Title: SPECIFICATION FOR SMALL VACUUM VALVES

SPECIFICATION FOR

SMALL VACUUM VALVES

FOR

LIGO VACUUM EQUIPMENT

Hanford, Washington and Livingston, Louisiana

PREPARED 1	BY:	I brown	Sten	
PROCESS EN	NGINEER:	Roberto To	nom.	
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TECHNICAL	DIRECTOR:	D. O. MIW	<u>colesin</u>	
PROJECT M	ANAGER:	Buld	Boylo	
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SPECIFICATION TABLE OF CONTENTS

- 1.0 Scope
- 2.0 Schedule
- 3.0 Design Requirements
- 4.0 Required Documentation
- 5.0 Shop Testing
- 6.0 Inspection

1.0 SCOPE

This specification covers the minimum requirements for the design, materials, fabrication, assembly, inspection, testing, preparation for shipping, shipment and delivery of small (1 1/2" and 2 1/2") high vacuum and ultra high vacuum angle valves for the LIGO vacuum system.

The specified equipment is for use as part of the Vacuum Equipment supplied for the Laser Interferometer Gravitational-Wave Observatory (LIGO). LIGO, which is operated by Caltech and MIT under an NSF grant, includes two sites (Hanford Reservation, near Richland, WA and Livingston, LA). Each site contains laser interferometers in an L shape with 4 km arms, a vacuum system for the sensitive interferometer components and optical beams, and other support facilities.

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SPECIFICATION

Number A

V049-2-059

Rev.

Page _______ of ______

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2.1 Equipment delivery shall be as follows:

	Quantity	<u>Date</u>	PSI Part No.
1 1/2" High Vac	137	9/30/96	V049AVHV15
2 1/2" High Vac	70	9/30/96	V049AVHV25
1 1/2" Ultra High Vac	7 7	9/30/96	V049AVUV15
2 1/2" Ultra High Vac	26	9/30/96	V049AVUV25

- 2.2 All valves shall be delivered to Process Systems International, Inc. at 20 Walkup Drive, Westboro, Massachusetts, 01581.
- 2.3 Acceptances at the sites are expected to occur on a staggered basis, with final acceptance at Washington expected to occur about May 31, 1998, and about November 30, 1998 in Louisiana.

3.0 DESIGN REQUIREMENTS

- 3.1 Angle valves shall be 304L or 316L stainless steel (304 or 316 stainless steel is acceptable if the valves are unavailable in L grade SS).
- 3.2 End connections shall be CF flanges.
- 3.3 The valves shall have stainless steel metal bellows stem feedthroughs.
- 3.4 Neither the body leakage not the seat leakage shall exceed 1 x 10⁻⁹ torr liters/sec of helium.
- 3.5 The valves shall be designed to seal in both directions.
- 3.6 The internal valve mechanisms shall be non-lubricated.
- 3.7 Valves shall be manually actuated by a handwheel.
- 3.8 Valves shall be bakeable to 150 C +/-20 C (170 C maximum).
- 3.9 The valves shall be cleaned in accordance with the Vendor's standard procedures applicable to the valve service.

SPECIFICATION

Number

Rev.

Page _____ of ___

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4.0 REQUIRED DOCUMENTATION

Engineering drawings shall be submitted for approval prior to fabrication. Manufacturer's standard QA reports shall be provided prior to shipment:

5.0 SHOP TESTING

Each valve shall be tested for leakage (using oil-free pumping equipment and leak detector) prior to shipment from the manufacturer

6.0 INSPECTION

The Vendor's standard inspections shall be performed. Also, each valve shall be inspected for cleanliness by black light prior to shipment. Valves shall be recleaned if any contamination is found.

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SPECIFICATION

Number

Rev.

V049-2-059 of 4

Title: FABRICATED CLASS 100 VACUUM AND AIR PIPING- WASHINGTON SITE

ATTACHMENT "D"

TO

V049-2-178

SPECIFICATION FOR SMALL VACUUM VALVES

V049-2-059

ATTACHMENT

Number:

V049-2-178

Rev.

Page __ of __

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SPECIFICATION FOR

SMALL VACUUM VALVES

FOR

LIGO VACUUM EQUIPMENT

Hanford, Washington and Livingston, Louisiana

PR	EPARED BY:		Thomas Mr.	Stan	
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SPECIFICATION

Number A

V049-2-059

Rev.

Page __ 2 of _4_

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2.1 Equipment delivery shall be as follows:

	<u>Quantity</u>	<u>Date</u>	PSI Part No.
1 1/2" High Vac	137	9/30/96	V049AVHV15
2 1/2" High Vac	70	9/30/96	V049AVHV25
I 1/2" Ultra High Vac	77	9/30/96	V049AVUV15
2 1/2" Ultra High Vac	26	9/30/96	V049AVUV25

- All valves shall be delivered to Process Systems International, Inc. at 20 Walkup Drive, 2.2 Westboro, Massachusetts, 01581.
- Acceptances at the sites are expected to occur on a staggered basis, with final acceptance 2.3 at Washington expected to occur about May 31, 1998, and about November 30, 1998 in Louisiana.

3.0 DESIGN REQUIREMENTS

- 3.1 Angle valves shall be 304L or 316L stainless steel (304 or 316 stainless steel is acceptable if the valves are unavailable in L grade SS).
- 3.2 End connections shall be CF flanges.
- 3.3 The valves shall have stainless steel metal bellows stem feedthroughs.
- Neither the body leakage not the seat leakage shall exceed 1 x 10⁻⁹ torr liters/sec of 3.4 helium.
- 3.5 The valves shall be designed to seal in both directions.
- 3.6 The internal valve mechanisms shall be non-hibricated.
- Valves shall be manually actuated by a handwheel. 3.7
- 3.8 Valves shall be bakeable to 150 C +/-20 C (170 C maximum).
- 3.9 The valves shall be cleaned in accordance with the Vendor's standard procedures applicable to the valve service.

SPECIFICATION

Number

Rev.

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REQUIRED DOCUMENTATION

Engineering drawings shall be submitted for approval prior to fabrication. Manufacturer's standard QA reports shall be provided prior to shipment:

SHOP TESTING 5.0

Each valve shall be tested for leakage (using oil-free pumping equipment and leak detector) prior to shipment from the manufacturer

6.0 INSPECTION

The Vendor's standard inspections shall be performed. Also, each valve shall be inspected for cleanliness by black light prior to shipment. Valves shall be recleaned if any contamination is found.

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SPECIFICATION

Number

V049-2-059

Rev.

Page __ 2 of _4

2.0 SCHEDULE

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2 1/2" High Vac	70	9/30/96	V049AVHV25
1 1/2" Ultra High Vac	77	9/30/96	V049AVUV15
2 1/2" Ultra High Vac	26	9/30/96	V049AVUV25

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Number

Rev.

Page _____ of ____

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SPECIFICATION

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SPECIFICATION

Number

Rev.