ENERPAC
Hydraulic Technology Worldwide

Instruction Sheet

ELECTRONICALLY OPERATED CONTROL VALVES VS3, VSR3, VS4, VSR4, VS324, VS424

L1058 Rev. B 08/01

1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is **not** covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

SAFETY FIRST

2.0 SAFETY ISSUES

Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Enerpac cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Contact Enerpac when in doubt as to the safety precautions and operations. If you have never been trained on high-pressure hydraulic safety, consult your distribution or service center for a free Enerpac Hydraulic safety course.

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A **DANGER** is only used when your action or lack of action may cause serious injury or even death.

WARNING: Wear proper personal protective gear when operating hydraulic equipment.

WARNING: Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be blocked mechanically.

WARNING: USE ONLY RIGID PIECES TO HOLD LOADS. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application

.

DANGER: To avoid personal injury keep hands and feet away from cylinder and workpiece during operation.

WARNING: Do not exceed equipment ratings. Never attempt to lift a load weighing more than the capacity of the cylinder. Overloading causes equipment failure and possible personal injury. The cylinders are designed for a max. pressure of 10,000 psi [700 bar]. Do not connect a jack or cylinder to a pump with a higher pressure rating.

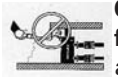
Never set the relief valve to a higher pressure than the maximum rated pressure of the pump. Higher settings may result in equipment damage and/or personal injury.

WARNING: The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system.

CAUTION: Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure.

Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.

IMPORTANT: Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or other means of safe transport.



CAUTION: Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C [150°F] or higher. Protect hoses and cylinders from weld spatter.

DANGER: Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.

WARNING: Only use hydraulic cylinders in a coupled system. Never use a cylinder with unconnected couplers. If the cylinder becomes extremely overloaded, components can fail catastrophically causing severe personal injury.

WARNING: BE SURE SETUP IS STABLE BEFORE LIFTING LOAD. Cylinders should be placed on a flat surface that can support the load. Where applicable, use a cylinder base for added stability. Do not weld or otherwise modify the cylinder to attach a base or other support.

Avoid situations where loads are not directly centered on the cylinder plunger. Off-center loads produce considerable strain on cylinders and plungers. In addition, the load may slip or fall, causing potentially dangerous results.

Distribute the load evenly across the entire saddle surface. Always use a saddle to protect the plunger.

IMPORTANT: Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Authorized ENERPAC Service Center in your area. To protect your warranty, use only ENERPAC oil.

WARNING: Immediately replace worn or damaged parts by genuine ENERPAC parts. Standard grade parts will break causing personal injury and property damage. ENERPAC parts are designed to fit properly and withstand high loads.

3.0 GENERAL INFORMATION

The Enerpac valve design incorporates the following features into a single unit:

- 10,000 PSI Operating Pressure
- Load Holding
- Electrical Fail-safe Control
- Manual Override (VS-4, VSR4, VS424 only)
- The Enerpac valves are specifically designed for use with Enerpac electric powered pumps and electric controls.

3.1 Capacity

Capacity is 1040 cubic inch per minute.

4.0 INSTALLATION

1. Connect and secure hoses and cylinder.
2. Connect control station.
3. Connect motor to specified electrical outlet.

   NOTE:

   - VS3, VSR3, VS4, VSR4 to be connected to 115 volts AC only.
   - VS324 to be connected to 24 volts AC only.
   - VS424 to be connected to 24 volts DC only.
4. Start pump motor. The valve is now automatically in the HOLD position.

   Note: Both valves are fail-safe; if the control station is not actuated or the electrical supply to the valves is interrupted, the valve will automatically shift to the HOLD position, allowing the pump output to be directed to the tank and the cylinder load to be held. The 4-way valve can be operated manually by depressing the pin actuator at the proper end of the spool valve.

5.0 OPERATION

1 To advance load, depress "**P**" button on control station.
2. To hold load, remove finger from control station.
3. To retract load, depress "**R**" button on control station.

5.1 Optional Automatic Return 3-way Valves Operation

The 3-way control valves can be converted into a dump valve. Conversion is done by replacing the control station supplied with the valve. A control station may be purchased separately, for 110 volt valves control station No. IC200 is required; for 24 volt valves control station No. IC224 is required.

6.0 MAINTENANCE

1. Periodically check all hydraulic connections to be sure they are tight. Loose or leaking connections may cause erratic and/or total loss of operation. Replace or repair all defective parts promptly.
2. Periodically check the hydraulic oil level in your system. Refer to the oil filling instructions for complete data.
3. Change hydraulic oil approximately every 250-300 hours of operation. In dusty or dirty areas, it may be necessary to change the oil more frequently.

7.0 HYDRAULIC SYSTEM

1. Keep all hydraulic components free of dirt, grease, chips, etc.
2. Keep the hydraulic component operating in areas that are uncluttered and free of unnecessary equipment.
3. Periodically check your hydraulic system for possible loose connections, leaks, etc. Replace or properly repair damaged or leaking hydraulic components immediately.
4. Check hydraulic oil in your hydraulic system every 40 hours of operation or more frequently in unusually dirty or dusty areas.

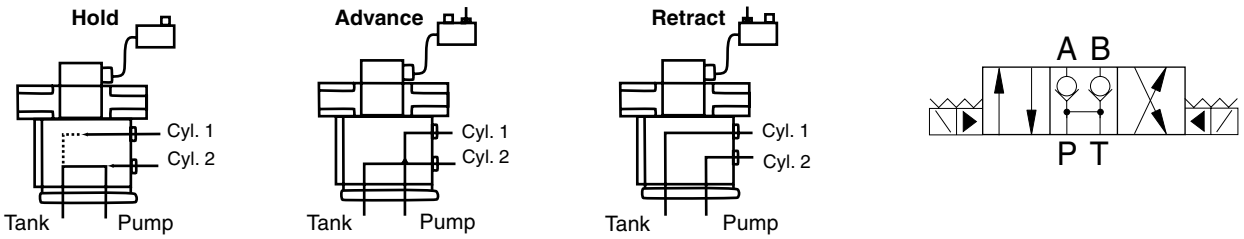
8.0 TROUBLESHOOTING

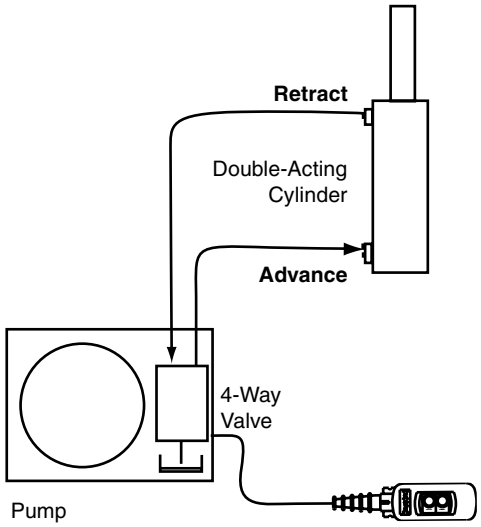
1. If the system will not build pressure, check relief valves in pump for proper setting (refer to pump repair sheet). Check and secure all hose connections. If trouble is not corrected by this action, remove cylinder and hoses from valve. Now place a 10,000 PSI gauge directly in valve port No. 1 (on 3-way valves, place gauge directly in valve port) and place the valve in ADV position. If pressure cannot be developed, the unit should be taken to the nearest ENERPAC authorized service center. If pressure develops, the problem is located in the cylinder, hoses, or couplers.
2. The cylinder will not load or the cylinder creeps when the valve is in the HOLD position. This is an indication of worn valve seats which must be replaced by a service center.
3. The cylinder is hung-up in either the ADV or RET position. This type of problem is usually a symptom of contaminated hydraulic oil. The system should be drained and refilled with fresh ENERPAC hydraulic fluid.
4. On the 4-way valve, center the spool valve manually by depressing the pin actuator on either end of the spool valve cover. Now press the ADV and RET buttons several times checking the valve operation and cylinder movement.

9.0 STORAGE INSTRUCTIONS

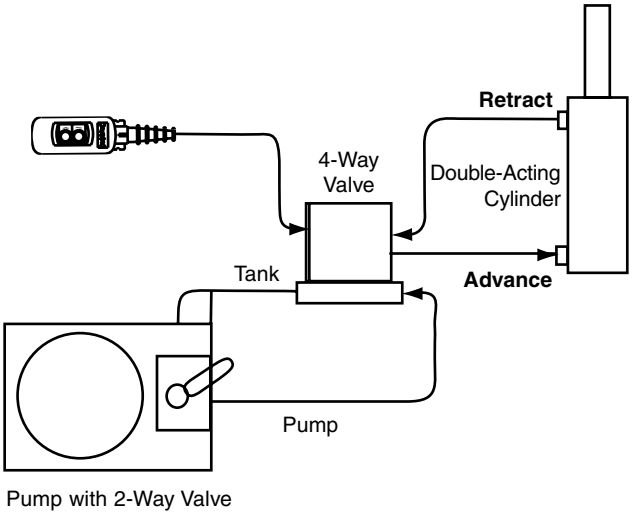
In the event that the unit would be stored for any prolonged period of time (30 days or more), prepare the unit as follows:

1. Wipe the entire unit clean.
2. Disconnect all hydraulic and electrical lines to prevent accidental operation.
3. Cover the unit with some kind of protective cover.
4. Store in a clean, dry environment that is NOT exposed to extreme temperatures.

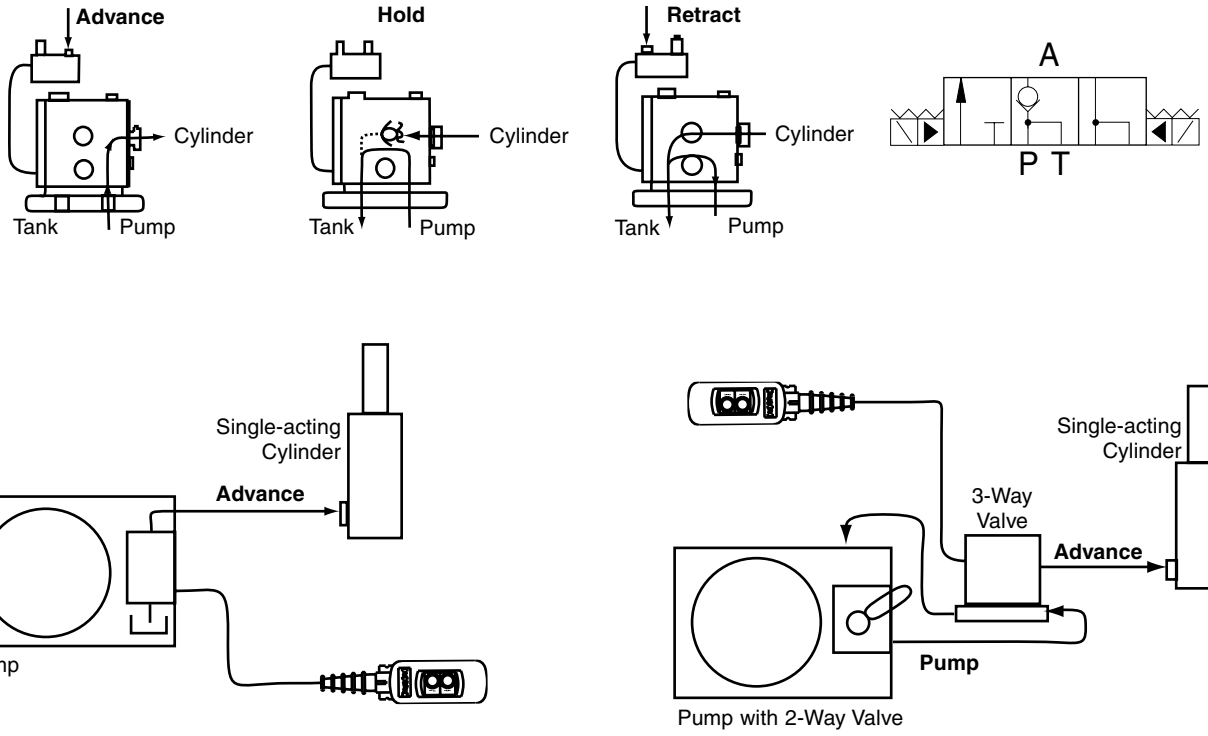




4-Way Valve, Pump Mounted
VS4, VS424



4-Way Valve, Remote Mounted
VSR4



3-Way Valve, Pump Mounted
VS3, VS324

3-Way Valve, Remote Mounted
VSR3

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