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Topic:

Approved Vendor Vacuum Components for Procurement:
Ion Pumps, Ion Gauges, Wide Range Gauges, Right angle valves

Preview:

The equipment used in the SSRL vacuum systems to monitor UHV vacuum pressure and to maintain clean UHV pumping have undergone many changes and improvements over the past several years. This memo attempts to detail the ion pumps and ion gauges currently in use at SSRL that have proven to be extremely reliable and have become the proposed “standard” for use in future applications. Equipment standardization will help mitigate spares inventories and expedite procurement and design time.

The components listed below can be ordered for new Accelerator Systems (SPEAR3 and Insertion Devices), SSRL Beam Lines, and also for replacement of antiquated or obsolete equipment.

The following details the recommended vendors and includes some specific ordering information for ion pumps, ion pump feed throughs and cables, ion pump controllers, ion gauge tubes, ion gauge cables, and ion gauge controllers. Of course, applications other than these proposed “standard” applications that we currently have at SSRL will be (and should be) reviewed.

Ion Pumps:

Gamma Vacuum (formerly Physical Electronics ion pump division) and Varian are the vendors of choice for the ion pumps. The ion pumps can be ordered either in the noble diode (differential-ion), diode, or a triode configuration. However, the Lab will be converting to the noble-diode configuration ion pumps wherever possible and as such, all ion pumps for new systems should be ordered in the noble-diode configuration. NOTE: Ion pumps of the same configuration and vendor should be matched to the system wherever possible).

Both Varian and Gamma Vacuum have a complete line of ion pumps that can perform satisfactorily for the SSRL Beam Lines and Accelerator Systems. The geometry of the pump body or the availability of a specific pump could be the deciding factor in choosing one vendor over the other.

Ion Pump Feedthru and cables:

Gamma Vacuum standard 10KV SHV ion pump feedthru welded onto a 1.33” conflat flange is now the SSRL standard. The part number for the feed thru itself is **220005** at a cost of \$203. The feedthru comes standard with the pump at no additional cost. The assembly configuration of the feedthru that is installed on the ion pump includes two male to female SST standoffs (P/N 100550) This allows for changing a feedthru in situ without removing the ion pump. An example of an ion pump part number with the replaceable feedthru is **100L-30-6S-KGR-N-N**. The designation KGR indicates the Kings type replaceable feedthru.

The local ion pump cables used will be fabricated at SSRL using RG400 cable that is bakeable to 200’c. The installation cable will be the long line cable connected directly to the ion pump.



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Ion Pump Power Supply:

Vendor Gamma Vacuum provides the Multiple Pump Control (MPC) power supply which can power either a Gamma Vacuum or Varian style ion pump, and can be configured in negative or positive polarity.

The MPC supply (2 types) has been selected for several reasons:

- Able to operate both Varian and Physical Electronics ion pumps
- Output polarity selectable: +/- (internal solder connections on the HV polarity board)
- Output voltage selectable: +/-5600Vdc to +/-7000Vdc (internal spade lug jumper)
- Short circuit: 1000W, 500mA
- Analog output, 0-10V standard
- Computer RS232/422/485 serial interface standard
- Weight: MPC single = 37 lbs.; MPC double = 57 lbs.
- Dimensions (ready for rack mount): 5.25" x 18.75" x 19"
- Input power: MPC single = 115Vac; MPC double = 115Vac or 220Vac
- 5% Government/Educational discount available

The power supply polarity must be determined prior to ordering, and should be made obvious in the purchase requisition (add an additional description note). Power supplies ordered with the negative polarity configuration will be labeled on the front and back panel.

Ordering Information: Gamma Vacuum (800-237-3603)

Multiple Pump Control (MPC), single output (single display):

Output voltage configured for Positive (or Negative) polarity (NOTE: specify polarity on req)

Input voltage 115 Vac

Digitel MPC with 1 large HV module,

Order #MPC/1/US110/232/N/N/500/(NEG - OR - POS)/7KV/K2

Approximate SSRL cost = \$2,786

Multiple Pump Control (MPC), independently operable double output (double display):

Output voltage configured for Positive (or Negative) polarity (NOTE: specify polarity on req)

Input voltage configured for 115 Vac

Digitel MPC with 2 large HV modules,

Order # MPC/2/US110/232/N/N/500/(NEG - OR - POS)/7KV/K2/500/(NEG - OR - POS)/7KV/K2

Approximate SSRL cost = \$4,676

Ionization Gauge Controller, Gauge Tube, and Cable:

Brooks Automation (formerly Helix Technology and Granville Phillips Corp.) is the vendor for the ion gauge controller, ion gauge tube, and ion gauge cable.

Ion Gauge Controller: **Model #330020, configured per the SLAC standard (does not have degas capability)**, at an approximate cost of \$1,740. Controller accessories provide for a single rack or double rack-mounting configuration. A single rack mounting kit (center or offset) can also be ordered. The dual rack mounting kit accessory is fabricated at SLAC (contact Tom Neal in the SSRL Vacuum Group for details).

Ion Gauge Tube: Series 274 Bayard Alpert type nude UHV ion gauge **Model #274041** (tungsten filaments). The ionization gauge tube and cable have locking connectors to ensure a positive, long-lasting connection.



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Ion Gauge Tube Cable: Specified for the Series 274 ion gauge tube is **Model #307046CE**, 10ft. long, and bakeable to 150°C.

Note: If needed to adapt to the SLAC modified gauge controller, the cable can be modified per dwg CA 444-805-70 CO.

Wide Range Gauges and Controllers

There are two types of wide range gauges and controller used throughout the beam lines and accelerators. The LN₂ cooled monochromators use the Granville Phillips product line of Brooks Automation.

Controller---Series 375 Convectron Gauge Controller, Brooks **P/N 375001-0-A-7**

Gauge Tube-Wide Range Convectron Gauge, NW16KF Flange **P/N 275203**

Gauge Tube-Wide Range Convectron Gauge, 2.75" CC Flange **P/N 275238**

Cable P/N 375012-length

The Argon interspaces, SPEAR and Leak Detectors use the Teledyne Hastings Wide Range Gauges and controllers.

Controller---Digital Wide Range Controller with dual relays **P/N HPM-2002-01-00-03**

Gauge Tube-Gauge Tube Sensor mounted on mini CC Flange **P/N HPM-2002-S-3**

Cable P/N CB-2002D99-length.

Right Angle Valves:

Right Angle Valves: Right angle all-metal valves can be purchased from Varian.

Varian right angle **valves (Model #951-5027)** have been used successfully for over 30 years at SLAC and SSRL, and have a very reliable track record for use on UHV systems.

R7-March, 23,2007
R6-August 1, 2006
R5-June 9, 2006
R4-March 28, 2006
R3-February 2, 2005
R2-July 21, 2004
R1-January 23, 2002
Proposed-May 8, 2001