not removed it will condense on the cooler surfaces of the incubator walls and form pools of water. The cabinet however is fitted with a large aluminium Condensation Plate which is kept a few degrees lower than the temperature inside the incubator by a fan which blows cool air from the room onto its outer surfaces. This reduction in temperature is sufficient to cause the excess water vapour inside the incubator to condense, run down its surface and collect at the bottom and finally fall via a drain tube into the collection bottle situated inside the cabinet. When this is full, remove it via the lock.

The fan for the Condensation Plate can be switched "OFF" at the Control Panel if the Service Engineer is working on the unit. The humidity within the incubator is controlled by the Humidistat that is mounted just above the inner door. The Humidistat switches the fan "ON" and "OFF" automatically.

## THE GAS TRAP BUBBLE BOTTLE

The Gas Trap Bubble Bottle is mounted on the incubator endplate just beneath the Condensation Plate and has several functions. Firstly, it is a safety device so that in the event of a gas Input Solenoid remaining open, the gas has a way of getting out of the cabinet and not doing any damage to the structure of the unit. Secondly, it allows the operator to be able to push their arms inside the cabinet without applying undue pressure. It must be remembered that all gas that gets out of the cabinet via the bubble bottle is wasted and therefore every effort must be made to minimise this when working inside the incubator. If one arm is withdrawn as the other arm is pushed into the unit, gas wastage can be reduced.

## THE HEATING AND GAS CIRCULATING SYSTEM

The heating and gas circulating system consists of four tubular 400 Watt heaters fixed directly behind the fan units mounted on detachable plates in the top of the incubator. The fans run continuously whilst the heater is burst fired.

## THE TEMPERATURE CONTROLLER

An adjustable electronic temperature controller fitted in the control panel of the cabinet regulates the temperature. The controller has a temperature sensor in the right hand top corner of the heating chamber and the temperature of the incubator can be adjusted between 3 degrees C above ambient to 40 degrees C. There is a green led incorporated in the temperature controller which indicates when the heater is operating and a temperature display to give an accurate reading of the internal temperature of the cabinet. A data sheet covering the temperature controller is included with this documentation.

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## THE GAS CIRCULATION SYSTEM

The fan units pick up the cooler incubator atmosphere which has been forced to the top of the incubator and first passes it over the warm heaters. This warmer gas is now forced down the channel at the back of the cabinet and passes under the bottom shelf of the incubator where it first meets the sachets of Conditioner and then the sachets of Catalyst. The gas now gives up just sufficient of its heat to maintain the required temperature before finding its way back to the top of the incubator due to the suctional force of the fan.

## WORKING INSIDE THE CABINET WITH BARE HANDS

Although the MUNRO cabinet can be used with long sleeved gloves it is much easier to work with bare hands. This bare hand facility is achieved in a very simple but effective way. The Bare Hand Gauntlet Assembly consists of four components as shown in diagram 1.

1. Sleeve 2. Solid Ring 3. Cuff 4. Bung

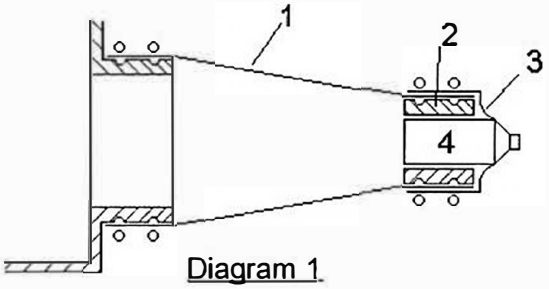



Diagram 1

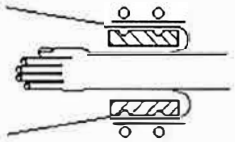


Diagram 2

The inside of the sleeve is always held at positive pressure by the Gas Pressure Switch, therefore if the Bung is removed from the Cuff, gas will flow out of the cabinet and no oxygen will enter.

To insert the hand into the cabinet simply lift up the end of the gauntlet and push the Bung into the cabinet using the tips of the fingers only, followed by the hand **( Note:- Do not grip the end of the bung with the fingers)**. The Cuff will seal around the wrist as shown in diagram 2. Now place the Bung inside the cabinet in a convenient position.

To remove the hands from inside the cabinet, simply collect the Bung and release it within the sleeve. Remove the hand and let the Bung fall into the Cuff where it will seal. Gravity will now hold the Bung in place. **Do not attempt to pull the bung back into the cuff.**

**ALWAYS ALLOW THE SLEEVE TO FILL WITH GAS BEFORE INSERTING OR WITHDRAWING THE HAND.**

If the hands and Cuffs are lightly dusted with talcum powder the operation becomes very simple.

If the Cuffs are too tight around the wrists they can be trimmed to a more comfortable fit with a sharp pair of scissors. However they must be sufficiently tight to prevent gas escaping whilst working inside the cabinet.

Two hooks are provided just above the arm ports together with a Gauntlet Holder for use when the Gauntlets are not being used. If the Gauntlet is fitted into the Gauntlet Holder about half way up its length, the Holder can be clipped onto the hook. This has two effects: firstly it prevents the Gauntlets hanging down and getting in the way and, secondly, it greatly reduces condensation in the Gauntlet Assemblies.

## GENERAL MAINTENANCE

The MUNRO Workstation, unlike other units, uses the energy contained in the gas bottles to do most of the work required. This means that there are no evacuation or circulation pumps to maintain.

Many of the components used in the construction of the unit are available "off-the-shelf" in almost every part of the world. However, all spare parts are readily available from MUNRO.

We recommend that the items below be replaced as indicated. However experience shows that they last approximately twice this period.

## RECOMMENDED LIST OF SPARES AND REPLACEMENT PARTS FOR AW800TGRF4P STD

| Quantity | Description | Recommended Replacement |
|---|---|---|
| 4 | Gauntlets | 1 year |
| 8 | Cuffs | 6 months |
| 5 | Fans | 4 years |
| 4 | Heaters | 3 years |
| 1 | Outer Door Seal | 6 months |
| 1 | Inner Door Seal | 6 months |
| 1 | Single Port Door Seal | 6 months |
| 4 | Large "O" Rings | 6 months |
| 12 | Small "O" Rings | 6 months |
| 1 | Spotlight Bulb | 2 years |
| 2 | Catalyst Sachet Large | 2 years |
| 1 | Catalyst Sachet Small | 2 years |
| 2 | Sachet Conditioner | 1 year |
| 1 | Alarm Battery | 1 year |

## SCHEDULE OF RECOMMENDED PREVENTATIVE MAINTENANCE TASKS FOR AW800TGRF4P STANDARD MODEL

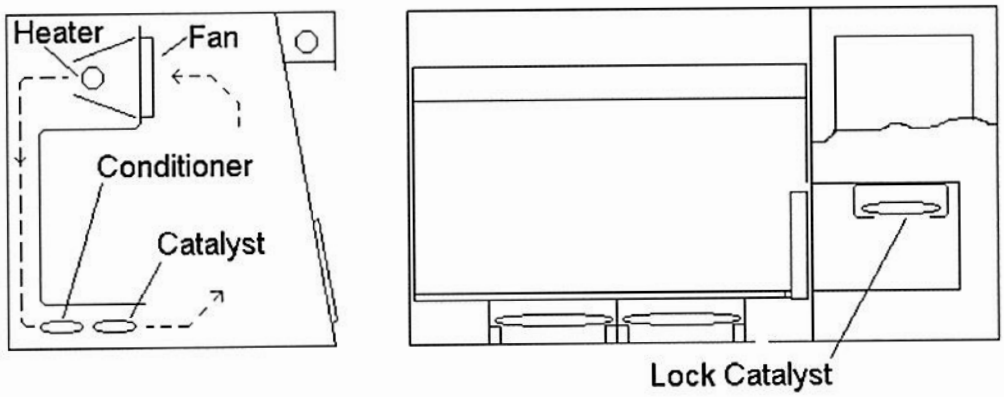
| Task | Interval |
|---|---|
| Check operating temperature | 6 months |
| Check thermometer | 6 months |
| Check solenoid seals | 2 years |
| Check gas flow and recalibrate | 6 months |
| Check for gas leaks | 6 months |
| Change alarm battery | 6 months |
| Check ALL functions are operating | 6 months |

**WE RECOMMEND THAT ALL THE ABOVE MAINTENANCE WORK IS CARRIED OUT BY A TRAINED SERVICE ENGINEER**

## CHANGING THE CATALYST AND CONDITIONER

The sachet of Catalyst and the sachet of Conditioner which are housed beneath the bottom shelf of the incubator will require replacing at a period in excess of one year. If for any reason the sachet of catalyst gets wet, the contents can be dried out by heating to a temperature of 160°C for a period of two hours. The sachet of conditioner can, if necessary, be dried at room temperature. The chemicals can then be returned to their respective containers for further use.

When replacing the sachets, ensure that the sachets of Atmospheric Conditioner are at the REAR of the cabinet so that the gas passes over them first. (See sketch below)




There is also a sachet of catalyst housed in the roof of the lock. This sachet can be both inserted and removed by bending it slightly and sliding it in or out of the holder.

## CHANGING THE FLUORESCENT LIGHTING TUBE

Switch off the power to the light on the Control Panel and remove the screws from the top and the Light Cover and remove the cover. The tube can now be removed from its Holding Clips, the end caps disconnected and the new tube fitted.

## CLEANING

The inside of the cabinet can be swabbed out with a weak solution of general laboratory detergent and warm water, and dried with a soft cloth. In the event of a culture spillage, a 5% Hypochlorite solution should be applied to the area and left for half an hour. It should then be wiped and swabbed with a 1% solution of Sodium Thiosulphate. Remove the catalysts and conditioners from the unit while the Hypochlorite solution is being used.

## TEST RECORD SHEET

| | |
|---|---|
| MODEL | AW800TGRF4P STD |
| SERIAL NO | |
| CUSTOMER | |
| FLUSH CYCLE | 4 SECONDS ON 2 SECONDS OFF |
| FLUSH DURATION | N2 - 3 MINUTES, MG - 2 MINUTES, TOTAL 5 MINS |
| MIXED GAS FALLING CUT OUT PRESSURE | 20____ PSI |
| MIXED GAS RISING SWITCH ON PRESSURE | 30____ PSI |
| $N_2$ GAS FALLING CUT OUT PRESSURE | 20____ PSI |
| $N_2$ GAS RISING SWITCH ON PRESSURE | 30____ PSI |
| MIXED GAS FLOW | 25 L / MIN |
| | 33L / LOCK FLUSH |
| $N_2$ GAS FLOW | 25 L / MIN |
| | 50L / LOCK FLUSH |
| MIXED GAS INPUT PIPE SIZE | 6 mm DIA |
| $N_2$ GAS INPUT PIPE SIZE | 6 mm DIA |
| INCUBATOR POSITIVE PRESSURE SETTING | 6 mm WG |
| INCUBATOR LEAK NOT DETECTED | 1 HOUR |
| TEMPERATURE SETTING | 36. 5deg C |
| OVER TEMP SETTING OF THERMAL FUSE | 96 deg C |
| LIGHT | INTERNAL SOCKET |
| SPOTLIGHT | COMMISSIONING SWITCH |
| HUMIDISTAT | INNER DOOR |
| MIXED GAS FLOW | OUTER DOOR |
| $N_2$ GAS FLOW | DEHUMIDIFIER |
| LOCK FLUSH | DIGITAL THERMOMETER |
| LOCK ANAEROBIC GAS FLOW | ELCB |
| ALARMS | GAS LEAK SETTING 2 MINS. |

CHECKED BY _____ DATE _____

CE

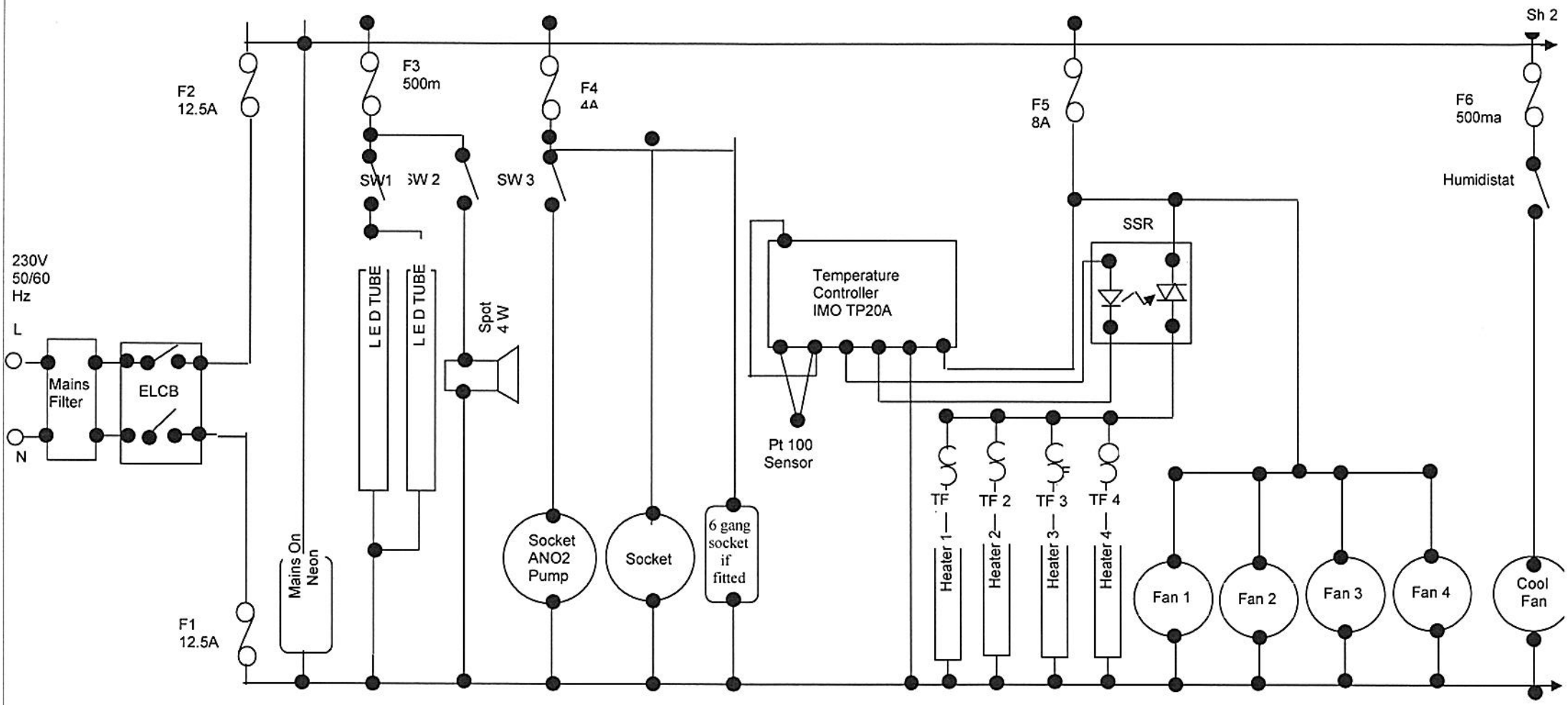
## Declaration of Conformity

| | |
|---|---|
| Equipment | Anaerobic Incubator type AW800TGRF4P STD |
| Manufacturer | Munro Instruments Ltd |
| Address | 44-45 Burnt Mill, Elizabeth Way, Harlow, Essex, CM20 2HU, UK |
| Description of Equipment | Incubator for the environmentally controlled incubation of anaerobic bacteria. |

I certify that the apparatus identified above conforms to the requirements of Council Directive 89/336/EEC

Signed _____ Date _____

Director, Munro Instruments Ltd

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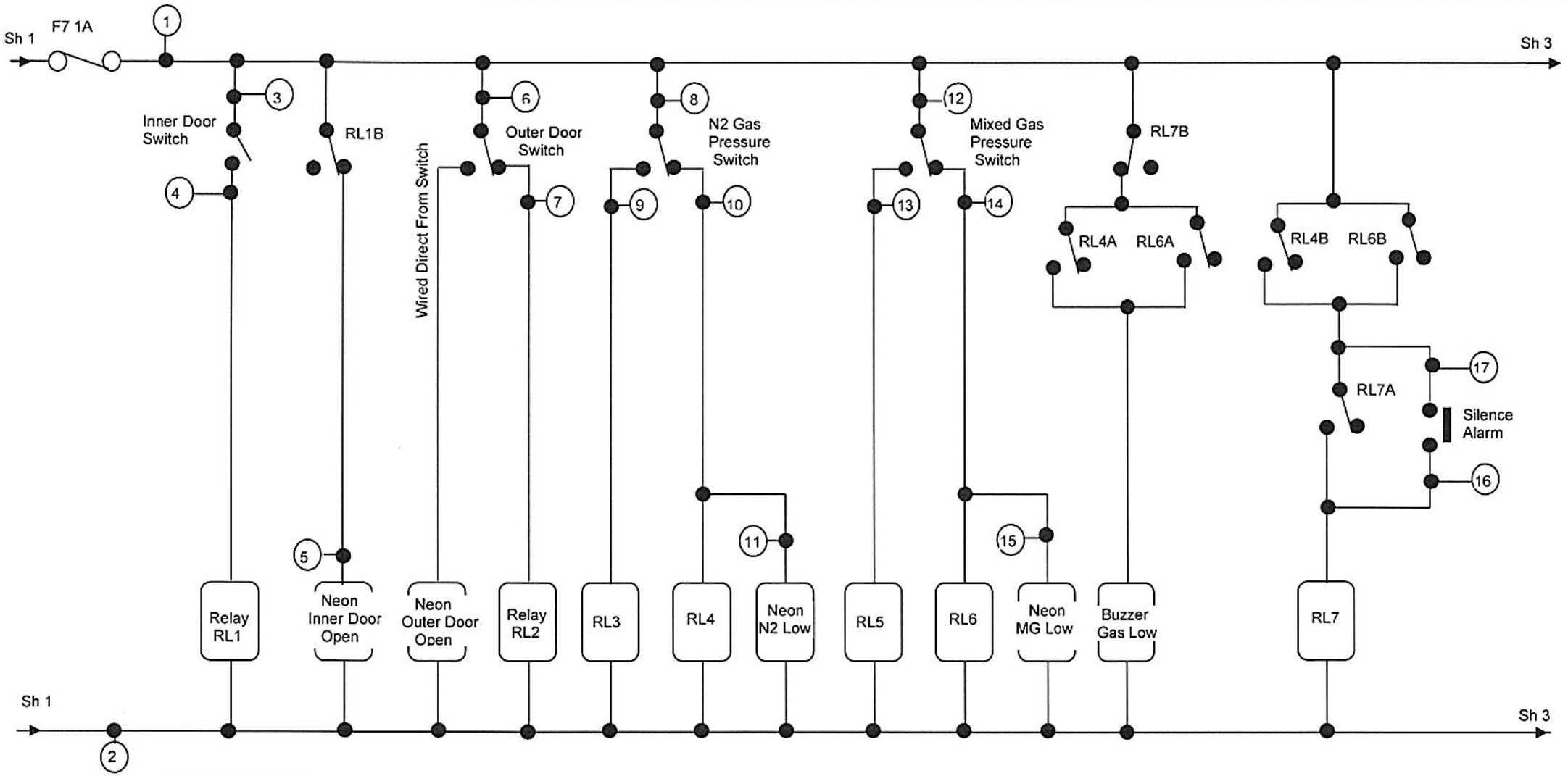
|---|---|---|---|---|
| Issue | | **Drawing No.** | **Title** | Drn. AWU |
| A | | **AW800TGRF4PSTD-0021** | **AW800TGRF4P STD Circuit Diagram** | Ckd WJF |
| 11/02/22 | | | Sheet 1 of 4 | App |
| | | | | Date |

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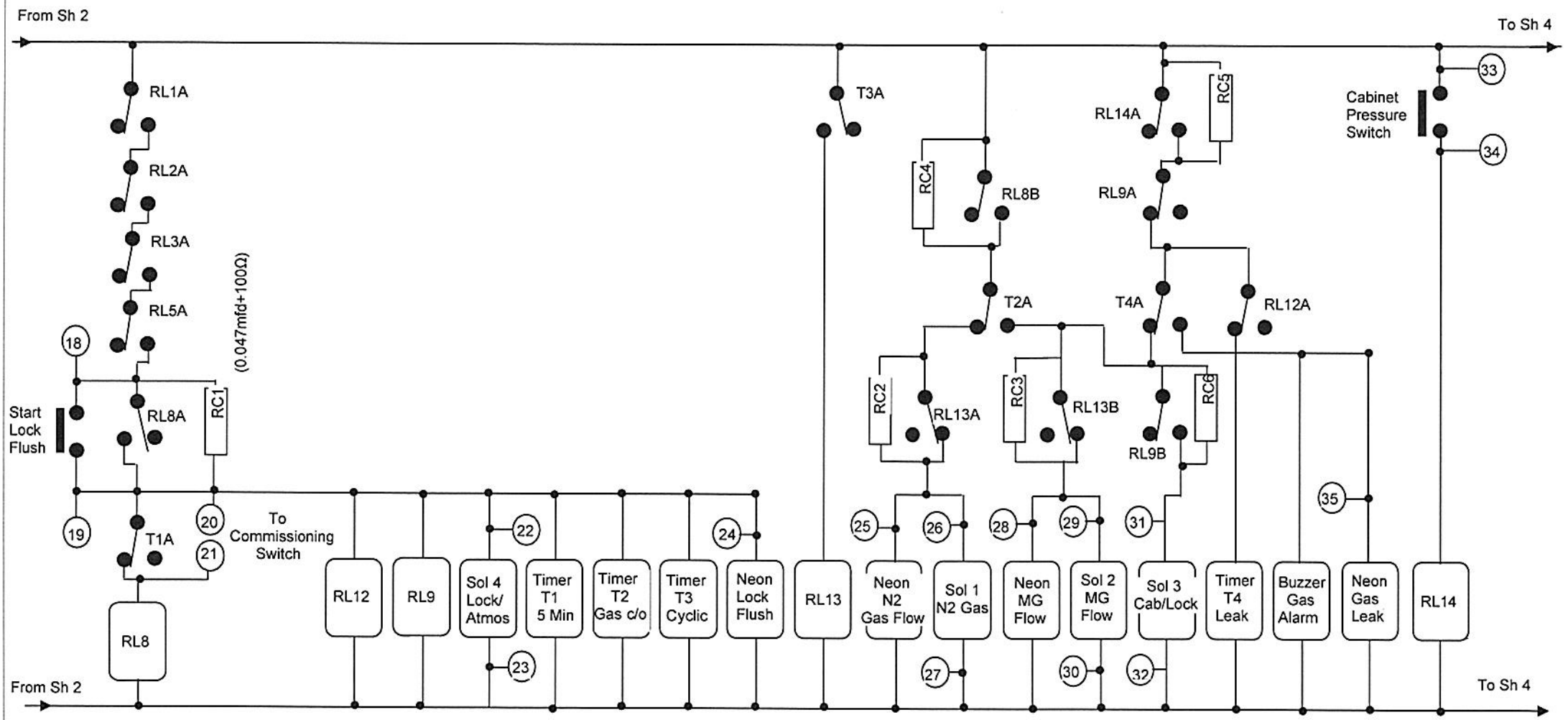
|---|---|---|---|---|
| Issue A | | **Drawing No.** | **Title** | Drn AWU |
| | | **AW5 0051** | **AW500TG Circuit Diagram** | Ckd WJF |
| | | | | App |
| | | | Sheet 2 of 4 | Date |

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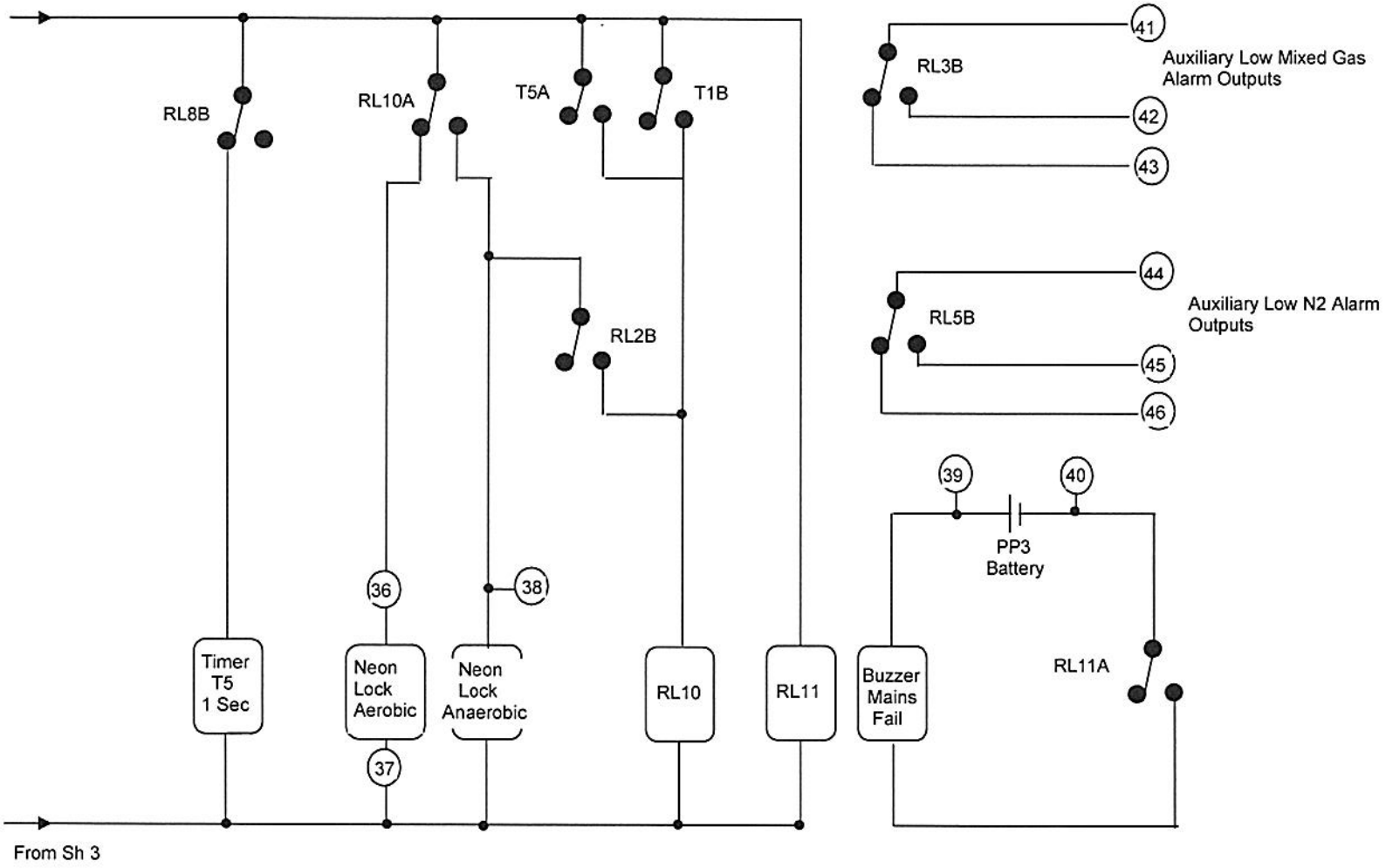
| Issue A | | **Drawing No.** | **Title** | Drn AWU |
| | | **AW5 0052** | **AW500TG Circuit Diagram** | Ckd WJF |
| | | | | App |
| | | | Sheet 3 of 4 | Date |




| | | | | | |
|---|---|---|---|---|---|
| Issue A | | **Drawing No** | **Title** | Drn | AWU |
| | | **AW5 0053** | **AW500TG Circuit Diagram** | Ckd | WJF |
| | | | | App | |
| | | | Sheet 4 of 4 | Date | |

**C22 controller**

To adjust the operating temperature of the Anaerobic Workstation Press ▲ to increase the .operating temperature or ▼ to decrease the temperature

**Main Menu**

○ Press mode key

PASS = 1008 (lock)

**The following sub settings have been programmed into the controller by the factory**

**"Sub setting mode "bASE**

Press and hold the mode key ○ for 6 seconds until "Set bASE" and release

○ Press mode key

oFSI = NoNE

oFS2 = NoNE

INPt = Pt.dN

UNIt = ℃

dP = I-dP

SPIL = 0.0

SPIH = 50.0

FILt = 0.5

pb = 1.0

ti = 200

td = 30

RAMP = NoNE

CodE = 1000 (lock) / (1008 = unlock)

oFtL = -1.5

oFtH = -1.5

CALo = 0.0

CAHi = 50.0

SFt = oFF

oFtL + oFtH are the sensor correction settings, both of them should have the same value

The sensor is positioned in the heating chamber of the cabinet which is 1.5°C higher than where the Petri dishes are being incubated therefore a -1.5°C setting is programmed in at oFtL and oFtH

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "oUt**

At Set bASE, press ▲to move to the second mode SEt oUt

oUti = REVR

oI.ty = SSRd

oI.Ft = 0.0

CYCl = 1.0

oUt2 = NoNE

PLIL = 0

PLIH = 100

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "ALRM**

At Set bASE, press ▲to move to the second mode SEt ALRM

AI.FN = NoNE

AI.Md = NoNE

AI.Hy = NoNE

AI.Ft = NoNE

AI.dV = NoNE

AI.dL = NoNE

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "E1**

At Set bASE, press ▲to move to the second mode SEt E1

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "SEL**

At Set bASE, press ▲to move to the second mode SEt SEL

SEL1 = NoNE

SEL2 = NoNE

SEL3 = NoNE

SET4 = NoNE

SEL5 = NoNE

SEL6 = NoNE

SEL7 = NoNE

SEL8 = NoNE

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "CoMM**

At Set bASE, press ▲to move to the second mode Set CoMM

(Reverts to PV/SV display by pressing on R key)

**"Sub setting mode "Ct**

At Set bASE, press ▲to move to the second mode SEt Ct

(Reverts to PV/SV display by pressing on R key)