

# Australian Standards on Demand Valves

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## **Sections of the Standard 'Australian Standard 2488-1995 Resuscitators' Intended for Use with Humans AS 2488-1995**

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**Note:** Not all clauses are outlined only those that are topical and of interest, clauses such as definitions, scope, references etc, are not included.

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| Clause   | Outline/Key Points   | Comment/Discussion   |
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| <b>5 Connectors</b><br><b>5.1 Patient Connectors</b> | <p>The patient connection ports of a resuscitator shall have a 15mm female fitting and a 22mm male fitting.</p> <p>These fittings must comply with AS 2496 Breathing Attachments for anaesthetic purposes for human use.</p>                       | <p>This is so that an Endotracheal Tube or similar invasive type of airway support will connect to the 15mm female as well as face masks will connect to the 22mm male fitting.</p>  |
| <b>6.2 Dismantling and Reassembly of Valves</b>      | <p>This clause states that the device should be easily reassembled in the correct order so it will work properly.</p> <p>It should not be able to be assembled incorrectly. A diagram should be provided stating number and order of assembly.</p> | <p>This is to prevent incorrect performance</p> <p>It is also important to note that valves should not be disassembled by untrained people.</p>  |
| <b>6.6 Bag Refill Valves</b>                         | <p>Bag Refill Valves shall not have a provision for manual operation.</p>  | <p>This is to prevent a situation where the button or lever on a demand valve being used as a bag refill valve is accidentally activated and the gas flows through the valve into a Bag Valve Mask and into the patient.</p> |
| <b>8.1.1.2 Gas Powered Resuscitators</b>             | <p>An oxygen concentration of at least 85% oxygen must be delivered.</p>   |  |
| <b>8.3 Expiratory Resistance</b>                     | <p>The clause states a resistance of no more than 5cmH<sub>2</sub>O is allowed.</p>  | <p>Each and every single unit that leaves our workshop is tested for this.</p>   |
| <b>8.4 Inspiratory Resistance</b>                    | <p>The pressure shall not be below - 5cmH<sub>2</sub>O.</p>  | <p>Each and every single unit that leaves our workshop is tested for this.</p>   |
| <b>8.7 Apparatus Dead Space</b>                      | <p>The device when tested according to the correct method shall not have a dead space of more than 5ml plus 10% of the tidal volume specified for the class of the resuscitator</p>  | <p>The importance of this clause to the user is that if a resuscitator is altered via long extension tubes etc. It may be rendered as non compliant to the standard.</p>   |

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| <b>8.8.1</b> Tidal Volume             | <p>When intended for use with children and infants resuscitators shall be grouped according to body weight based on 15ml per Kilogram.</p> <p>All devices that deliver a tidal volume of 600ml and over shall be for adults</p>                                      | <p>This makes it almost impossible to say a demand valve is compliant for a child.</p> <p>Because young lungs very are fragile we will not recommend a demand valve for them.</p> <p>We generally advise a manually powered child BVM be carried in all resuscitators.</p> <p>All demand valves with child settings should probably be removed from service unless they are specifically designed for infants and children alone and are volume sensitive and not only flow adjustments.</p> |
| <b>8.9</b> Gas-Powered Resuscitators  | <p>This clause states that the airway pressure shall not exceed 60cmH20.</p>   | <p>All units leaving our facility are individually checked for this performance.</p>   |
| <b>8.9.1</b> Pressure-Limiting System | <p>And an audible or physical warning should occur when the pressure-limiting device activates.</p>  | <p>It is one of the tests that must be carried out on a frequent basis and recorded.</p>   |
| <b>8.9.2</b> Inspiratory Flow         | <p>Shall be capable of delivering a flow in the range of 40L/min to 60L/min against a backpressure of 2kPa when the device is activated by a trigger or button.</p> <p>Plus they must be able to provide at least 100L/min if the patient breaths spontaneously.</p> | <p>This is another test that should be done frequently.</p> <p>Unfortunately it requires specialised equipment.</p> <p>See our document on Respical Calibration Analyser for more information.</p>   |

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|   | <p>The demand valve on the right is a Robert Shaw head which flows up to 160L/min on trigger activation. This does not meet the standard and should be replaced.</p> <p>Some units are restricted to 40 L/min and as such do not meet the "on demand" element of the standard.</p> <p>The other unit is an MTV (image not shown), this meets the standard and has multiple safety features above the standard requirements.</p> <p>It flows at 40L/min on trigger/button activation.</p> <p>It supplies 100+L/min on patient demand.</p> |   |
| <p><b>8.10</b> Demand Valves</p> <p><b>8.10.1</b> Pressure for Initiation</p> | <p>The maximum negative pressure required to initiate a gas flow shall be no more than -2cmH2O.</p>  | <p>This is another test that should be done frequently.</p> <p>Every unit leaving our facility is tested for this.</p> <p>The reason for this performance requirement is to ensure a patient does not have to struggle to initiate flow if they have weak inspiratory strength.</p> <p>Example: they do not have to suck to hard!</p> |
| <p><b>8.10.2</b> Peak Inspiratory Flow</p>                                    | <p>Minimum peak inspiratory flow when demanded by the patient, not by the operator shall be at least 100L/min when a negative pressure of -8cmH2O is applied.</p>  | <p>This another test that should be done frequently.</p> <p>Every unit leaving our facility is tested for this.</p> <p>This standard exists to ensure a patient can get the flow they require without finding resistance at the peak portion of the inspiratory wave.</p>   |
|   | <p>The control system on the left is designed to limit the flow for children on trigger activation.</p> <p>However, not only does it not allow at least 100L/min in demand, it does not limit the tidal volume to that which is specified for children.</p>  | <p>These type of controls are used on Robert Shaw heads in some older resuscitators and as such do not comply.</p>  |

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| <b>8.10.3</b><br>Termination<br>Pressure | The demand valve shall stop flow when the sensing device is at ambient atmospheric pressure. | This is to prevent a slow constant flow.<br><br>This another test that should be done frequently.<br><br>Every unit leaving our facility is tested for this. |

If you have any questions please do not hesitate to give us a call or drop us an email via our contacts us page.