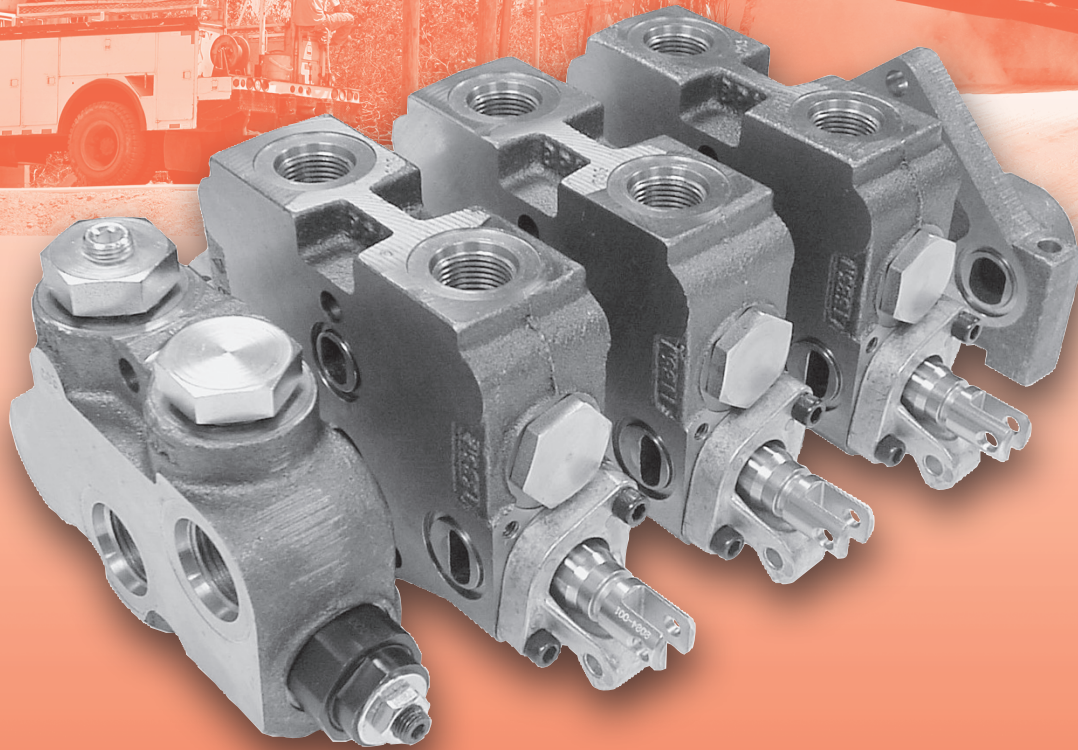




# V20 SERIES DIRECTIONAL CONTROL VALVE



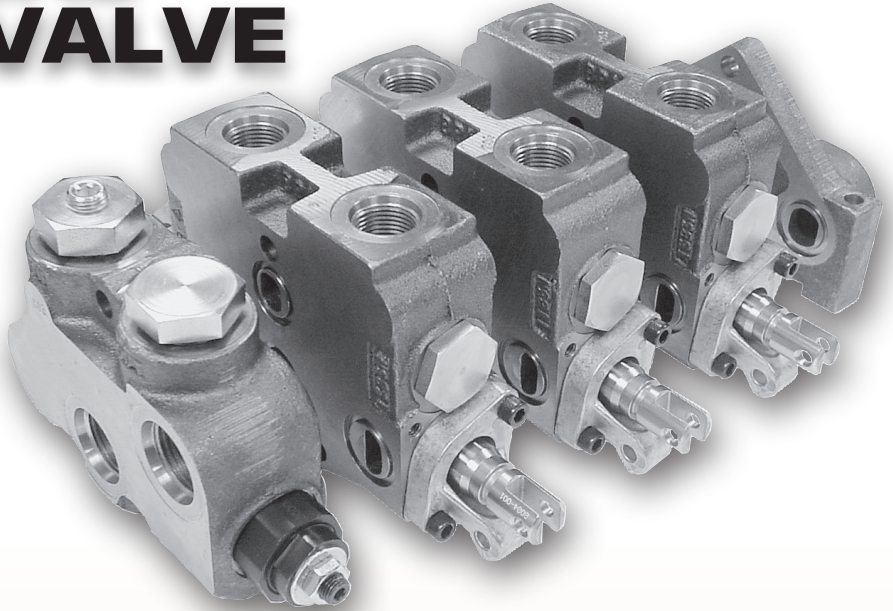
**30 GPM (114 LPM) • 3500 PSI (242 BAR) • SECTIONAL TYPE**

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**Muncie Power Products, Inc.**

# V20 SERIES DIRECTIONAL CONTROL VALVE

Muncie Power Products is proud to offer the V20 series of directional control valves. The V20's valves design can be assembled with numerous spool types, control styles, and port options to fit your application needs.



Muncie Power Products has served the truck industry for over 65 years. Our success is based upon providing the highest quality products and support. Call today and let us put you in control of your hydraulic systems.

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## APPLICATIONS

- Snow and Ice Control Systems • Utility Equipment • Dump Bodies • Spreaders •
- Recovery Vehicles • Lube Trucks • Cranes • Refuse Equipment

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## VALVE FEATURES

- High tensile ductile iron for durability and shock load resistance.
- Compact size and lightweight to fit your installation needs.
- Precision machined spools with extra fine metering control and low spool forces.
- Available in SAE or NPT porting.
- Stackable design to customize to your needs.
- Large variety of spool types and backcap options.
- Wide range of work port options including port reliefs, anti-cavitation valves, port restrictors, pilot operated check valves (lock valves), and power beyond capabilities.

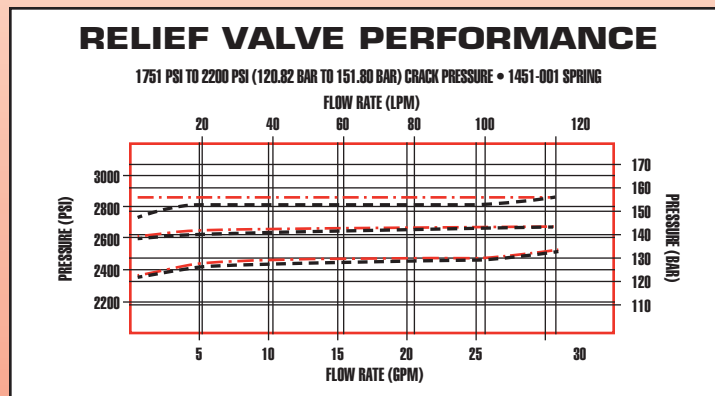
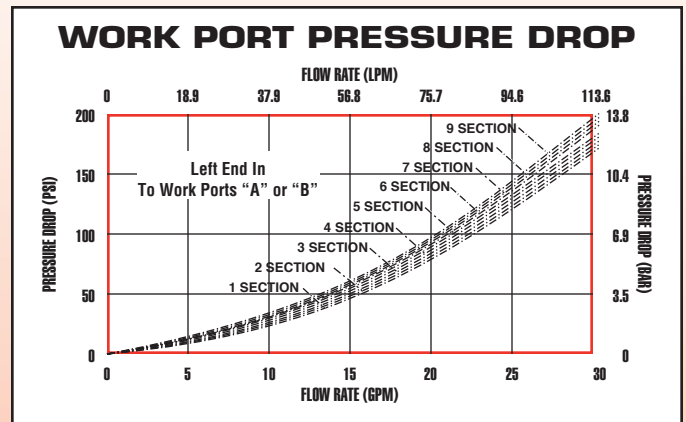
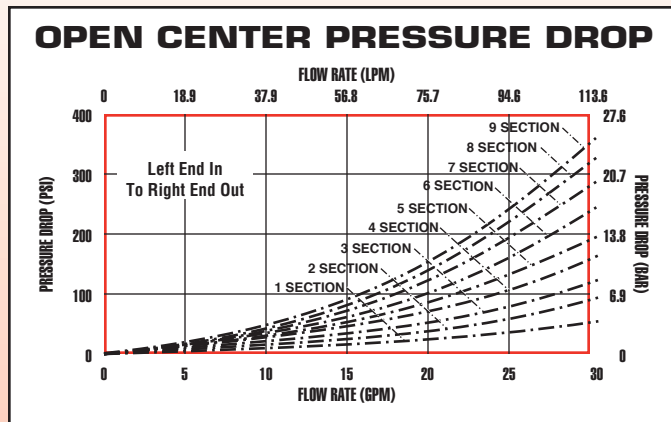
# PERFORMANCE AND SPECIFICATIONS

## TECHNICAL DATA

<b>Design Type</b> .....	Sectional
<b>Circuit</b> .....	Open Center Design: Parallel, Tandem, Combined Parallel/ Tandem, & Series. Also: Closed Center, Load Sensing, Load Sensing/Pressure Comp. available.
<b>Capacity</b> .....	20 GPM (76 LPM) Nominal, 30 GPM (114 LPM) Maximum
<b>Maximum System Pressure</b> .....	3500 PSI (242 Bar)
<b>Maximum Tank Pressure</b> .....	200 PSI (13.8 Bar)
<b>Filtration</b> .....	33 Micron
<b>Spool Force</b> .....	50 Lbs. (22.7 Kg) Maximum
<b>Temperature</b> .....	-20°F to 180°F (-29°C to 82°C)
<b>Seal Type</b> .....	Buna-N standard, Optional Viton
<b>Relief Valves</b> .....	Shim Adjust, Optional Screw Adjust
<b>Weight (approx. non-solenoid)</b> ....	Inlet 6Lbs (2.7 Kg), Outlet 3.5Lbs (1.6 Kg), Wk. 9 Lbs (4.1 Kg)

## VALVE PERFORMANCE

Valve performance curves are based on 150 SUS oil at 100°F (38°C) with SAE 12 inlet and outlet ports, and SAE 10 work ports. Performance for Series type sections will be approximately 2X higher than shown.



# CIRCUIT TYPES

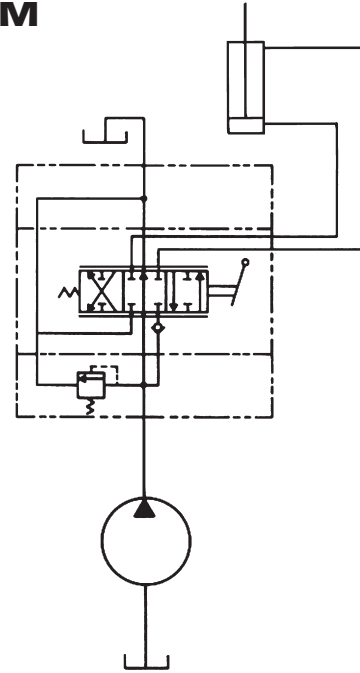
**Open Center** – Directs the inlet oil through the open center valve core, the power core, and on to the outlet cover. Circuit types include Parallel, Tandem, Combined Parallel/Tandem, and Series. Used with fixed displacement pumps.

- **Parallel (V20P):** Valve sections see common (parallel) inlet oil. If two spools are actuated simultaneously, the oil will take the path of least resistance unless the lightest loaded spool is throttled back to limit flow. A fully shifted spool blocks all oil available to the power beyond core.
- **Tandem (V20T):** Sometimes referred to as a priority section or series/parallel design. Valve sections see common inlet oil. If two spools are fully actuated simultaneously, the upstream section will always have priority for oil over any downstream sections. A fully shifted spool blocks all oil available to the power beyond core.
- **Series (V20S):** Valves sections receive inlet oil only after it is passed through the previous section, subsequently in series with each other. Note: The pressures are additive and the load pressures of simultaneously operated sections should not exceed relief valve or pump capability.
- **Note:** Any of these types can be assembled together. If a series section is used upstream from a parallel section, a tandem section must be used between the two sections. A series section assembled downstream can bolt directly to a parallel or tandem section.

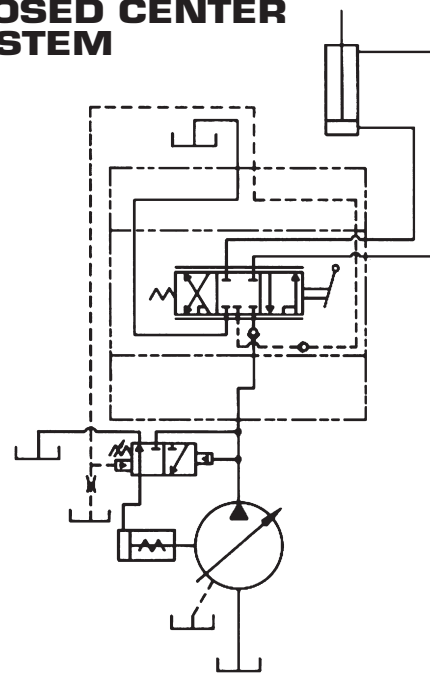
**Closed Center** – Directs the inlet oil into the closed (blocked) valve core. Circuit types include closed center, load sensing, and load sensing/pressure compensated. All circuits are parallel type only. Used with variable displacement pumps.

- **Closed Center (V20C):** Valve sections see common (parallel) inlet oil but oil flow becomes blocked at the outlet.
- **Load Sensing (V20LS):** Same as the closed center circuit. In addition the work ports are inter-connected through passages for a communication network that allows a signal to be sent to the pump to indicate the need for flow. These passages prevent the loss of neighboring oil through check valves that shuttle open and closed based on the load pressures for each section.

## OPEN CENTER SYSTEM



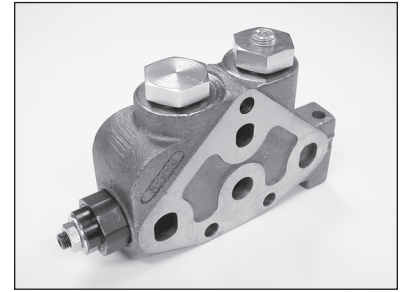
## CLOSED CENTER SYSTEM



# INLET AND OUTLET COVERS

**Inlet Covers** – Directs the pump oil into the valve assembly for use by the work section(s). All inlets are machined to accept a relief valve cartridge (sold separately) used to limit the system maximum pressure.

- **Standard Inlet (20-LC-\*\*):** Is machined with both top and side inlet ports and outlet ports. Choose between SAE or NPT porting. Shipped with two plugs, one of which is machined with a ¼ NPT gauge port.
- **Flow Control Inlet (20-LC-12-FC):** Available only with SAE ports. Machined for top and side inlet, end outlet. Provides adjustable controlled flow from 5 to 25 GPM, which is directed into the valve assembly. Controlled flow has priority over excess flow. Excess flow is directed internally into the valve tank core unless the excess flow plug (included loose) is installed. When the plug is installed, the outlet port directs the excess flow to another circuit or into a mid-inlet.
- **Standard Relief Valves (WH-\*):** Relief valves are shim adjustable within a predetermined adjustment range. Four ranges are available which include 500-1,249 PSI, 1,250-1,749 PSI, 1,750-1,999 PSI, 2,000-2,599 PSI. An optional kit, part number K-WH-A, converts the cartridge from shim adjust to screw adjust.
- **Optional Adjustable Relief Valve (RP51A-3000):** Screw adj. pilot operated relief valve 500-3500 PSI.
- **Relief Blanking Plug (K-20-NR):** If a relief valve is not required, a blanking plug is required to block machined passage.

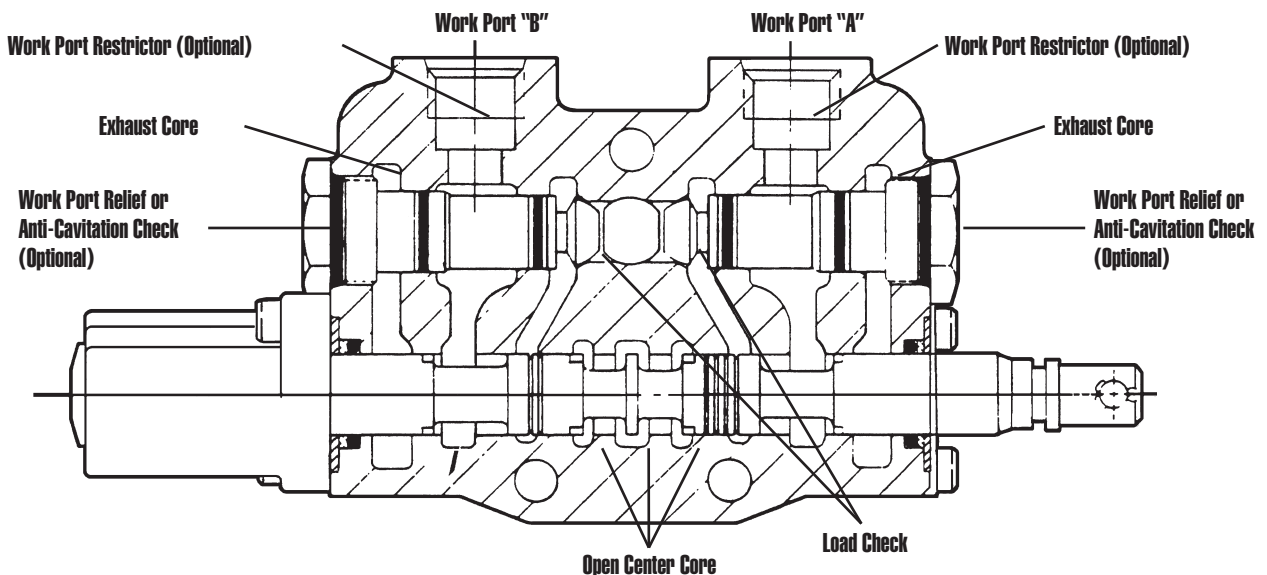


**Outlet Covers** – Directs the pump oil that has passed through the valve assembly back to the tank. Choose between SAE or NPT porting. Note: the inlet cover does have outlet porting also. Solenoid outlets required for use with solenoid operated work sections. Note: Add an extra section to the stud kit when the top outlet ports are specified for the additional cover length.

- **Standard Outlet (20-RC-\*-E-\*):** Side outlet port. With or without side machining for power beyond conversion sleeve.
- **Optional Outlet (20-RC-\*ET-\*):** Top outlet port. With or without top machining for power beyond conversion sleeve.
- **Outlet Plugs/Sleeves (K-20-\*):** Plug and sleeve options for closed center and power beyond.



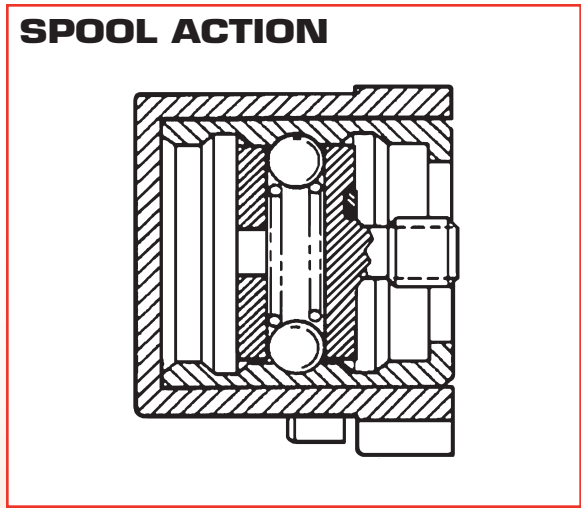
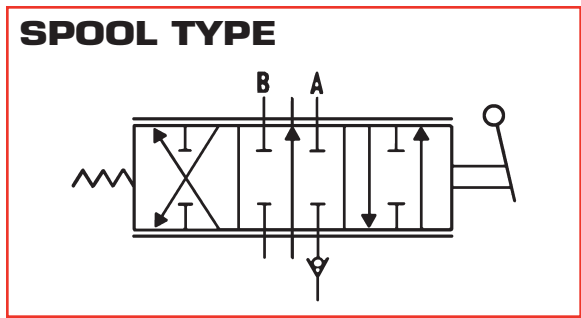
## VALVE CONSTRUCTION



# WORK SECTIONS

**Work Sections** – Directs the oil from the valve core to the work ports via the valve spool. Spools are designed to control hydraulic cylinders or motors.

- **Spool Types:** A large variety of spool types are available for all applications:
  - Code 03: SA Cyl. 3-way, 3 position
  - Code F3: SA Motor, 3-way, 3 position, free flow
  - Code 04: DA Cyl. 4-way, 3 position
  - Code F4: DA Motor, 4-way, 3 position, free flow
  - Code K4: DA Cyl. 4-way, 4 position
- **Spool Action:** A variety of backcaps provide specific spool operation with spring return, detent, hydraulic remote, pneumatic, electro-magnetic release, and solenoid controlled.
  - Code - : Spring centered (std., no code)
  - Code D: 3 position detent, no spring
  - Code K4: 4th pos. detent for float
  - Code R: Detent In, spring out
  - Code RO: Detent Out, spring in
  - Code PA1: Pneumatic
  - Code A: Spring Return, cam activated
  - Code E: Electro-Magnetic spool release
  - Code M: Manual, no spring or detent assy.
  - Code HR: Hydraulic Remote
  - Code HRO: Hydraulic Remote w/screw override
  - Code EPC: Solenoid controlled, proportional
  - Code SOL: Solenoid controlled, on/off
  - Note: Hydraulic remotes require separate controller

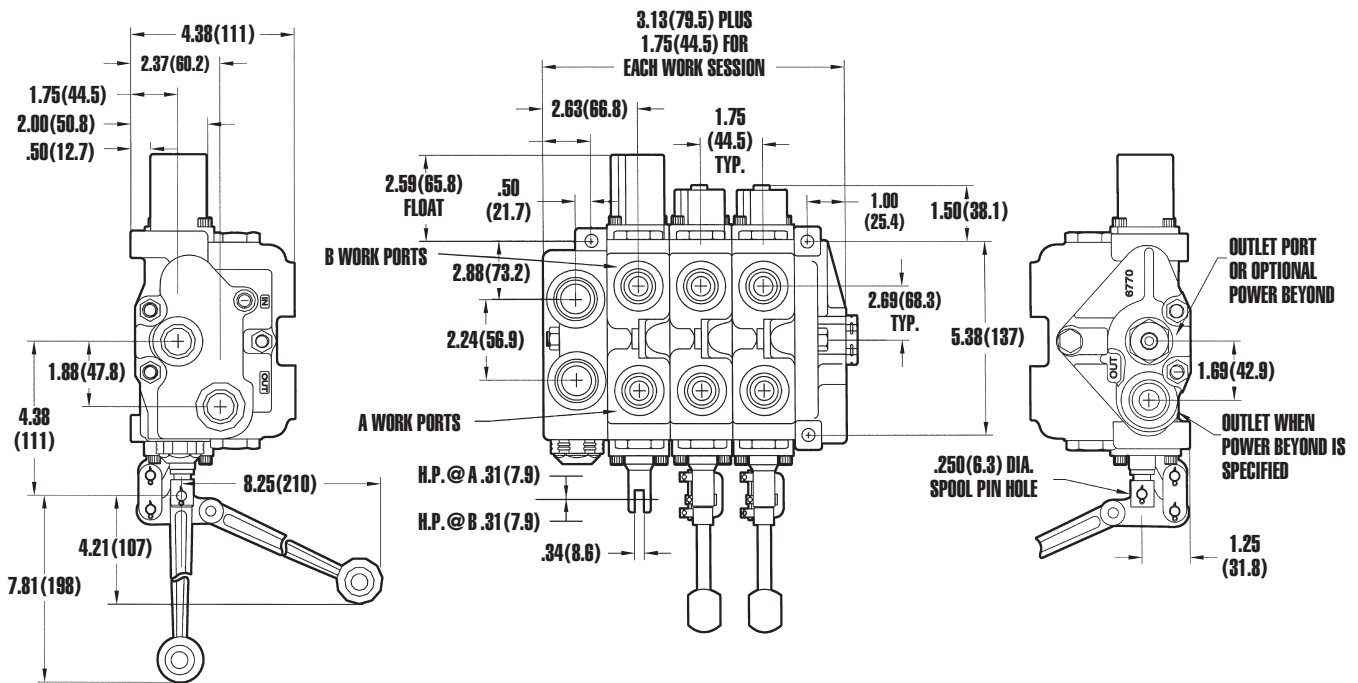


- **Specialty Work Sections:** Some work sections have special machining characteristics to provide additional features such as reduced pressure drop, load sensing, or load sensing with pressure compensation. Also most work sections are available with machined pilot passages for use with hydraulic remotes or solenoids.
  - V20R: Section w/reduced pressure drop, -12 SAE Ports
  - V20LS: Section w/load sense network
  - V20LO: Section w/PO check valve (no RV available), modified 4 way free flow spool only

**Work Port Relief Valves** – Provides specific protection for component connected to this port. Relief valves also contain the load check valve. Load check and relief valve cartridges for Series and Pressure Compensated sections are unique to these particular sections. Port reliefs are ordered separately.

- **Work Port Relief Valves (RC-\*):** Work port relief valves are shim adjustable within a predetermined adjustment range. Four ranges are available which include 500-1,249 PSI, 1,250-1,749 PSI, 1,750-1,999 PSI, 2,000-2,599 PSI.
- **Optional Adjustable Relief Valve (RP-\*):** Screw adj. pilot operated relief valve 500-3500 PSI.
- **Relief Blanking Plug:** Not available, use load check valve cartridge.
- **Anti-Cavitation valve (\*AC):** Used to prevent cylinder or motor cavitation by allowing work ports to refill from the tank core.
- **Combination Anti-Cavitation valve/Relief valve (CRA\*):** Combines the anti-cavitation and relief valve features into a common cartridge. Relief is shim adjustable (see above for adjustment ranges available).

## DIMENSIONAL DATA IN INCHES (MM)



PORT SIZES	INLET	OUTLET	WORK PORTS	POWER BEYOND
NPT/SAE	-12	-12	-8 or -10 (Std.)	-8 or -10 (Std.)
Weights (Approx.)	6 lbs. (2.7 kgs.)	3.5 lbs. (1.6 kgs.)	9 lbs. (4.1 kgs.)	NA
Stud torque: 32 ft.lbs. (43.5 Nm)				

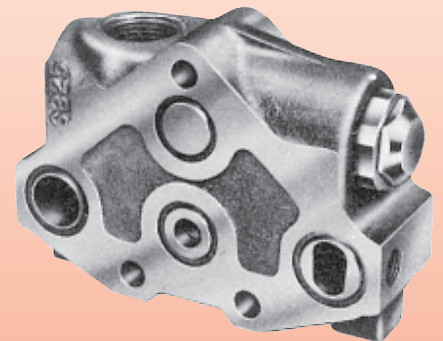
**Note:** Information shown for standard components. Not all port sizes available in NPT thread. Different assemblies and options could affect weight.

## OTHER WORK SECTIONS

**Utility Sections** – Utility sections are added to the valve assemblies to provide pilot pressure for solenoid operation. Different machining is required for internally vs. externally piloted sections. Tubing kits are required for external pilots.

Also available are utility sections for unloading fixed displacement pumps if used with a closed center, load sensing, or load sensing pressure compensated work section.

**Mid-Inlet Sections** – Mid-inlet sections assemble into the valve assembly to provide a means to bring a second inlet line from a tandem pump or flow control for sections mounted downstream. Sections are machined to accept the same relief valve cartridges (sold separately) as the inlet. Available in SAE or NPT porting.



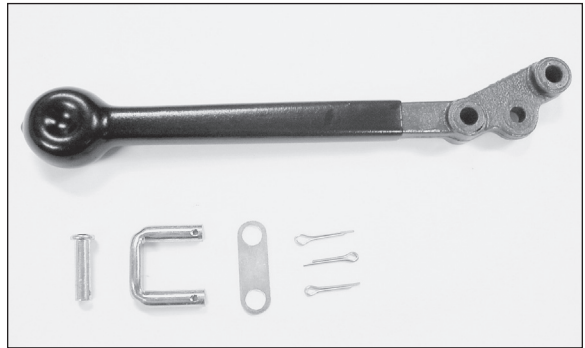
- **Split Flow (\*SF):** The upstream flow stays separate from the secondary flow. Secondary flow is only used by downstream sections.
- **Combined Flow (\*CF):** Combines upstream flow with secondary flow for use by downstream sections.



# MISCELLANEOUS

**Misc. Accessories** – Various accessories are available to enhance valve performance for unique or harsh applications. Ordered as individual components, not part of work section.

- **Spool protective boot assembly:** Protects the spool and seal area completely from external contamination. Cannot be used with handle or cable hook up kit.
- **Handle kits:** Five different handle kits are available to fit every need. Available for vertical or horizontal operation. Choose between black or plain steel or die cast aluminum. Also available is a cast iron handle bracket.
- **Port Restrictors:** Available for SAE porting only. Used to control the speed of a cylinder or motor. Restricts flow going into or coming out of the work port depending on assembly of the orifice plate. Orifice plates available in nominal sizes from .015 in. to .220 in.
- **Air Cylinder Activation kits:** Toggle valves and air kits available for in cab control of valve air cylinder.
- **Remote Cable Systems:** RVC series hook kits are available for in cab control with a push pull cable.



## VALVE WARRANTY

The Muncie V20 Series Valve is warranted against any defect in material and workmanship which existed at the time of sale by Muncie, according to the following provisions, subject to the requirements that the Valve must be used only in accordance with catalogue and package instructions.

The Valve is warranted for a period of one year from date of installation. If during the warranty period the Valve fails to operate to Muncie's specifications due to a defect in any part in material or workmanship that existed at the time of sale by Muncie, the defective part will be repaired or replaced, at Muncie's election, at no charge, if the defective part is returned to Muncie with transportation prepaid.

Warning. The above warranty shall terminate if any alterations or repairs are made to the Valve other than at a Service Center owned by Muncie, or if the Valve is used upon any equipment other than the equipment upon which it is first installed.

**THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER OBLIGATIONS AND LIABILITIES, INCLUDING NEGLIGENCE AND ALL WARRANTIES OF MERCHANTABILITY AND SUITABILITY, EXPRESSED OR IMPLIED AND STATE MUNCIE'S ENTIRE AND EXCLUSIVE LIABILITY AND BUYER'S EXCLUSIVE REMEDY FOR ANY CLAIM OF DAMAGES IN CONNECTION WITH THE SALE, REPAIR OR REPLACEMENT OF THE ABOVE GOODS, THEIR DESIGN, INSTALLATION OR OPERATION. MUNCIE WILL IN NO EVENT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND OUR LIABILITY UNDER NO CIRCUMSTANCES WILL EXCEED THE CONTRACT PRICE FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.**



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