



Western Surgical®

EMERGENCY RESUSCITATION KIT

USER MANUAL



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EMERGENCY RESUSCITATION KIT USER MANUAL



- * Controlled Mechanical Ventilation (CMV)
- * Pneumatic Suction
- * 100% Oxygen Inhalation
- * Manual Suction & Resuscitation

* Carrying Warranty at Rajkot only on site warranty not provided free of cost.

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MEDISYS

EMERGENCY RESUSCITATION KIT

VENTILATOR :

It is a pneumatically powered, time cycled, flow adjustable **Ventilator** which is specifically designed to provide Medical and Paramedical Personnel with an **automatic device** to meet **emergency situations which demand respiratory support.**

It requires minimum skill for operation. There are only three controls for adjustments of **Inspiratory Flow, Expiratory Time & Inspiratory Time.** Suitable adjustments in the **Breathing Frequency** may be made for both **Child & Adult patients by the Inspiratory Time & Expiratory Time controls.** Correspondingly, the **Inspiratory Flow** control may be set to a suitable position as indicated by the patients's chest excursion.

To minimise the wastage of Oxygen, a **Switch-Over Control** is provided which cuts off the ventilatory cycle when **Pneumatic Suction** is in operation. Once the suction is completed, ventilatory cycle takes over at Pre-set timings **automatically.**

A Ventilator 'ON-OFF' control is provided which obviates the need to shut-off the Oxygen Cylinder Valve when the Ventilator is not in use. Apart from this, a calibrated control in the range of **1 to 10LPM** is provided for **100% Oxygen Inhalation Therapy.** This control is independent of the Ventilator 'ON-OFF' Control.

In the event of emergency situations, such as, emptying of Oxygen Cylinder, there is a provision for **Manual Resuscitation** with the help of an **Ambu Bag** and **Manual/ Foot Operated Emergency Suction.**

CLINICAL APPLICATIONS :

- Short Term Automatic Resuscitation or longer periods of continuous ventilation
- Mechanical Ventilation during Transportation
- Emergency Ventilation of small Children and large Adults
- Emergency Suction of Secretions, Mucus, Blood etc.
- Provision for short-term Manual Resuscitation
- Provision for short-term Manual Suction
- Provision for 100% Oxygen delivery through calibrated scale

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The unit consists of the following components:-

1) Ventilator 2) Oxygen Cylinder (3 Ltrs. Water capacity) with preset Regulator at 4 bar (60 PSI approx); 3) Manual Resuscitation Bag (Ambu's Bag) with Face Mask and Corrugated Tube; 4) Splints (Pack of Six); 5) Suction (Inbuilt) Pneumatically Operated; 6) Foot Operated Suction Pump; 7) Tubing for use with bigger Cylinder, 8) Patient Circuit; 9) Cylinder Key; 10) I.V. Stand; 11) Inhalation outlet for Oxygen Therapy (Gas Flow Rate 1-10 Ltrs. per minute); 12) Tubing for Suction; 13) Oxygen Catheter, 14) Suction Catheter, & 15) Refilling Attachment for filling the Small Cylinder from a Bigger Cylinder.

DIAGNOSTIC & GENERAL INSTRUMENTS:-

1) Stethoscope: 2) Clinical Thermometer, 3) Aneroid Sphygmomanometer, 4) Percussion Hammer, 5) Tongue Spetula, 6) Examination Torch, 7) Dressing Scissors, 8) Dissecting Forcep 9) Tissue Forcep, 10) Haemostatic Forcep, 11) Needle Holder, 12) Tourniquette, 13) Magill's Introducing Forcep, 14) Intubation set comprising of a Macintosh Laryngoscope with 03 Stainless Steel, Non-magnetic removable Blades (small, medium & large) suitable for infant, children and adults, supplied in a foam Leather Pouch, 15) Mouth Bite, 16) B.P. Handle (Size No. 03).

DISPOSABLE & DRESSING:

1) Sterilised Endotracheal Tubes-04 Nos, 2) Endotracheal Connections set of 20, 3) Infusion Set (Disposable I.V. Set); 4) Adhesive Plaster-01 Roll, 5) Sterilized Gauge 01 No., 6) Rolled Bandages, 7) Disposable Syringe-01 No., 8) Disposable Needles-05 Nos: 9) B.P. Blades 02 (Size No. 03), 10) Sterilised Gloves One Pair, 11) Mask with tubing for Oxygen Therapy (Adult-01 No.) Guedal Airways PVC-1,2 & 3.

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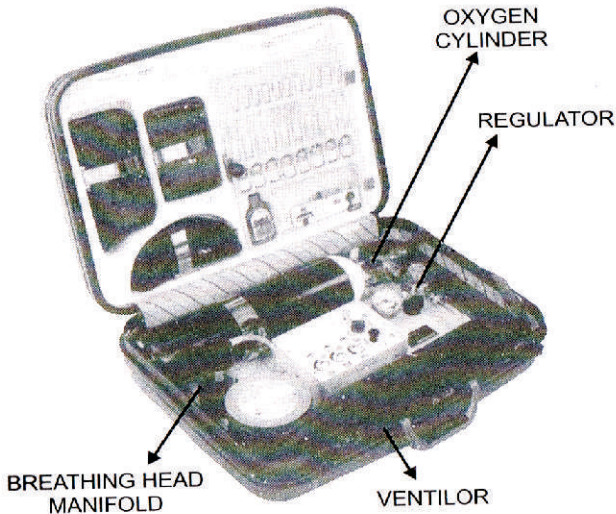
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MEDISYS

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All the components are conveniently assembled in a sturdy Blow-Moulded lockable Carrying Case with shaped compartments and extra space for drugs, medicines etc.

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SPECIFICATION:

DIMENSION	:	60cm X 44cm X 22cm (Approx.)
WEIGHT	:	16 Kgs.
MODE	:	Pneumatically Controlled Time Cycled
TIDAL VOLUME	:	200CC to 1200 CC (Approx.)
BREATHING FREQUENCY	:	8 to 30 Breaths Per Minute
I:E RATIO	:	1 : 1 to 1 : 7
REGULATOR PRESSURE	:	60 PSI
PNEUMATIC SUCTION	:	190mm of Hg (Approx.)
FOOT OPERATED	:	Spring Loaded Collapsible
SUCTION	:	Bellows Type
100% OXYGEN DELIVERY	:	1 to 10 LPM
CYLINDER	:	3 Litres Water Capacity Bull Nose Oxygen Cylinder
REFILLING ROD	:	Bull Nose Type with Pressure Gauge
EXPIRATORY VALVE	:	Open Venturi Type without any moving parts
CARRYING CASE	:	Blow Moulded with Compartments for Accessories, Disposable, Diagnostic Instruments, Drugs & Medicine etc.

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INTRODUCTION :

The MEDISYS EMERGENCY RESUSCITATION KIT consists of a Pneumatically Operated **Ventilator**, designed specifically to **resuscitate patients during emergency and rescue operation**. It provides **automatic Artificial Lung Ventilation** to patients having complete respiratory failure or partial respiratory insufficiency as a result of **head injury, accident, fire, toxic gas poisoning, drowning, asphyxia** etc.

In addition to this, a provision has been made for short-term emergency suction of secretions, mucus, blood etc., of the patient by providing a compact **Pneumatic Suction** control module. Thus, it performs dual functions in providing **Intermittent Positive Pressure Ventilation (IPPV)** and **Automatic Emergency Suction**.

In emergency, an operator must act at once. There is no time to be wasted for clinical judgement for complicated adjustments of control knobs etc. As such, the Resuscitator has been made very simple to operate by keeping only three controls for **Inspiratory Flow, Expiratory Time & Inspiratory Time** which are also provided with **Colour coded range markings** for **ease in operation**. In fact, situations may arise where the patient is not breathing at all or his breathing is not adequate. The Ventilator can ventilate effectively in all such difficult situations without the operator having to waste precious lifesaving time in making complicated adjustments of control knobs. He will simply have to switch 'ON' the Ventilator control and by keeping the pointers of the control knobs **aligned with 'MEDIUM' Range markings** provided for each control, he can promptly start providing automatic ventilation to the patient.

During controlled ventilation provided by the Ventilator, if the patient recovers consciousness and makes effort for spontaneous breathing, he can **draw atmospheric air** to his desired requirement through the **Expiratory Port-cum-Ambient Air Port** as the Expiratory Valve is of "**Open-Venturi-Type**". This also guarantees safety against over pressure.

To avoid wastage of gas the unit is provided with a **Switchover Control** which automatically cuts-off the Ventilator when the Suction is in use. The Ventilator automatically starts functioning as soon as the suction knob is pushed back to its normal position.

For Inhalation Therapy with 100% Oxygen, the Ventilator Control should be kept at 'OFF' position, since the 100% Oxygen delivery control is independent of Ventilator control. This also enables the patient to breathe spontaneously from the Oxygen Catheter/Oxygen Mask.

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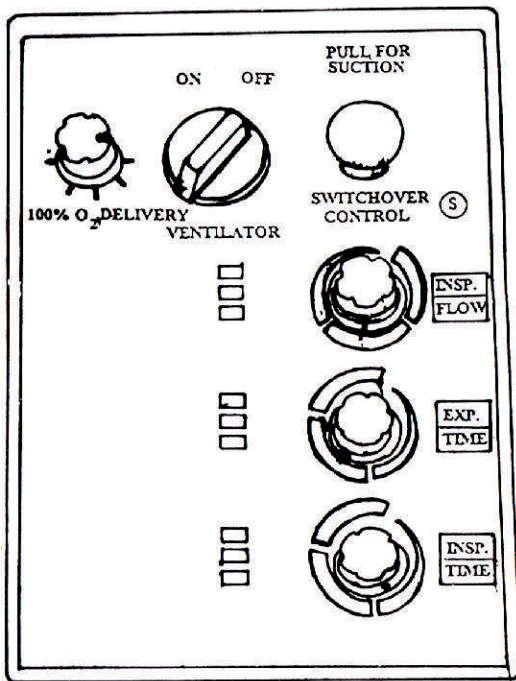


FIGURE - 3

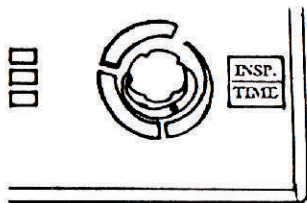


Figure 6

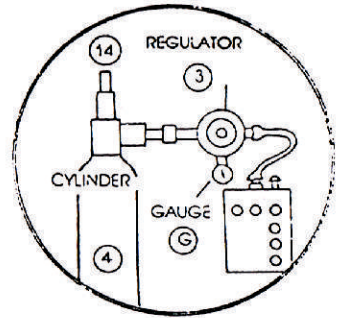


Figure 5

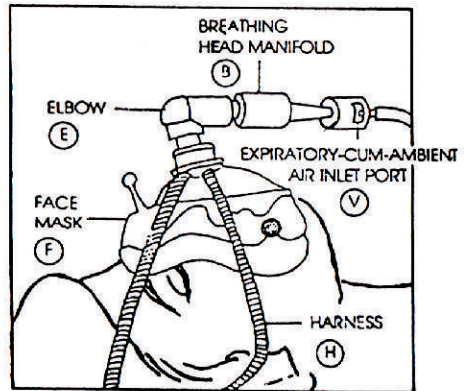


FIGURE-4

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RESUSCITATOR

HOW TO OPERATE :

Keep the pointers of Inspiratory Flow, Expiratory Time & Inspiratory Time Knobs aligned with the Medium Range markings of each control for obtaining 'Normal' ventilatory pattern. (Figure-6)

Open the cylinder valve one full turn anti-clockwise by holding the cylinder with one hand. Switch 'ON' the Ventilator. The ventilator starts functioning. (Figure 3 & 5)

Put Face Mask (F) attached to the Breathing Head Manifold (B) on the patient's face and fix the Head Harness (H). (Figure-4)

Adjust Frequency to desired Breaths/Minute with the help of Expiratory Time Knob. (Figure-6)

Adjust Inspiratory Time & Inspiratory Flow with the help of respective knobs for proper chest expansion. Inspiratory Flow increases anti-clockwise. (Figure-6)

NOTE :

Expiratory cum-Ambient Air Inlet Port (V) is the passage for air entrainment as well as patient's exhalation. Hence, caution should be taken not to obstruct this port. (Figure-4)

When the Cylinder gets emptied as indicated in the Regulator Gauge (G), pull out the Elbow (E) from Face Mask (F) and continue resuscitation manually by using the Manual Resuscitator provided alongwith the unit. In the mean time, fill the empty Cylinder as instructed separately under the heading "Refilling of Empty Cylinder"

After use, remove the Face Mask alongwith Breathing Head Manifold by releasing the Harness from patient's face and turn-off the Ventilator by closing the Cylinder 'ON-OFF' Valve. (14) (Figure 4 & 5)

CAUTION :

It is advisable to refill the Cylinder after its use and keep it ready for the next operation. For refilling, follow instruction under the heading "Refilling of Empty Cylinder".

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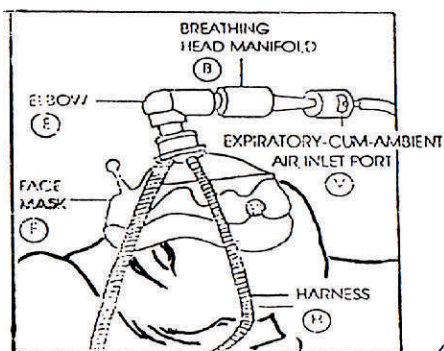
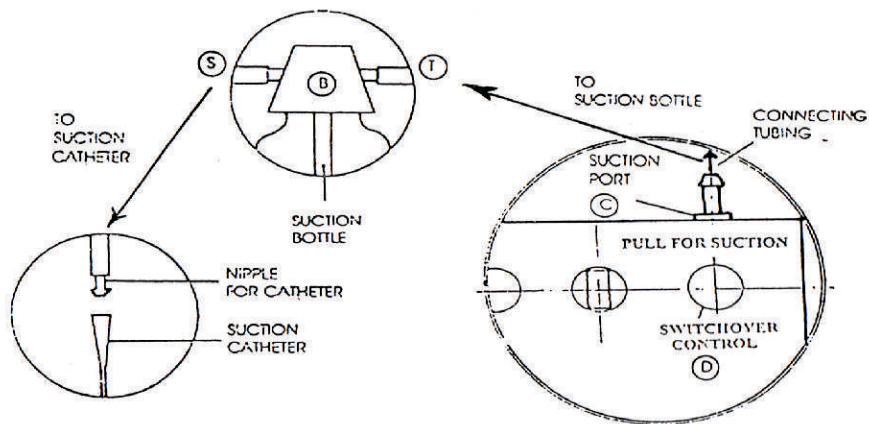


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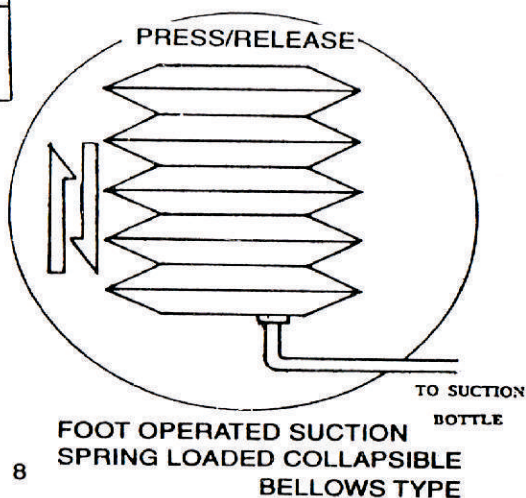
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(FIGURE 4)



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PNEUMATIC SUCTION:

HOW TO OPERATE :

Connect one end of the smaller suction tube (S) to the one end of the Suction Bottle (B) Marked 'Patient' and other end of the tube to the Suction Catheter. (Figure-7)

Connect one end of the bigger suction tube (T) to the other end of the Suction Bottle (B). The other end of the bigger suction tube (T) is permanently fixed to the ventilator at the 'Outlet for suction.' (Figure-7)

Remove Face Mask (F) from the patient's face. Switch 'ON' the Ventilator. (Figure-4)

Pull out the Switchover Control (D) and proceed for suction of secretions, mucus, blood etc. from the patient's mouth with the help of Suction Catheter provided alongwith the unit. (Figure-7)

When the Suction Operation is over, press the Switchover Control (D) back to its normal position. Suction is cut-off and Ventilator starts functioning automatically. (Figure-7)

Replace the Face Mask (F) on patient's face and fix it with the help of Harness. (H) (Figure-4)

Dismantle the Suction Collection Bottle and clean thoroughly after each use.

NOTE :

The Pneumatic Suction works on Oxygen Pressure, which is powered through the portable cylinder which is also the driving source of the Ventilator. As the Suction Module consumes considerable amount of driving gas, it is advisable to use it in short spells. Never use the Suction for longer duration than is absolutely necessary.

Process of using Foot Operated Suction is the same as Pneumatic Suction. Here, you have to connect the bigger tubing of Manual Suction in place of suction tubing coming from the Ventilator. Once this is done, simply press & release the spring loaded Bellows for obtaining Manual Suction.

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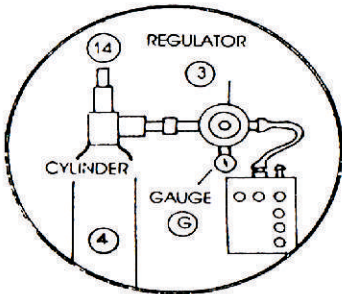
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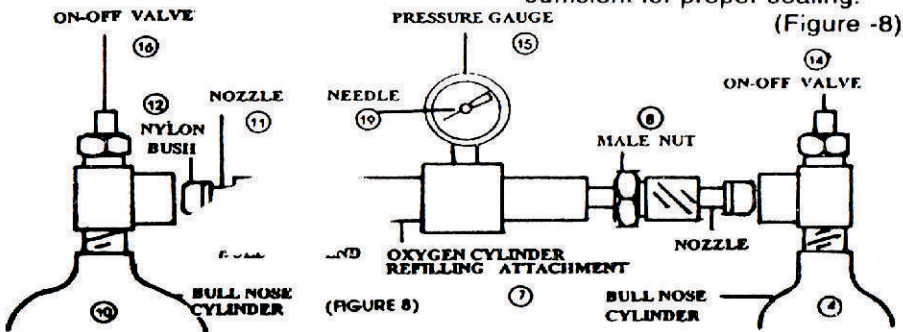
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REFILLING OF EMPTY CYLINDER :

- Unscrew Swivel Nut (1) from the Oxygen Regulator Outlet (2).
(Figure-5)
- Take out the Cylinder attached to Oxygen Regulator from the Carrying Case. (6) (Figure-1)
- Release the Cylinder (4) from the Oxygen Regulator (3) by unscrewing Male Adaptor of Bull Nose.
(Figure-5)
- Attach empty Cylinder (4) to one End of the Oxygen Cylinder Refilling Attachment (7) by tightening the Male Adaptor.
- Hold the Cylinder connected with the Oxygen Cylinder Refilling Attachment in your hand and connect the other Bull Nose End (9) of the Attachment to fully pressurised Bull Nose Type Bulk Cylinder (10). While doing this, one should remember that the Bull Nose End Nozzle (11) has been provided with a Nylon Bush (12) and thus, slight tightening of the Male Adaptor (13) is sufficient for proper sealing.
(Figure -8)



(FIGURE 5)



(FIGURE 8)

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REFILLING OF EMPTY CYLINDER

- Open 'ON-OFF' Valve (14) of the Small Cylinder (4). If the Cylinder is empty, the Pressure Gauge (15) will indicate 'ZERO' pressure. (Figure-8)
- Open 'ON-OFF' Valve (16) of the Bulk Cylinder (10). You will hear a 'Hissing Sound' as due to pressure difference of the two cylinders, gas starts flowing from the Bulk Cylinder to the empty small Cylinder. Needle (19) of the pressure Gauge (15) also starts rising. After a few seconds, the 'Hissing Sound' will stop and the Needle of the Pressure Gauge will also stabilise, which will indicate that the refilling has been completed. Gauge Pressure will now indicate gas pressure of the refilled small Cylinder. (Figure-8)

NOTE :

As refilling is done on the principle of Differential of Pressure, it is advisable to confirm before refilling that the Bulk Cylinder from which refilling is to be done is fully pressurised.

- Close 'ON-OFF' Valve (16) of the Bulk Cylinder (10).
- Close 'ON-OFF' Valve (14) of the Small Cylinder (4)
- Unscrew Bull Nose Male Adaptor (13) from the Bulk Cylinder (10) by holding the small Cylinder (4) in one hand.
- Take out the small cylinder attached to the Refilling Attachment (7) from the Bulk Cylinder (10).
- Release the small cylinder (4) from the Refilling Attachment. The small cylinder is now ready for use.
- Put the Cylinder attached to the Oxygen Regulator back in its position in the carrying case and put the camps back. (Figure-1)
- Connect Swivel Nut (1) to the Oxygen Regulator Outlet. (Figure-5).
- Open 'ON-OFF' Valve (14) of the Cylinder (4) for operating the Ventilator.

CAUTION :

'ON-OFF' Valve (14) of the Small Cylinder (4) should be opened first while refilling and never vice-versa. Similarly, after refilling is completed, 'ON-OFF' Valve (16) of Bulk Cylinder (10) should be closed first.

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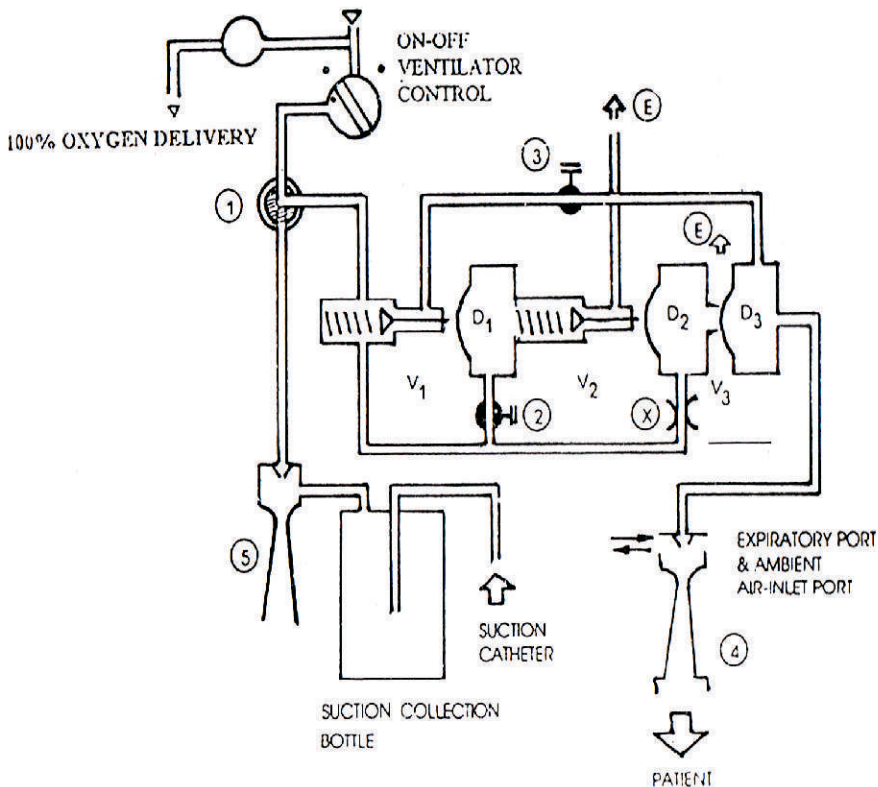


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CIRCUIT DIAGRAM

- SWITCHOVER CONTROL — (1)
- EXP. TIME CONTROL — (2)
- INSP. FLOW CONTROL — (3)
- INSPIRATORY VENTURI — (4)
- SUCTION VENTURI — (S)
- PRE-SET ORIFICE — (X)
- EXHAUST — (E)
- DIAPHRAGM : D₁, D₂ and D₃
- VALVE : V₁, V₂ and V₃

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CIRCUIT:

V_1, V_2 and V_3 are three Pneumatic Valves, actuated by Diaphragms D_1, D_2 & D_3 . The Valves V_1 and V_2 are 'Normally Closed' whereas the Valve V_3 is 'Normally Open'

When the Switchover Control is at downward position, the Driving Gas at 60PSI is directed to Valve V_1 ; Valve V_2 through Expiratory Time Control (2); and to the Valve V_3 through pre-set Orifice X.

HOW IT WORKS :

The gas passes very slowly through Orifice X and escapes to the atmosphere through Valve V_3 as it is normally open. But the gas can not escape through V_1 and V_2 as they are normally closed. As such, the gas flow regulated through Expiratory Time Control (2) slowly pressurises the Diaphragm D_1 and moves to the left. At one stage, it causes Valve V_1 to open, thereby directing the gas flow to pressurise Diaphragm D_3 and finally this gas flow is delivered to the patient through the Inspiratory Venturi (4). This is Inspiration. The Inspiratory Flow of gas is regulated by Inspiratory Flow Control (3) and gets diluted by entrainment of atmospheric air at the Expiratory-cum-Ambient Air Inlet Port of the Inspiratory Venturi (4).

During Inspiratory Phase, Diaphragm D_3 is pressurised which closes Valve V_3 . As a result Diaphragm D_2 is slowly pressurised by gas flow through Orifice X and this opens the Valve V_2 after some time. As soon as Valve V_2 opens, the pressure exerting on Diaphragm D_1 is released and Valve V_1 returns to its normally Closed Position. Thus Inspiration ends and Expiration begins. The process repeats automatically.

When the Switchover Control is pulled up for Suction, the gas at 60 PSI flows to the Suction Venturi (5). Thus, the ventilatory cycles of the Ventilator stop automatically. The jet of gas passing through the Suction Venturi (5) creates Negative Pressure/Vacuum in the Suction Collection Bottle. Thus, mucus, blood, secretions etc., are sucked in through the tubing and get collected in the suction Collection Bottle.

When the Switchover Control is pushed back to downward position, gas flow at 60 PSI is directed to the Ventilator which starts functioning automatically.

For Inhalation Therapy using 100% Oxygen, align the control marking to the corresponding graduation for obtaining the desired Litre Per Minute (LPM) flow of 100% Oxygen.

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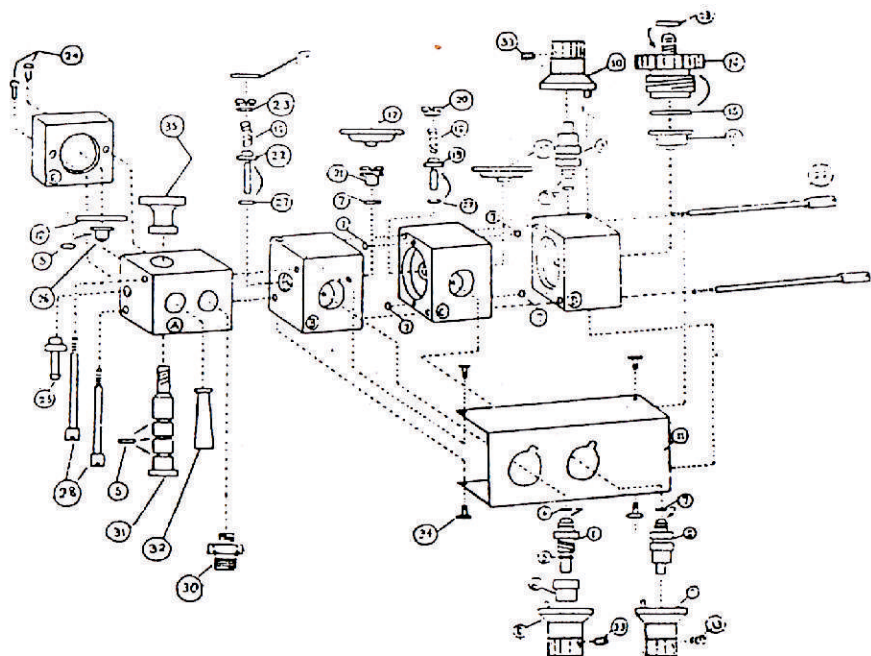


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AUTOMATIC RESUSCITATOR WITH SUCTION MODULE ASSEMBLY

- | | | | |
|-----|-----------------------------------|-----|--------------------------------------|
| A. | Suction Control Block | 16. | Inspiratory Time Valve Diaphragm |
| B. | Insp. Flow Control Module Block | 17. | Insp. Flow/Exp. Time Valve Diaphragm |
| C. | Exp. Time Control Module Block | 18. | Expiratory Time Plunger |
| D. | Insp. Time Control Module Block | 19. | Spring |
| E. | Sealing Plate | 20. | Exp. Time Module Check-Nut |
| 1. | Inspiratory Flow Needle Valve | 21. | Inspiratory Flow Module Check-Nut |
| 2. | Expiratory Time Needle Valve | 22. | Inspiratory Flow Plunger |
| 3. | Inspiratory Time Needle Valve | 23. | Inspiratory Flow Stopper |
| 4. | Rubber 'O' Ring (3 mm x 5.2 mm) | 24. | Screw 5/32 BSW |
| 5. | Rubber 'O' Ring (4.5 mm x 8 mm) | 25. | Suction Nipple- |
| 6. | Needle Valve Cap | 26. | Suction Jet |
| 7. | Rubber 'O' Ring (3.2 mm n 6.3 mm) | 27. | Rubber 'O' Ring (2 mm x 6 mm) |
| 8. | Inspiratory Flow Knob | 28. | Suction Block Stud |
| 9. | Expiratory Time Knob | 29. | Ventilator Stud |
| 10. | Inspiratory Time Knob | 30. | Inlet Adaptor Male |
| 11. | Ventilator Casing | 31. | Suction Venturi |
| 12. | Rubber 'O' Ring | 32. | Allen Screw (3/16" BSW) |
| 13. | Rubber 'O' Ring (5.2mm x 9 mm) | 33. | Ventilator Casing Screw (7 BA) |
| 14. | Inspiratory Time Cap | 34. | Suction Switch-Over Knob |
| 15. | Rubber 'O' Ring (17 mm x 21.5 mm) | | |

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SERVICE/MAINTENANCE MANUAL

1. All the Control valves (viz., Inspiratory Flow, Expiratory Time & Inspiratory Time Control) are the most delicate parts of the Resuscitator, and as such, extra care should be taken so that chances of damage to these Needle Valves due to mishandling could be minimised.
2. Do not exert pressure on the Control Knobs.
3. Always start the Ventilator after keeping the Control Knobs at normal settings. For obtaining this, align pointer marks of the knobs with the 'MEDIUM' Range Marks provided on the Ventilator. For any adjustment, rotate the knobs with a slight turn and observe the change before making further readjustments.
4. For operator's convenience, Outlet Pressure of the Oxygen Regulator has been Re-fixed at 60 PSI. Do not try to alter the setting as being a Pneumatically operated Ventilator, this would affect the Timings of the Ventilator.
5. Most of the attachments have been provided with Rubber 'O' Ring Seals and as such, do not require tightening with Spanner. Hand tightening is sufficient for sealing of these attachments, viz., Breathing Head Manifold, High Pressure Tubing with End fittings etc.
6. Do not run the Ventilator without the Breathing Head Manifold attached to it as this would result in a continuous Inspiratory Phase.
7. In case, normal Inspiratory Flow is not obtained even after keeping the Inspiratory Flow Control at maximum setting, then check if the Jet Hole is obstructed due to dust particle etc. Clean the Jet by inserting a fine wire, pin or needle into the hole.
8. When the suction is not in use, keep the Switchover Control at downward position to avoid wastage of gas.
9. Always clean the Suction Collection Bottle after use and keep it ready for the next operation:
10. While refilling of small Cylinder, use correct Spanner provided alongwith the unit for tightening the Male Adaptor of the Bull Nose End to the Bulk Cylinder. Since Bull Nose End Nozzle has been provided with a Nylon Bush, slight tightening of the Male Adaptor is sufficient for proper sealing.
11. Pin-Index Ends of the Oxygen Refilling Attachment are provided with Nylon Washers for leak proof operation. Leakage of gas should not occur if respective Male Adaptors are tightened properly.
12. As refilling is done on the principle of Pressure Differential, one can not obtain a gas pressure in the refilled cylinder more than the gas pressure of the Bulk Cylinder from which it has been refilled. As such, it is advisable to confirm before refilling that the Bulk Cylinder from which refilling is to be done is fully pressurised.

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Date of Installation	Installed By
Model No.	Serial No.
Warranty Period	
Name of Doctor & Address :	

Customer Sign. With Stamps

**Marketed By: Western Surgical
Sign. With Stamps**

No Claim Warranty :

1) Any Defect Throughtout Power Supply

2) Any Physical Damage

3) Under Warranty Standby Unit Not Provide

4) Under Warranty When Company Send Parts or Machine we Imidiat send to Buyer.

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- * Carrying Warranty at Rajkot only on site warranty not provided free of cost.
- * Due to constant upgradation design, price and features are subject to change any time without prior notice.

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