CLS Vacuum Leak Detector Specification

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REVISION HISTORY

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A	23 December 1999	Draft	John Swirsky
B	10 February 2000		Dimo Yosifov
0	2001-04-18	General Revisions – Issued for use.	Dimo Yosifov

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1. INTRODUCTION

1.1 Purpose

A vacuum leak detector is required for testing and troubleshooting of in house manufactured and purchased vacuum components.

1.2 Scope

This document specifies the requirements of vacuum leak detectors for use in the Canadian Light Source facility.

1.3 Background

The Canadian Light Source, CLS, is a national facility in the initial phase of construction on the University of Saskatchewan campus in Saskatoon, Saskatchewan. This facility is a 3rd generation synchrotron light source, which will produce a high intensity source of infrared, visible, ultraviolet and x-ray radiation.

This facility contains systems operating in the high to ultra high vacuum regions. To test and maintain these systems helium leak detectors are required.

2. REQUIREMENTS

2.1 Functional Requirements

2.1.1 The unit shall be able to operate in both evacuation and sniffer modes.

2.1.2 The high vacuum and roughing equipment of the leak detector shall be “hydrocarbon free” to be able to perform without contaminating the working environment as well as the part/system it is testing.

2.1.3 The unit shall be portable to troubleshoot any components located in the Linac To Booster transfer line (LTB1), Booster Ring (BR1), Booster to Storage transfer line (BTS1), Storage Ring (SR1) and beam lines.

2.1.4 The unit should be operator friendly.

2.1.5 The unit should be low maintenance, thus reducing any possible downtime.

2.1.6 The unit must have a reasonable response time.

2.2 Performance Requirements

2.2.1 The pump-down time to ready-for-test shall be less than 25 minutes for test volumes of 100L or less.

2.2.2 The unit shall have a minimum detectable leak rate (MDL) of 2.0×10^{-8} Pa l/s. or better, unless otherwise specified.

2.2.3 The unit shall be portable and able to plug into 120V/60Hz standard North American wall sockets.

2.2.4 The unit shall be able to interface with a computer (via RS232) or other peripherals.

2.2.5 Background Zeroing: unit shall be capable of separating (zeroing) background helium signal, allowing vacuum mode testing to continue with multiple possible leak sites.

2.2.6 Rugged Construction: The unit should be able to be moved while running and withstand drop test at one end of instrument of 4-6 inches.

2.2.7 The cart frame (optional) shall be on casters and fitted with handles, allowing transport of leak detector system to the desired location. Caster wheels shall be air filled rubber tires with a diameter of at least 75mm diameter.