

# Valves

## Technical support

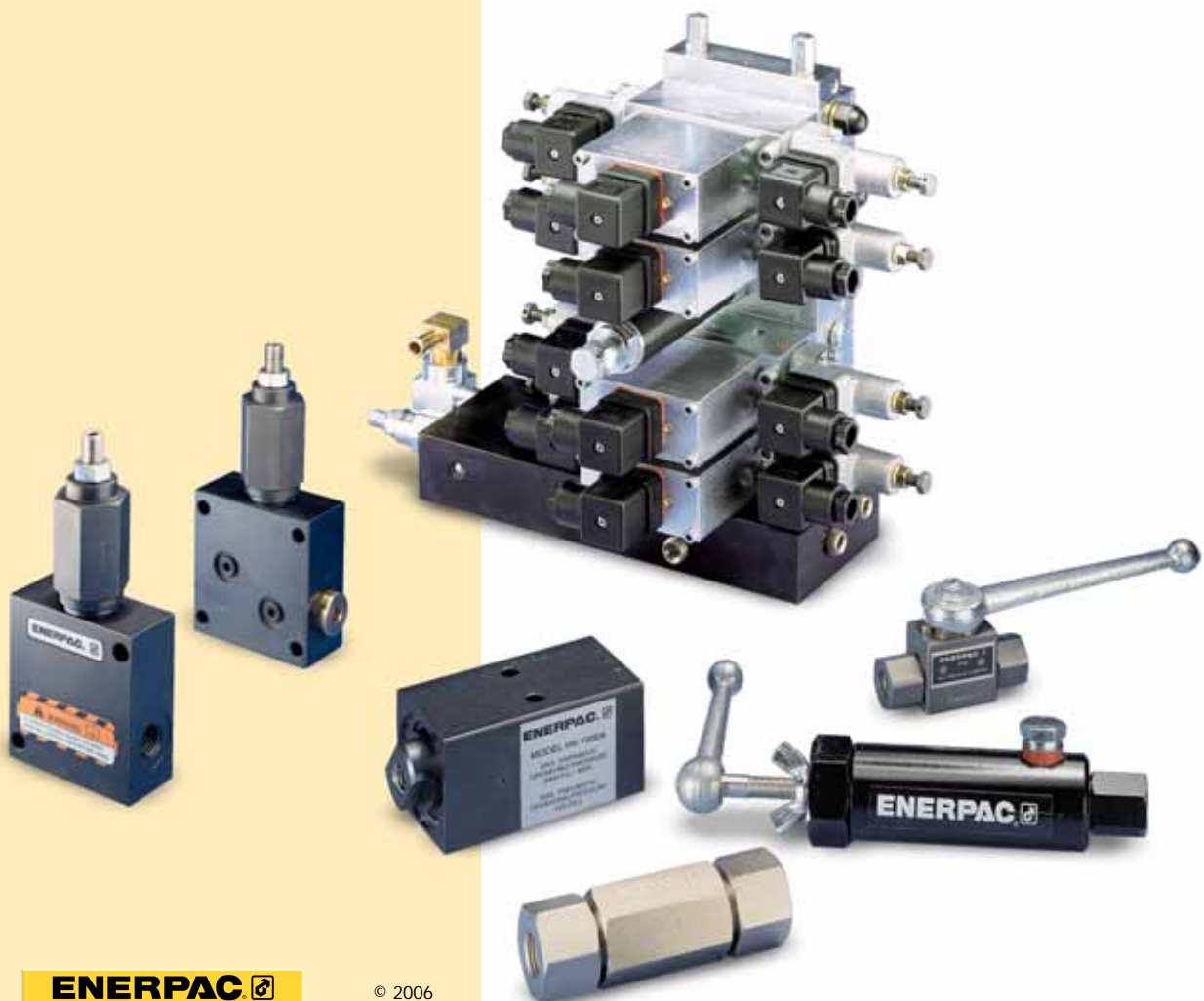
Refer to the "Yellow Pages" of this catalog for:










- Safety instructions
- Basic hydraulic information
- Advanced hydraulic technology
- FMS (Flexible Machining Systems) technology
- Conversion charts and hydraulic symbols

 113 ▶

## Valves

Valves – Controlling the operation of your clamping system requires the use of many specialized directional, pressure and flow control valves. Enerpac has the complete line of valving components to complement any hydraulic system. Choose from electric directional valves and a wide variety of pressure control, flow control and specialty valves to provide the control and automation that your application needs.



	▼ series	▼ page	
Modular directional valves	VP	88	
Pressure switches, Flow control valve	PSCK VFC	89	
Tie rod kits, Remote/porting manifolds	TRK WM, PB	90	
Pressure reducing valves	PRV	91	
Sequence valves	MVPM V	92	
Pilot operated check valves	MV, V	93	
Accessory valves	MH, HV PLV, V	94 - 95	
Flow Control Valves	VFC	96	
Air valves and accessories	VA, VR RFL, QE	97	

Shown: VP-11

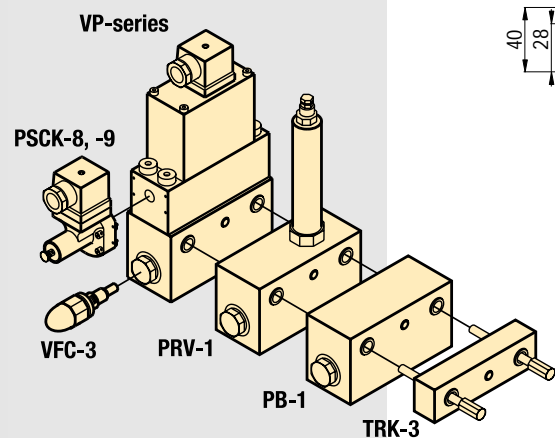


## VP-series

Solenoid directional valves control the direction of the oil flow to each cylinder port.

### Application

VP-valve in combination with all its options in the drawing and photo below. For remote mounting of these valves use WM-10 manifold (□ 90).

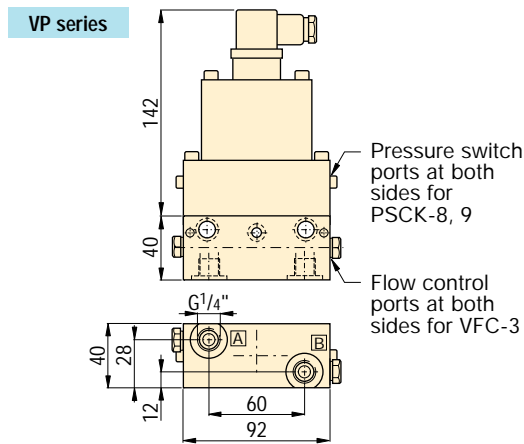


■ Enerpac VP-series valves stackbuilt on a workholding pump.



## Solenoid directional valves

- Dual poppet valve design for zero internal leakage
- Inlet check-valve standard
- High cycle switching
- Stackable to 8 valve stations high
- 17 - 350 bar operational pressure
- Oil flow capacity 7 l/min @ 350 bar
- Oil flow capacity 15 l/min @ 0 bar
- G<sup>1</sup>/<sub>4</sub>" oil connections and integrated filtration

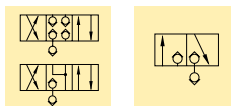


Pressure: 350 bar

Max. Flow: 15 l/min @ 0 bar

Voltage: 24 VDC

- Ⓔ Válvulas de control
- Ⓕ Electro distributeurs
- Ⓖ Wegesitzventile



## Options

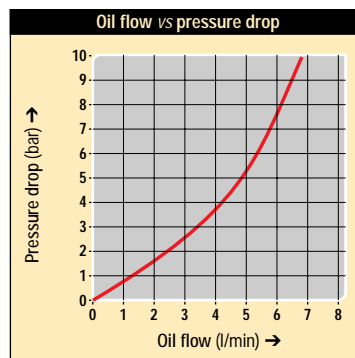
PB-1 Auxiliary block

□ 90 ▶

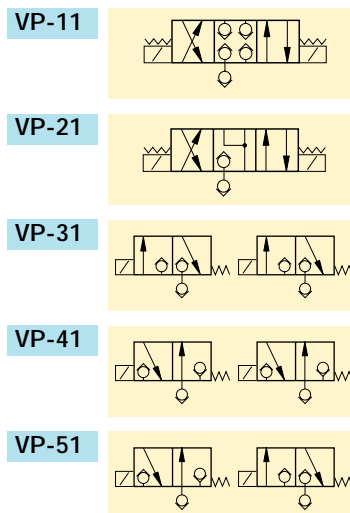


Tie Rod Kits

□ 90 ▶



### Flow Path <sup>1)</sup>



<sup>1)</sup> See page 129 for full hydraulic scheme.

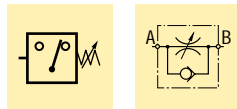
## Product selection

Voltage @ current	Model number	Used with cylinder(s)
at 50/60 Hz @ 1,13 Amps		
▼ 4/3 Closed centre		
24 VDC @ 1,13 A	VP-11	1x DA / 2xSA
▼ 4/3 Float centre		
24 VDC @ 1,13 A	VP-21	1x DA / 2xSA
▼ 3/2 Normally closed		
24 VDC @ 1,13 A	VP-31	1x DA / 2xSA
▼ 3/2 Normally open		
24 VDC @ 1,13 A	VP-41	1x DA / 2xSA
▼ 3/2 one port normally open, one port normally closed		
24 VDC @ 1,13 A	VP-51	1x DA / 2xSA

Note: DIN 43650 electrical connector included. Valve weight 3,0 kg.

- Pressure: 350 bar
- Flow: 7 l/min @ 350 bar
- Voltage: 24 VDC

- E** Presostatos
- F** Pressostats
- D** Druckschalter

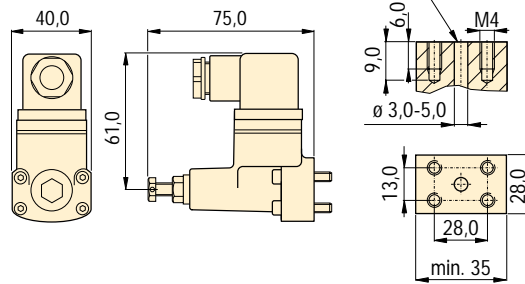


## To control your hydraulic system

- Mounts directly into VP-series modular valves
- In-line installation
- Cartridge type flow control valve and pressure switches can be manifold mounted for remote use
- Lockable adjustment screw on PSCK models

PSCK-8, 9

Mounting dim.



### PSCK-8, 9

Adjustable pressure switches will open or close electrical contacts when the desired pressure value is reached.

### Application

To open or close an electric circuit when a preset pressure value is reached. The electrical circuit is used to control further working cycles, such as actuating control valves or to terminate a working cycle. Directly mounted into Enerpac VP-series valves.

### VFC-3

Screw-in throttle type valve to control the amount of oil flow to the hydraulic cylinder.

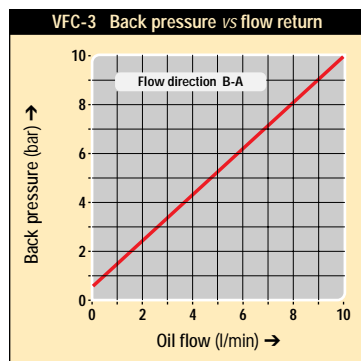
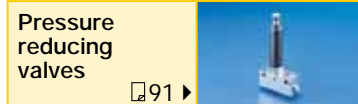
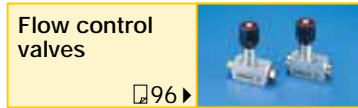
### Application

Used to control cylinder speed in hydraulic circuits. Directly mounted into Enerpac VP-series valves or custom made manifolds for remote applications.

■ PSCK-8 and VFC-3 directly mounted on VP-valves.

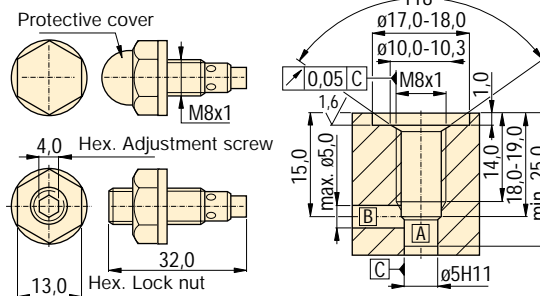


## Options



VFC-3

VFC-3 Mounting dimensions



## Product selection

Solenoid voltage @ current	Model number	Hydraulic scheme	Pressure range	Deadband	Maximum oil flow
at 50/60 Hz			bar	bar	l/min
▼ Pressure switch					
24 VDC @ 2 A	PSCK-8		100 - 350	18 - 35	7
▼ Pressure switch					
24 VDC @ 2 A	PSCK-9		20 - 210	6 - 15	7
▼ Flow control valve					
Screw-in throttle valve	VFC-3		0 - 350	-	7

# Tie Rod Kits, Remote/Porting Manifolds TRK, WM, PB-series

Shown: WM-10, TRK-4, PB-1



## ▶ TRK-series

Tie Rod Kits mount Enerpac VP-series modular valves to the WM-10 manifold or pump mounted manifold and can accommodate one to eight VP-valve stations.

## ▶ WM-10

Remote manifold allows mounting of VP-series modular valves to a remote location from the pumping unit. This manifold has a built-in adjustable relief valve.

## ▶ PB-1

Porting manifold provides three pressure ports for auxiliary lines or accessories, such as a pressure gauge. Mounts between VP-series modular valve stations using TRK-series tie rod kits.

■ Tie rods mount VP-series valves and accessories to manifold, providing leak-free sealing.



## Simplifies valve and accessory mounting

### TRK-series Tie Rods

- Connects 1 to 8 VP-series valves
- Provide leak-free sealing valves
- G1/4" oil connection

### WM-10 Remote manifold

- Allows remote VP-series valve mounting
- Adjustable relief valve incorporated
- G1/4" oil connection

### PB-1 Porting manifold

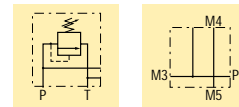
- Provide 3 auxiliary pressure lines
- G1/4" oil connection

Mounting: 1-8 VP valve stations

Pressure: 350 bar max.

Flow: 15 l/min

- Ⓔ Pernos de montaje de válv.
- Ⓕ Vis de montaje de distrib.
- Ⓖ Zugstangen



## Options

Pressure switches

☐ 89 ▶



VP-series directional valves

☐ 88 ▶

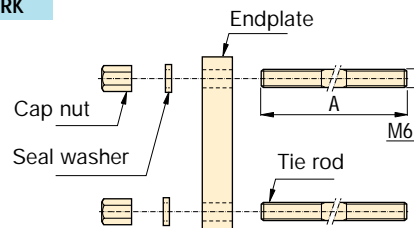


Gauges

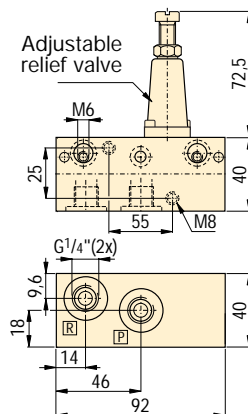
☐ 106 ▶



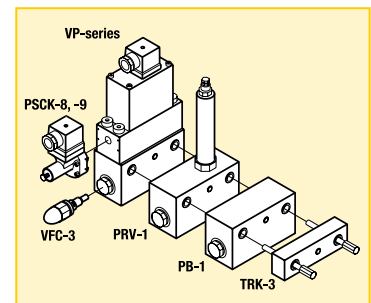
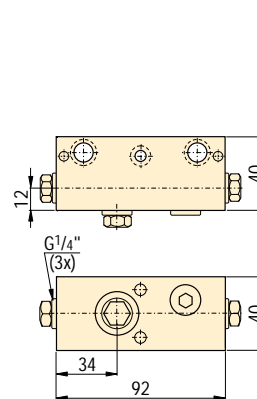
### TRK



### WM-10



### PB-1



## Product selection

Quantity of stackable VP-series directional valves	Model number	Tie rod length	Mounting thread
		mm	mm
▼ Tie rod kits			
1	TRK-1	85	M6
2	TRK-2	125	M6
3	TRK-3	165	M6
4	TRK-4	205	M6
5	TRK-5	245	M6
6	TRK-6	285	M6
7	TRK-7	325	M6
8	TRK-8	365	M6

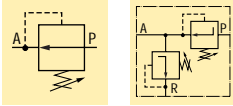
## Product selection

Oil ports	Model number	Hydr. scheme	Maximum pressure
BSPB			bar
▼ Remote manifold with pressure relief			
2x G1/4"	WM-10		350
▼ Porting manifold (P port connection)			
3x G1/4"	PB-1		350

Pressure: 350 bar

Flow: 7 l/min

- (E) Válv. reguladora de presión
- (F) Valve de pression réglable
- (D) Druckreduzierventil



## Precise control of hydraulic pressure

- Stackbuilding with VP series modular valves
- Stackable for multiple pressures on one valve stack assembly
- Tool adjustable knob can be locked
- Precise control of pressure
- G1/4" oil connection
- Remote mount PRV-3

## Options

VP-Modular valves

88 ▶



Pressure switches

89 ▶



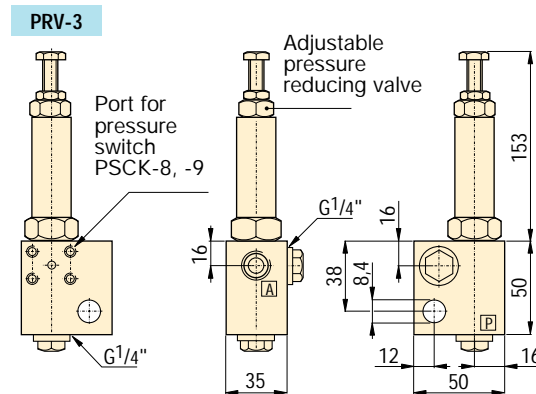
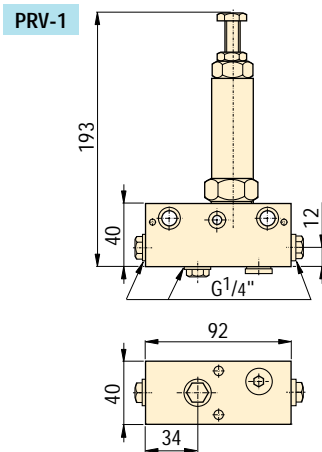
Tie rod kits

90 ▶



Fittings

110 ▶



## Product selection

Mounting style	Adjustable pressure range	Maximum pressure	Built-in adjustable pressure relief valve	Model number	Oil ports	Maximum oil flow	
	bar	bar	bar		BSPP	l/min	kg
VP-series	30 - 300	350	-	PRV-1	G1/4"	7	1,6
Remote	30 - 300	350	-	PRV-3	G1/4"	7	1,3

Shown: PRV-1



## PRV-series

These valves regulate system pressure for all subsequent valves, according to the adjusted pressure. Maintains a constant pressure in a secondary circuit. Includes a check valve that prevents pressure drop on secondary side.

## Application

Used when a hydraulic supply with a higher pressure (primary side) must also be used for another circuit with a lower pressure (secondary circuit).

PRV-1 can be stack built between VP-series valves. PRV-3 is for remote mounting. The cartridge from PRV-3 can be removed from manifold for direct integration into gundrilled fixture.

■ PRV-1 connected with remote manifold WM-10.



Shown: MVPM-5



## ▶ Sequence valves

Sequence valves block the oil to a secondary hydraulic circuit until pressure in the primary circuit reaches a preset level. The sequence valves have a built-in check system to allow the oil to flow back without external piping. Pressure settings for the V-2000 can be adjusted by screwing the slotted pin in or out. The pressure settings for the other models is adjusted by loosening the jam nut and turn the set screw to reach your setting.

## Application

The sequence valves can be mounted in-line or fixture mounted using mounting bolts. A typical application for the sequence valve would be to build pressure within work supports before the swing cylinders are applied to the supported part, to prevent deflection in the part.

■ Two MVPM-5 sequence valves used in conjunction with Enerpac MCA-series Auto Coupler to provide system automation.



## Pressure dependent sequence control

### MVPM-5

- Direct accurate pressure setting
- Pressure setting between 35 - 350 bar for secondary circuit is secured with lock nut

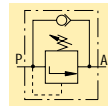
### V-2000

- Direct accurate pressure setting
- Pressure setting between 14 - 140 bar for secondary circuit
- Flag indicator appears every time the valve is operated

Pressure: 350 bar max.

Flow: 4,1 - 6,0 l/min max.

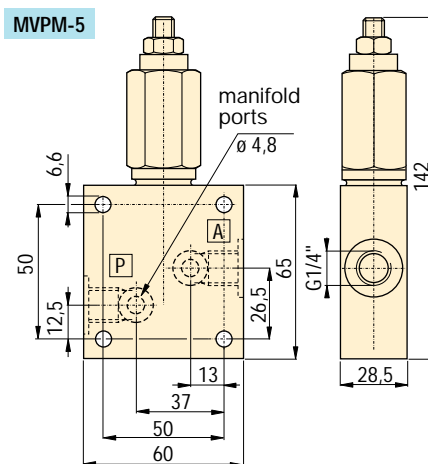
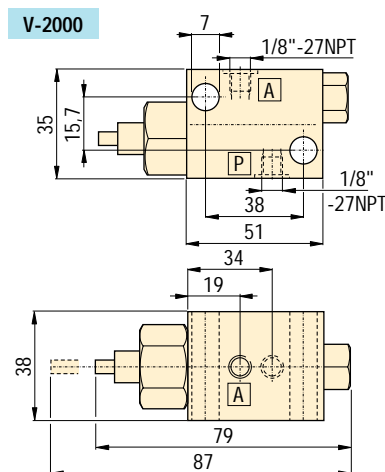
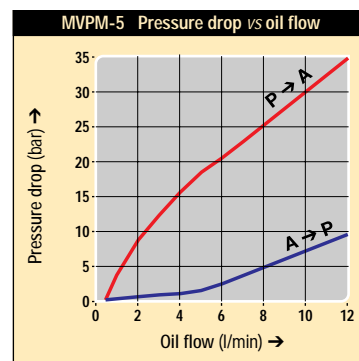
- Ⓔ Válvulas de secuencia
- Ⓕ Valves de séquence
- Ⓖ Folgeventile



## 💡 Options

### Gauges

106 ▶



## 🔍 Product selection

Pressure adjustment range	Maximum pressure	Maximum oil flow	Model number	Oil ports	Opening pressure check valve	
bar	bar	l/min			bar	kg
14-140	350	4,1	V-2000	1/8" - 27N P T	-	0,9
35-350	350	6,0	MVPM-5	G 1/4"	1,4	1,3

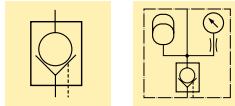
Seal material: Buna-N. Manifold O-rings included with MVPM-5. For manifold mounting installation information consult Enerpac for surface preparation.

Pilot ratio: 7:1
Flow: 38 l/min max.

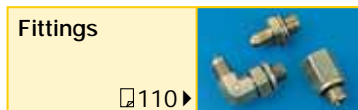
**To hold cylinder load and ensure remote unlocking**

- (E) Válvulas antiretorno pilotada
- (F) Clapets antiretour piloté
- (D) Rückschlagventile

- Fast check-off response
- Hardened seats ensure long life and positive pressure holding
- Built-in accumulator to maintain system pressure
- Mounting holes
- Manifold mount body MVM-72



## Options

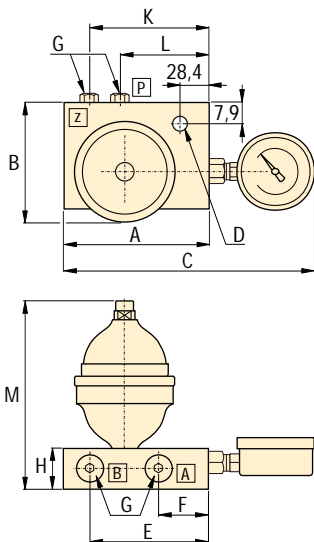


## Product selection

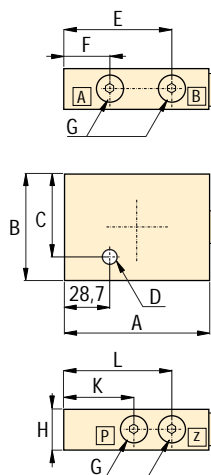
Pilot ratio	Accumulator included	Maximum oil flow l/min	Maximum pressure bar	Model number	Oil ports	Optional charging tool for ACL	kg
7 : 1	-	38	350	MV-72	G 1/4"	-	1,8
7 : 1	ACL-22	38	350	MV-722B	G 1/4"	WAT-2	2,7
7 : 1	ACL-202	38	350	MV-7202B	G 1/4"	WAT-2	3,4
7 : 1	-	38	350	MVM-72	G 1/4"	-	1,4

For more information on ACL-series Accumulators see page 104.

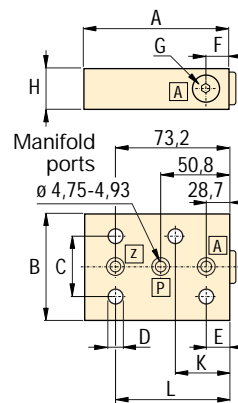
### MV-722B, -7202B



### MV-72



### MVM-72



## Product dimensions in mm [⌀]

Model number	A	B	C	D	E	F	G	H	K	L	M
MV-72	89,0	63,5	55,6	7,1	73,2	28,7	G1/4"	31,8	50,8	73,2	-
MV-722B	89,0	71,1	184,2	7,1	73,2	28,4	G1/4"	31,8	73,2	50,8	145
MV-7202B	89,0	92,4	181,1	7,1	73,2	28,4	G1/4"	31,8	73,2	50,8	185
MVM-72	89,0	63,5	38,1	7,1	28,7	28,4	G1/4"	31,8	44,5	73,2	-

Seal material: Buna-N. Manifold O-rings included with MVM-72. For manifold mounting installation information consult Enerpac for surface preparation.

Shown: MV-72, MVM-72



## MV-series

Pilot operated check valves check the oil flow with a built-in pilot circuit providing fast, automatic check-off for your workholding applications. The pilot operated check valves with built-in accumulator help to maintain system pressure due to minor oil loss.

## Application

Added capability to open with pilot pressure to allow cylinders to retract. By using a pilot operated check valve, cylinder retraction can be accomplished automatically without operator activity.

# Accessory valves *Application & selection*

Shown: HV-1000A, V-17, V-10, V-12, V-152



## Accessory valves

Enerpac accessory valves, available in a wide variety and many configurations to control hydraulic pressure or oil flow. These valves are used in conjunction with other valves and system components to provide full automation and control.

### Application

Accessory valves are used to automate clamp cycles, prevent pressure loss and provide additional operator and component safety.

## Your hydraulic control solution

- Regulate oil flow or system pressure
- All valves feature NPT or SAE porting to insure against leakage at rated pressure
- Can easily be installed in any system
- All valves are painted, coated or plated for corrosion resistance

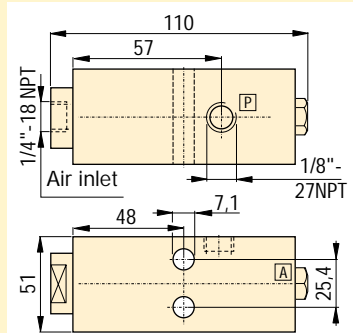
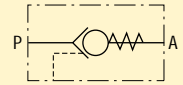
## Product selection

Valve type	Maximum pressure bar	Model number	Oil ports
Holding valve, air pilot	210	<b>HV-1000A</b>	1/8" NPT
Holding valve, modular	210	<b>MHV-1</b>	1/8" NPT
Pressure limiting valve	210	<b>PLV-40013B</b>	1/8" NPT
Manual shut-off valve	350	<b>V-12</b>	SAE #4
Auto-damper valve	700	<b>V-10</b>	1/2" NPT
Safety check valve	700	<b>V-17</b>	3/8" NPT
Pressure relief valve	700	<b>V-152</b>	1/8" NPT

## Product specification

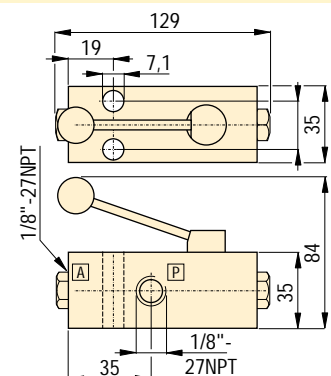
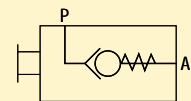
### HV-1000A Air pilot holding valve

- Holds fluid under pressure offering independent control of different branches of the same fixture
- Valve can control the pilot air and the booster in sequence
- Max. oil flow 5 l/min
- Works with the VA-42 four-way air valve and a booster



### MHV-1 Modular holding valve

- Allows separate operation of clamping fixtures with a single power source
- Ideal for applications when fluid feed lines are impractical. If system pressure is interrupted, the MHV-1 will hold the pressure beyond the valve
- Max. oil flow 5 l/min
- To release system pressure, rotate valve handle in either direction 90° to release and retract system pressure



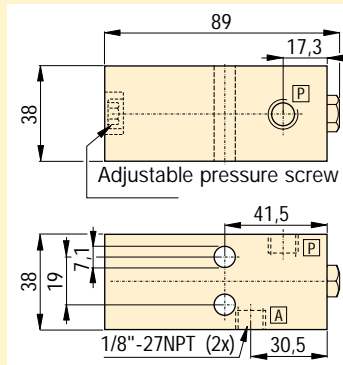
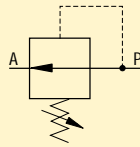
■ V-17 Safety check valve installed on a fixture.





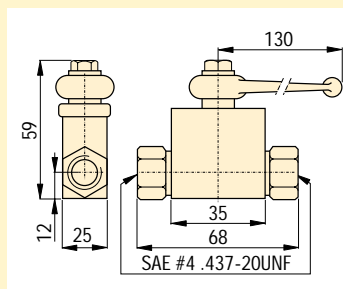
**PLV-40013B**  
Pressure limiting valve

- Allows precise control of pressures reaching specific clamps
- When pressure build-up reaches a preset level, the valve closes, stabilizing pressure to that section of the fixture
- Pressure adjustment between 14 - 105 bar
- Max. oil flow 5 l/min



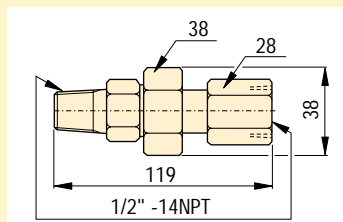
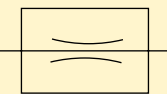
**V-12 Manual shut-off valve**

- Ball type valve can be used for the master system shut-off or for isolating separate circuits on a fixture
- Viton seals standard
- Straight through design for easy system plumbing and installation
- Fully open allows high flow return of oil
- Max. oil flow 12 l/min



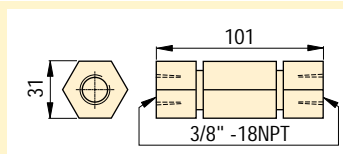
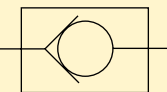
**V-10 Auto-damper valve**

- To protect gauge during high cycle applications
- Creates a flow resistance when load is released suddenly. No adjustments are necessary
- Fits directly into GA-series gauge adaptor



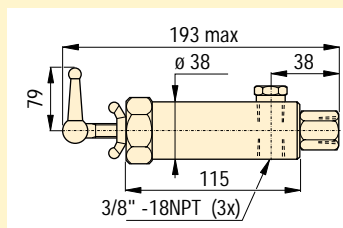
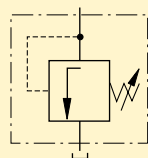
**V-17 Safety check valve**

- Ruggedly built to resist shock and operate with low pressure drop
- Closes smoothly without pounding
- Max. oil flow 30 l/min



**V-152 Pressure relief valve**

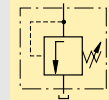
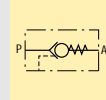
- Limits pressure developed by the pump in hydraulic circuit, thus limiting the force imposed on other components
- 55 - 700 bar adjustment range;  $\pm 3\%$  repeatability
- Valve opens whenever preset pressure is reached. To increase pressure setting, turn handle clockwise
- Max. oil flow 30 l/min
- Includes 1 m return line hose kit



Pressure: 0 - 700 bar

Flow max.: 5 - 30 l/min

- E** Válvulas de control
- F** Valves de contrôle
- D** Regelventile



Valves

System components

Yellow pages

**Options**

**VA-42**  
Air valve

📄 97 ▶



**Gauges and adaptors**

📄 106 ▶



**Hoses and couplers**

📄 108 ▶



**Fittings**

📄 110 ▶



**Important**

**Valving help**  
See Basic System Set-up and Valve information in our "Yellow Pages".

📄 113 ▶

Shown: VFC-1, VFC-2



## VFC-series

Provide repeatable oil flow control. The internal check valve allows metered flow in one direction and free flow in the opposite direction. Precise control is achieved with a micro-meter style adjustment knob, which can be locked with the set screw.

## Application

Use VFC-series flow control valves in-line with the Enerpac WE-series workholding pump to protect your components from damage due to high flow rates.

## In-line installation of a VFC-1 flow control valve.



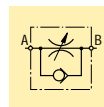
## Regulate the flow of oil

- Color coded flow indicator
- Free flow return
- Fine metering capability
- Lockable
- Standard Viton seals

Max. Flow: 38 l/min

Pressure: 0 - 350 bar

- Ⓔ Válv. reguladoras de caudal
- Ⓕ Valves de control débit
- Ⓓ Stromregelventile



## Options

### Fittings

110 ▶



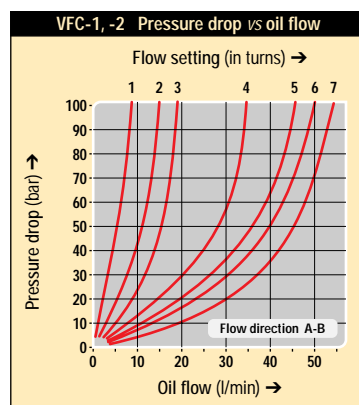
### High pressure filters

109 ▶

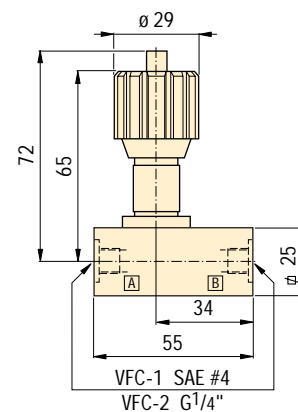


### Inline Flow Control Valve

89 ▶



## VFC-1, -2



## Product selection

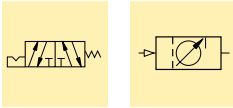
Maximum oil flow	Pressure range	Oil ports	Model number	Flow path	Maximum pressure drop	Weight
l/min	bar				bar	kg
<b>▼ Flow control valves</b>						
38	0 - 350	SAE #4	VFC-1		105	0,8
38	0 - 350	G 1/4"	VFC-2		105	0,8

Seal material: Viton.



Air Pressure: 0 - 10 bar

- (E) Válvulas de aire
- (F) Valves à air
- (D) Luftventile



## Options

Gauges and adaptors

106 ▶



Hoses and couplers

108 ▶



Fittings

110 ▶



## To control and regulate air supply

### VA-42 Manual operated air valve, 5-way, 2-pos.

- For control of boosters
- Viton seals standard

### VAS-42 Solenoid operated air valve 5-way, 2-pos.

- For control of pump and boosters air supply
- Viton seals standard
- Solenoid: 120 VAC, 50/60Hz
- Amperage: inrush 0,11 Amp, holding 0,07 Amp
- Maximum cycle rate: 600 cycles per minute

### VR-3 Rapid exhaust valve

- Enables booster to advance and retract faster
- Instantly exhaust air supply from booster to atmosphere

### V-19 Air check valve

- Prevent rapid drop of air pressure to the booster in the event of sudden loss of input air

### RFL-102 Regulator-Filter-Lubricator

- Regulates air pressure
- Filter air input
- Lubricates air motors with a fine oil vapor mist
- Maximum air flow 1500 l/min

### QE-375 Air/Noise silencer

- Reduces noise level of exhaust air from pump to 45 dBa

Shown: VA-42, VAS-42



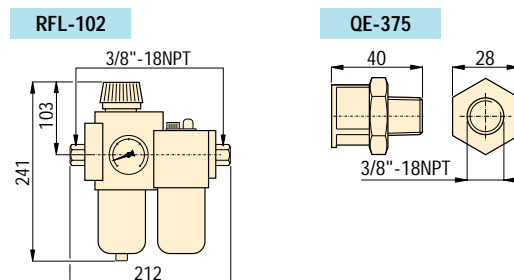
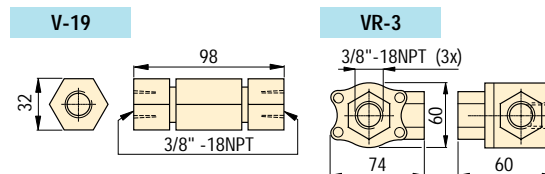
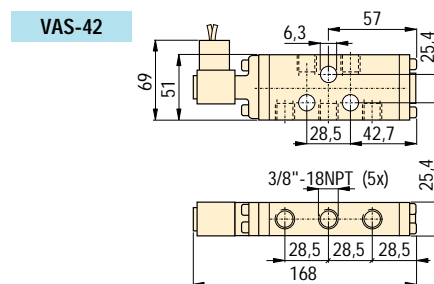
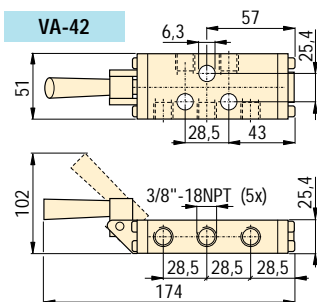
## Air valves

Enerpac's line of directional air valves and accessories complete your workholding system. Used to control air operated hydraulic units, they increase your productivity and efficiency.

## Application

VA-series directional air valves provide either manual or electric control to air operated hydraulic units. Accessories such as rapid exhaust, check valves, silencers and regulators complete the air control system.

- Accessory valves provide greater safety and more efficient clamping cycles
- Recommended for use with all air powered units
- Directional valves to control booster and pump air supply
- Remote air valve permits either hand or foot operation



## Product selection

Maximum pressure	Model number
bar	
▼ Air valves	
2 - 10	VA-42
2 - 10	VAS-42
0 - 7	VR-3
0 - 7	V-19
▼ Accessories	
0 - 9	RFL-102
0 - 9	QE-375