



Client	Vandagraph	
Project	Oxygen Analyser	www.smallfry.com

## VANDAGRAPH - Oxygen Analyser Prototype

Work Programme	Smallfry Design Budget	Estimated Man days
<b>Oxygen Analyser</b> - SLA Rapid prototype - Finishing and assembly - Tool for prototype seals - Seals  <b>&gt; Review Meeting</b>	x1 off £685 x2 off £880 £200 3 @ £12 each	1-2 weeks
	<b>Total for 1</b> <b>Prototype = £921</b> <b>Total for 2</b> <b>Prototype = £1152</b>	

## Notes

Project time scales are estimated in good faith dependent on convening the appropriate meetings and prompt decision making. If the project demands, the time scales shown can often be shortened by increasing the resources used.

This work will be subject to our current Terms of Business (January 2003) a copy of which is attached. All fees are subject to VAT at the current rate. Payment shall be made within 30 days of the date of each invoice.



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### Background

Vandagraph have developed a new, easy-to-use and accurate Oxygen Analyser to replace their VN202 model. The New Model can be offered directly up to the end of the diving cylinder's outlet valve, as opposed to being attached to it via a DIN kit, as with the VN202. This makes the whole process far quicker but without losing accuracy. Also Vandagraph would like to wall mount the Analyser, so that it can test multiple cylinders.

When testing multiple cylinders the analyser will need to be wall mounted in some way.

The unit will be used in wet and salty conditions that are associated with driving. As such it will want to be water resistant.

All components are "off the shelf" to reduce costs and has a target retail price of \$99 in the US, £99.50 in the UK. The new Analyser exists as a working prototype and a CAD image.

### Objective

Take the design in its existing form and developed 3D CAD data for production tooling.

Work Programme	Smallfry Design Budget	Estimated Man days	Target Completion Date
<b>Oxygen Analyser</b> - Design Evaluation - Source component details - Design Development - 3D CAD files  > Review	£10,000	20 man days	

We would recommend that a rapid prototype is produce to fully evaluate the new design before sending CAD data for tooling and that is should be budgeted for. We estimate that this will cost about £500/£800

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## Oxygen Analyser Time Schedule

Work Programme	Smallfry Design Budget	Estimated Stage Duration
<b>Stage 1 : Set Up &amp; Produce 1<sup>st</sup> off CAD</b> <b>Project Set Up</b> Design Evaluation 3D model components <b>Produce 1<sup>st</sup> off CAD</b> - External form. - Component layout > Vandagraph CAD review (possibly via email / web meeting) <b>Deliver</b> – Cad visuals of Analyser showing External form and component layout.	£3,500	2 weeks
<b>Stage 2 : Design Detail for manufacture</b> - Implement feed back from review - Design detail plastic components for manufacture - Address sealing, battery access and wall mounting issues - Component mounting. - Review of CAD data. Note: This would be an ideal time to arrange for a rapid prototype for full evaluation of the CAD data. <b>Deliver</b> – Final CAD design for approval.	£6,500	4 weeks
<b>Total budget</b>	<b>£ 10,000</b> plus on-going design support as required	

### We also offer on-going Design Support

- Prototype assessment
- On-going design troubleshooting
- Arrange for tooling and unit cost quotations.

Project time scales are estimated in good faith dependent on the timely receipt of information, convening the appropriate meeting and prompt decision making.

Smallfry can commence work on receipt of a purchase order, or written confirmation of intent to proceed, for the first stage.

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## VANDAGRAPH – Oxygen Analyser CAD modification and Prototype

Work Programme	Smallfry Design Budget	Estimated Stage Duration
<b>CAD Design modifications</b> <ul style="list-style-type: none"> <li>- Add more clearance around PCB</li> <li>- Extend body by 10mm</li> <li>- Remove valve in base</li> <li>- Make room for nut on sensor connection jack.</li> </ul>	1,250	1 week
<b>Oxygen Analyser Prototype</b> <ul style="list-style-type: none"> <li>- SLA Rapid prototype</li> <li>- Finishing and assembly</li> <li>- Tool for prototype seals</li> <li>- Seals</li> </ul>	£890	1-2 weeks
<b>Oxygen Analyser Prototype (optional)</b> <ul style="list-style-type: none"> <li>- Finishing, priming and spraying. colour and finish TBC</li> </ul>	£500	

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