

Newport BV-100D
Beam Valve Driver



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MODEL BV-100
PULSED MOLECULAR BEAM VALVE
INSTRUCTION MANUAL
FOR
BV-100V VALVE
AND
BV-100D DRIVER

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8410

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1.0 INTRODUCTION

The BV-100 Pulsed Molecular Beam Valve is a device for producing short duration, high speed gas pulses. The BV-100 System consists for the BV-100V Valve, BV-100D Driver, and an assortment of accessories and fittings for enhancing the useability and performance of the BV-100V Valve. (See Figure 1 - BV-100 Pulsed Molecular Beam Valve and Accessories.)

In most applications, the BV-100 is used to inject pulses of gaseous material under pressure into a vacuum chamber where the material is studied in an isolated state or mixed with other species. In spectroscopy, the BV-100 generates pulses at supersonic velocities producing molecular beams cooled to as low as 3K, thereby reducing hot band absorption and allowing increased spectral resolution. In studies of molecular collision dynamics, multiple beams are generated to study physical or chemical interaction among different molecules.

2.0 DESCRIPTION

The BV-100 consists of two subassemblies: the BV-100V Valve and the BV-100D Valve Driver. The two are interconnected with an 8 foot cable which can be disconnected at the valve.

2.1 BV-100V VALVE DESCRIPTION

The BV-100V consists of a dual electro-magnetic coil actuator assembly housed in a 1-1/4 inch diameter stainless steel cylinder. The housing is flanged at one end to carry gas inlet ports and electrical feedthru connections. Mounted at the other end is the removable end plate which contains the valve orifice.

The valve is designed to be mounted on a vacuum chamber with the orifice end protruding through a common feedthru fitting (e.g. Cajon Company Ultra-Torr) or one of Newport's BV-F Series feedthru fitting accessories.

The beam valve is divided into two chambers separated by a bellow diaphragm. (See Figure 2 - BV-100V Valve.) The sample gas chamber carries the gas to be metered by the valve. All materials exposed to the sample gas are corrosion resistant (Viton, Teflon, Stainless Steel, Nickel). The backing gas chamber carries an inert gas at a pressure necessary to balance the differential pressure across the bellows diaphragm.

The actuator assembly drives a polymer seal tip against the orifice to close the valve. Actuator stroke can be controlled from the BV-100D Driver up to its maximum of .015 inches.

The valve is preset at the factory such that with no holding current applied and zero differential pressure across the bellows, the closing force will be zero. With the driver current on in standby, the valve is closed. However, differential pressure of approximately 3psi will open the valve.

2.2 BV-100D DRIVER DESCRIPTION

The BV-100D Driver is an AC linepowered controller which provides proper current level and pulse timing sequence to the two actuator coils in the beam valve.

The driver enclosure is furnished with hardware for rack mounting or it can be used on a bench as it is supplied with rubber feet.

The driver contains an internal pulse rate generator, a trigger delay generator, and timers for coil current pulsewidth and timing control. Front panel controls provide adjustability of pulse rate, pulse delay, pulse intensity and duration.

See Drawing - Block Diagram - BV-100D Molecular Beam Valve in Section 5.1 of Appendix.

2.3 BV-100 ACCESSORIES

BVP Series Endplates

Stainless steel end plates with different orifice diameters and exit face configurations are available as accessories. Unless otherwise specified, the standard end plate, BVP-0.5, is furnished with all valves.

<u>End Plate Model No.</u>	<u>Exit Face Configuration</u>	<u>Orifice Diameter</u>
BVP-0	Flat	None
BVP-0.5	Flat	0.5mm
BVP-1.0	Flat	1.0mm
BVP-0.5C	120° Conical	0.5mm
BVP-1.0C	120° Conical	1.0mm
BVP-0.5CL	30° Conical	0.5mm
BVP-1.0CL	30° Conical	1.0mm

BV-F Series Fittings

Three styles of high vacuum-compatible feedthru fittings are available to accept the BV-100V. All are furnished with VITON O-ring seals and are fabricated from stainless steel.

BV-FF: Standard 2.75 inch knife-edge vacuum flange.

BV-FW: Weld-on fitting with 1.50-inch tubular end.

BV-FP: 1-1/4 inch NPT male threaded end.

BV-100R Dome-Loaded Pressure Regulator

This is a stainless steel pressure regulator which, when used with an inert auxiliary gas, regulates the pressure of the sample gas to provide a constant controlled differential pressure across the beam valve actuator diaphragm. Its use is recommended when high pressure operation with corrosive sample gasses is required.

OPERATING CHARACTERISTICS:

Maximum Inlet Pressure: 2000psi

Outlet Pressure Control Range: 0 to 150psi

Differential Pressure Control Range: -15 to +15psi

Inlet and Outlet Port: 1/4" NPTF

Auxiliary Inlet Port: 1/8" NPTF

2.4 SPECIFICATIONS

BV-100V Valve

- . Pulse Duration: 100 microsec min.
- . Beam Intensity: to 10^{22} molecules/steradian-sec
- . Repetition Rate: ≤ 50 Hz
- . Maximum Pressure: 10 atmosphere
- . Maximum Operating Temperature: 100°C
- . Orifice Diameter: 0.5mm supplied with valve; optional 1.0mm, blank
- . Size: Valve housed in 6" x 1-1/4" diameter package for variable intrusion depth into vacuum port
- . Gas Inlet Fittings: 1/8" NPTF Backing gas inlet, 1/16" Tubing sample gas inlet

BV-100D Valve Driver Unit

- . Repetition Rate: 0.5 to 50 Hz, continuously variable
- . Pulse Width: 100 microsec to 1 msec
- . Pulse Delay: 0.05 to 2 msec
- . Beam Intensity: Continuously variable
- . Trigger Select: Internal/External/Off
- . Input: TTL-compatible External Trigger
- . Outputs: TTL-compatible SYNC; Pulse Current Monitor
- . Size: 3-1/2"H x 12"D x 10"W Rack Mount
- . Power: 115/230 VAC 50-60 Hz, 1 amp
- . Control Cable: 8' length

3.0 OPERATION

3.1 OPERATING PRINCIPLES

The valve actuator assembly is comprised of two electromagnet coils separated by a fixed gap with a soft iron disc placed in the gap between the coils. Each coil is placed in a ferrite pot core to close and confine the flux path. A valve actuator stem attached to the iron disk is driven axially about .4mm as current is switched between coils. A polymer seal fitted on the end of the actuator stem opens and closes the valve orifice.

During operation, the "close" coil (coil located nearest the orifice) carries approximately one ampere of steady current to hold the valve in its closed position. At the beginning of an operational cycle, the holding current is turned off in the "close" coil and a 2 ampere current pulse is driven through the "open" coil thus pulling the seal tip away from the orifice and allowing gas to expand out of the valve. The open pulse width is varied by the INTENSITY adjustment to effectively control the length of the actuator stroke and hence the intensity of the pulse.

After the "open" pulse is terminated, the valve will remain open until a "close" pulse is initiated. This delay between "open" and "close" pulses effectively controls the beam pulse duration.

At the end of the "duration" timeout, a "close" cycle is initiated which reapplies the 1 amp hold current along with a 2 ampere "close" pulse. The "close" pulse width is set to approximately 500 microseconds.

A composite coil current waveform can be obtained at the CURRENT MONITOR connector on the front panel. (See paragraph 3.2.2)

3.2 OPERATING PROCEDURES AND GUIDELINES

3.2.1 GAS SUPPLY CONNECTIONS

Two gas inlet ports are located on the flange plate at the rear of the valve. Both are 1/8-inch NPTF tapped holes and open directly into the backing gas chamber. However, as shipped from the factory, a 1/16" stainless steel sample gas tube leading to the sample gas chamber protrudes from one hole and is covered by tube-like fitting. A fitting to adapt 1/16" tube to 1/8" NPT is supplied as a separate item with the valve. This arrangement allows access to both gas chambers and easy conversion between operation with a single gas supply and operation with dual gas supplies.

Single Gas Operation (Non-Corrosive Gases Only)

If the sample gas to be used in the valve is compatible with materials in the actuator (aluminum, ferrite, iron, bronze, copper, and 60-40 solder) a backing gas supply is not necessary and the sample gas can fill the entire housing flooding both sample and backing gas chambers, thereby eliminating differential pressure across the diaphragm. The recommended connection for this mode of operation is shown in Figure 3. If desired, the 1/16" tube can be removed entirely from the valve by simply unscrewing it and withdrawing it from the housing together with its TEFLON seal washer.

CAUTION: The BV-100V valve housing is designed and rated to operate at pressures up to 200psi. Do not exceed this pressure level!!

Dual Gas Supply Operation (Corrosive Gases)

Where the sample gas is corrosive and may damage actuator components, only the sample gas chamber can be exposed to the gas which must be supplied through the 1/16" stainless steel tube. The tube-like fitting located on the flange cover is removed entirely from the flange cover plate and replaced with the 1/16" tube to 1/8-inch NPT fitting supplied with the valve. Note that this fitting slides on over the 1/16" sample tube. The 1/16" sample tube should be attached to the sample gas supply system by a slide-on type connector such as a Cajon Ultra-Torr fitting or equivalent.

If the sample gas supply operates within ± 3 psi of atmospheric pressure, the backing gas chamber can be left open exposing it to atmospheric pressure. However, if the supply operates significantly above 1 atmosphere, an inert backing gas will be required to minimize differential pressure across the diaphragm. This can be accomplished by means of a dome-loaded pressure regulator connected as shown in Figure 4. The Newport BV-100R accessory is specifically recommended for this purpose.

CAUTION: The BV-100V valve housing is designed and rated conservatively to operate at pressures up to 200psi. Do not exceed this pressure!!

3.2.2 DRIVER CONTROLS AND INDICATORS

<u>Control/Indicator</u>	<u>Function</u>
1. POWER ON Switch	Illuminated AC power switch (must be left on for positive valve seal).
2. INTERNAL RATE Control	Adjusts the pulse rate of the internal generator over a range of 0.5 to 50 Hz.
3. EXTERNAL TRIGGER Connector	This BNC type connector allows triggering of the valve delay and timing sequence from an external signal. Triggering is on the pulse leading edge. Input impedance: 50 ohms. Requires signal level > 3 volts. Enabled only when TRIGGER SELECT switch is in EXT position.
4. TRIGGER DELAY Switch	A three-position toggle switch which selects the triggering source.
5. TRIGGER DELAY Control	This control varies the delay between trigger pulse and start of valve pulsing sequence over a range of about 50 microseconds to 2 milliseconds.
6. SYNC OUT Indicator	The LED light will flash once for each valve pulse sequence.

7. SYNC OUT
Connector

This BNC-type connector provides an output pulse the leading edge of which is coincident with the start of a valve pulse sequence. Output level: 4 volts (min), 300 ohms. Pulse width may vary from 50 microseconds to 1 millisecond.

8. INTENSITY
Control

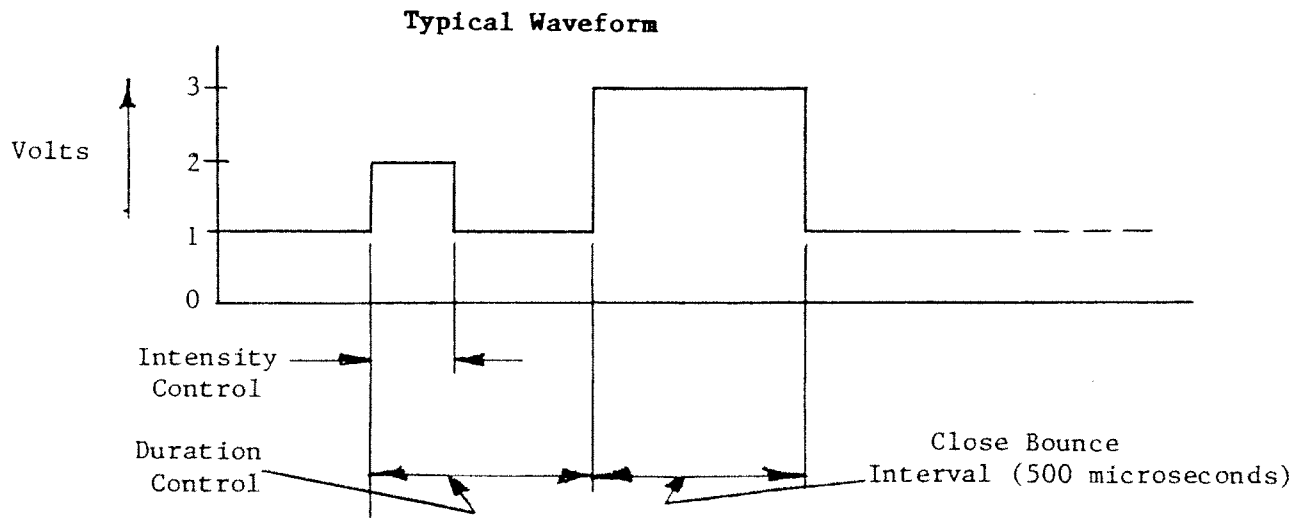
This two-digit switch pot controls the open cycle pulse width. The effectively varies how fast and how far the valve opens. The setting corresponds to the open current pulse width in tens of microseconds.

9. DURATION
Control

This two-digit switch pot controls the valve open time duration. The setting corresponds to the "close coil current interrupt period in tens of microseconds.

10. CURRENT MONITOR
Connector

This BNC-type connector outputs a summed composite of the waveform in both "open" and "close" coils.



3.2.3 OPERATING GUIDELINES

Startup: Forming a Pulsed Jet

1. With the valve installed and connected to the BV-100D Driver, preset the controls on the Driver as follows:

POWER:	On (This holds valve closed.)
TRIGGER SELECT:	Off
INTERNAL RATE:	Counterclockwise (Minimum)
INTENSITY:	00
DURATION:	30
2. Turn on gas supply to the valve after vacuum chamber has reached operating pressure.
3. While monitoring vacuum pressure, move the TRIGGER SELECT switch to INTERNAL RATE and advance the INTERNAL RATE control to the desired pulse rate.
4. Increase the INTENSITY control setting until the desired gas load is achieved. The valve should start opening at about 100 to 250. Should it be desirable to operate with the INTENSITY control above 300, the DURATION control should be advanced. To avoid overlapping open and close pulses, the DURATION setting should always be greater than the INTENSITY setting. Long pulses can be achieved by increasing the DURATION setting after desired pulse intensity is achieved.

4.0 MAINTENANCE/SERVICE

Operation with gases that degrade viton or long use in general may swell or deform the tip-seal. A symptom of this is a valve that will not seal (deformed tip) or one that will not open (swollen). This necessitates a change of tip-seal which is performed as follows:

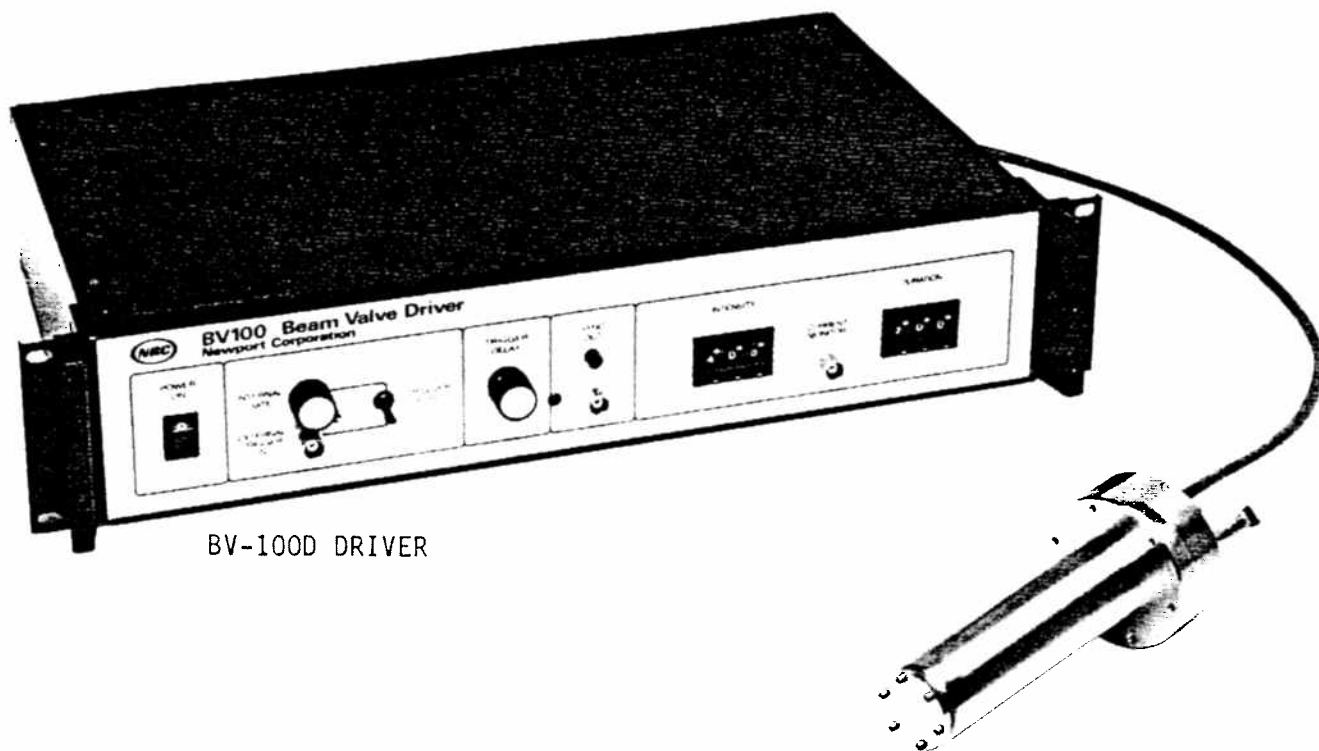
1. Remove the end plate.
2. Taking care not to stress the bellows, remove the old tip-seal by simply pulling it out of its socket.
3. Cut a three inch length of .070" diameter Viton o-ring stock.
4. Holding the stock like dental-floss, stretch it over the vapors of liquid nitrogen to harden it (a styrofoam coffee cup is a convenient dewar for this purpose).

5. Quickly cut the o-ring material in the stretched region and insert the thin cut end into the bellows tip holding it while the material warms and expands.
6. Slide the tip-seal trim tool provided with the valve over the free end of the o-ring stock and fasten to the end of the valve with 2 #2 cap screws used to hold the end plate. (The o-ring that normally seals the circumference of the end plate should be removed for this operation.)
7. Connect the valve to the driver and turn on the power with the TRIGGER SELECT switch in the OFF position.
8. Using a new razor blade, carefully cut the protruding tip-seal flush to the surface of the trim tool. The cut tip-seal must be flat with no serrations or burrs. If necessary, 400 grit wet/dry emory paper can be used to polish the end of the seal.

5.0 APPENDIX

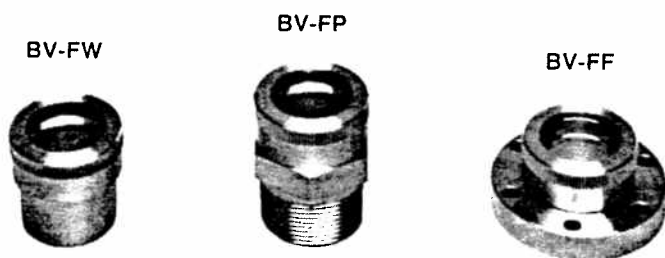
5.1 SCHEMATICS AND ASSEMBLY DRAWINGS

06427	Beam Valve Assembly
06024	Actuator Assembly
02739	Block Diagram BV-100D
05590	Schematic Beam Valve Driver
05598	Assembly Beam Valve Driver



BV-100D DRIVER

BV-100V VALVE

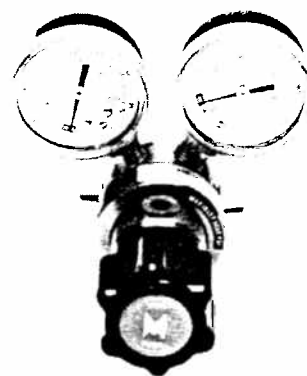


BV-FW

BV-FP

BV-FF

BVF SERIES FITTINGS



BV-100R REGULATOR



BVP SERIES END PLATES

Fig. 1 - BV-100 MOLECULAR BEAM VALVE SYSTEM AND ACCESSORIES

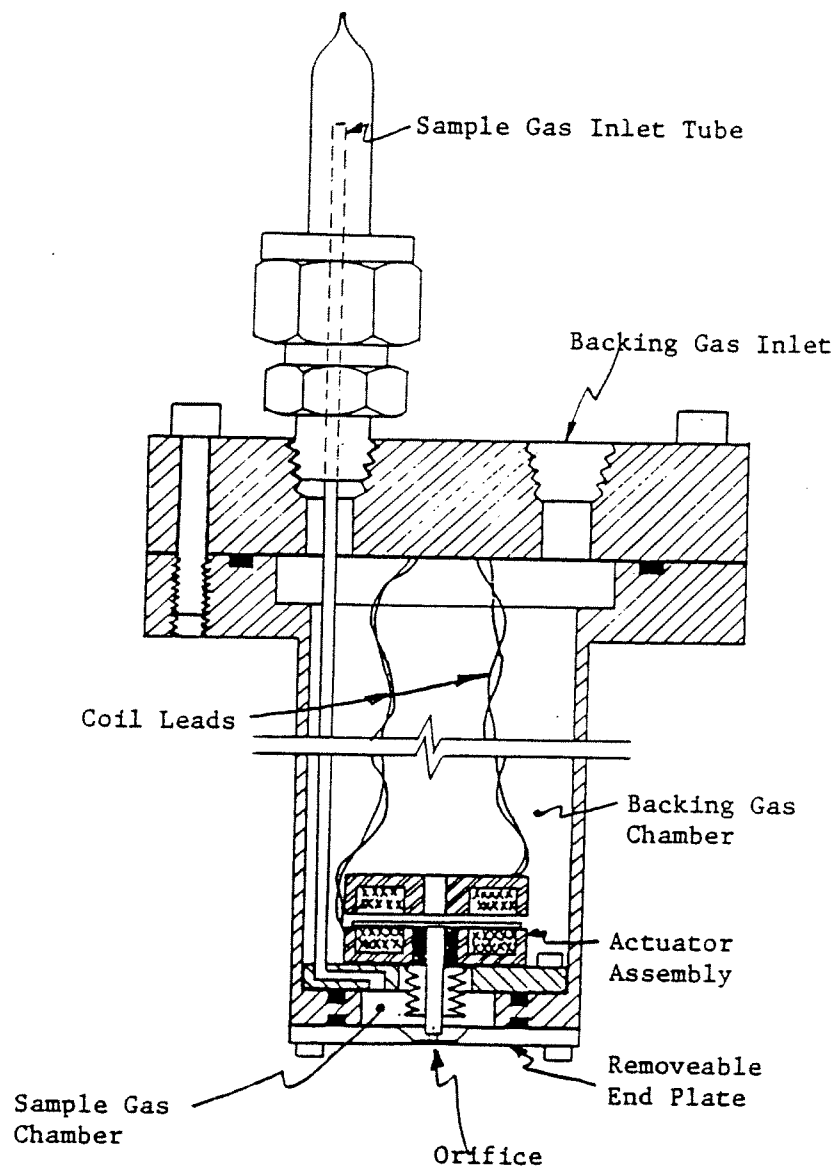


Fig. 2 - BV-100V Valve

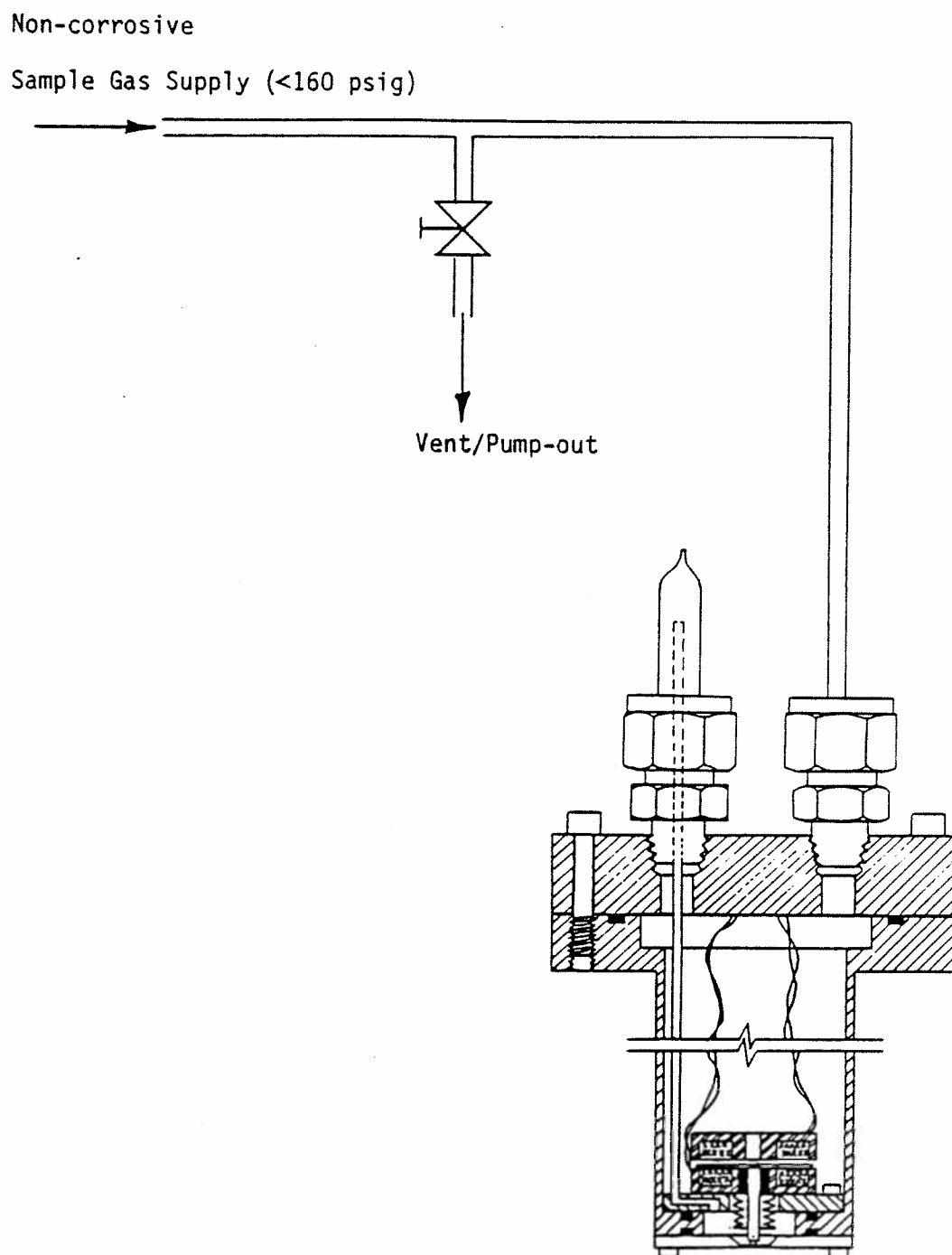


Fig. 3 - Connections for Use with Non-corrosive Materials

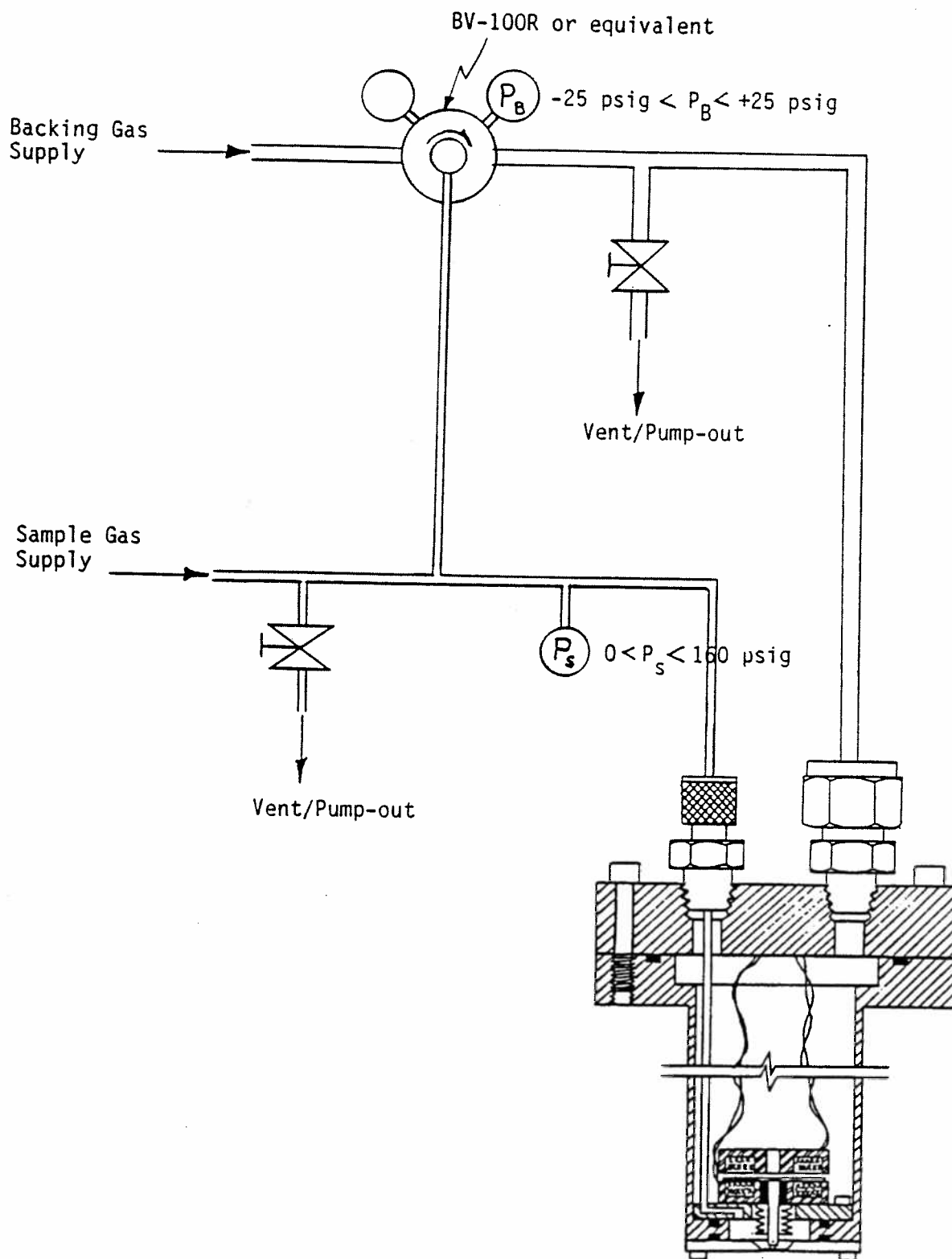
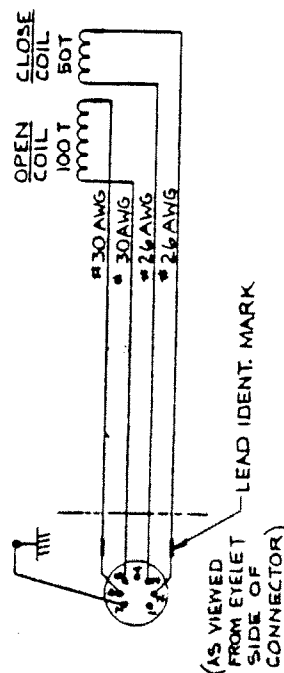
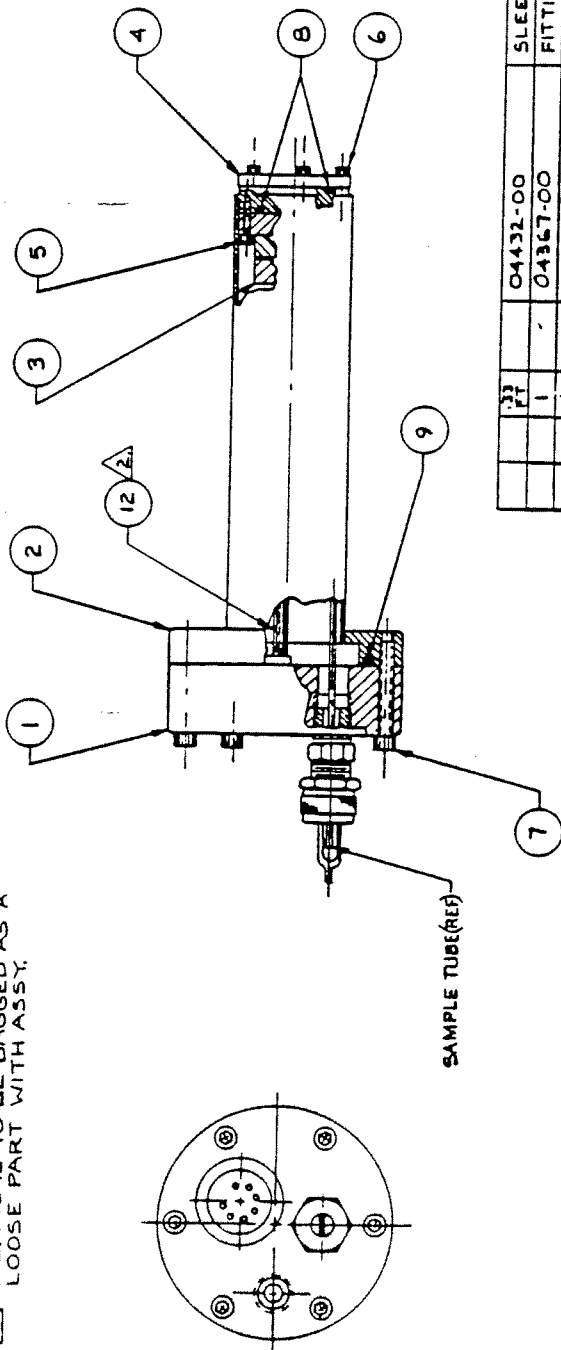


Fig. 4 - Connections for Use with Corrosive Materials

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- 1 ITEM 11 TO BE BAGGED AND SHIPPED AS A LOOSE PART WITH ASSY
- 2 ITEM 12 IS USED ON EYELET 2, 3, 5, 6 ONLY. TEFLON SLEEVING IS TO BE COMPLETELY OVER END OF EYELET.
- 3 ITEM 10 IS TO BE BAGGED AS A LOOSE PART WITH ASSY.



REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	ITEM 41 BVP-0.5 WAS 04029-01 (PICTURE CHANGE TO TUBE FITTING (MUT))	11/13	41620
B	ITEM 10 P/N (V43) 3674-B0-073, ADDED: ITEM 12, NOTE 2, REVISED ELECT. SCHEM.	1-12-04	41620
C	ADDED ITEM 10 & NOTE 3.	8-5-04	41620

DWG NO
06427

REV
C

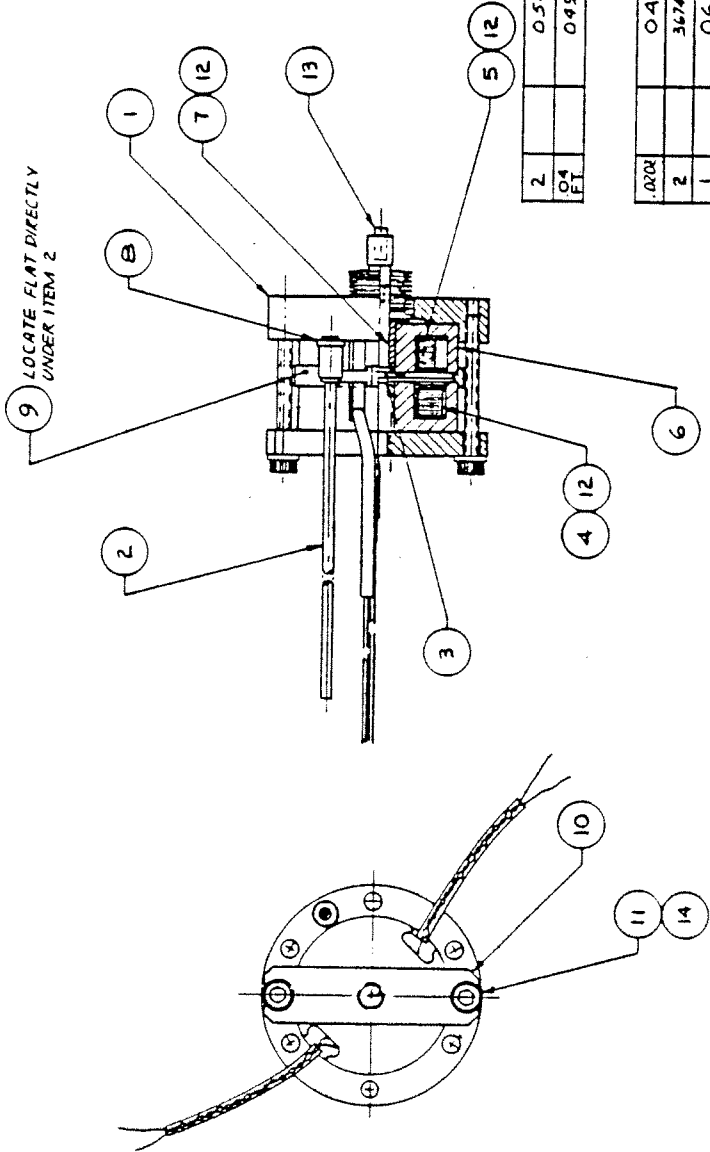
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1			04432-00				SLEEVING, TEFLON	.053 I.D., .012 WALL	12
1			04367-00				FITTING, 1/4" TUBE TO TOOL, TRIM	1/8" NPT	11
1			T10260				10" RING, VITON	1.674 I.D. x .103 W. (SIZE 2 B1)	10
2			4568-131-75V				10" RING, VITON	.676 I.D. x .070 W. (SIZE 2 B1)	9
2			4568-017-75V				SCREW, CAP HD 80C	198-32UNC x 1.00 LG. CRES	8
6			3674-B0-050				SCREW, CAP HD 50C	.086-56UNC x .25 LG. CRES	7
6			3674-B0-052				SCREW, CAP HD 50C	.086-56UNC x .39 LG. CRES	6
1			BVP-0.5				PLATE, END		5
1			06024-00				ACTUATOR ASSY		4
1			06423-00				TUBE ASSY		3
1			06420-00				FLANGE ASSY		2
1									1

PARTS LIST

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		TOLERANCES:		CONTRACT NO.		newport corporation 18725 Mt. Baldy Circle, Fountain Valley, CA 92708	
DATE	BY	CHK	BY	DATE	BY	CHK	BY	BEAM VALVE MODEL BV-100	
10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	SIZE CODE IDENT NO DWG NO	
10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	C 06427	
10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	SCALE: FULL WT	
10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	10/11/03	SHEET 1 OF 1	

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REV	DESCRIPTION	DATE	APPROVED
A	DELETED NOTE 1, ADDED ITEM 14, ITEM 11	11-11-89	HV.9
B	3704-B0-050, ITEM 13 (WAS) 06417-00	8/1/84	HV.9
C	ITEM 9 (WAS) 06027-00, 2 REQD	8/1/84	HV.9
	CORRECTED PICTURE, UPDATED P/L	8/1/84	HV.9

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2	05416-01		WASHER, SPLIT, STSL, #2			
1	04995-01		O-RING, NITR, CORD STL			
1	04429-00		ADH RTN 100, SILCON, CLEAR			
2	3674-B0-056		SCM, SHC, STSL, 2-5/8 x 3/4			
1	06028-00		CAP, BLACK			
1	05491-00		RING, SPACER			
1	06035-00		WASHER, GAS SEAL, TEFLON			
1	06033-00		BEARING			
2	06424-00		CORE, MODIFIED			
1	06428-01		COIL ASSY			
1	06428-02		COIL ASSY			
1	06037-00		DISC/TUBE ASSY			
1	06418-00		TUBE ASSY, SAMPLE 600 MT			
1	06038-00		FLANGE/BELLOWS ASSY			

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		CONTRACT NO.		DWG NO. 06024	
TOLERANCES:		DWN BY CLUMMING		REV C	
AXES ANGLES		CHK BY HV.9		DATE 8/1/84	
FRACCTIONS		RESP ENGR J. R. LAW		SCALE: 2/1	
SURFACE FINISH: OR BETTER		DESIGN ACTIVITY APPROVAL		SHEET 1 OF 1	
DESIGN & BREAK ALL SHARP EDGES					
DRAWING IN ACCORDANCE WITH ANSI Y14.5-1972					
MATERIAL					
06427 06427 BV-100					
NEXT ASSY TOP ASSY MOD NO					
APPLICATION					

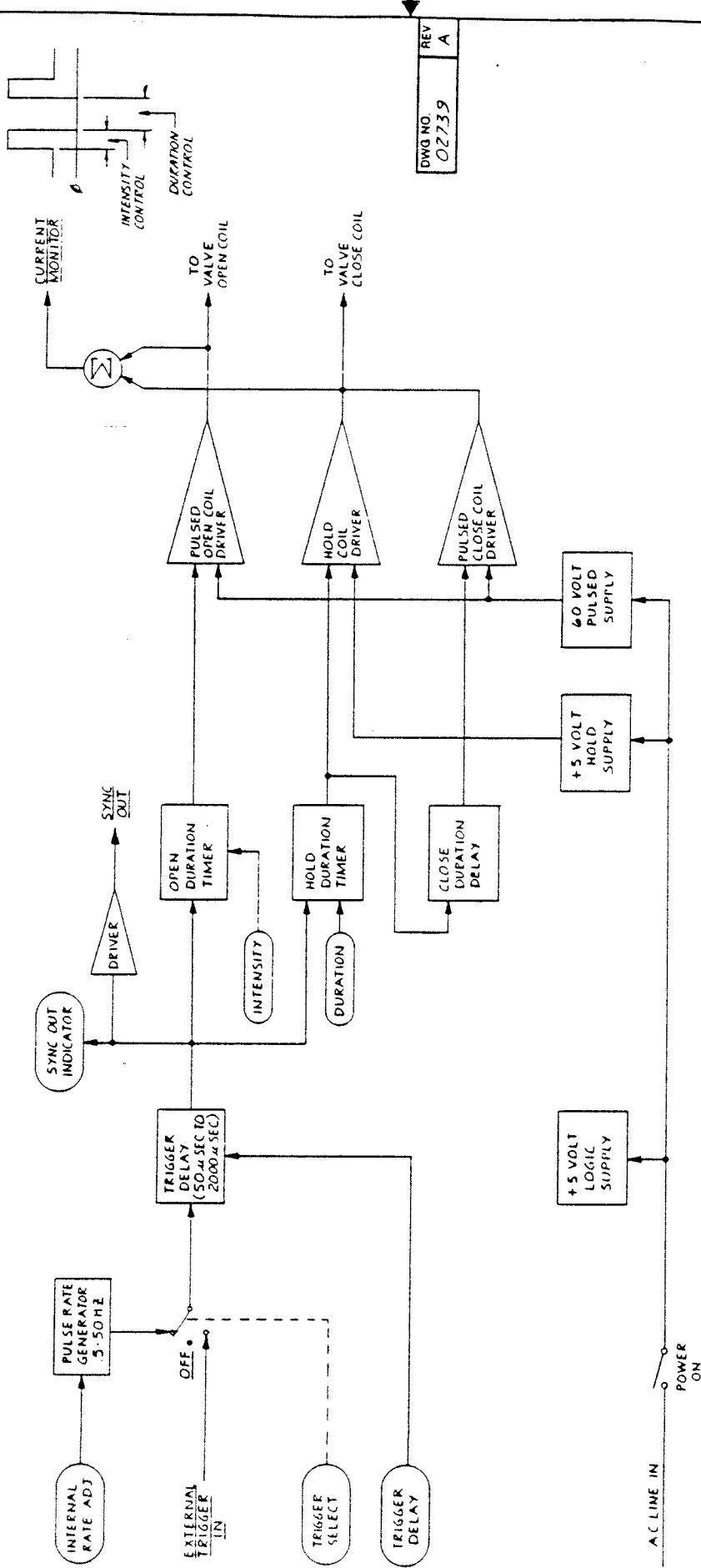
NRC newport corporation
1825 Mt. Rainier Circle, Fremont, CA 94536

ACTUATOR ASSY - BEAM VALVE

SIZE CODE IDENT NO DWG NO. 06024

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DWG NO. 02739
REV A

REVISIONS	
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A	REVISED, SEE ECO # 02739A

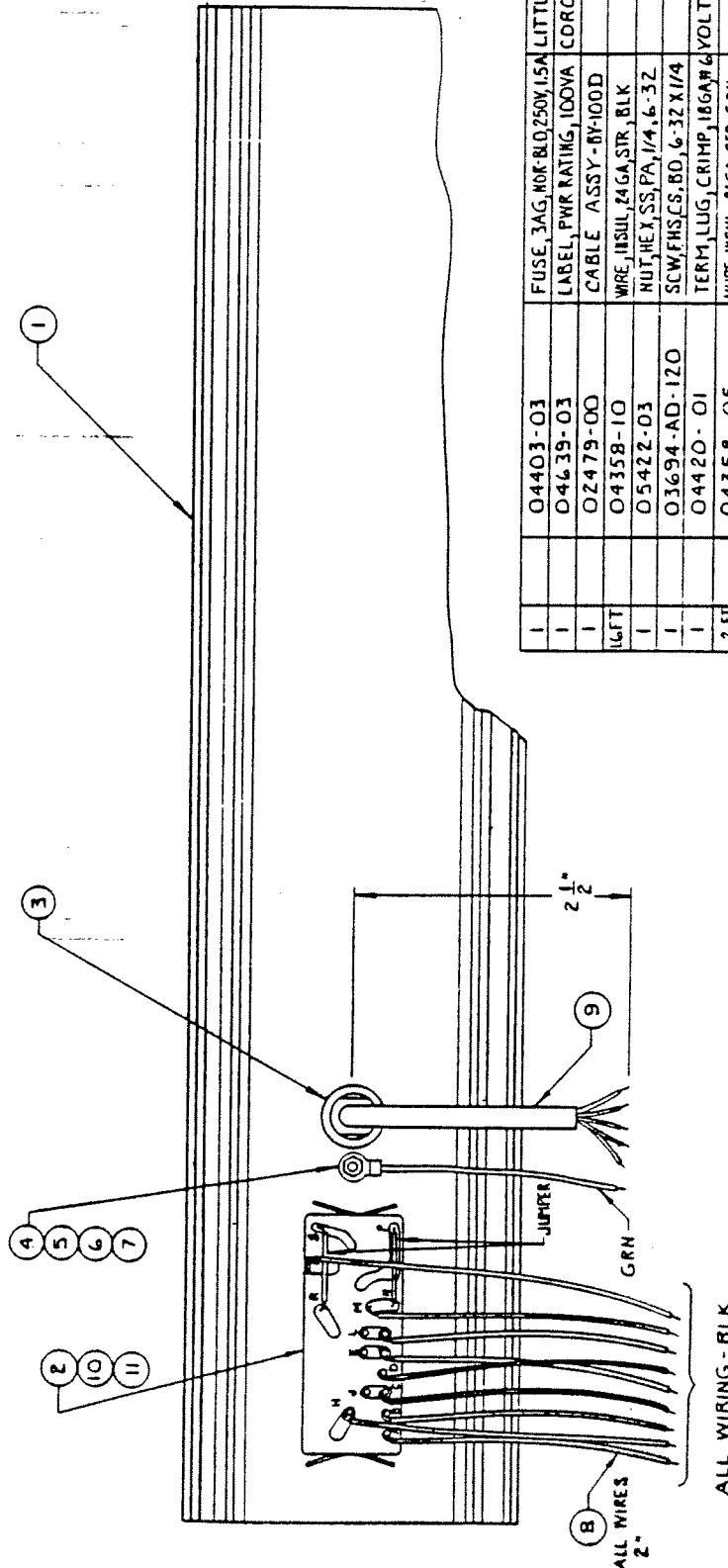
DATE 03/28/84
APPROVED JLS

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DWN BY AOM					
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RES' ENGR J. J. J. J.					
DESIGN ACTIVITY APPROVAL					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES					
TOLERANCES:					
ALL .0005					
ALL .0005					
ALL .0005					
SURFACE FINISH: .0005 AFTER DEBURRING BREAK ALL SHARP EDGES DRAWING IN ACCORDANCE WITH ANSI Y14.5-1973					
MATERIAL					
APPLICATION					
NEXT ASSY 05598					
TOP ASSY MOD NO					
BV-100D					
SIZE CODE IDENT NO DWG NO.					
C 02739					
SCALE NONE					
SHEET 1 OF 1					

(NRC) newport corporation
18330 Mt. Blvd., Costa Mesa, Calif. 92626

BLOCK DIAGRAM
BV-100D MOLECULAR BEAM VALVE

NOTES: UNLESS OTHERWISE SPECIFIED



DWG NO
O5608
REV

QTY REQD PER DASH NO.	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	DATA: SPECIFICATION, SIZES, SUPPLIERS	SEE ITEM NOTE NO
1	04403-03		FUSE, 3AG, 100V, 15A LITTLE FUSE # 312 003		11
1	04639-03		LABEL, PWR RATING, 100VA CORCOM # 05-1502		10
1	02479-00		CABLE ASSY-BV-1000		9
1	04358-10		WIRE, INSUL, 24GA, STR, BLK		8
1	05422-03		NUT, HEX, SS, PA, 1/4, 6-32		7
1	03694-AD-120		SCW, FHS, CS, 80, 6-32 X 1/4		6
1	04420-01		TERM, LUG, CRIMP, 18GA, #6 VOLTREX # CRS-T0-1806		5
1	04358-05		WIRE, INSUL, 24GA, STR, GRN		4
1	04293-04		STR RELE, PWR (UKD), 1/2 D.D	HEYCO # 1147	3
1	04334-00		CONN, PWR, MALE, 100-240V, W/TUB	CORCOM # 6VJ1	2
1	05560-00		PANEL, REAR-BV-1000		1

PARTS LIST

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES:
X.XX ± .01 ANGLES ± .1
X ± .01 FRACTIONS ± .01

SURFACE FINISH:
DEBURR & BREAK ALL SHARP EDGES
DRAWING IN ACCORDANCE WITH ANSI Y14.5-1975

MATERIAL

0.5598 05598 BV-1000

NEXT ASSY TOP ASSY MOD NO

APPLICATION

CONTRACT NO.

DWN BY LDW

CHK BY dfl

RESP ENGR J. K. S. / 04/24

DESIGN ACTIVITY APPROVAL

newport corporation
18335 Mt. Rainier Circle / Portland, OR 97228

REAR PANEL ASSY-BV-1000

SIZE CODE IDENT NO DWG NO.
C O5608

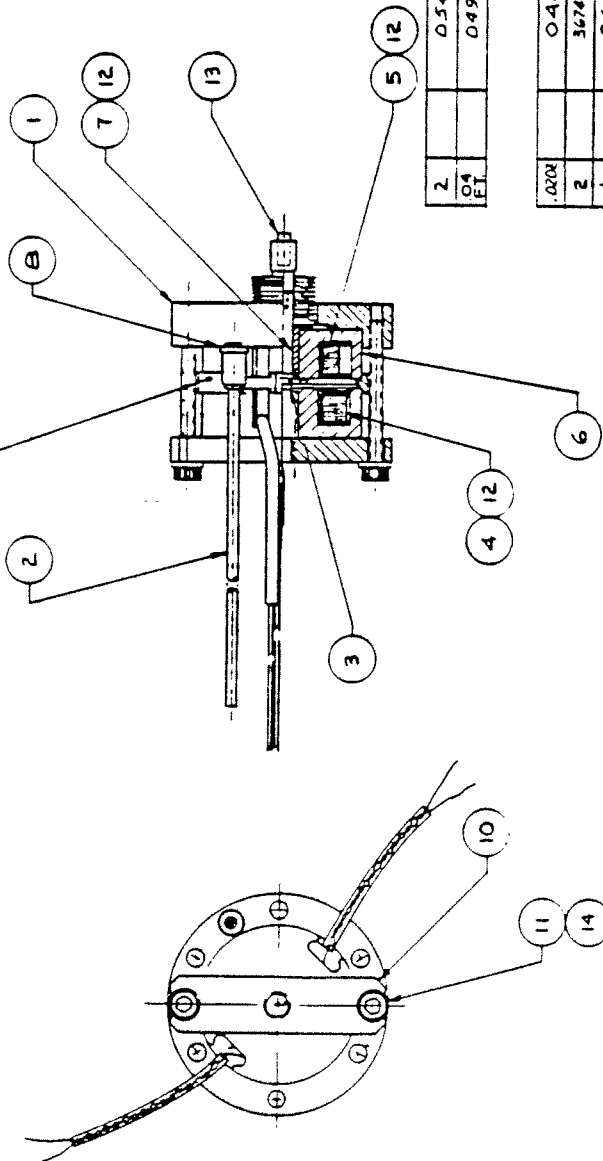
SCALE 1/1 WT

SHEET 1 OF 1

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NOTES: UNLESS OTHERWISE SPECIFIED

9 LOCATE FLAT DIRECTLY UNDER ITEM 2



REVISIONS

REV	DESCRIPTION	TE	APPROVED
A	DELETED NOTE 1, ADDED ITEM 14, ITEM 11 (A) 3764-B0-050, ITEM 13 (WAS) 06417-00.	11/11/84	HYD
B	ITEM 9 (WAS) 06027-00, 2 REQD	11/11/84	HYD
C	CORRECTED PICTURE, IMPROVED P/L	11/11/84	HYD

2	05416-01	WASHER, SPLIT, STSL, #2	14
04	04995-01	O-RING, WIDOM, CORD STL	13

0204	04429-00	ADHPTN 108, SILCON, CLEAR MIT	12
2	3674-B0-056	SCM, SMC, STSL, 2-3/4 X 1/4	11
1	06028-00	CAP, BLACK	10
1	05491-00	RING, SPACER	9
1	06035-00	WASHER, GAS SEAL, RFION	8
1	06033-00	BEARING	7
2	06424-00	CORE, MODIFIED	6
1	06428-01	COIL ASSY	5
1	06428-02	COIL ASSY	4
1	06037-00	DISC/TUBE ASSY	3
1	06418-00	TUBE ASSY, SAMPLE GRI MT	2
1	06038-00	FLANGE/BELLOWS ASSY	1

DWG NO. 06024

REV C

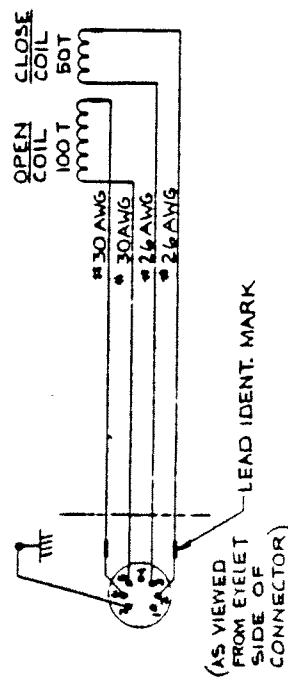
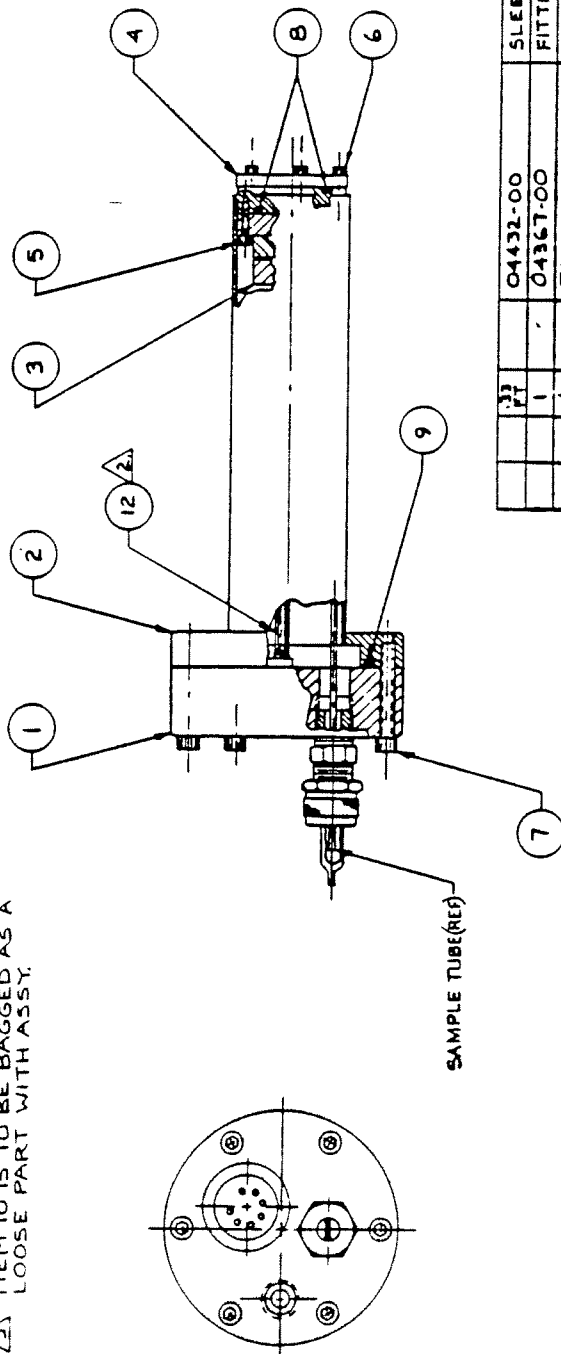
PARTS LIST

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		QTY REQD PER DASH NO.		CONTRACT NO.		NRC newport corporation 18750 Mt. View, Glen Carbon, Illinois, 62038	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DWN BY CLIMMING		CHK BY HYD		ACTUATOR ASSY - BEAM VALVE	
TOLERANCES:		FRACTIONS		DECIMALS		SIZE CODE IDENT NO. DWG NO.	
XX ANGLES		XX FRACTIONS		XX DECIMALS		C 06024	
SURFACE FINISH: 125 OR BETTER		DESIGN ACTIVITY APPROVAL		REV		C	
PERMANENT BREAK ALL SHARP EDGES		MATERIAL		SCALE: 2/1		SHEET 1 OF 1	
WITH ANGLES 1/16-1/8		APPLICATION		WT			
06427 TOP ASSY MOD NO							
06427 TOP ASSY MOD NO							

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NOTES: UNLESS OTHERWISE SPECIFIED

- 1 ITEM 11 TO BE BAGGED AND SHIPPED AS A LOOSE PART WITH ASSY
- 2 ITEM 12 IS USED ON EYELET 2,3,5,6 ONLY. TEFLON SLEEVING IS TO BE COMPLETELY OVER END OF EYELET.
- 3 ITEM 10 IS TO BE BAGGED AS A LOOSE PART WITH ASSY.



REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	ITEM 4: BVP-0.5 WAS 04029-01 (PICTURE CHANGE TO TUBE FITTING (MUT))	7/1/83	11V.0
B	ITEM NO P/N (WAS) 3674-B0-073, ADDED: ITEM 12, NOTE 2, REVISED ELEC. SCHEM.	1-12-84	11V.0
C	ADDED ITEM 10 & NOTE 3.	8-5-84	11V.0

DWG NO
06427

REV
C

QTY	RECD	PER DASH NO.	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	DATA: SPECIFICATION, SIZES, SUPPLIERS	SEE ITEM NOTE NO
1	PT	04432-00			SLEEVING, TEFLON	.053 I.D., .012 WALL	12
1		04367-00			FITTING, 1/16 TUBE TO 1/8 NPT		11
1		T10260			TOOL, TRIM		10
1		4568-131-75V			1/8" RING, VITON	1.674 I.D. x .103 W. (SIZE 2 IN)	9
2		4568-011-75V			1/8" RING, VITON	.676 I.D. x .070 W. (SIZE 2 IN)	8
6		3674-B0-120			SCREW, CAP HD 80C	.198-32UNC x .100 LG. CRES	7
6		3674-B0-050			SCREW, CAP HD 50C	.086-66UNC x .25 LG. CRES	6
6		3674-B0-082			SCREW, CAP HD 50C	.086-56UNC x .38 LG. CRES	5
1		BVP-0.5			PLATE, END		4
1		06024-00			ACTUATOR ASSY		3
1		06423-00			TUBE ASSY		2
1		06420-00			FLANGE ASSY		1

PARTS LIST

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		CONTRACT NO.		newport corporation 10228 Mt. Baldy Circle, Fountain Valley, Ca. 92708	
DWN BY CUMMINGS	IO MAY 83	CHK BY HKE-3	4/1/83	BEAM VALVE MODEL BV-100	
RESP ENGR F.S. / 04/1	8/83	DESIGN ACTIVITY APPROVAL HKE		SIZE C	REV C
TOLERANCES: ALL DIMENSIONS ARE IN INCHES FRACTIONS		SURFACE FINISH: .001 OR BETTER UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS		SCALE: FULL	SHEET 1 OF 1
MATERIAL SEE P/L		BY JOG MOD NO		DWG NO 06427	
APPLICATION TOP ASSY NEXT ASSY					

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	REVISED, SEE ECO # 02739A	5-23-66	W. J. K.

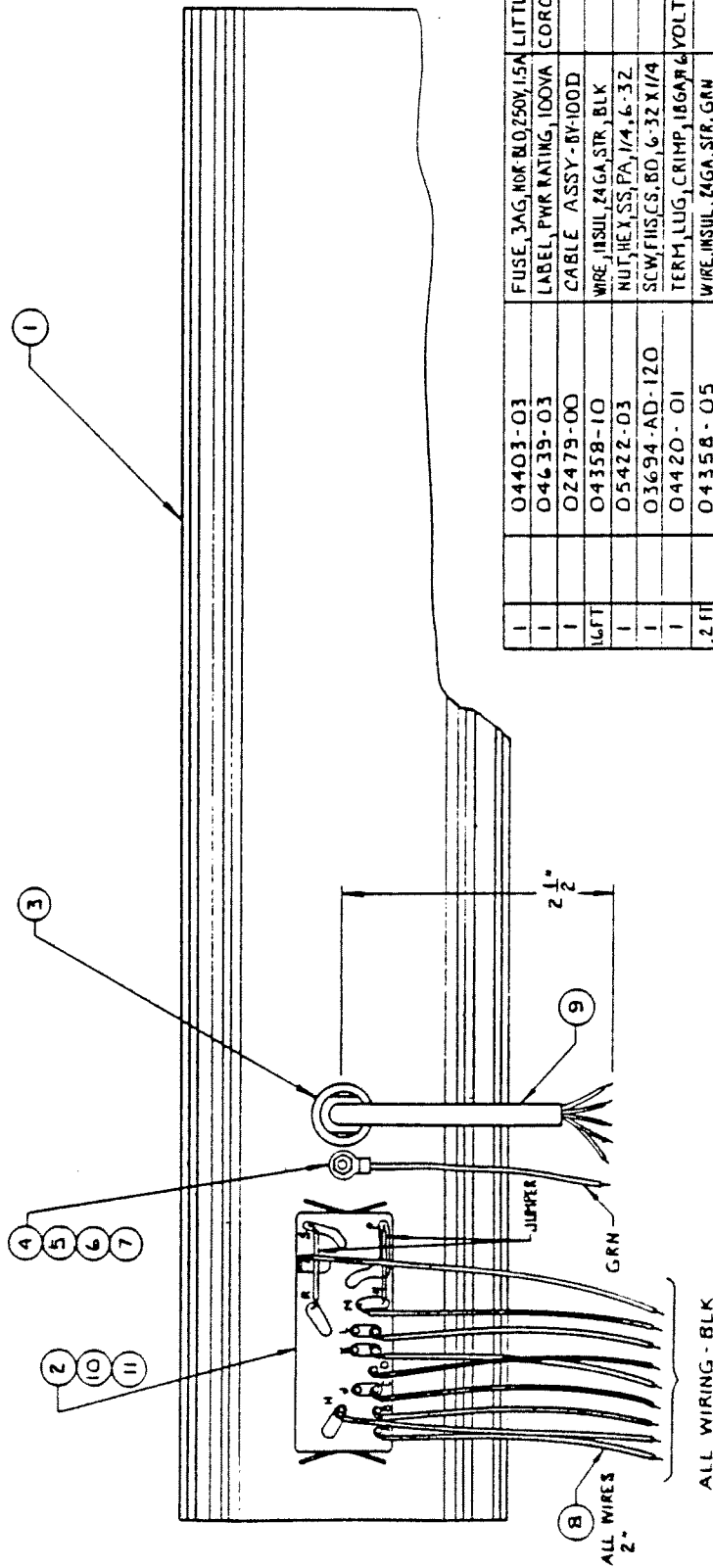
The diagram illustrates the control logic for a valve system. It begins with an **INTERNAL RATE ADJ** (Internal Rate Adjust) knob connected to a **PULSE RATE GENERATOR 5-50 HZ**. This generator's output is fed into a switch that can be set to **OFF** or **EXTERNAL TRIGGER IN**. The **EXTERNAL TRIGGER IN** is also connected to a **TRIGGER SELECT** knob. Both the switch and the **TRIGGER SELECT** knob feed into a **TRIGGER DELAY (50 μ SEC TO 2000 μ SEC)** block. The output of the trigger delay block goes to a **SYNC OUT INDICATOR** and a **DRIVER** block. The **DRIVER** block's output is connected to the **OPEN DURATION TIMER**. The **OPEN DURATION TIMER** is also influenced by an **INTENSITY** knob. Its output goes to the **PULSED OPEN COIL DRIVER** and a **SUM** junction. The **SUM** junction also receives input from a **CURRENT MONITOR** and a **DURATION CONTROL** signal. The output of the **PULSED OPEN COIL DRIVER** is connected to the **TO VALVE OPEN COIL**. The **TRIGGER SELECT** knob also feeds into a **HOLD DURATION TIMER**, which is also influenced by a **DURATION** knob. Its output goes to the **HOLD COIL DRIVER** and the **TO VALVE CLOSE COIL**. The **TRIGGER SELECT** knob also feeds into a **CLOSE DURATION DELAY** block, which outputs to the **PULSED CLOSE COIL DRIVER**. The **PULSED CLOSE COIL DRIVER** is also influenced by a **+5 VOLT LOGIC SUPPLY**. The **HOLD COIL DRIVER** is influenced by a **+5 VOLT HOLD SUPPLY**. The **PULSED CLOSE COIL DRIVER** is influenced by a **+5 VOLT PULSED SUPPLY**. The **TO VALVE OPEN COIL** and **TO VALVE CLOSE COIL** lines lead to the valve assembly. A **DWG NO 02739** label is present in the top right corner.

DWG NO.	REV
02739	A

FREE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		QTY REQD PER DASH NO.		CODE IDENT		PART OR IDENTIFYING NO.		NOMENCLATURE OR DESCRIPTION		DATA: SPECIFICATION, SIZES, SUPPLIERS		SEE ITEM NOTE NO.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: JUL . . . ANGLES . . . JUL . . . FRACTIONS . . .				CONTRACT NO.				 newport corporation 10320 Mt. Baldy Circle, Portland, Maine, Me 04108					
				DWN BY <i>ADM</i> CHK BY		6-7-83		BLOCK DIAGRAM BV-100D MOLECULAR BEAM VALVE					
SURFACE FINISH DRAWING TO BREAK ALL SHARP EDGES WITH AN RLY 1/16 & .1875 MATERIAL				RES' ENGR <i>7/15/83</i>				DESIGN ACTIVITY APPROVAL		SIZE CODE IDENT NO C		REV A	
				TOP ASSY MOD NO				SCALE NONE		WT		SHEET 1 OF 1	
APPLICATION													

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NOTES: UNLESS OTHERWISE SPECIFIED



DWG NO
05608

REV

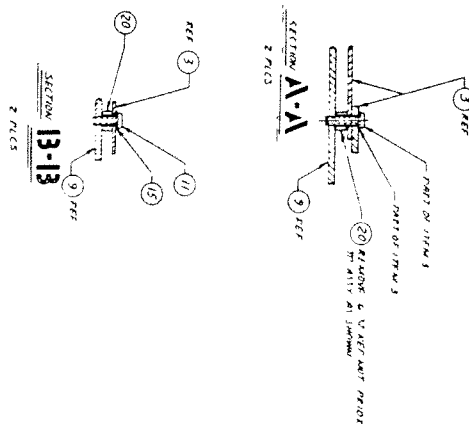
QTY REQD PER DASH NO.	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	DATA, SPECIFICATION, SIZES, SUPPLIERS	SEE ITEM NOTE NO
1	04403-03		FUSE, 3AG, HOR, 10, 250V, 15A	LITTLE FUSE # 312 003	11
1	04639-03		LABEL, PWR RATING, 100VA	CORCOM # 05-1502	10
1	02479-00		CABLE ASSY - BV-1000		9
1	04358-10		WIRE, INSUL, 24GA, STR, BLK		8
1	05472-03		NUT, HEX, SS, PA, 1/4, 6-32		7
1	03694-AD-120		SCW, FINE, CS, 80, 6-32 X 1/4		6
1	04420-01		TERM, LUG, CRIMP, 18GA, 6	VOLTREX # CRS-TO-1806	5
2 FT	04358-05		WIRE, INSUL, 24GA, STR, GRN		4
1	04293-04		STR, RELF, DWR (UK), 1/2 O.D	HEYCO # 1147	3
1	04334-00		CONN, PWR MALE, 100-240V, W/TCS	CORCOM # 6VJ1	2
1	05560-00		PANEL, REAR - BV-1000		1
- 00					

PARTS LIST

SEE ENGINEERING RECORDS FOR COMPLETE APPLICATION DATA		CONTRACT NO.		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
05598	05598	05598	05598	05598	05598
NEXT ASSY	TOP ASSY	MOD NO	REV	SCALE	1/1
APPLICATION		DESIGN ACTIVITY APPROVAL		SHEET 1 OF 1	
		RESP ENGR			
		CHK BY			
		DWN BY			
		TOLERANCES:			
		X.X ANGLES			
		X.X FRACTIONS			
		SURFACE FINISH: OR BETTER			
		DRAWING TO BE MADE IN ACCORDANCE WITH ANSISTYLE B17.2			
		MATERIAL			
		DESIGN ACTIVITY APPROVAL			
		RESP ENGR			
		CHK BY			
		DWN BY			
		CONTRACT NO.			
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		X.X ANGLES			
		X.X FRACTIONS			
		SURFACE FINISH: OR BETTER			
		DRAWING TO BE MADE IN ACCORDANCE WITH ANSISTYLE B17.2			
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		RESP ENGR			

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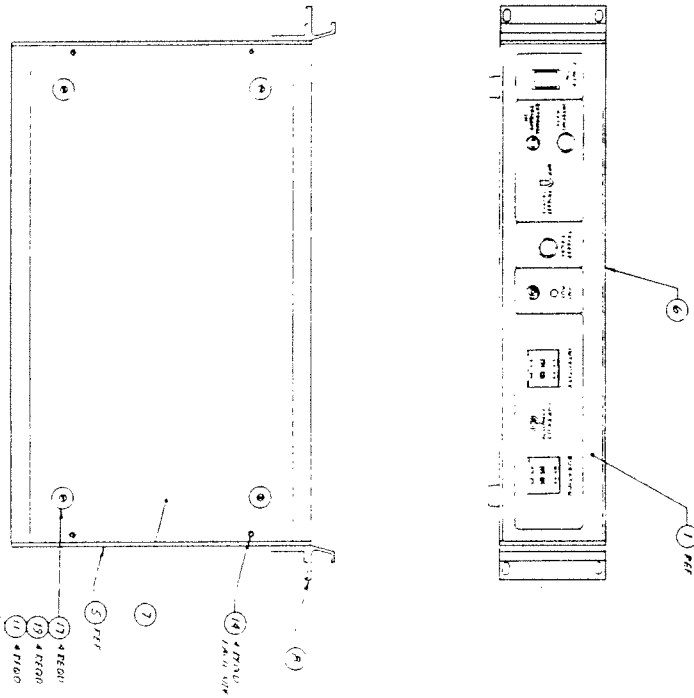
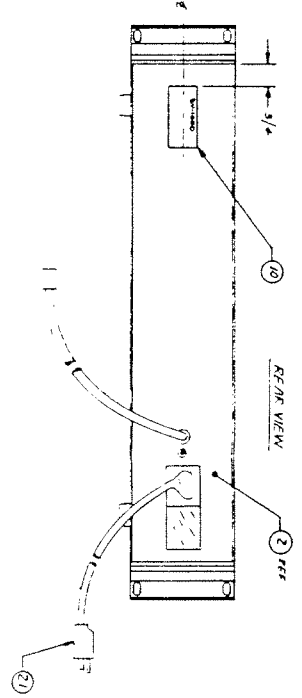
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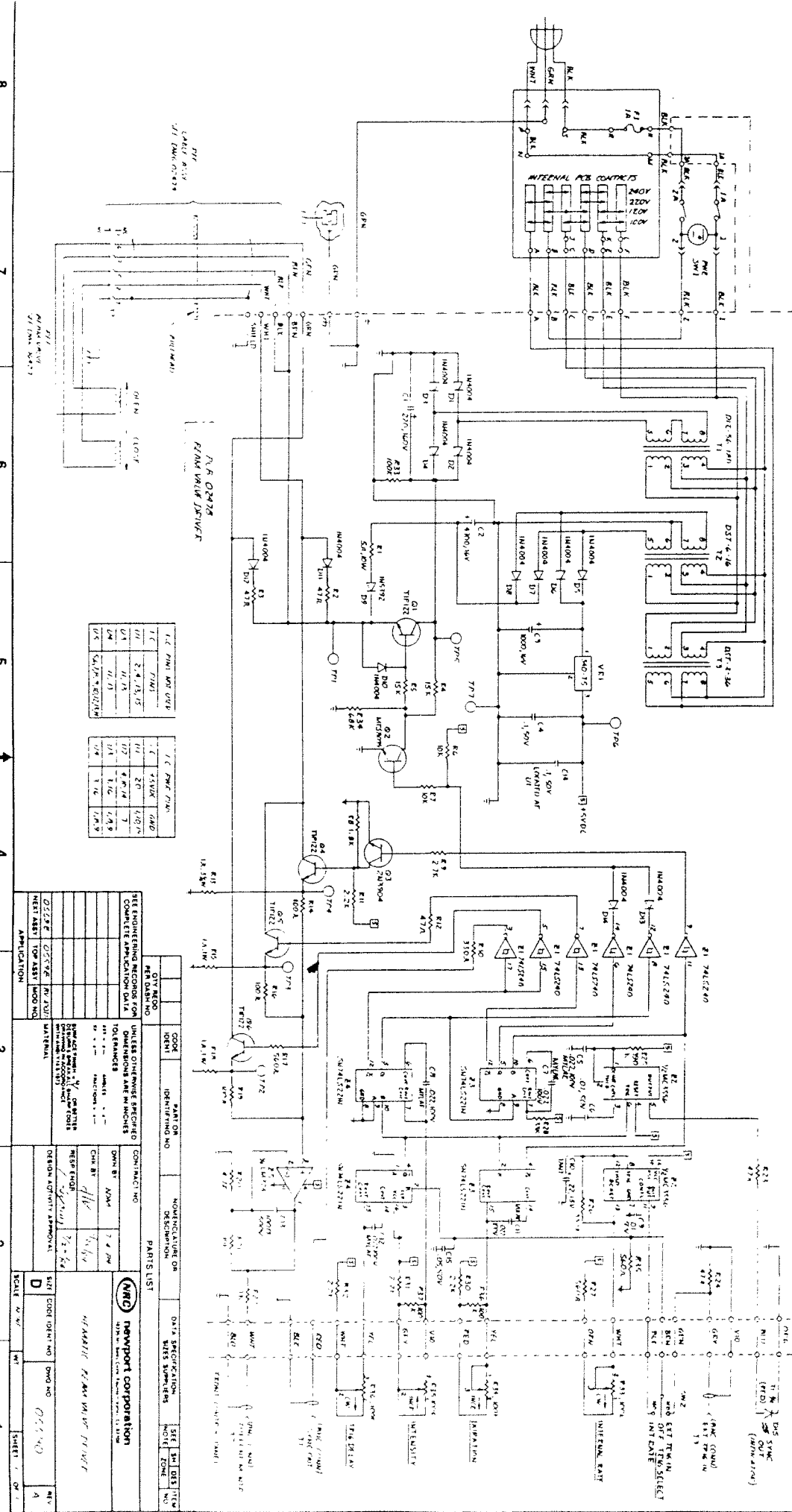
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NOTES: UNLESS OTHERWISE SPECIFIED
 1. ALL DIMENSIONS ARE IN INCHES (25.4 mm)
 2. ALL DIMENSIONS ARE IN MILLIMETERS
 3. ALL DIMENSIONS ARE IN MILLIMETERS



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