

SD61VH-1
Rev 4
March 2008
Supersedes Rev 3

Model 61VH VHC Booster Relay

INTRODUCTION

Model 61VH is a high-capacity volume booster designed for use on control valve actuators that require very fast stroking speed. In addition, it can respond to small or gradual input changes without jeopardizing steady-state accuracy or stability. It is particularly well suited to double-acting, large-volume actuators.

This relay contains an integral stabilizing bypass valve, eliminating the need for an externally piped bypass. The bypass opening is controlled by a screwdriver adjustment in the body of the relay which permits tuning for optimal dynamic response. It is recommended that the bypass valve be opened 1/4-turn (counter-clockwise) at initial start-up.

This instruction has six major sections: Introduction, Installation, Principle of Operation, Maintenance, Warranty, and Parts List.

Options

The Model 61VH is available with an optional mounting bracket. Refer to the Product Support section to contact your local Siemens sales representative.

Specifications

Supply Pressure 150 psig max. **Not to exceed actuator rating.**
 Input..... 150 psig max.
 Nominal Flow Capacity Supply: 120 SCFM; Exhaust: 110 SCFM
 Input/Output Ratio 1:1 ±5%
 Deadband Less than 0.15 psi
 Temperature Limits -40° to +180°F (-40° to +82.2°C)
 Weight 3 lbs. (1.36kg)

Materials of Construction

Top and Bottom Housings Aluminum 413.1
 Exhaust Ring and Spacer PPS (Polyphenylene Sulfide)
 Plunger 18-8 SS
 Seats Teflon
 Diaphragms Neoprene
 Diaphragm Disks Aluminum
 Diaphragm Stud..... Brass
 Retaining Screw Nickel-Plated Brass
 Needle Valve 18-8 SS (Buna-N)
 Body Screws..... 18-8 SS



INSTALLATION

Shipping and Storage

If the relay is to be stocked, stored, or shipped to another location prior to piping, make sure that the factory installed plastic plugs are in the ports to prevent entry of moisture, dirt, or other contaminants.

Mounting

Refer to Figure 1 for mounting dimensions. Mount the relay in a reasonably vibration free location. It can be mounted indoors or outdoors in any position, either in-line or with the optional mounting bracket, and should be close-coupled to the actuator to achieve maximum stroking speed.

Operating temperature limits are listed in the Specifications section of this Instruction. The temperature in the selected location must not exceed the specified operating temperatures.

CAUTION

Exceeding the specified ambient temperature limits can adversely affect performance and may cause damage to the relay.

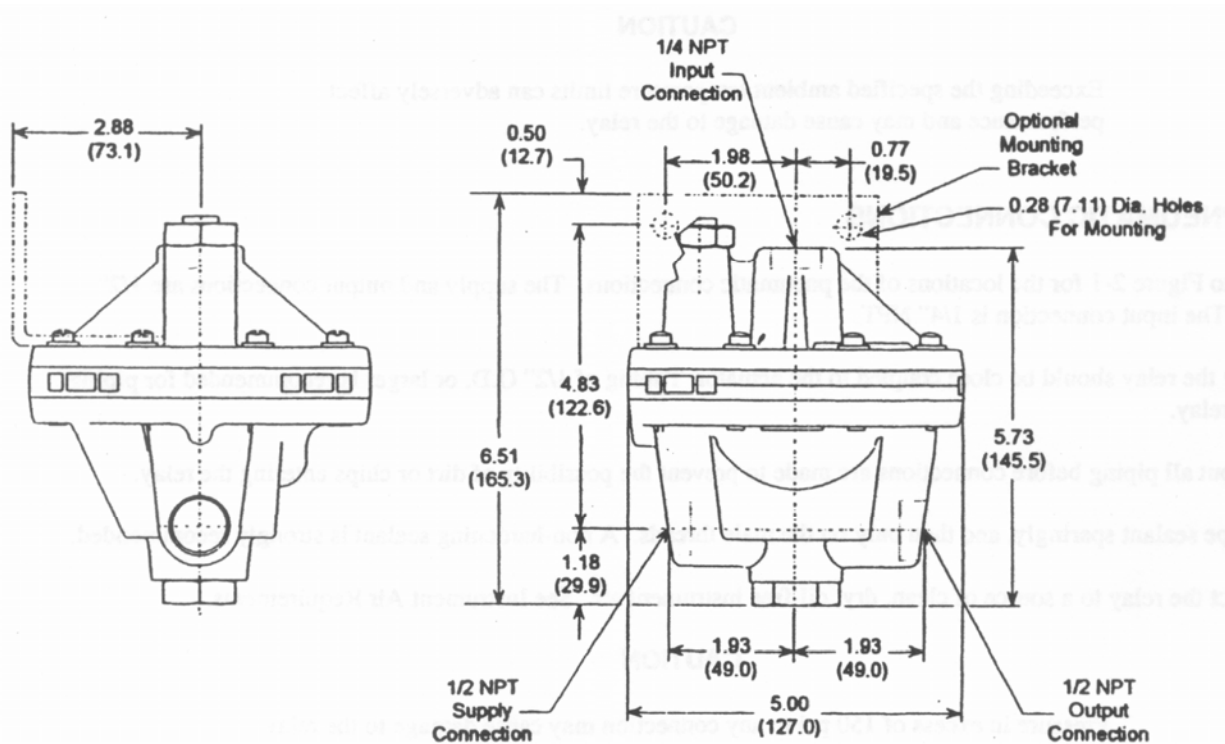


Figure 1 Mounting Dimensions

Pneumatic Connections

Refer to Figure 1 for the locations of the pneumatic connections. The supply and output connections are 1/2" NPT. The input connection is 1/4" NPT.

Ideally the relay should be close coupled to the actuator. Tubing of 1/2" O.D. or larger is recommended for piping to the relay.

Blow out all piping before connections are made to prevent the possibility of dirt or chips entering the relay. Use pipe sealant sparingly, and then only on the male threads. A non-hardening sealant is strongly recommended. Connect the relay to a source of clean, dry, oil-free instrument air. See Instrument Air Requirements.

CAUTION

Pressure in excess of 150 psi to any connection may cause damage to the relay. In any event, maximum actuator pressure should never be exceeded.

Instrument Air Requirements

Connect the relay to a source of clean, dry, oil-free instrument air. Failure to do so will increase the possibility of a malfunction or a deviation from specified performance.

CAUTION



Use of process fluids other than instrument air is not recommended. No claim is made as to the suitability of this product for use with other process fluids, such as hazardous gases, except as listed on the appropriate certificate. Non-approved instruments are suitable for use with instrument air only. Optional features and modifications such as tapped exhaust do not imply suitability for use with hazardous gases except as listed on the approval certificate.

CAUTION

Synthetic compressor lubricants in the air system at the instrument may cause the instrument to fail.

There are many types of synthetic compressor lubricants. Some may not be compatible with materials used in construction of the relay. Wetting of these materials with such an oil mist or oil vapor, etc., may cause deterioration and may ultimately result in the failure of the instrument. Refer to Specifications on page 1 for a list of materials.

The requirements for a quality air supply can be found in the Instrument Society of America's "Quality Standard for Instrument Air" (ISA-S7.3). Basically this standard calls for the following:

Particle Size – The particle size in the air stream at the instrument shall be no larger than 3 microns.

Dew Point – The dew point, at line pressure, should be at least 10°C (18°F) below the minimum temperature to which any part of the instrument air system is exposed at any season of the year. Under no circumstances should the dew point, at line pressure, exceed 2°C (35.6°F).

Oil Content – The maximum total oil or hydrocarbon content, exclusive of non-condensable, should not exceed 1 ppm under normal operating conditions.

PRINCIPLE OF OPERATION

Input pressure, acting upon the effective area of the upper diaphragm, produces a force which is opposed, in a 1:1 ratio, by the force from output pressure acting on the lower diaphragm. A change in input pressure will create a differential requiring pilot action to re-balance. An increase will depress the diaphragm assembly, opening the pilot valve and admitting supply air to the output until balance is restored. Conversely, a decrease will allow the diaphragm assembly to rise, opening the exhaust seat and lowering the output to match input. These units incorporate a stabilizing bypass needle valve which allows input to pass directly to output for small or gradual input changes. Since the booster is bypassed, there is no loss of accuracy and, with proper needle valve setting, steady-state stability can be maintained. The appropriate needle valve setting depends on the size of the actuator. Typically, the larger the actuator the more the needle valve can be closed and still maintain stability.

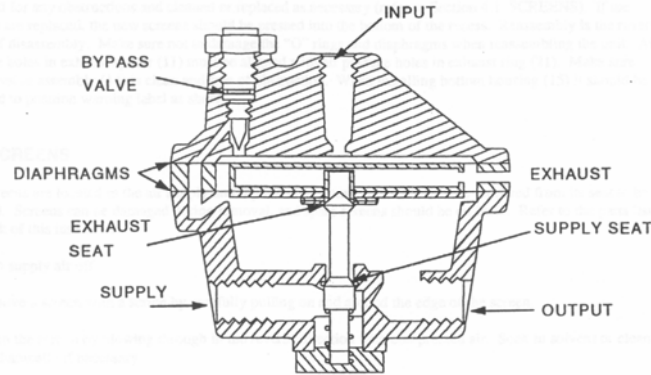


Figure 2 Booster Relay Operation

MAINTENANCE

These instruments do not normally require any routine maintenance. However, it may become necessary to clean the plunger and seats if they accumulate enough foreign matter to prevent the valve plunger from seating properly. The supply seat O-ring (8) is located in the bottom housing (15) (refer to Parts List Drawing 16230-108PL) and is accessed by removing the sealing screw (5), spring (20) and plunger (13). The exhaust seat is located in the diaphragm assembly (16) and may require the use of a pipe cleaner or similar device for cleaning. If this is not practical, the booster relay may be disassembled for easy access to the diaphragm assembly (and the exhaust seat).

CAUTION

Before disassembling the unit, make sure all air pressure to the unit is turned off.

When disassembling the unit, make sure all parts are clean and free of dirt and debris. Screens 6 and 10 should be checked for any obstructions and cleaned or replaced as necessary (refer to Screens below). If the screens are replaced, the new screens should be pressed into the bottom of the recess. Reassembly is the reverse order of disassembly. Make sure not to damage the O-rings and diaphragms when reassembling the unit. Air passage holes in exhaust spacer (11) must be aligned with air passage bores in exhaust ring (21). Make sure needle valve assembly (14) is clean and free of obstruction. When installing bottom housing (15) it should be oriented to position warning label as shown.

Screens

The screens are located in the air supply and input connections. A screen must be removed from its seat to be cleaned. Screens can be damaged during removal, and spare screens should be on hand. Refer to the parts list at the back of this instruction.

1. Turn supply air off.
2. Remove a screen with a scribe by carefully pulling on and around the edge of the screen.

3. Clean the screen by blowing through in the reverse direction with compressed air. Soak in solvent or clean mechanically if necessary.
4. Insert the screen until it bottoms using an object, such as the eraser end of a pencil, which will not cause damage.

Troubleshooting

If output pressure will not respond to changes in input pressure:

1. Check supply pressure.
2. Check supply and exhaust seats for dirt. Clean if necessary (see Maintenance).

If output pressure does not respond properly to changes in input pressure:

1. To reduce overshoot turn bypass valve counter-clockwise.
2. To increase speed of response turn bypass valve clockwise.

Parts Replacement

Refer to the Parts List at the back of this instruction when performing maintenance on the relay. It provides a list of replacement parts and an exploded view.

Customer/Product Support

This section provides the Internet site addresses, e-mail addresses, telephone numbers, and related information for customers to access Siemens product support.

When contacting Siemens for support:

- Please have complete product information at hand:
 - For hardware, this information is provided on the product nameplate (part number or model number, serial number, and/or version).
 - For most software, this information is given in the Help > About screen.
- If there is a problem with product operation:
 - Is the problem intermittent or repeatable? What symptoms have been observed?
 - What steps, configuration changes, loop modifications, etc. were performed before the problem occurred?
 - What status messages, error messages, or LED indications are displayed?
 - What troubleshooting steps have been performed?
 - Is the installation environment (e.g. temperature, humidity) within the product's specified operating parameters? For software, does the PC meet or exceed the minimum requirements (e.g. processor, memory, operating system)?
- A copy of the product Service Instruction, User's Manual, or other technical literature should be at hand. The Siemens public Internet site (see the table) has current revisions of technical literature, in Portable Document Format, for downloading.
- To send an instrument to Siemens for repair, request a Return Material Authorization (RMA).



IMPORTANT

An instrument must be thoroughly cleaned (decontaminated) to remove any process materials, hazardous materials, or blood born pathogens prior to return for repair. Read and complete the Siemens RMA form(s).

Contact Information

For customer/product support, visit the Siemens Process Instrumentation product support page at <http://www2.sea.siemens.com/Products/Process-Instrumentation/Support/Customer-Support.htm>. Select the desired type of support (e.g. application, product selection, sales, technical – see below).

Technical Support	
Telephone	1 800 333 7421
E-mail	techsupport.sea@siemens.com
Hours of Operation	8 a.m. to 4:45 p.m. eastern time, Monday through Friday (except holidays)
Technical Publications in PDF	http://www2.sea.siemens.com/Products/Process-Instrumentation/Support/PI-User-Manuals.htm then click the product line (e.g. Control Solutions)
Public Internet Site	http://www2.sea.siemens.com/Products/Process-Instrumentation
Repair Service	1-215-646-7400 extension 3187

WARRANTY

(a) Seller warrants that on the date of shipment the goods are of the kind and quality described herein and are free of non-conformities in workmanship and material. This warranty does not apply to goods delivered by Seller but manufactured by others.

(b) Buyer's exclusive remedy for a nonconformity in any item of the goods shall be the repair or the replacement (at Seller's option) of the item and any affected part of the goods. Seller's obligation to repair or replace shall be in effect for a period of one (1) year from initial operation of the goods but not more than eighteen (18) months from Seller's shipment of the goods, provided Buyer has sent written notice within that period of time to Seller that the goods do not conform to the above warranty. Repaired and replacement parts shall be warranted for the remainder of the original period of notification set forth above, but in no event less than 12 months from repair or replacement. At its expense, Buyer shall remove and ship to Seller any such nonconforming items and shall reinstall the repaired or replaced parts. Buyer shall grant Seller access to the goods at all reasonable times in order for Seller to determine any nonconformity in the goods. Seller shall have the right of disposal of items replaced by it. If Seller is unable or unwilling to repair or replace, or if repair or replacement does not remedy the nonconformity, Seller and Buyer shall negotiate an equitable adjustment in the contract price, which may include a full refund of the contract price for the nonconforming goods.

(c) SELLER HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE. SPECIFICALLY, IT DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, COURSE OF DEALING AND USAGE OF TRADE.

(d) Buyer and successors of Buyer are limited to the remedies specified in this article and shall have no others for a nonconformity in the goods. Buyer agrees that these remedies provide Buyer and its successors with a minimum adequate remedy and are their exclusive remedies, whether Buyer's or its successors' remedies are based on contract, warranty, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or non-conformities from any cause.

(e) Note: This article 1 does not apply to any software which may be furnished by Seller. In such cases, the attached Software License Addendum applies.

For warranty and non-warranty service, refer to Customer/Product Support in this publication.

PARTS LIST**Siemens Model 61VH VHC Booster Relay**

Drawing 16230-108PL

Rev 3/08

IMPORTANT

Service Parts Kits are available for servicing the instrument. Contact Siemens for available kits; refer to the Product Support section of this instruction. Some parts in this Parts List may not be available for separate purchase.

Item	Part No.	Description	Qty.
1	1-3520	1/4-20 x 1-3/8 Screw	8
2	-----	Nameplate Drive Screw	2
3	1-7303	1/4 Lockwasher	8
4	1-7872	Locknut	1
5	16230-92	Retaining Screw	1
6*	2155-225	Screen	1
7*	TGX: 2938-86	O-ring (Buna-N)	1
8	-----	O-ring (Teflon) (Supplied as part of Item 15) Not field repairable	1
9	-----	Nameplate	1
10*	16230-86	Screen	1
11	16230-14	Exhaust Spacer	1
13	16230-59	Plunger	1
14	16230-62	Needle Valve	1
15	16230- 106	Bottom Housing	1
16*	16230-73	Diaphragm Assembly	1
17	16230-78	Top Housing	1
18*	1912-7	Diaphragm	1
20*	16230-89	Spring	1
21	16230-90	Exhaust Ring	1
25	-----	Shipping Plug	2
26	-----	Shipping Plug	1
27	-----	Warning Label	1

* Recommended on-hand spare part. Always specify range, serial no. and other nameplate information when ordering spare parts.

All dimensions are in inches unless otherwise indicated.

