

VST Series Seated Valves

Also refer to "Directional Valve Features, Selection and Operating Recommendations" ([dynexdcvoperating.pdf](#))

CONTACT INFORMATION

USA Headquarters

Dynex/Rivett Inc.
770 Capitol Drive
Pewaukee, WI 53072 U.S.A.
Tel: 262-691-2222
FAX: 262-691-0312
E-mail: sales@dynexhydraulics.com

Power Units & Systems

Dynex/Rivett Inc.
54 Nickerson Road
Ashland, MA 01721 U.S.A.
Tel: 508-881-5110
FAX: 508-881-6849
E-mail: ashland@dynexhydraulics.com

European Sales

Dynex/Rivett Inc.
Unit C5 Steel Close, Little End Road, Eaton Socon,
Huntingdon, Cambs. PE19 8TT United Kingdom
Tel: +44 (0) 1480 213980
FAX: +44 (0) 1480 405662
E-mail: sales@dynexhydraulics.co.uk

**For more information
visit our web site:
www.dynexhydraulics.com**

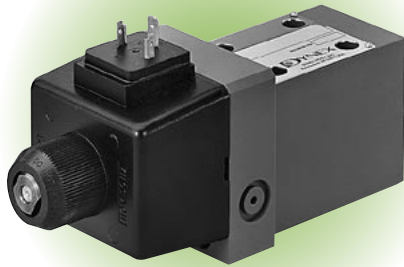
BROCHURE NOTES:

Consult the Dynex sales department for a review of any application which requires operating above the rated flows or pressures, or higher than normal operating temperatures.

Specifications shown were in effect when published. Since errors or omissions are possible, contact your sales representative for the most current specifications before ordering. Dynex reserves the right to discontinue or change designs at any time without incurring any obligation.



VST SERIES SEATED VALVES



VALVE DESCRIPTION

VST valves operate at high pressures: 10 000 psi (700 bar) for directional valves, and 15 000 psi (1040 bar) for vent functions.

These seated valves provide critical advantages compared to spool valves.

Spool lock, caused by a build-up of fine 'silt' particles, can occur when a spool is held in a fixed position at high pressure. Silting does not occur in this seated valve design. The result is reliable shifting, even when the valve remains unactuated for long periods at high pressure.

Positive sealing also makes this design ideal for circuits requiring load holding functions.

Valve Functions

VSTV and VST22 models are two position, two-way valves for venting, unloading, dumping or similar on/off "switching" functions.

VST23 models for three-way directional control are ideal for circuits which require locking of actuators used in clamping systems, presses and load-holding applications.

Mounting

Special HP03 pattern. Refer to page 3

Operation

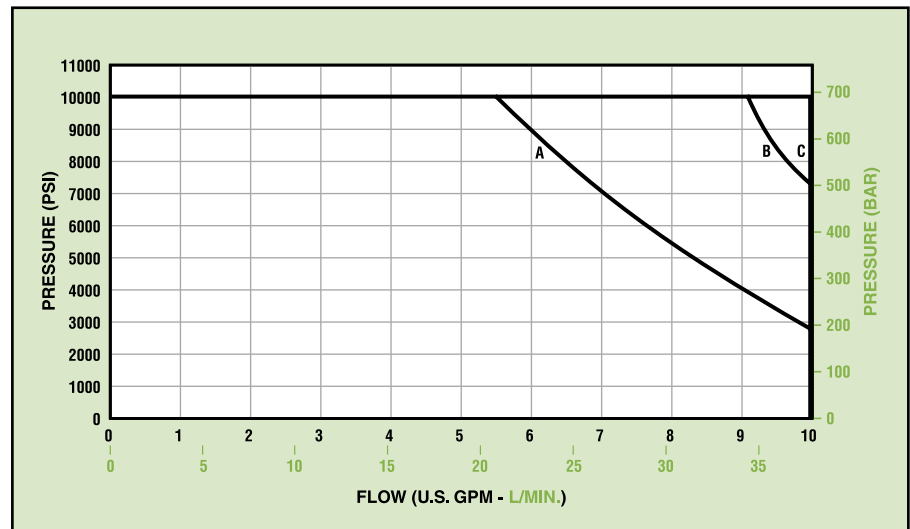
VSTV: Vent Valve;
VST22: Two Position, Two-Way;
VST23: Two Position, Three-Way.

Rated Flow

VST Vent Valves:
Nominal, 1 U.S. gpm (3,8 L/min);
Maximum, 2 U.S. gpm (7,6 L/min).

VST22 and VST23 Valves:
Nominal, 5 U.S. gpm (19 L/min);
Maximum, 10 U.S. gpm (38 L/min) for some models. See "Valve Flow Capacity".

Flow Capacity – Solenoid Models



Rated Pressure

VST Vent Valves:
15 000 psi (1040 bar).

VST22 and VST23 Valves:
10 000 psi (700 bar).

Tank Port Pressure (Maximum)

Solenoid Actuated Models:

Standard,
1500 psi (70 bar);
High Pressure Option ("HT"),
AC models, 2000 psi (140 bar);
DC models, 2500 psi (170 bar).

Hydraulic and Air Actuated Models:
3000 psi (210 bar).

Plug-in Terminal Solenoid

All models feature Plug-In-Terminal Solenoids, which fit DIN Connector, Standard 43650 Form A ("Hirschmann" type).

For electrical specifications, see [dynexdcvoperating.pdf](#).

Solenoid Response Time (ms)

Model	On		Off	
	AC	DC	AC	DC
VSTV	10-18	25-30	20	35
VST22	15-20	30-35	20	35-40
VST23	15-20	30-35	20	35-40

Flow Curve Reference

Model (Operation)	Function	Curve
VST22	PT	B
	PC	C
VST23	BT-PC	A
	PB-TC	C

Explosion Proof Option ("EP")

Solenoids with special enclosures are approved by UL and CSA for use in hazardous locations.

UL Classification:
Class I, Group C, D;
Class II, Group E, F, G.

VALVE FLOW CAPACITY

VSTV Models

All vent valves have a nominal rating of 1 U.S. gpm (3,8 L/min), with maximum capacity of 2 U.S. gpm (7,6 L/min).

Solenoid Actuated Directional Valves

The flow capacity curves show typical performance for VST22 and VST23 models. The letters in the "Flow Curve Reference" table identify the appropriate curve for each function.

VST SERIES SEATED VALVES

Hydraulic and Air Actuated Models

Generally, the maximum flow for VST22 or VST23 models is 10 U.S. gpm (38 L/min).

Minimum Pilot Pressure:

Hydraulic, 350 psi (24,1 bar);

Air, 40 psi (2,8 bar).

These values are based on zero tank pressure. For hydraulic actuated models, as back pressure increases above zero, the minimum pilot pressure must be increased by the same amount.

Maximum Pilot Pressure:

Hydraulic, 3000 psi (207 bar);

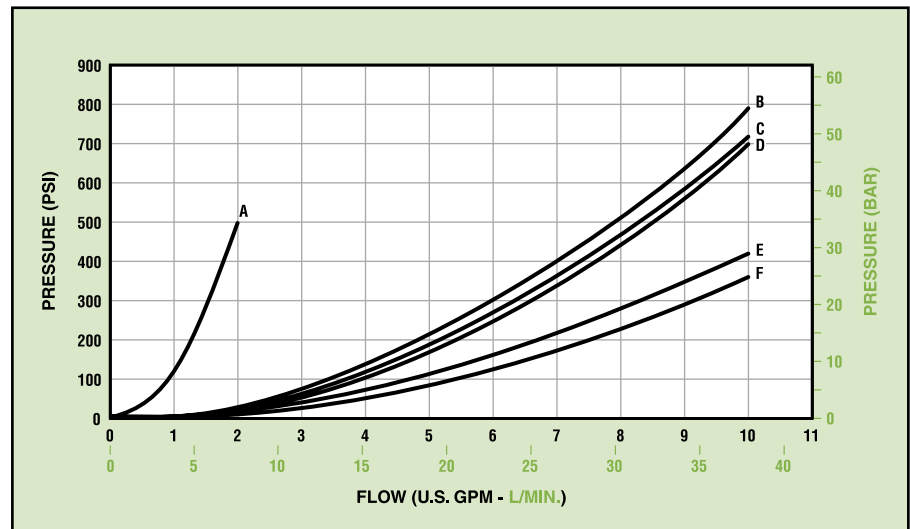
Air, 200 psi (13,8 bar).

Required Volume to shift the valve:

Hydraulic, 0.018 in³ (0,30 cm³);

Air, 0.640 in³ (10,49 cm³).

Pressure Drop (ΔP)



VALVE EFFICIENCY

Efficiency for all models is shown by the typical performance curves. The table identifies the appropriate pressure drop curve for specific model, function and flow path.

An Example

In the table for VST23 models with function BT-PC (spring offset B→T, P closed), curve "C" is called out for flow path B→T. Looking at the curves, "C" indicates a drop of about 190 psi (13 bar) at 5 U.S. gpm (19 L/min).

Flow Curve Reference

Model (Operation)	Function	Curve
VSTV	NO	A
	NC	A
VST22	PT	E
	PC	F
VST23	BT-PC:	
	Flow Path B→T	C
	Flow Path P→B	B
	PB-TC:	
	Flow Path P→B	D
	Flow Path B→T	F

INSTALLATION AND DIMENSIONS

The valve body and overall dimensions vary depending upon the valve operator. Refer to the variable dimension tables.

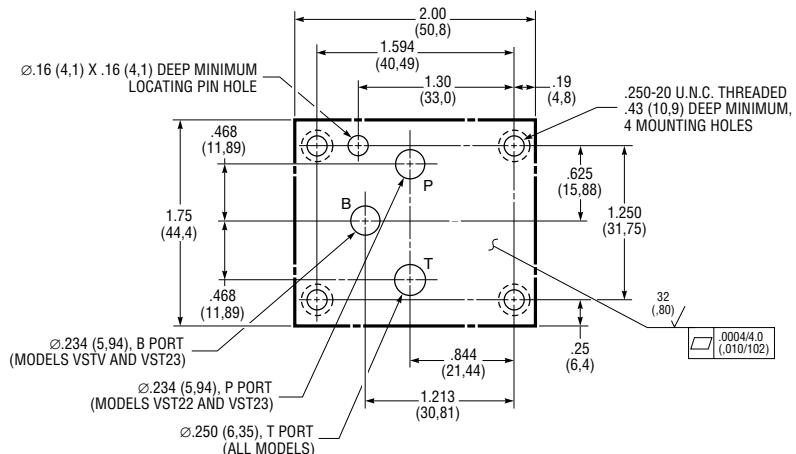
HP03 Valve Mounting

The mounting surface drawing shows the minimum flush or raised surface required for this special pattern.

As indicated, port "B" is required for Models VSTV and VST23; port "P" is required for VST22 and VST23.

Port o-rings are included with valves.

Mounting bolts must be ordered separately: .250-20 U.N.C. Threaded x 2.00 inch (50,8 mm), Grade 8 or better, four required. Recommended mounting torque is 12 lb·ft (16 N·m).



Minimum Mounting Surface, Special HP03 Pattern

VST SERIES SEATED VALVES

Solenoid Model Dimensions

The drawing shows dimensions for both AC and DC solenoids. DC configuration is shown printed in gray.

Weight (Mass):

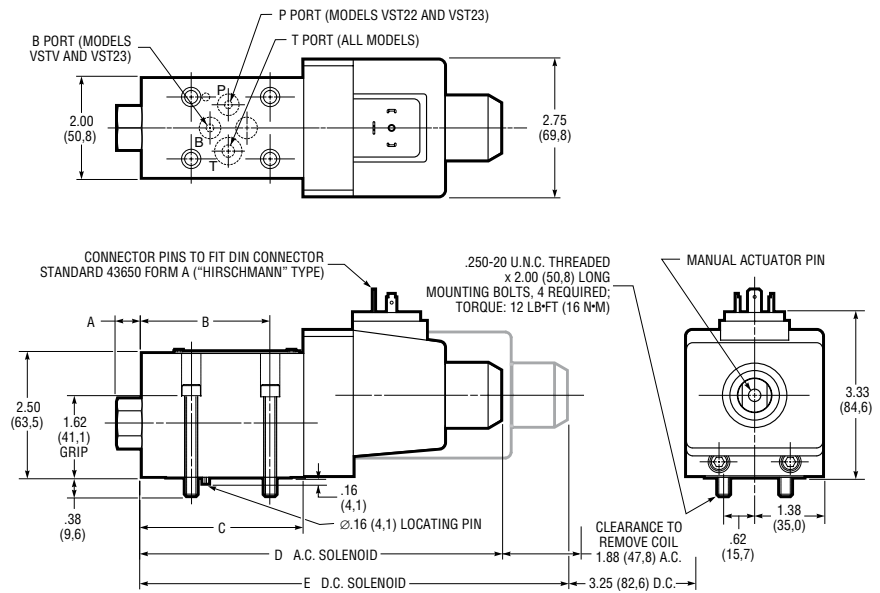
Model VSTV,
AC, 7.2 lb (3,3 kg);
DC, 8.5 lb (3,9 kg).

Model VST22,
AC, 8.1 lb (3,7 kg);
DC, 9.5 lb (4,3 kg).

Model VST23,
AC, 8.8 lb (4,0 kg);
DC, 10.2 lb (4,6 kg).

Variable Dimensions

Dimension	Valve Model		
	VSTV	VST22	VST23
A	0.31 (7,9)	0.50 (12,7)	0.50 (12,7)
B	1.94 (49,3)	2.59 (65,8)	3.05 (77,5)
C	2.53 (64,3)	3.26 (82,8)	3.73 (94,7)
D	6.52 (165,6)	7.25 (184,2)	7.71 (195,8)
E	7.86 (199,6)	8.59 (218,2)	9.05 (230,0)



Solenoid Actuator Models (Standard Plug-In Terminal)

Explosion Proof Solenoids

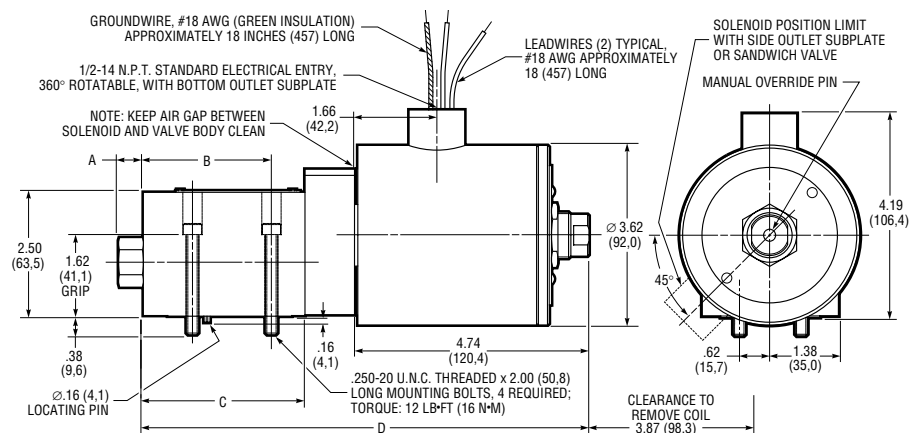
A kit with a spacer plate (part number KVH0301066) is required when EP valves are mounted on manifolds, or when used as a pilot valve.

Weight (Mass):

Model VSTV, 14.8 lb (6,7 kg);
Model VST22, 15.7 lb (7,1 kg);
Model VST23, 16.4 lb (7,4 kg).

Variable Dimensions

Dimension	Valve Model		
	VSTV	VST22	VST23
A	0.31 (7,9)	0.50 (12,7)	0.50 (12,7)
B	1.94 (49,3)	2.59 (65,8)	3.05 (77,5)
C	2.53 (64,3)	3.26 (82,8)	3.73 (94,7)
D	8.27 (210,1)	9.00 (228,6)	9.47 (240,5)



Explosion Proof Solenoid Models ("EP" Actuator Option)

VST SERIES SEATED VALVES

Hydraulic Piloted Models

Weight (Mass):

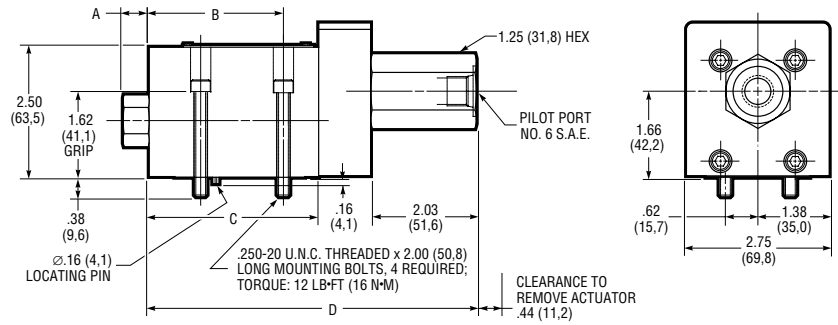
Model VSTV, 6.2 lb (2,8 kg);

Model VST22, 7.1 lb (3,2 kg);

Model VST23, 7.8 lb (3,5 kg).

Variable Dimensions

Dimension	Valve Model		
	VSTV	VST22	VST23
A	0.31 (7,9)	0.50 (12,7)	0.50 (12,7)
B	1.94 (49,3)	2.59 (65,8)	3.05 (77,5)
C	2.53 (64,3)	3.26 (82,8)	3.73 (94,7)
D	5.56 (141,2)	6.29 (159,8)	6.76 (171,7)



Hydraulic Actuated Models ("H" Actuator Option)

Air Piloted Models

Weight (Mass):

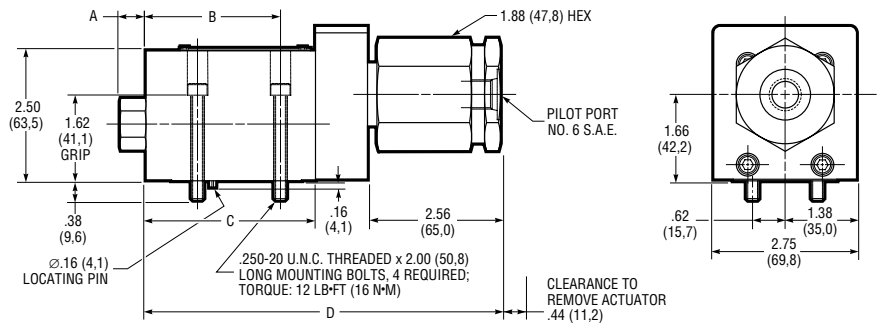
Model VSTV, 7.0 lb (3,2 kg);

Model VST22, 7.9 lb (3,6 kg);

Model VST23, 8.6 lb (3,9 kg).

Variable Dimensions

Dimension	Valve Model		
	VSTV	VST22	VST23
A	0.31 (7,9)	0.50 (12,7)	0.50 (12,7)
B	1.94 (49,3)	2.59 (65,8)	3.05 (77,5)
C	2.53 (64,3)	3.26 (82,8)	3.73 (94,7)
D	6.09 (154,7)	6.82 (173,2)	7.29 (185,2)



Air Actuated Models ("A" Actuator Option)

VST SUBPLATE AND BOLT KITS

Part Number	Description
<i>Subplates:</i>	
PS032-VST-SAE8	Side Ports, No. 8 S.A.E.
PS032-VST-BSP6	Side Ports, G 3/8 (B.S.P.)
PS032-VST-.56MP	Side Ports, 9/16 Medium Pressure Coned and Threaded, .8125-16 U.N. Threaded ^①
<i>Mounting Bolt Kit:</i>	
P22-BK-32	Four .250-20 U.N.C. Threaded x 2.00 inch (50,8 mm)
<i>Spacer Plate Kit:</i>	
KVH0301066	Permits mounting of "EP" valves on PS0 subplate or manifold.

^① "P" port uses Autoclave Medium Pressure, Butech M/P or equivalent fitting.

VST SEATED VALVES

TYPICAL MODEL CODE

VST

23

BT - PC

-

HP03

-

115HA

-

*

-

*

-

1

-

0

Valve Type

VST

Subplate Mounted Seated Valve

Operation

22

Two Position, Two-Way

23

Two Position, Three-Way

V

Vent

Mounting Pattern

HP03

High Pressure Special Mounting Pattern

Design Number

Modification Number

Electric Options

HT

High Pressure Tank Port, Maximum: AC models, 2000 psi (140 bar); DC models, 2500 psi (170 bar).

M

Hand Actuated Manual Override

Seals

No Code (Standard)

Fluorocarbon (Viton® or equivalent)

E

EPR

N

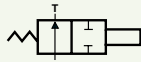
Buna-N

Functions^①

Vent Valve:

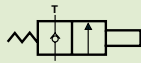
NO

Spring Offset Open



NC

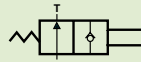
Spring Offset Closed



Two Position, Two-Way:

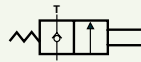
PT

Spring Offset Open



PC

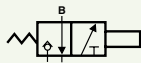
Spring Offset Closed



Two Position, Three-Way:

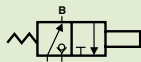
BT-PC

Spring Offset B→T, P Closed



PB-TC

Spring Offset P→B, T Closed



^① As shown in the schematic, the "T" port on these valves must be connected to tank. For maximum tank port pressures, refer to page 43.

Actuator

Plug-In Terminal Solenoids:^{①②}

115HA

Dual Frequency AC, 115V/60Hz/110V/50Hz

230HA

Dual Frequency AC, 230V/60Hz/220V/50Hz

12HD

12VDC

24HD

24VDC

Explosion-Proof Solenoids:^②

115EP

115V/60Hz

110EP

110V/50Hz

220EP

220V/50Hz

Hydraulic:

H

Hydraulic Actuator

Air:

A

Air Actuator

^① Fits DIN Connector Standard 43650 Form A ("Hirschmann" type).

^② For other voltages, contact the Dynex sales department.