



**BRAND**  
HYDRAULICS Co.

Made in the Heartland of America  
Serving the World

Engineering & Manufacturing Solutions

# Series 20

Sectional Directional  
Control Valve



## Specifications:

- 6 gpm Nominal Capacity.
- Pressure Ratings:
  - 4500psi (301 bar), Parallel
  - 3000psi (207 bar), Series
  - 400 psi (27 bar) max tank pressure.
- 6 sections max (consult factory for more).
- 10-Micron Filtration Recommended.
- Assembly Torque = 85 inch-lbs.
- Weights: Inlet = 2.6 lbs. (1.2 kg).
  - Work = 3.1 lbs. (1.4 kg).
  - Outlet = 2.2 lbs. (1.0 kg).
- Port Size: #6SAE (9/16-18), All Ports



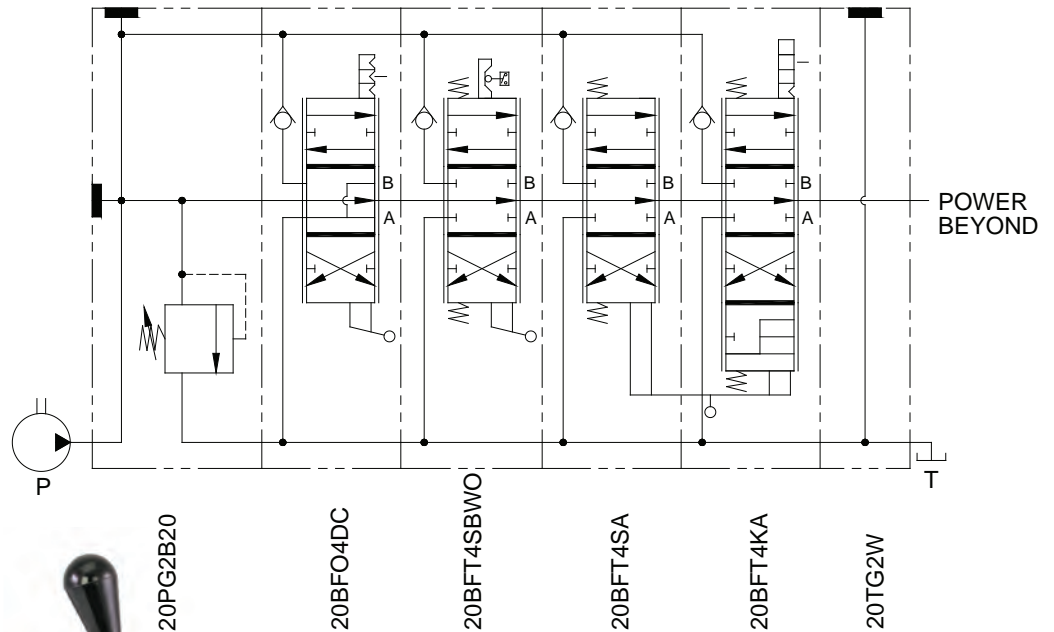
ISO 9001:2008 WITH DESIGN  
Certificate #02.002.1



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# Series 20

Sectional Directional Control Valve



P20A000620

## FEATURES:

- O'RING PORTS to eliminate leakage.
- METERING SPOOLS provide smooth control of load.
- POWER BEYOND CAPABILITY to fit your multi-valve circuits.
- PRECISION GROUND IOSSO PLATED SPOOL that assure long life.
- DIAMOND HONED SPOOL BORES provide consistent spool fit with low leakage.
- ENCLOSED HANDLES increase handle rigidity and eliminate exposure to the elements.
- INDIVIDUAL LOAD CHECK built into each section to prevent the load from dropping when the spool is shifted.
- ALL SECTIONS & ASSEMBLIES ARE 100% TESTED including both internal & external leakage & flow tests.

## MATERIALS:

- Cast Iron Body.
- Iosso Chrome Plated Steel Spools
- Buna N O'Rings (standard).
- Stress Proof Tie Rods

## SERIES 20 – GENERAL INFORMATION:

The Brand, Series 20 Sectional Directional Control Valves are assembled to meet our customer's requirements for up to six individual applications per assembly (consult factory for more sections). Brand Hydraulics does not charge anything extra for this process and assembly is priced solely on the overall sum of the prices of its components.

When assembled in their normal manner the series 20 spool sections are in parallel. When the spools are in neutral position, the flow passes by each spool and then onto the tank (outlet) port. If two or more spools are shifted simultaneously their work ports are in parallel. The oil flow will take the path of least resistance allowing lighter loads to move first. All spools are machined with metering chamfers, and have a high "handle vs. spool" movement ratio, resulting in good metering capability. Input flow can be divided among several circuits (spool sections) by feathering the spools.

### INLETS –

Can be provided with no relief, or an adjustable high lift relief (B). Standard inlets are end ported (1) which is not field convertible. The other optional inlets are machined with end, top (2) and side (3) ports, these two options are field convertible to all three ports. Option (4) is similar to option (2) except it also has a relief drain port.

### OUTLETS –

Are available end ported (1) which is not convertible to top or side porting. The other optional outlets are top (2) and side (3) porting; these two options are field convertible to all three ports. Options (2) and (3) are machined for power beyond and closed center cartridge. Specify (W) to receive the outlet assembled with power beyond cartridge. Specify (C) to receive the outlet assembled with closed center cartridge.

### SPOOL TYPE –

Open Center four-way (**O**) connects ports A and B to tank in neutral. Tandem Center four-way (**T**) blocks port A and B in neutral. Tandem Center, three-way (**T3**) powers a cylinder in one direction. Please note that closed center four-way operation can be obtained by using a tandem center four-way spool and a closed center plug in the assembly's outlet section.

### HANDLE OPTIONS –

- **Joystick handle (A)** is used to actuate two adjacent spool sections with one handle (use on any spool section).
- **B-style handle (B)** is assembled to the valve vertically.
- **C-style handle (C)** is assembled to the valve horizontally.

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## SPOOL ACTION –

- **Standard spring center (S)** returns the handle to neutral when the handle is released.
- **Standard three-position detent (D)** holds the spool in neutral and both active positions.
- **Spring center detent (SD or DS)** springs back to neutral from one position and is mechanically detented in the other direction.
- **Fourth-position float (K)** is similar to spring center except it has a fourth position that makes all ports common to each other (last spool section only).
- **Two-position detent (D2)** P to A only.
- **Two-position detent (2D)** P to B only.

## OPTIONS -

Normally open electric switch (WO) used with spring center option only. Normally closed electric switch (WC) is used with spring center option only.

Paint (Optional) (P) painted black (other colors available, consult factory), (MP) epoxy coating.

## ACCESSORY ITEMS –

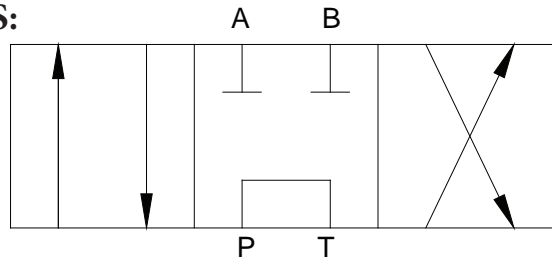
All standard tie rod kits contain rods, lock washers and hex nuts. Please be sure to note correct tie rod torque spec of 85 inch pounds.

Seal kits, power beyond kit, closed center kit and many other accessory items are available, please see the “SERIES 20 COMPLETE LIST OF OPTIONS AND ACCESSORIES” section of this catalog, for model codes and descriptions of these items.

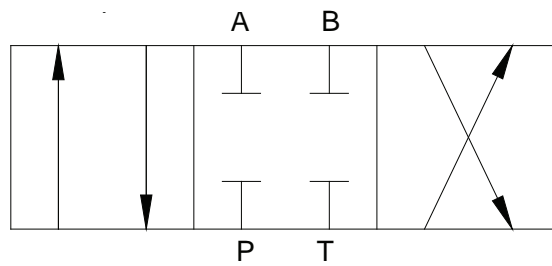
## ASSEMBLY –

Model codes and list prices for complete assemblies will be issued by the factory, upon request of an authorized Brand Distributor. All model codes so issued become proprietary to the requesting distributor. Model codes so issued will not be descriptive in nature, but shall be of sequential numerical type. Individual sections and accessories can be purchased so that custom valve stacks may be assembled or modified outside the factory.

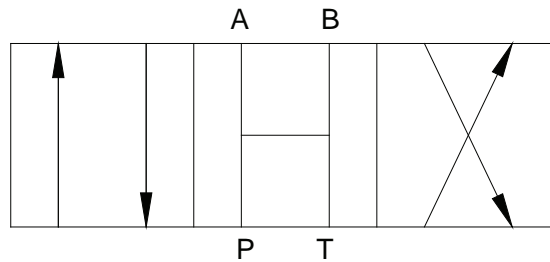
**SPOOL SCHEMATICS:**



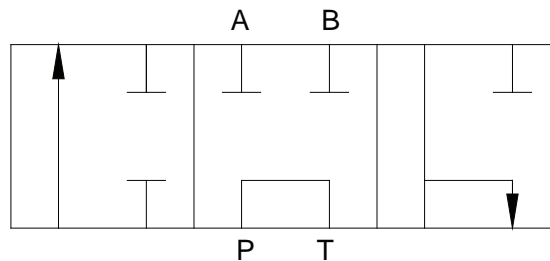
**Tandem Center (T)** - Powers cylinder or motor in both directions. Pump unloads to tank when spool is in neutral. Cylinder or motor blocked when spool is in neutral.



**Closed Center (C)** - All ports are blocked in neutral. Blocks cylinder or motor in neutral. Required for use with pressure compensated pump.



**Open Center (O)** - All of the ports are connected to tank when the spool is in neutral. Allows cylinder to move or motor to rotate when spool is in neutral.



**Tandem Three Way (T3)** - Powers the cylinder in one direction. Pump unloads to tank when spool is in neutral, or when spool is being reversed. Cylinder is blocked when spool is in neutral. Port "B" is plugged.

# Series 20 Sectional Directional Control Valve

## SERIES 20 – CREATING A MODEL CODE FOR SERIES 20:

**INLET SECTION:**

**20PG**

**PORTING:**

- 1 – End port (not convertible)
- 2 – Top port (convertible to end or side port)
- 3 – Side port (convertible to top or end port)
- 4 – Top port with relief drain port (convertible to side or end port)

**RELIEF SETTING:**

- 15 - 1500 psi
- 20 - 2000 psi
- ETC...

**RELIEF:**

- OMIT – Not machined for relief
- B – Adjustable high lift relief

## SERIES 20 – CREATING A MODEL CODE FOR SERIES 20:

**OUTLET SECTION:**

**20TG**

**PORTING:**

- 1 – End port (not convertible)
- 2 – Top port (convertible to end or side port)
- 3 – Side port (convertible to top or end port)

**OPTION:**

- OMIT – No options
- W – Power beyond cartridge used with top port (2) call out
- C – Closed center cartridge used with top port (2) call out

## SERIES 20 – CREATING A MODEL CODE FOR SERIES 20 CONT...

**WORK SECTION:**

**20 B F**

**PARALLEL/SERIES:**

- OMIT – Parallel
- S – Series

**SPOOL TYPE:**

- T – Tandem center
- O – Open center

**TYPE:**

- 3 – Three-way (T spool only)
- 4 – Four-way

**HANDLE OPTION:**

- A – Joystick assembly for adjacent spool sections
- B – Vertical handle assembly
- C – Horizontal handle assembly

**SPOOL ACTION:**

- S – Spring center
- D – Three-position detent
- SD – Spring center (P to A) detent
- DS – Detent / spring center (P to B)
- K – Fourth position float / spring center (Last spool only)
- D2 – Two-position detent P to A
- 2D – Two-position detent P to B

**SERIES 20 – EXAMPLES OF COMMON MODEL CODES:****INLET SECTIONS**

**20PG1**.....Inlet section plain, no relief, end ported.

**20PG1B20**.....Inlet section, end ported, and adjustable high lift relief set at 2000 psi.

**OUTLET SECTIONS**

**20TG1**.....Plain, end ported.

**20TG2W**.....Top ported outlet with power beyond cartridge, convertible to end ported.

**WORK SECTIONS**

**20BFO4DC**.....Open center, four-way, three-position detent, horizontal handle.

**20BFT4SB**.....Tandem center, four-way, spring to center, vertical handle.

**HANDLE KITS**

**20HA**.....Joystick handle, used to shift two adjacent spools.

**20HB**.....Standard enclosed handle kit, handle is in vertical position.

**20HC**.....Optional enclosed handle kit, handle is in horizontal position.

**TIE ROD KITS**

**20TR1**.....Tie rod kit for valve stack containing a standard inlet, outlet and one spool section.

**20TR2**.....Tie rod kit for valve stack containing a standard inlet, outlet and two spool sections.

**STANDARD ASSEMBLY MODEL CODES:**

**20A1**.....Single spool assembly, tandem center four-way, spring to center action, no relief and with B style handle assembly. End ported inlet and outlet.

**20AB1**.....Same as above but with an adjustable high lift relief added and set at 2000 psi.

**20A2**.....Two spool assembly, tandem center four-way, spring to center action, no relief, and with B-style handle assemblies. End ported inlet and outlet.

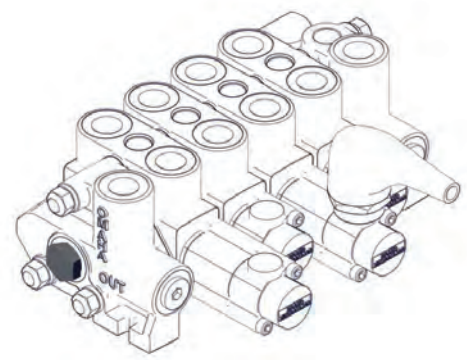
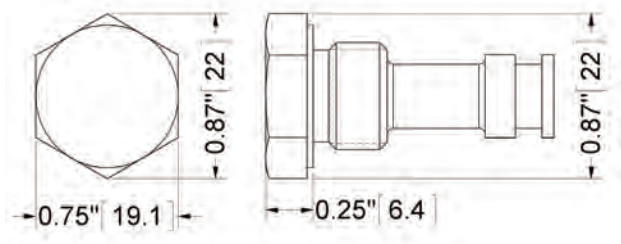
**20AB2**.....Same as above but with an adjustable high lift relief added and set at 2000 psi

Standard assemblies are available with up to 6 spool sections using the model code format outlined above for the one and two spool assemblies.

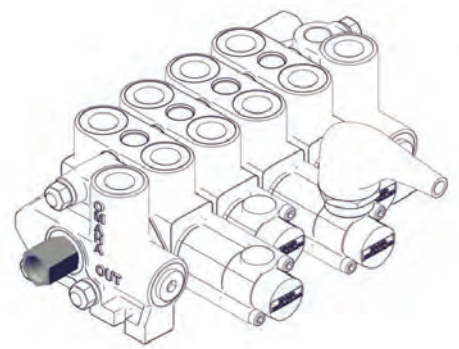
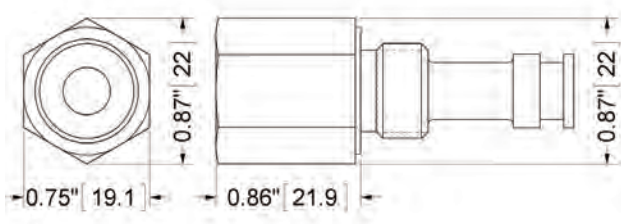
# Series 20 Sectional Directional Control Valve

## SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES:

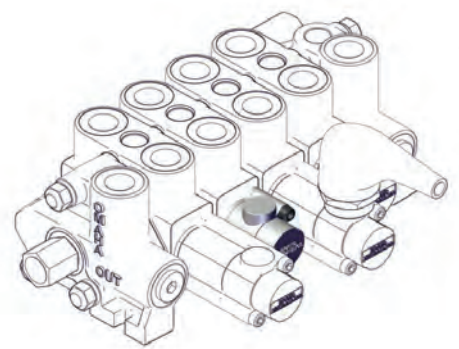
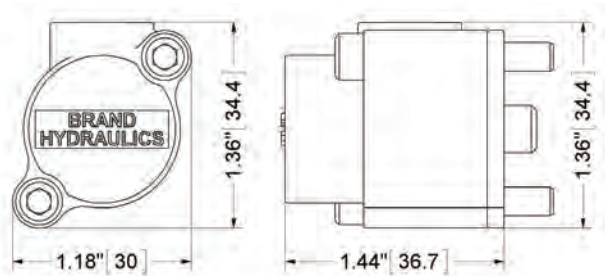
**20-AGCC**.....Closed center plug kit, for outlet sections with porting 2 in their model code.  
 (Cannot be used with power beyond)



**20-AGPB**.....Power beyond cartridge kit, for outlet sections with porting 2 in their model code.



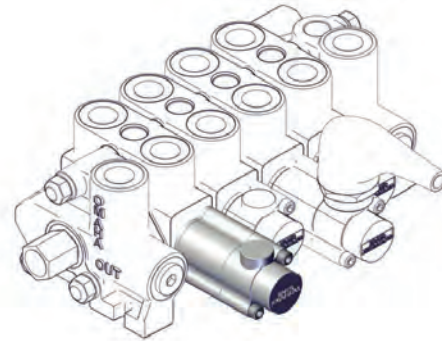
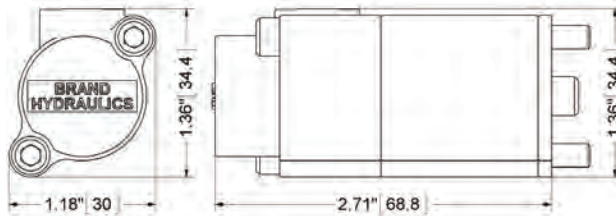
- 20-D**.....Three-position detent kit.
- 20-D2**.....Two-position detent kit, P to A and neutral.
- 20-2D**.....Two-position detent kit, P to B and neutral.
- 20-S**.....Spring to center kit.



**External dimensions are the same for all kits listed above.**

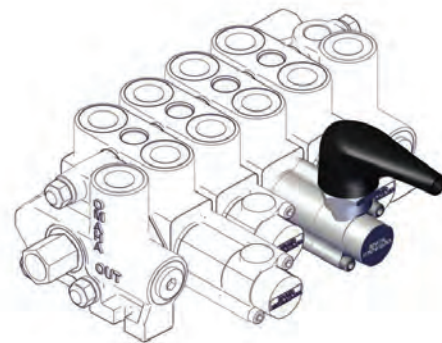
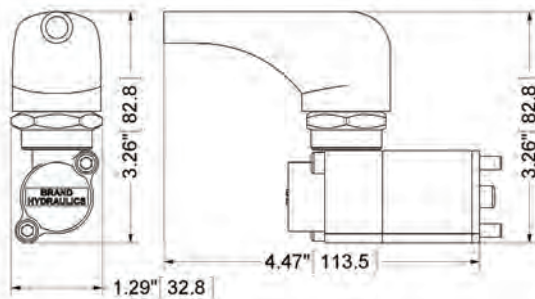


- 20-DS**.....Spool is detented in one work position (P to A), and springs to center (P to B) from the other.
- 20-SD**.....Spool springs to center in one work position (P to A), and detented (P to B) in other position.
- 20-K**.....Fourth position float kit, use on last spool section in assembly only.



External dimensions are the same for all kits listed above.

- 20-SWC**.....Spring to center kit with normally closed electric switch.
- 20-SWO**.....Spring to center kit with normally open electric switch.



External dimensions are the same for all kits listed above.

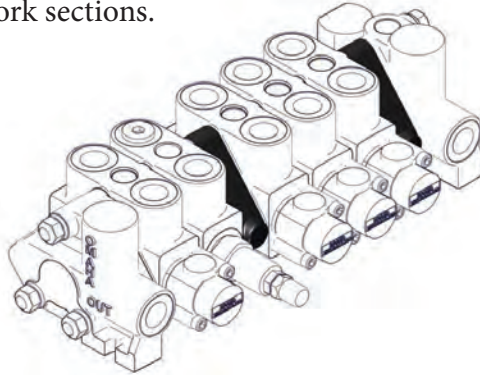
- 20ASB**.....Series block allows the customer to meter multiple work sections independently without losing fluid to tank core. The down side to this section is that pressures are additive and pressure rating of valve is reduced to 3000 psi (207 bar) because the tank core is seeing system pressure. This section must be installed between two spool sections to put them in series. (0.656" [16.7mm] casting width) Note: Adjacent work section towards Inlet must have Series call out in model code. Joystick ("A" option) cannot be used when 20ASB is used between two adjacent work sections. Inlet section with relief ("B" option) must have porting option"4"

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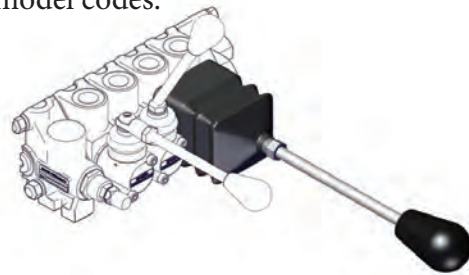
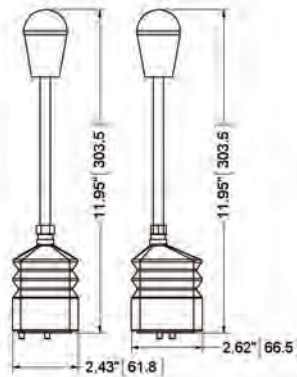
## SERIES 20 – COMPLETE LIST OF OPTIONS AND ACCESSORIES: *(continued)*

**20ASP**.....Series/Parallel block (also referred to as a tandem flow or priority valve) allows the customer to meter multiple work sections independently. The neutral flow path is in parallel but the pressure core is in series. Tank fluid is not combined to neutral flow passage. Upstream section has priority when shifting multiple sections. Pressures are not additive. The pressure rating remains at 4500 psi (301 bar) since the tank cores are not pressurized. This spool section must be installed between two spool sections to put them in series/parallel. (0.656" [16.7mm] casting width)  
 Note: Joystick ("A" option) cannot be used when 20ASP is used between two adjacent work sections.

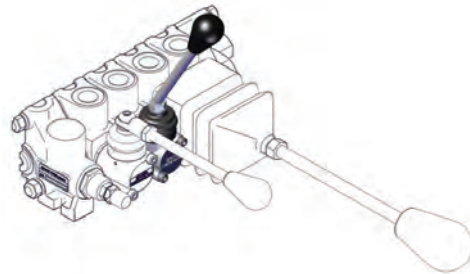
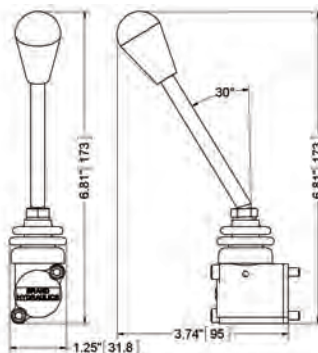


External dimensions are the same for all kits listed above.

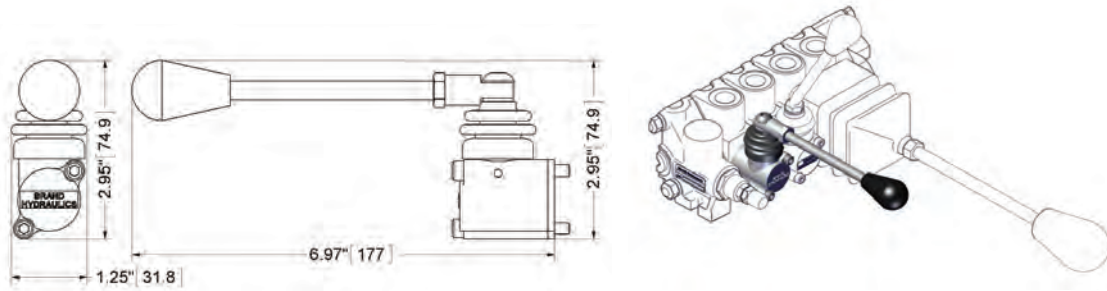
**20HA**.....Joystick handle kit for series 20, note, this kit may only be used on two adjacent spool sections in a valve assembly, and both of these two sections must have the (A) actuator call out in their model codes.



**20HB**.....B-style handle kit, with bent handle, use on spool sections with (B) handle call out.



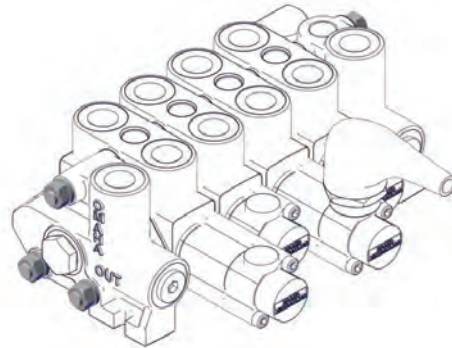
**20HC**.....C-style handle kit, with straight handle, use on spool sections with (C) handle call out.



**20HB-K**.....Replacement handle kit which includes ball knob, bent handle and jam nut.

**20HC-K**.....Replacement handle kit which includes ball knob, straight handle, jam nut, link age and cap screw.

**20TR**.....Tie rod kits, specify number of spool sections in valve assembly, i.e. 3 spool sections in valve assembly, requires using 20TR3 tie rod kit. Please note that when using extra items in the assembly, such as series blocks, drain blocks etc., the tie rod kit must have its length extended.



External dimensions are the same for all kits listed above.

### Seal Kits:

**20AK**.....Replacement seal kit for work section.

**20BK**.....Seal kit, contains seals for use in between work sections.

**20CK**.....Replacement seal kit for inlet section.

**20DK**.....Replacement seal kit for outlet sections.

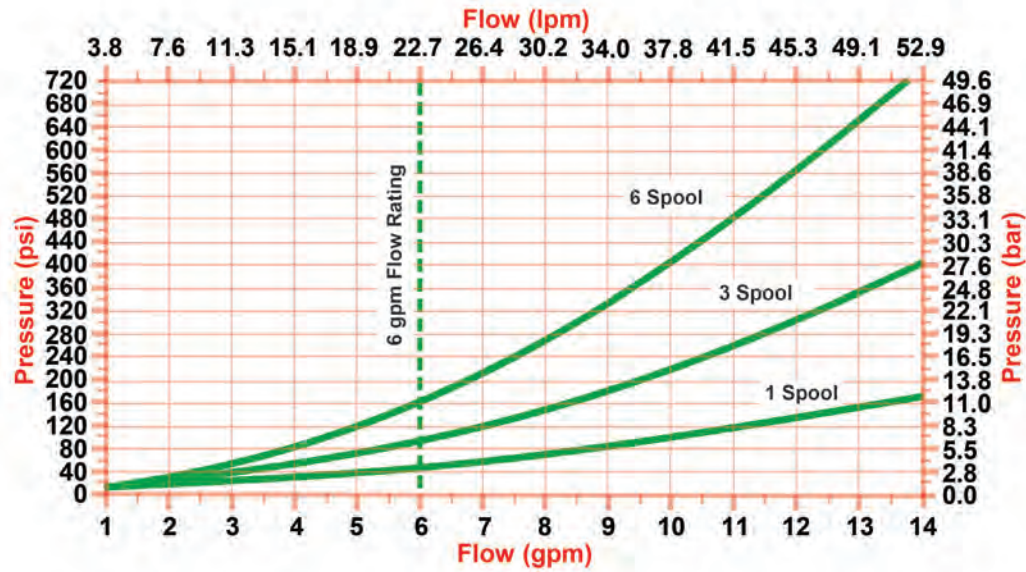
Please feel free to contact the factory with your ideas regarding custom options or accessories, we will be happy to review them to see if they can be put into production for your assemblies.

# Series 20

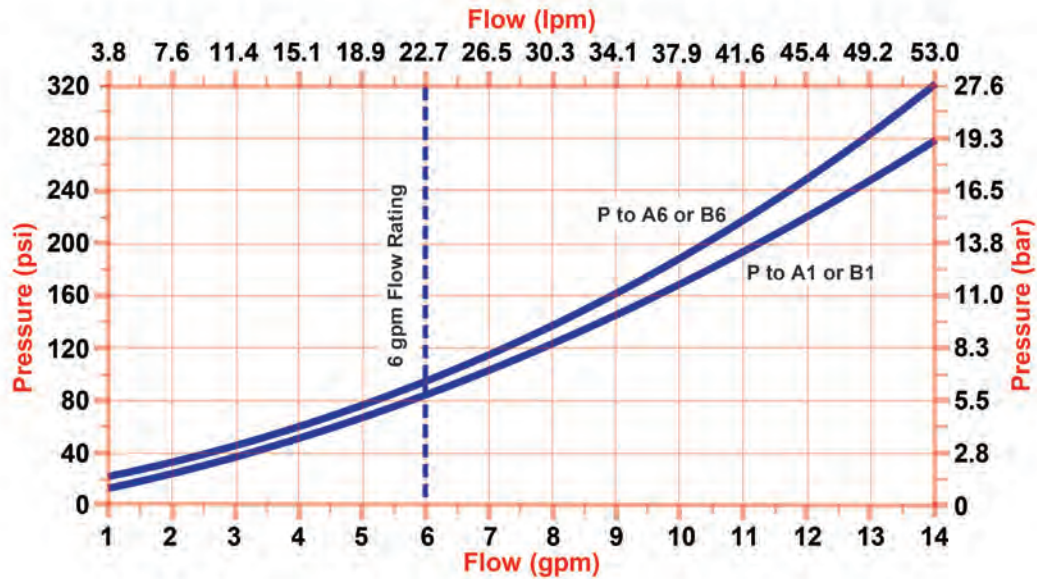
Sectional Directional Control Valve

## SERIES 20 – FLOW AND PRESSURE INFO:

### Neutral Flow Pressure Drop

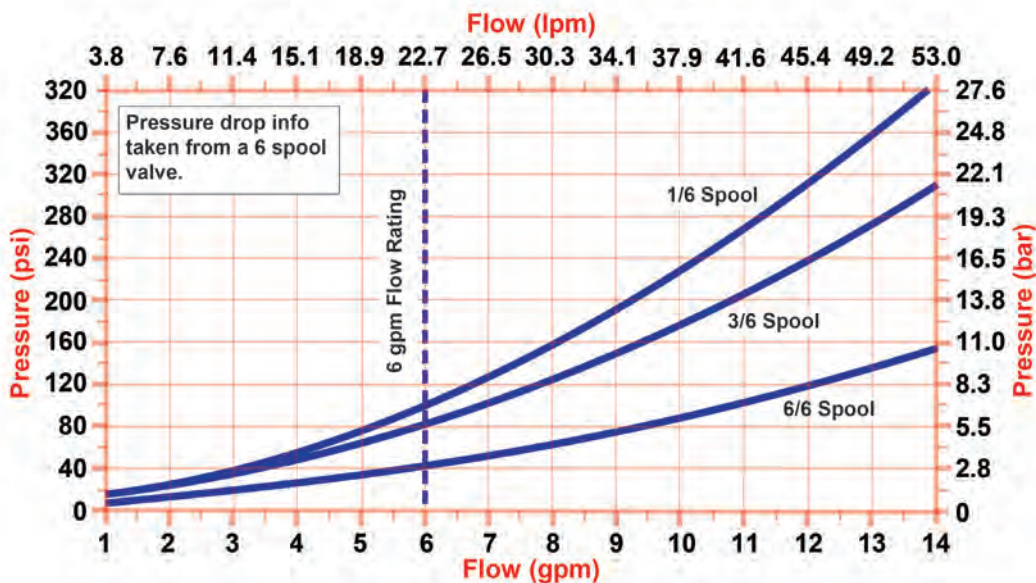


### Pressure Drop VS. Flow for P to A or B

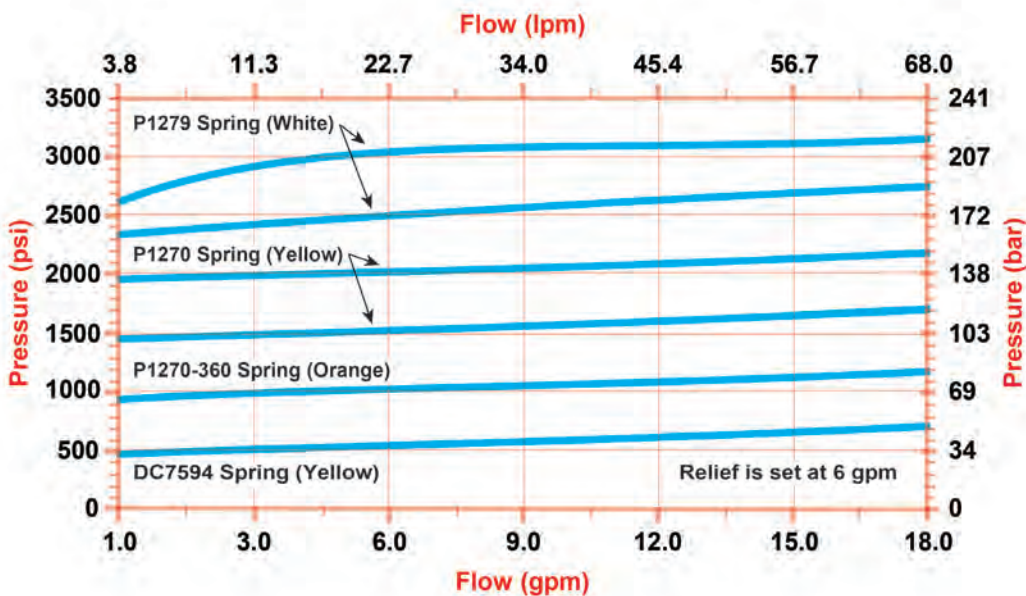


SERIES 20 – FLOW AND PRESSURE INFO:

Pressure Drop VS. Flow for A or B to T

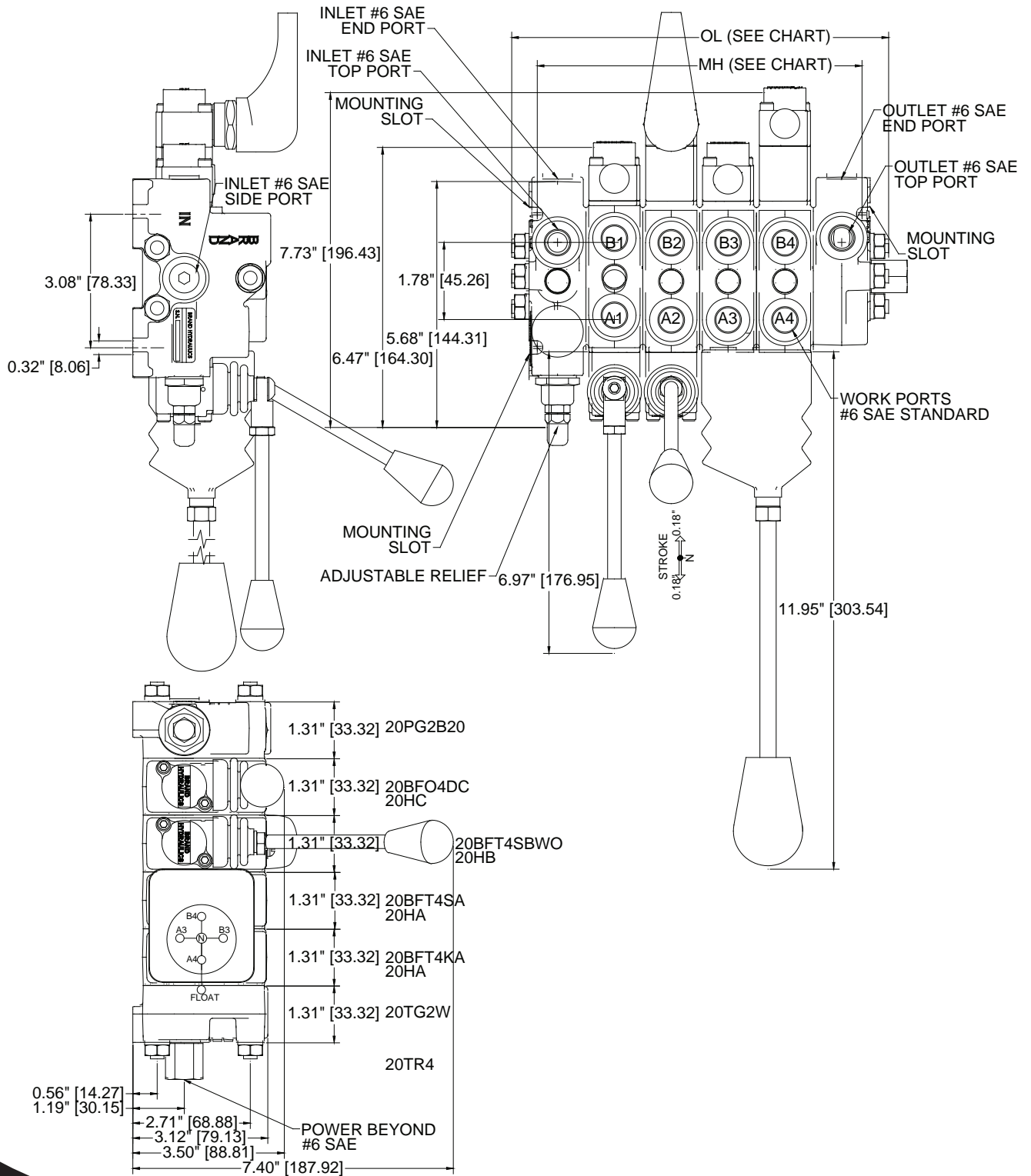


Pressure VS. Flow for S20 Inlet Relief



# Series 20 Sectional Directional Control Valve

## DIMENSIONAL DATA: inches & [millimeters]



**VALVE ASSEMBLY ARRANGEMENT:**

**PRICE**

(P)	P20A (Painted black)		
(MP)	MP20A (Epoxy coating)		
	20A		
INLET	20PG		
SPOOL #1	20BF		
SPOOL #2	20BF		
SPOOL #3	20BF		
SPOOL #4	20BF		
SPOOL #5	20BF		
SPOOL #6	20BF		
SPOOL #7	20BF		
SPOOL #8	20BF		
SPOOL #9	20BF		
SPOOL #10	20BF		
SPOOL #11	20BF		
SPOOL #12	20BF		
OUTLET	20TG		
MISC.			
TIE ROD	20TR		
(Torque to 85 inch lbs)			
HANDLES	20H	QNTY. _____	PRICE _____ = \$ _____
ASSEMBLY	20A		LIST \$ _____

**DISTRIBUTOR:** \_\_\_\_\_

**NAME:** \_\_\_\_\_

**EMAIL:** \_\_\_\_\_ **PHONE:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**CITY:** \_\_\_\_\_ **STATE:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

