

Series V20 PC, SOL-I, EPC-1

Solenoid-Controlled Directional Control Valve

Effective: February 1, 2004
Supersedes: Cat. No. GPD-1110 dated 12/96

Features

- 20 GPM (76 LPM) nominal
- 3500 PSI (241 Bar)
- On-Off control (V20-SOL-I)
- Proportional control (V20-EPC-I)
- Internal pilot porting
- Manual lever option available
- Pressure compensated sections available (V20PC)
- Conversion section allows models V20 and V30 to be combined in same valve assembly

Description

Parker's new solenoid-controlled, pilot-operated remote spool actuators provide for on-off or proportional control of Series V20 Directional Control Valves.

The new actuator design incorporates internal pilot porting within the valve section - actuators require no external tubing.

The Parker Series V20 Solenoid-Controlled Valves are available with open center, closed center or load sensing type work sections. Manually operated, hydraulic remote operated and solenoid-controlled work sections may be intermixed in the same valve assembly.

A manual lever option which allows for full manual control of the valve section is also available. This option is ideal for applications where two control stations are required.

Specifications

■ Flow Rating (nominal)	20 GPM (76 L/Min.)
■ Operating Pressure (maximum)	3500 PSI (241 bar)
■ Exhaust Pressure (maximum)	450 PSI (31 bar)
■ Filtration Required (nominal)	33 micron
■ Number of Work Sections	1-9
■ Fluid	Petroleum Base, 50-4000 SSU
■ Fluid Temperature Range	-20°F to 180°F (-29°C to 82°C)
■ Weight (approx.)	Work Section w/Solenoid Actuator (standard): 15 lbs. (6,8 kg) Work Section w/Solenoid Actuator (lever option): 15.5 lbs. (7,0 kg) Utility Section: 9.5 lbs. (4,3 kg)

FEATURES

SOLENOID ACTUATOR SPECIFICATIONS

Electrical Requirements

Operating Voltage 12 VDC nominal*
 Coil Resistance Proportional 7.5 ohms @ 68°F (20°C)
 On-Off 6.5 ohms

Signal (for proportional solenoid) PWM, 50 Hz frequency

Pilot Supply Requirements**

Minimum Pressure 250 PSI (17 bar)***
 Maximum Pressure 750 PSI (52 bar)
 Flow (minimum) 1.5 GPM (5,7 litres/min.)
 Filtration Required (nominal) 10 micron

Step Response Time (neutral to full flow or

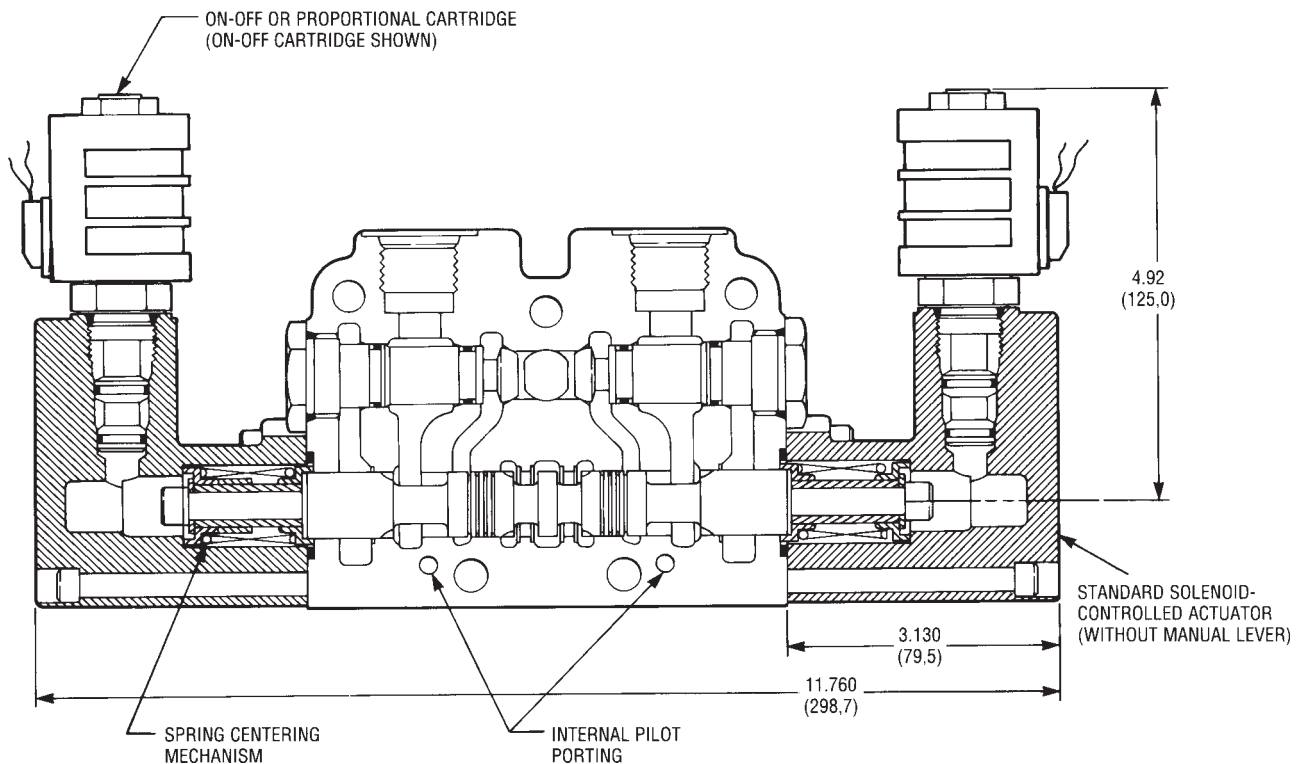
full flow to zero flow) Less than 150 milliseconds

Flow Hysteresis Less than 5%

*Contact factory for 24 VDC option.

**Pilot supply may be generated from within control valve assembly as an option.

***250 PSI (17 bar) above control valve exhaust pressure.



- Internal pilot porting. Actuators require no external tubing.
- Pilot source may be supplied by customer or from optional utility section.
- Proportional Actuators provide

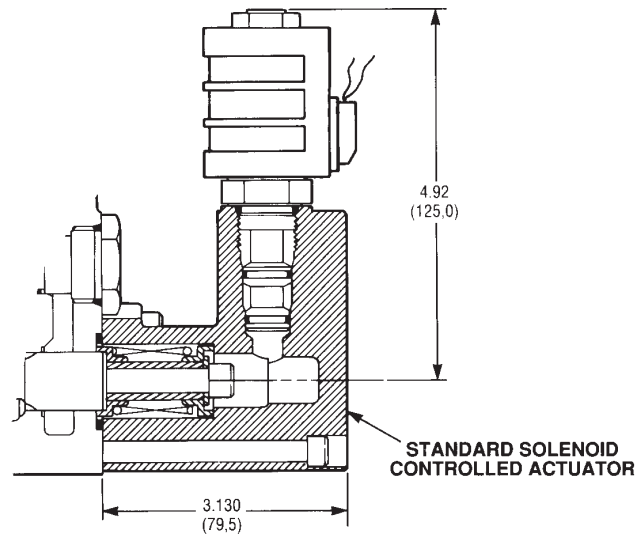
- smooth and accurate remote control of metering functions.
- 24 Inch lead wires are standard. Weather tight connections are available. Consult Factory for details.

ACTUATORS

V20-SOL-I

ON-OFF SOLENOID ACTUATOR

The On-Off Solenoid Actuator option contains two 3-way, normally closed solenoid-operated valve cartridges; one at each end of the control valve spool. When a solenoid is energized, the 3-way valve cartridge directs pilot pressure to one end of the control valve spool causing the spool to shift full stroke from its neutral position. When both solenoids are de-energized, both ends of the control valve spool are open to exhaust and the spool is spring-centered to neutral.

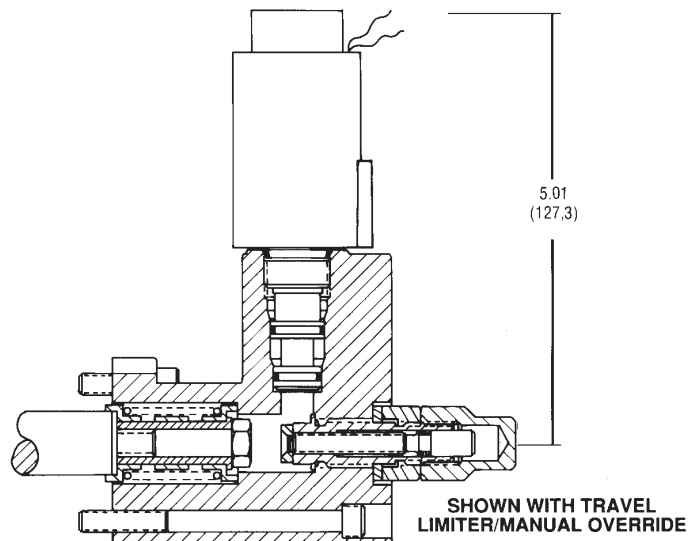


V20-EPC-I

PROPORTIONAL SOLENOID ACTUATOR

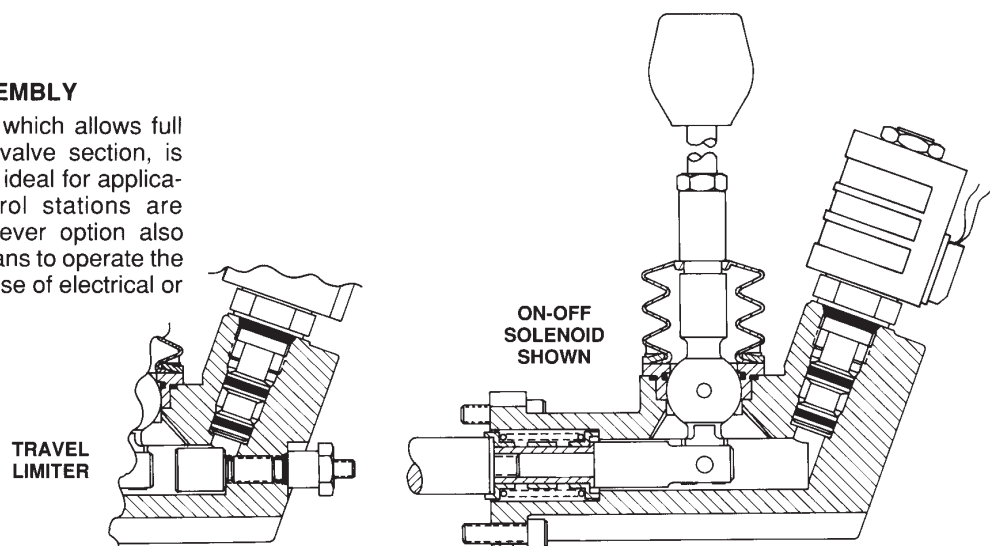
The Proportional Solenoid Actuator option contains two proportional solenoid-operated pressure reducing cartridges; one at each end of the control valve spool. When current is sent to a solenoid, a pilot pressure is directed to one end of the control valve spool. As the current is increased or decreased, the pilot pressure (directed to the spool) is increased or decreased proportional to the change in current. The pressure directed to the end of the spool causes the spool centering spring to compress to a given load, giving spool position. When both solenoids are de-energized, both ends of the control valve spool are open to exhaust and the spool is spring-centered to neutral.

A proportional controller (PWM, 50 Hz DC signal) is required.



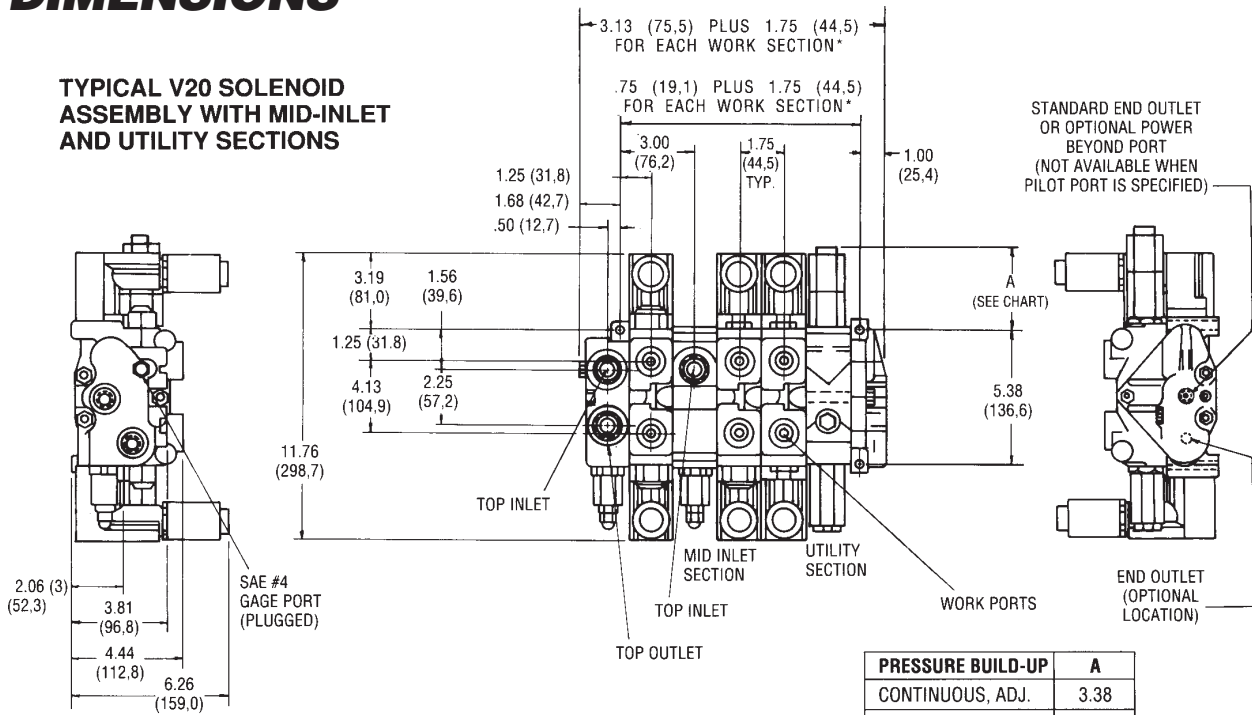
MANUAL LEVER ASSEMBLY

A manual lever option, which allows full manual control of the valve section, is available. This option is ideal for applications where two control stations are required. The manual lever option also offers a mechanical means to operate the control valve spool in case of electrical or hydraulic failure.



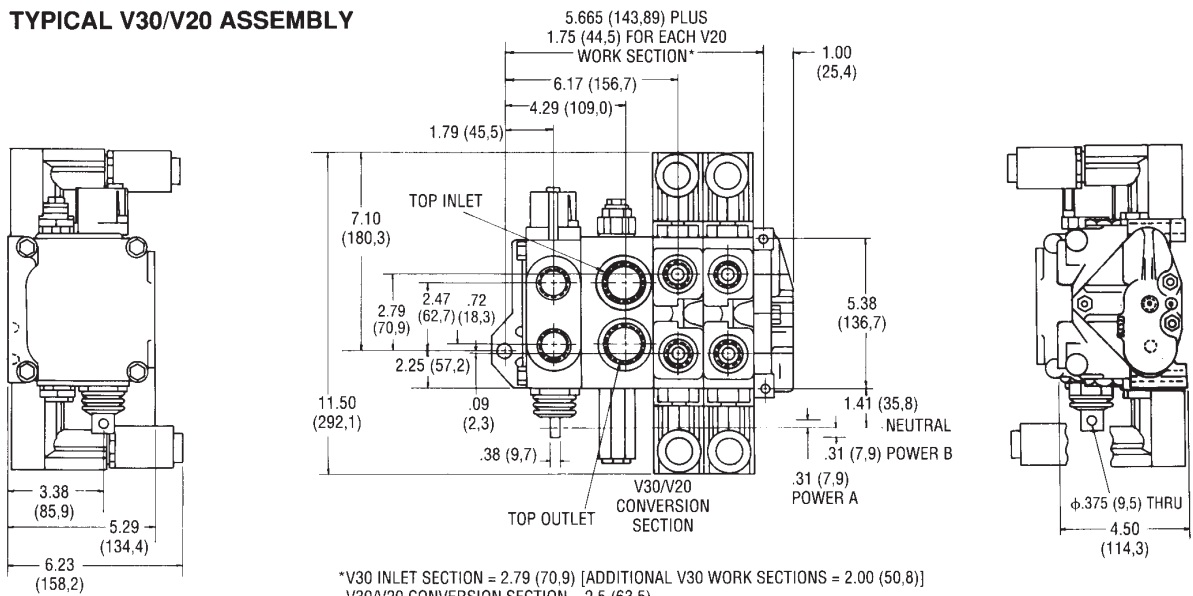
DIMENSIONS

TYPICAL V20 SOLENOID ASSEMBLY WITH MID-INLET AND UTILITY SECTIONS



*MID INLET AND UTILITY SECTIONS HAVE THE SAME WIDTH AS WORK SECTIONS.

TYPICAL V30/V20 ASSEMBLY



DIMENSIONS ARE IN INCHES (MILLIMETERS) AND ARE FOR REFERENCE ONLY.

FEATURES

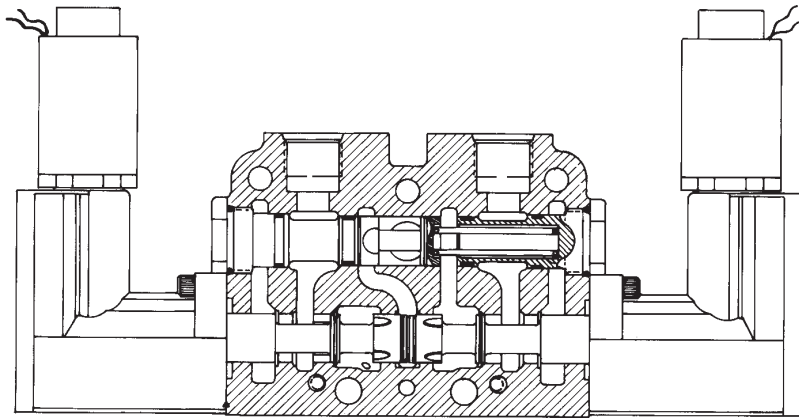
MODEL V20PC*

PRESSURE COMPENSATED VALVE SECTION

A pressure compensator spool has been designed to fit in the power core of the V20C/V20LS section and to deliver a constant metered flow to the work ports. The main spool has been designed to proportionally meter flow up to a maximum flow determined by its metering notches. Spools are available in 5, 10, and 15 GPM flow rates. The spool's flow rating indicates maximum flow to the work ports with the spool fully stroked to either power position. The pressure comp main spool will meter flow throughout the entire spool stroke, from zero flow to maximum flow.

The pressure compensated section has the capability to meter flow to two or more functions simultaneously and maintain the

*Also available as manual valve.



metered flow within $\pm 10\%$ or 1 GPM, whichever is greater. The pressure compensated section is particularly suited for multiple function applications where controlled flows are required under varying system pressure conditions. When using proportional solenoids to control the position of the main spool, this valve can accurately control the speed of hydraulic motors while operating other functions in the system. Typical applications are snow plows, ag tractors, cranes, backhoes, and loaders.

Load checks are not available with the pressure compensated sections.

Pressure compensated sections can be placed anywhere in a stack of closed center or load sensing sections. Pressure compensated sections cannot be used in an open center valve.

Spools available for pressure compensated sections:

- 3-Way
- 4-Way
- 3-Way Free Flow
- 4-Way Free Flow

PILOT SOURCE

UTILITY SECTION

A pilot source of 1.5 GPM (5.7 litres/min.) at 250-750 PSI (17-52 bar) is required to operate the solenoid actuators. This pilot source may be supplied by the customer from a source external to the control valve, or it may be supplied by an optional utility section which is assembled as an integral part of the control valve.

The utility section incorporates all components required to provide pilot pressure to the actuators, eliminating the need to supply any external pilot lines. The entire control valve is self contained. The utility section must be installed between the last work section in a directional control valve and the right or outlet cover. Both open center and closed center applications are available.

The following components are included in the utility section:

Pressure Control Cartridge

Because of the low open center pressure drop found in the Model V20 Directional Control Valve, the pressure control cartridge is necessary to increase the oil pressure required to shift the valve spools.

For closed center applications, the pressure control cartridge is not required. However, the system pump must have a standby pressure of 250 PSI (17 bar).

Two types of pressure control cartridges are available:

- On-Off Pressure Control Cartridge—The solenoid must be energized before pilot pressure can be obtained. When pilot pressure is not required, the solenoid can be de-energized, thus minimizing open center pressure drop thru the directional control valve.
- Continuous On Pressure Control Cartridge—The continuous on pressure control cartridge re-

quires no electrical connections and therefore simplifies installation. Pilot pressure is maintained at all times. The standard mechanical pressure build-up valve is non-adjustable/tamper-proof.

Pressure Reducing Valve

The pressure reducing valve reduces oil pressure to the solenoid-controlled actuator to 325 PSI (22 bar) at 1 GPM (3.8 litres/min.).

HYDRAULIC SYSTEMS WITH A CUSTOMER-SUPPLIED EXTERNAL PILOT SOURCE

The utility section is not required if the system has a 1.5 GPM (5.7 litres/min.), 250-750 PSI (17-52 bar) pilot source available. Pilot tubing must be a minimum of $\frac{3}{8}$ -inch tubing with SAE No. 6 ($\frac{9}{16}$ "-18) fittings.

The pilot exhaust is connected (internal to valve section) to the control valve exhaust core.

ORDER CODE

The following information is required when ordering V20 solenoid-controlled or pressure compensated valve assemblies:

- V20 Inlet Flow
- Work Port Pressures
- Spool Type
- Solenoid Actuator Type
 - On-Off
 - Proportional
- Voltage
 - 12 VDC
 - 24 VDC
- Manual Lever Option (if required)
- Pilot Source
 - External (customer supplied)
 - Utility Section (optional)
- Pilot Flow and Pilot Pressure (required for external pilot sources only)
- Pressure Control Cartridge
 - On-Off (12 or 24 VDC)
 - Continuous On
- Maximum Flow Required from the Sections Work Ports (for Pressure Compensated Sections) — 20 GPM Maximum
- Load Sensing Standby Pressure (for Load Sensing Systems)

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Bulletin HY14-2705-B4/US,
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