



HPLC Hardware

an eLearning course

About the Instructor



Dr. Gerard Sharp has more than 25 years experience in chromatography. This experience has ranged from the stringent requirements of working in a key forensic drug lab (Melbourne) to the production stresses associated with a high sample throughput environmental lab (as Chief Chemist). Gerard spent 15 months in a major government research lab in Japan developing methods for low level sampling of halomethanes for analysis by bench top and high resolution GC-MS. Other experience includes roles as a senior analyst for a leading paint company and a multinational chemical manufacturer. More recently he has been employed as the Global Technical Manager for a major GC consumables supplier so understands manufacture and specification of supplies and how this relates to performance. Gerard has carried out technical training throughout Australia, Europe, the USA and Asia and appreciates language and cultural barriers to learning. Gerard has a B.Sc (Hons) in synthetic organic chemistry from Monash University and a PhD in Analytical Chemistry from the University of New South Wales, Australia.

Ardent Scientific Pty Ltd makes no representations or warranties of any kind, express or implied as regard to the material in this document; including but not limited to the implied warranties of merchantability and fitness for a particular purpose, except as otherwise provided under applicable laws.

Neither Ardent Scientific Pty Ltd, nor its affiliates, directors, officers, employees, agents, contractors, successors or assigns will be liable for any damages whatsoever arising out of, or in any way related to, the use of information from this document. This limitation applies to direct, indirect, consequential, special, punitive or other damages you or others may suffer, as well as damages for loss of profits, business interruption or the loss of data or information.

This document and its contents are provided to you on "as is" basis, the document may contain errors, faults and inaccuracies and may not be complete and current. Ardent Scientific shall not be liable for errors contained herein or for incidental, or consequential damages in connection with the furnishing, performance, or use of this material.

The information contained in this document is subject to change without notice.

This training manual site and its contents are subject to copyright. The material copyright is owned by Ardent Scientific Pty Ltd, or in the case of some material, a third party.

No part of this document may be reproduced, modified, translated or distributed without the prior written consent of Ardent Scientific.

This document includes registered trademarks, and other trademarks that are otherwise protected by law. Except as expressly authorized, the use or misuse of any of these trademarks is strictly prohibited.

Included Trademarks and Registered Trademarks are Trademarks of their respective owners.

© 2011 by Ardent Scientific Pty Ltd

www.ardentscientific.com.au

All rights reserved

Table Of Contents

ABOUT THE AUTHOR	ERROR! BOOKMARK NOT DEFINED.
INTRODUCTION TO HARDWARE.....	1
WHAT YOU WILL LEARN.....	2
FROM LOW PRESSURE TO HIGH PERFORMANCE.....	3
THE DEGASSER	4
THE PUMP	5
THE AUTOSAMPLER	6
THE COLUMN COMPARTMENT	7
THE DETECTOR	8
STACKING ORDER OF THE MODULES	9
LEARNING ACTIVITY	10
SUMMARY.....	11
DEGASSER.....	13
WHAT YOU WILL LEARN.....	14
VACUUM DEGASSING	15
MEASURING THE VACUUM CHAMBER PRESSURE.....	16
ROLE OF THE VACUUM PUMP.....	17
CONTINUOUS OPERATION	18
LEARNING ACTIVITY I	19
LEARNING ACTIVITY II.....	20
SUMMARY.....	21
PUMP.....	23
WHAT YOU WILL LEARN.....	24
SINGLE PISTON PUMP.....	25
THE CHECK VALVE.....	26
PUMP AND CHECK VALVES	27
DUAL PISTON PUMP	28
DUAL PISTONS IN SERIES	29
THE PURGE VALVE	30
CHANGING FLOW RATE	31
QUATERNARY VALVES	32
MAKING A QUATERNARY PUMP.....	33
BINARY PUMP	34
BINARY PUMP – SOLVENT PROPORTIONING.....	35
LEARNING ACTIVITY I	36
LEARNING ACTIVITY II.....	37
SUMMARY	38
AUTOSAMPLER	39
WHAT YOU WILL LEARN.....	40
SAMPLING VALVE.....	41
THE AUTOSAMPLER	42
ROTOR SEAL	43
LEARNING ACTIVITY I	44
LEARNING ACTIVITY II.....	45
SUMMARY	46
DETECTOR.....	47
WHAT YOU WILL LEARN.....	48
VARIABLE UV DETECTOR	49
SAMPLE DETECTION	50
FLOW CELL.....	51

QUANTITATION	52
DIODE ARRAY DETECTOR.....	53
LEARNING ACTIVITY I	54
LEARNING ACTIVITY II.....	55
SUMMARY.....	56