DYNEX
High Pressure Hydraulics

ENGINEERING SPECIFICATIONS

VST Series
Seated Valves

VST SERIES
5 gpm (19 L/min) Nominal, 10 gpm (38 L/min) Max
Vent Model: 1 gpm (3,8 L/min) Nominal, 2 gpm (7,6 L/min) Max
10000 psi (700 bar), Vent Model: 15000 psi (1040 bar)

VST valves operate at high pressures: 10000 psi (700 bar) for directional valves, and 15000 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.

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 acutuators 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:

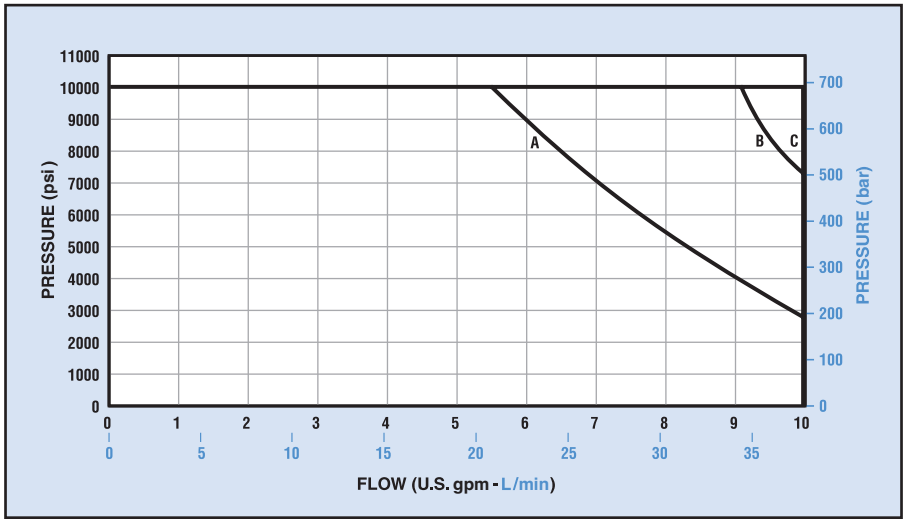
Nominal, 5 U.S. gpm (19 L/min); Maximum, 10 U.S. gpm (38 L/min) for some models. See *Flow Capacity*.

Rated Pressure

VST Vent Valves:
15000 psi (1040 bar).

VST22 and VST23 Valves:
10000 psi (700 bar).

Flow Capacity – Solenoid Models



Fluid Recommendations

50 to 1500 SUS (7 to 323 cSt) viscosity; -20° to 200° F (-29° to +93° C) temperature range.

Recommended Filtration

Use filtration to provide fluid which meets these ISO Code 4406 cleanliness values: 19/17/14.

Flow Curve Reference

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

Tank Port Pressure (Maximum)

Solenoid Actuated Models:
Standard, 1500 psi (105 bar).

Plug-in Terminal Solenoid

For electrical specifications, see table below or refer to *Typical Model Code* on page 5.

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.

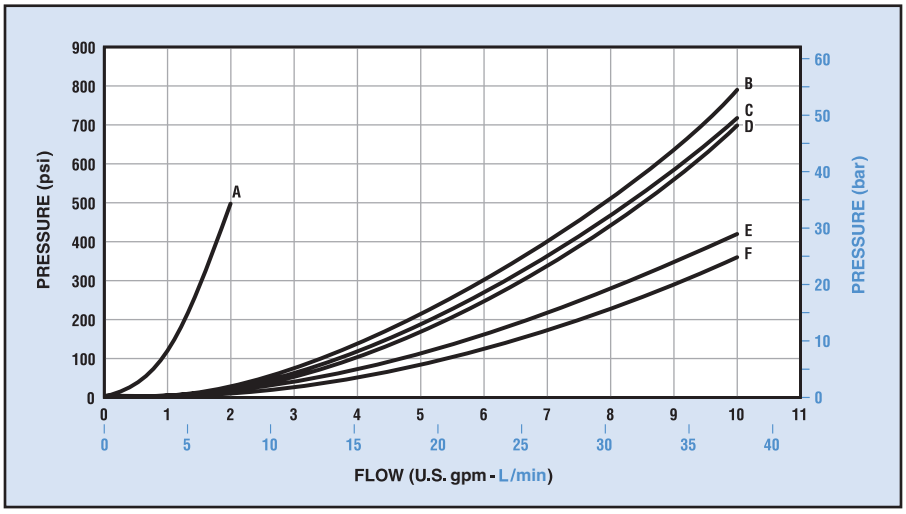
VALVE EFFICIENCY

Efficiency for all models is shown by the typical performance curves. The table identifies the appropriate pressure drop ΔP 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).

Pressure Drop (ΔP)



Flow Curve Reference

Model (Operation)	Function①	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

① *Refer to Functions in "Typical Model Code" on page 5.*

Solenoid Response Time (ms)

	On		Off	
Model	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

Solenoid Electrical Data

Solenoid Type①	Volts	Frequency (Hz)②	Coil Resistance (Ohms) at +77° F (+25°C)	Power (Watts)
AC Standard	24AC	60	10.45 - 11.55	36
	115AC	60	250 - 276	36
	230AC	60	–	36
DC Standard	12DC	–	3.8 - 4.2	36
	24DC	–	15.1 - 16.9	36
	125DC	–	368 - 408	36

① *Refer to "Typical Model Code" on page 5 for connector options.*
② *Information shown is for 60Hz models only. At other frequencies the coil characteristics must be revised.*

INSTALLATION AND DIMENSIONS

The valve body and overall dimensions vary depending upon the valve operator. Refer to the *Variable Dimensions* table.

Installation drawing dimensions are shown in inches (millimeters in parentheses) and are nominal.

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 UNC Threaded x 2.00 inch (50,8 mm), Grade 8 or better, four required. Recommended mounting torque is 12 lb-ft (16 N•m).

Solenoid Models

Weight (Mass)

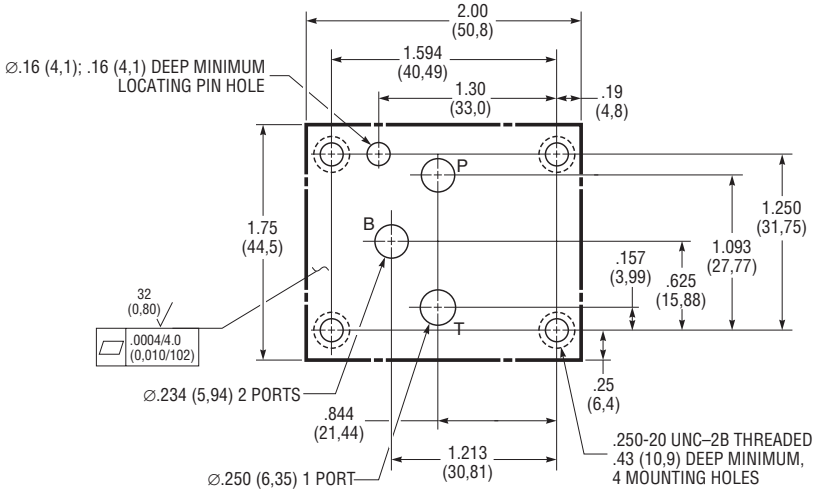
Model VSTV,
AC, 8.7 lb (3,9 kg).

Model VST22,
AC, 9.6 lb (4,4 kg).

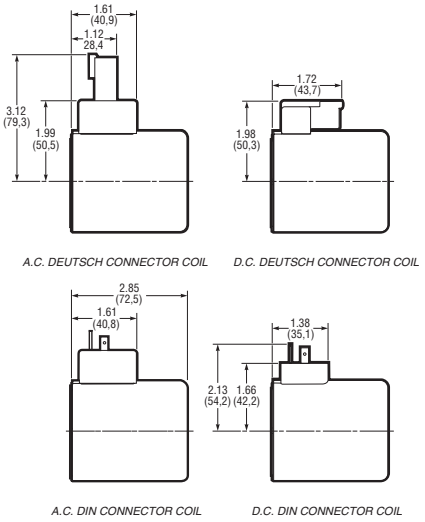
Model VST23,
AC, 10.3 lb (4.7 kg).

Electrical Connections

Plug-In-Terminal Solenoids fit Deutsch DT04-2P Connector, or DIN 43650 Form A (Hirschmann Type) Connector.



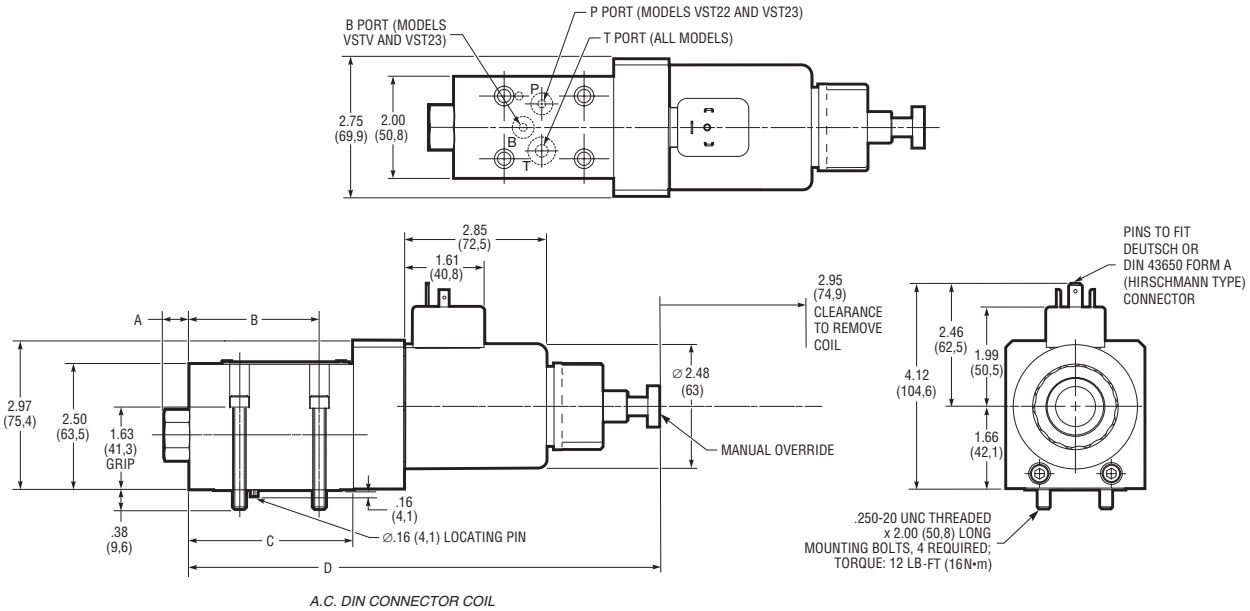
Minimum Mounting Surface, Special HP03 Pattern



Electrical Connector Options

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	8.73 (221,7)	9.47 (240,6)	9.94 (252,9)
E	7.86 (199,6)	8.59 (218,2)	9.05 (230,0)



Solenoid Actuator Models (Standard Plug-In Terminal)

Hydraulic Piloted Models

Weight (Mass)

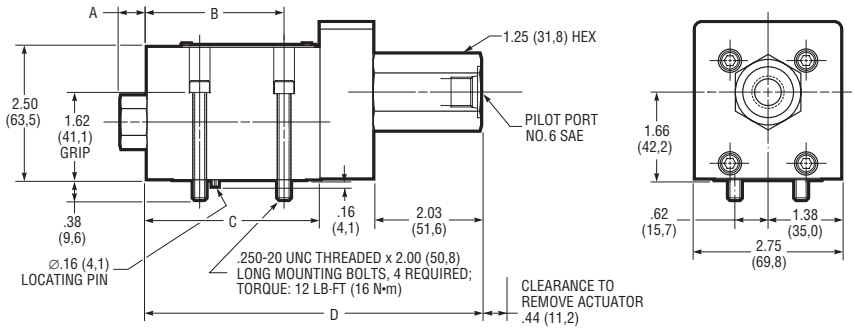
Model VSTV, 6.2 lb (2,8 kg).

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)

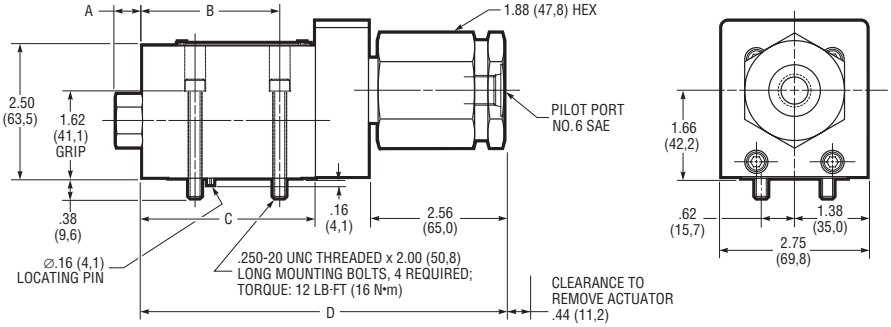
Model VSTV, 7.0 lb (3,2 kg).

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)

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 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 (210 bar).
Air, 200 psi (13,8 bar).

Required volume to shift the valve:

Hydraulic, 0.018 in^3 (0,30 cm^3).
Air, 0.640 in^3 (10,49 cm^3).

Tank Port Pressure (Maximum)

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

VST SUBPLATE AND BOLT KITS

Part Number	Description
Subplates:	
PS032-VST-SAE8	Side Ports, No. 8 SAE
PS032-VST-BSP6	Side Ports, G 3/8 (BSPP)
PS032-VST-.56MP	Side Ports, 9/16 Medium Pressure Coned and Threaded, .8125-16 UN Threaded①
Mounting Bolt Kit:	
P22-BK-32	Four .500-20 UNC Threaded x 2.00 inch (50,8 mm)

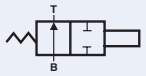
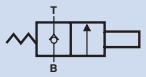
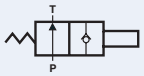
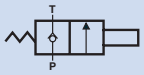
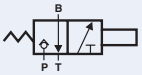
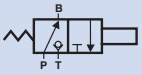
① *"P" port fits Medium Pressure Coned and Threaded, (Autoclave, Butech, or equivalent fitting).*

TYPICAL MODEL CODE

VST 22 NO – HP03 – 115DA – E – 2 0

Valve Type	
VST	Subplate Mounted Seated Valve

Operations	
22	Two Position, Two-Way
23	Two Position, Three-Way
V	Vent

Functions①		
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 2.*

Valve Size	
HP03	High Pressure Special Mounting Pattern

Actuators	
H	Hydraulic Actuator
A	Air Actuator

Electrical Options			
AC Solenoids Deutsch Connector:①		*DC Solenoids Deutsch Connector:①*	
115DA	115V/60Hz, 110V/50Hz	12DD	12VDC
230DA	230V/60Hz, 220V/50Hz	24DD	24VDC
24DA	24V/60Hz, 24V/50Hz	125DD	125VDC
AC Solenoids DIN Connector:②		*DC Solenoids DIN Connector:②*	
115HA	115V/60Hz, 110V/50Hz	12HD	12VDC
230HA	230V/60Hz, 220/50Hz	24HD	24VDC

① *Fits Deutsch DT04-2P Connector.*
② *Fits DIN 43650 Form A (Hirschmann Type) Connector.*

Seals	
No Code (Standard)	Fluorocarbon (Viton® or Fluorel®)
E	EPR (Ethylene-Propylene Rubber)①

① *Contact the Dynex Sales department for complete ordering information.*

Design Number

Modification Number

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

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