



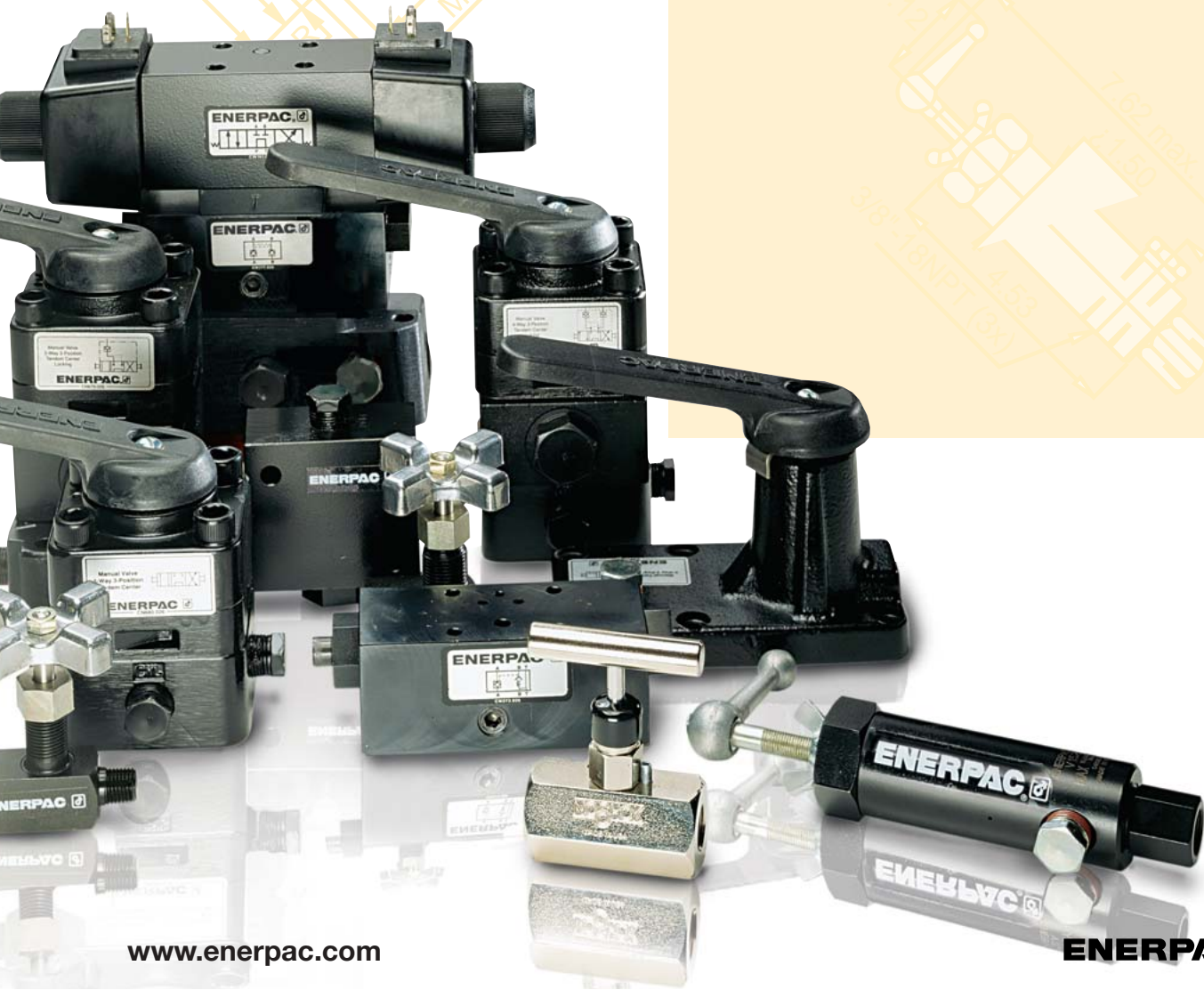


ENERPAC hydraulic valves are available in a wide variety of models and configurations.

Whatever your requirements... directional control, flow control, or pressure control... you can be sure that Enerpac has the correct valve to match your application exactly.

Designed and manufactured for safe operation up to 10,000 psi, the range of Enerpac valves allows for direct pump mounting, remote mounting, manual or solenoid actuation, and in-line installation, giving you flexible solutions to control your hydraulic system.

Valve Type	Series		Page
Pump-Mounted Directional Control Valves	VM, VE		130 ▶
Remote-Manual Directional Control Valves	VC		132 ▶
Modular/Solenoid Operated Directional Control Valves	VE		134 ▶
Pressure and Flow Control Valves	V		136 ▶



▼ Shown from left to right: VM32, VE33, VM33, VM43L, VE43-115



- Advance/Retract and Advance/Hold/Retract operation of single-acting and double-acting cylinders
- Manual or solenoid operation
- Pump mounting will retrofit on most Enerpac pumps
- Available “locking” option on VM Series valves for load-holding applications
- Standard “locking” feature on VE Series 3-position valves

▼ ZE4420SB-FH Z-Class pump is mounted next to an Enerpac H-frame press, includes VE43 electric valve to control cylinder operation.



For Reliable Control of Single and Double-Acting Cylinders



Valving Help

See Basic System Set-Up and Valve Information in our ‘Yellow Pages’

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Valve Operation	Used with Cylinder	Valve Type	
Manual	Single-acting	3-Way 2 Position	
Manual	Single-acting	3-Way 3 Position, Tandem Center	
Manual	Double-acting	4-Way 3 Position, Tandem Center	
Manual	Single-acting	3-Way 3 Position, Tandem Center, Locking	
Manual	Double-acting	4-Way 3 Position, Tandem Center, Locking	
Solenoid 24 VDC	Single-acting	3-Way 2 Position, Dump	
Solenoid 24 VDC	Single-acting	3-Way, 3 Position, Tandem Center	
Solenoid 115 VAC	Single-acting	3-Way, 3 Position, Tandem Center	
Solenoid 24 VDC	Double-acting	4-Way, 3 Position, Tandem Center	
Solenoid 115 VAC	Double-acting	4-Way, 3 Position, Tandem Center	

For remote valve applications, see page 133.

Pump Mounted Directional Control Valves



About the VM/VE Series

Enerpac's new line of VM and VE series valves include several new features and design improvements over competitive models.

All valves feature several gauge ports for "system", A port and B port pressure monitoring. User adjustable relief valves are included on all models to allow the operator to easily set the optimum working pressure for each application. VM33 and VE43 valves include "System Check" feature, for more precise pressure holding and improved system control. The VM33 has improved porting which provides faster cylinder retraction while motor is running.

All of the features make it easy to see that Enerpac is the only choice for high pressure hydraulic pumps and valves.

VM, VE Series



Flow Capacity:

4.5 gal./min.

Maximum Operating Pressure:

10,000 psi

Model Number	Hydraulic Symbol	Schematic Flowpath			Weight (lbs)
		Advance	Hold	Retract	
VM32					5.6
VM33					6.7
VM43					6.8
VM33L					10.7
VM43L					10.8
VE32D					8.7
VE33					20.3
VE33-115					20.3
VE43					20.3
VE43-115					20.3



Push-Button Control Station

VE33-115 and VE43-115 electric valves are supplied with IC400 control station. These valves include an 8 ft. power cord, and can be used on any Enerpac pump. They require a separate 115 volt power supply to operate.



Locking Valves

For applications that require positive load holding, VM Series valves (except the VM32 valve) are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

To order this feature, place an "L" at the end of the model number.



Pendants for VE-Series Solenoid Valves

When ordering Enerpac VE-Series solenoid valves, the pendant must be ordered separately for Z-Class pumps. Pendant connection to be plugged into electric box of pump.

To be used with solenoid valves:	Pendant Model Nr.
VE32D	ZCP-1
VE32, VE33	ZCP-3

▼ Shown from left to right: VC-20, VC-4L



VC Series



Flow Capacity:

4.5 gal/min.

Maximum Operating Pressure:

10,000 psi



Locking Valves

For applications that require positive load holding, VC and VM Series valves are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

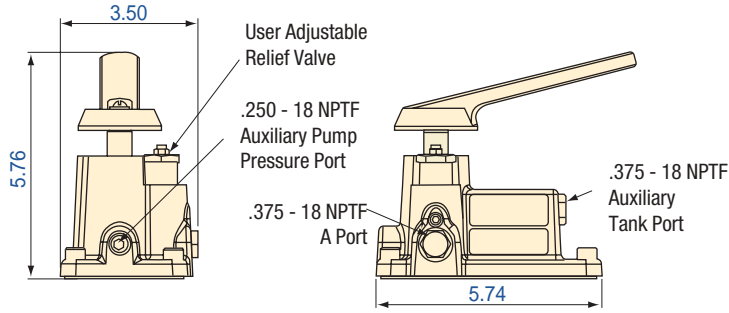
- Advance/Hold/Retract operation for use with single-acting or double-acting cylinders

Valve Operation	Valve Type	Model Number	Hydraulic Symbol	Schematic Flowpath			Weight (lbs)
				Advance	Hold	Retract	
Manual	3-Way, 3 Position, Tandem Center	VC-3					6.4
Manual	3-Way, 3 Position, Tandem Center, Locking	VC-3L					10.3
Manual	3-Way, 3 Position, Closed Center	VC-15					6.4
Manual	3-Way, 3 Position, Closed Center, Locking	VC-15L					10.3
Manual	4-Way, 3 Position, Tandem Center	VC-4					6.4
Manual	4-Way, 3 Position, Tandem Center, Locking	VC-4L					10.3
Manual	4-Way, 3 Position, Closed Center	VC-20					6.4
Manual	4-Way, 3 Position, Closed Center, Locking	VC-20L					10.3

Return line kit included with remote valves

Directional Control Valves Dimensions

Valve dimensions in inches



VM32

**VM,
VE
Series**

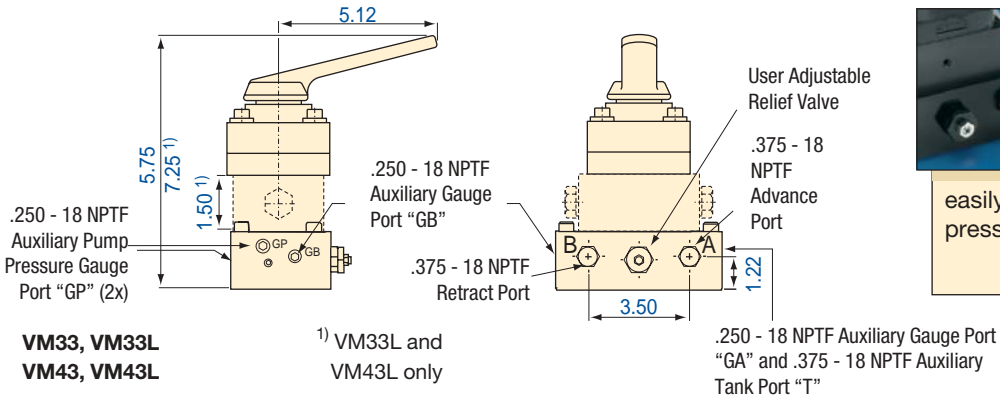


Flow Capacity:

4.5 gal./min.

Maximum Operating Pressure:

10,000 psi



**VM33, VM33L
VM43, VM43L**

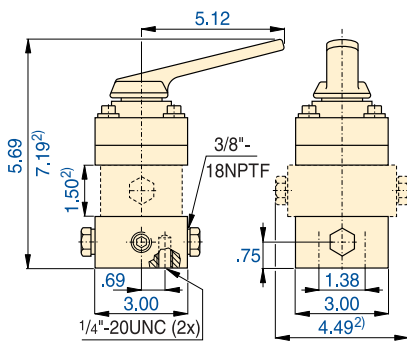
¹⁾ VM33L and VM43L only



User Adjustable Relief Valve

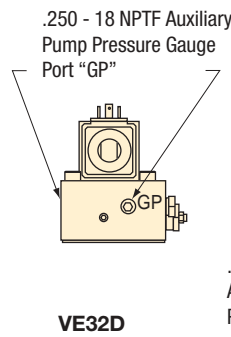
All VM- and VE-Series have a user adjustable relief valve to allow the operator to

easily set the optimum working pressure.

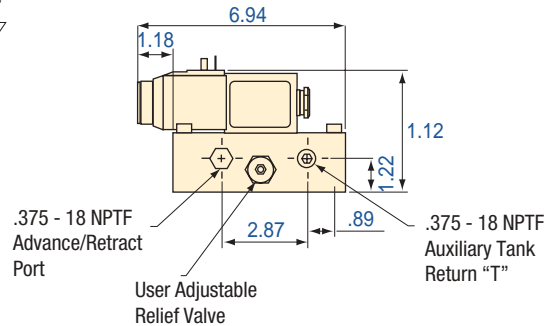


VC-3, VC-3L, VC-15, VC-15LVC-4, VC-4L, VC-20, VC-20L

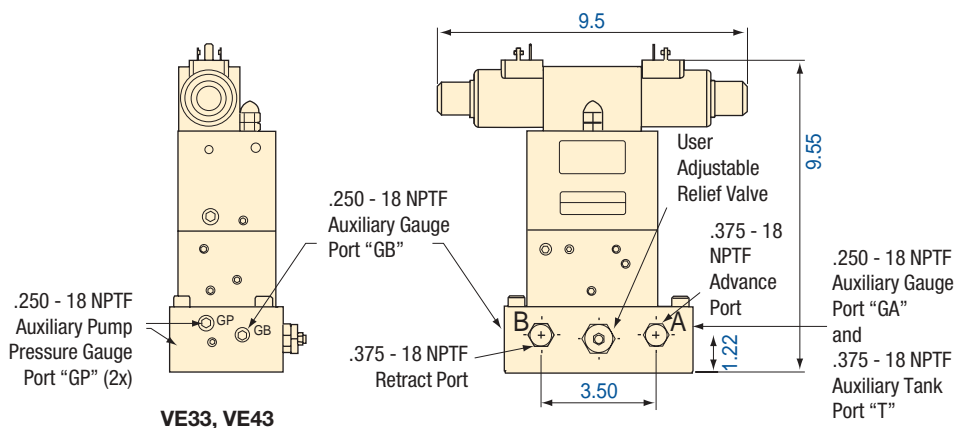
²⁾ VC-3L, VC-15L, VC-4L and VC-20L only



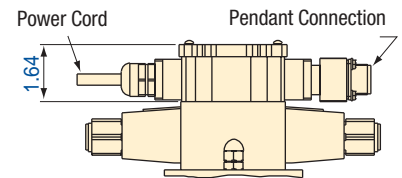
VE32D



**VE33-115
VE43-115**



VE33, VE43



▼ Shown top to bottom: VEC-15600D, VEK-15000B, VEC-15000B



- Shear seal design minimizes internal leakage
- Ideal for independent control of multiple cylinders or functions
- Relief valve and pilot-operated check accessory valves are stackable between manifold and valve body
- Remote and pump mounting

Valve Flow Path	Used with Cylinder	Valve Code	Hydraulic Symbol
4-Way, 3-Position (4/3) Open Center	Double-acting	A	
4-Way, 3-Position (4/3) Closed Center	Double-acting	B	
4-Way, 3-Position (4/3) Tandem Center	Double-acting	C	
4-Way, 3-Position (4/3) Float Center	Double-acting	D	
4-Way, 2-Position (4/2) Crossover Offset	Double-acting	E	
3-Way, 3-Position (3/3) Tandem Center	Single-acting	F	
3-Way, 3-Position (3/3) Closed Center	Single-acting	G	
2-Way, 2-Position (2/2) Normally Closed	System	H*	
2-Way, 2-Position (2/2) Normally Open	Un-loading	K*	
4-Way, 2-Position (4/2) Float Offset	Double-acting	M	
3-Way, 2-Position (3/2) Normally Open	Single-acting	P	

* Requires use of tank port for dump or unloading

Unmatched Combinations and Possibilities



3-Way Check Valve

Use a **VS-51** 3-way pilot operated check valve assembly to convert your 3-way modular valve into a load-holding valve.



4-Way Check Valve

Use a **VS-61** 4-way pilot operated check valve assembly to convert your 4-way modular valve into a load-holding valve.



System Pressure Control

To add system pressure control to your modular valve, order **VS-11 Relief Valve** assembly.



Bolt Kits for Accessory Valves

Order Bolt Kit **BK-2** when adding one of the accessory valves. Order Bolt Kit **BK-3**

when adding any combination of two accessory valves.

How to order one of the 1,300 possible model numbers:

With over 1,300 possible model numbers, Enerpac has the perfect valve for you. Use the "chart" to build your own valve for the specific application you require. This is the complete guide to all the Modular valves that are available.

Solenoid Operated Modular Valves

CUSTOM BUILD YOUR MODULAR VALVES

▼ This is how a Modular Valve Model Number is built up:



1	2	3	4	5	6
Solenoid Operated Valve	Valve Flow Path	Flow Capacity	Voltage	Accessory Valves	Manifold

1 Product Type

VE = Solenoid Operated Valve

2 Valve Code

- A** = 4/3 Open Center
- B** = 4/3 Closed Center
- C** = 4/3 Tandem Center
- D** = 4/3 Float Center
- E** = 4/2 Crossover Offset
- F** = 3/3 Tandem Center
- G** = 3/3 Closed Center
- H** = 2/2 Normally Closed
- K** = 2/2 Normally Open
- M** = 4/2 Float Offset
- P** = 3/2 Normally Open

3 Flow Capacity

1 = 4 gallons per minute

4 Voltage

- 1** = 24 VDC
- 2** = 220/240 V, 1 ph, 50 Hz
- 5** = 115 V, 1 ph, 60 Hz
- 6** = 230 V, 1 ph, 60 Hz

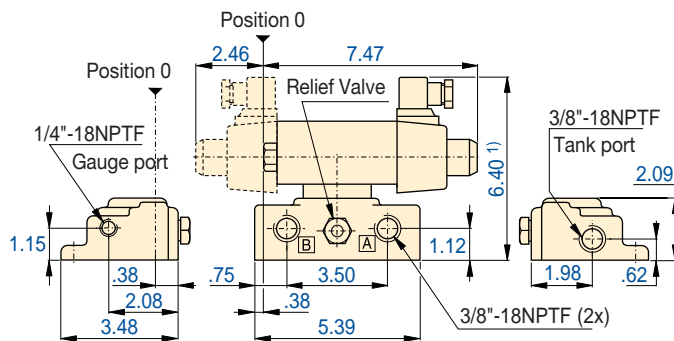
5 Accessory Valves

- 000** = No accessory valves
- 100** = Relief Valve only
- 150** = Relief Valve and 3-way pilot operated check valve
Only for VEF/VEG
- 160** = Relief Valve and 4-way pilot operated check valve
Only for VEA/VEB/VEC/VED
- 500** = 3-way pilot operated check valve
Only for VEF/VEG
- 600** = 4-way pilot operated check valve
Only for VEA/VEB/VEC/VED

6 Manifold

- A** = No manifold
- B** = Remote Mounted
- D** = Pump Mounted*

* Only for valve code: **VEA/VEC/VEF**



1) add 1.85 inch for each Accessory Valve

Modular Valve Pump Mounted

Valve dimensions in inches

Maximum Operating Pressure (psi)	Amperage Draw			Seal Material	Valve Plug
	24 VDC	115 VAC 60 Hz	230 V 60 Hz		
0 - 10,000	N/A inrush	3.6 A inrush	1.8 A inrush	Buna-N, Polyurethane	DIN 43650
	2.5 A Holding	1.0 A Holding	.5 A Holding		

VE Series



Flow Capacity:

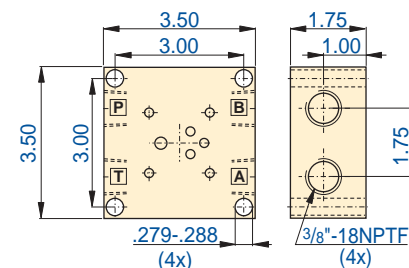
4 gal/min.

Maximum Operating Pressure:

10,000 psi

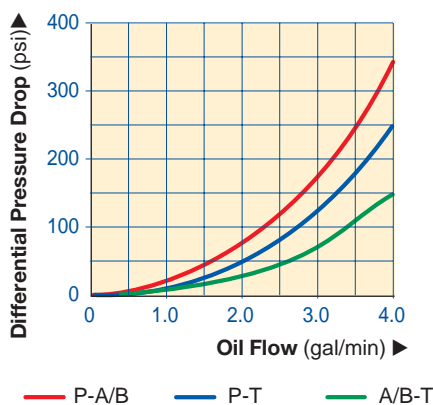
Example: VEA-15600-D

VEA-15600-D is a Modular Valve with a 4-way, 3-position open center flowpath, 115 VAC, and an integral pilot-operated check valve, for mounting on an Enerpac pump.



Modular Valve Remote Mount Manifold

Pressure Drop versus Oil Flow

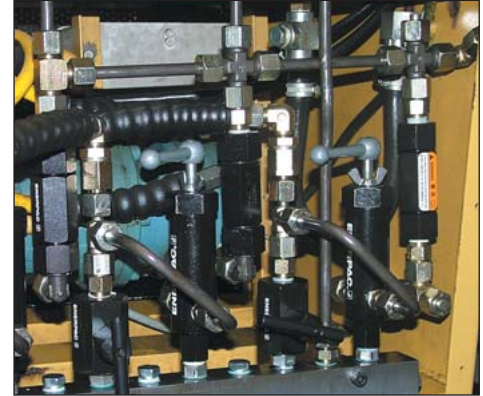


▼ Shown from left to right: V-152, V-66, V-82, V-161, V-42, V-17



Your Hydraulic Control Solution

▼ The V-152 Pressure Relief Valve limits the pressure or force developed in the hydraulic system.



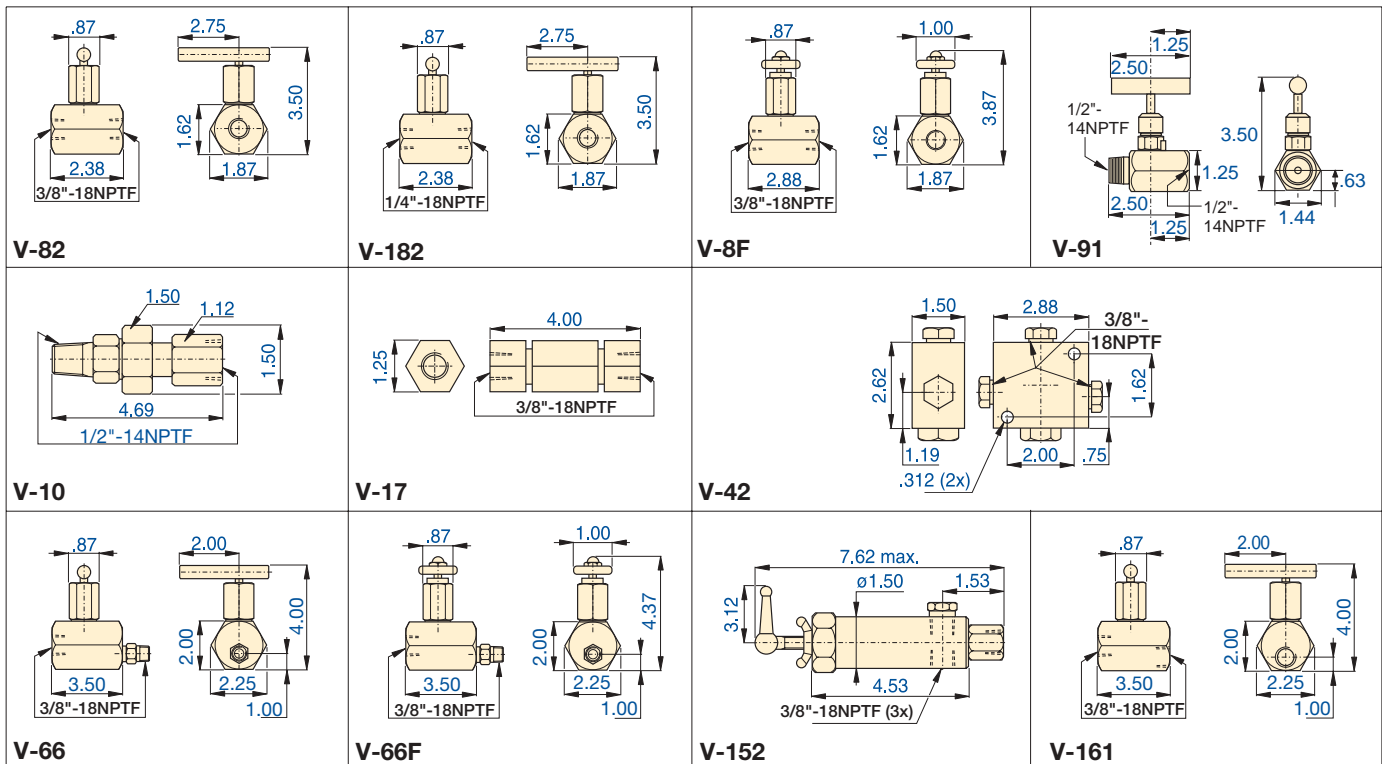
- All valves are rated for 10,000 psi operating pressure
- All valves feature NPTF porting to insure against leakage at rated pressure
- All valves are painted, coated, or plated for corrosion resistance



Valve Applications

To see these valves used in typical hydraulic circuits, please see our "Yellow Pages".

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Valve Dimensions in inches.

Flow and Pressure Control Valves



Premounted Manifold

For two or four port manifold with integral flow control valves, see the manifold page of the System Components section.

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Fittings

For additional fittings see the fitting page of the System Components section.


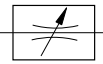

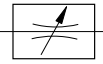



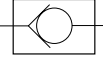

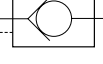

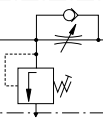

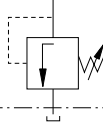

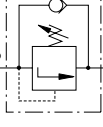
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V Series



Maximum Operating Pressure:

10,000 psi

Valve Type and Model Number	Description	Hydraulic Symbol
Needle Valve V-82 V-182F V-8F	 <p>V-82: To control cylinder speed. Can also be used as shut-off valve for temporary load holding. 1/4" NPTF female ports. Also suitable for gauge snubbing. V-8F: Similar to V-82, but with very fine metering for precise flow control. V-182: Same as V-82, but with 3/8" NPTF female ports. Not recommended as shut-off valve.</p>	
Snubber Valve V-91	 <p>V-91: Adjustable for metering oil out of a gauge to prevent snapping of gauge pointer when load or pressure is suddenly released. Also suitable as shut-off valve to protect the gauge during high cycling applications. 1/2" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.</p>	
Auto Damper® Valve V-10	 <p>V-10: To be used when gauge pressure must be monitored during high cycle applications. Creates a flow resistance when load is released suddenly. No adjustments are necessary. 1/2" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.</p>	
Check Valve V-17	 <p>V-17: Ruggedly built to resist shock and operate with low pressure drop. Closes smoothly without pounding. 3/8" NPTF female ports.</p>	
Pilot Operated Check Valve V-42	 <p>V-42: Can be mounted at the cylinder to hold the load in case of system pressure loss. Normally used with double-acting cylinders where pilot port receives pressure from a Tee-fitting in the cylinder retract line. 3/8" NPTF female ports. Pilot pressure ratio 14% (6.5:1).</p>	
Manually Operated Check Valve V-66* V-66F	 <p>V-66: Used for load holding applications with single and double acting cylinders. Valve is manually opened to allow oil to flow back to tank when cylinder retracts. V-66F: Similar to V-66, but with very fine metering capability for precise flow control. Not designed for load holding applications.</p>	
Pressure Relief Valve V-152*	 <p>V-152: Limits pressure developed by the pump in hydraulic circuit, thus limiting the force created by other components. Valve opens whenever preset pressure is reached. To increase pressure setting, turn handle clockwise. Includes: • 3 ft return line hose kit • ±3% repeatability • 800-10,000 psi adjustment range.</p>	
Sequence Valve V-161	 <p>V-161: To control oil flow to a secondary circuit. Flow is blocked until system pressure rises to the V-161 setting. When this pressure level is reached, the V-161 opens to allow flow to the secondary circuit. A pressure differential is always maintained between the primary and secondary circuit. Min. operating pressure: 2000 psi.</p>	

* See page 56-57 for more information on extreme pressure and flow control valves.