We Sustain. ™

Directional Control Valve Load Sense Pressure Compensated MP22

RA 64 980/05.05 1/16
Replaces: 05.94

Series 20

Nominal pressure 5000 psi (345 bar) pump side
Nominal pressure 5500 psi (310 bar) actuator side
Max. flow
– pump side:
  • 80 GPM (303 l/min) standard closed center inlet element
– actuator side:
  • 55 GPM (208 l/min) consult factory for higher flow rates

Functional Description

MP22, series 20 mobile stack type valves are load sensing pressure compensated valves. They control the volume, direction of oil flow and maintain a constant flow regardless of changing load pressures.
An advantage of the MP22 is that the starting point for movement of the function always remains the same, i.e., a specified control spool position always has the same metering characteristics. This is accomplished by a compensating spool in each section.
While the main spool is in neutral, the primary shuttle and secondary shuttle are vented to tank. When the main spool is operated, the load pressure is directly via the primary shuttle to the spring end of the pressure compensator spool. The section compensator now moves to the open position. Dependent on the pressure drop between the section compensator and the control spool opening, a specific volume now flows to the function. The load signal also simultaneously communicates to the secondary shuttle and on to the system load sense compensating variable displacement pump.

Features

- Parallel and series parallel type valve with wide range of section circuitry including 3-way, 4-way, float, motor control, 3 position and priority. Available with both flow and pressure control spools.
- Section compensators allows each section to operate at a predetermined flow rate independent of pump discharge flow and pressure.
- Low spool operating forces possible by elimination of series by-pass circuits through the valve sections. This lends itself to remote operation of valve spools.
- Variety of main spool operators including manual, hydraulic, electro-hydraulic (proportional or on-off control), and mechanical detents. Electro-hydraulic and hydraulic remote also available with manual handle override.
- Section with pressure regulator or remote regulator port allows each section to operate at a predetermined maximum pressure level independent of pump discharge pressure.
- Secondary port options available; plug, anti-cavitation check valve, combination pilot operated relief and anti-cavitation check valve, combination proportional pilot relief and anti-cavitation check valve.

Ordering Code

	MP 22–20	/		/

Fluid

Petroleum Oil *(For operation with other fluids, consult a Rexroth Application Engineer)*	

Number of Sections

Directional control sections *(8 sections maximum)*	

Directional Control Valve

Mobile stack valve, pressure compensated, Series 20	**MP 22**

Inlet

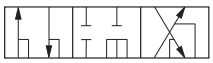
Standard closed center	**C**
Closed center with relief valve	**CG (_)**

Directional Control Section

High Boy Section	**HB**
High Boy Section Priority	**HBP**

Schematic Designation

1



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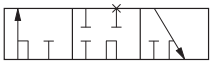

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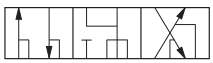

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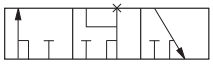

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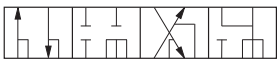

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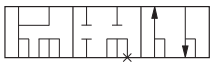

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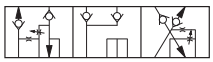
12

16



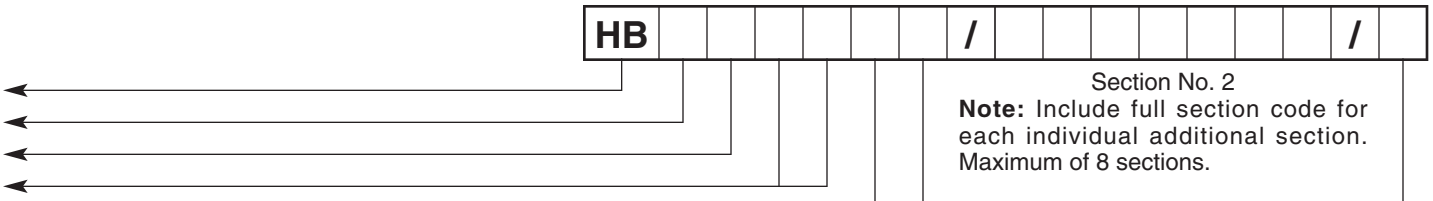
All spool designations except number 10 and 16 are available with flow limited main spools for improved metering characteristics. If flow limited main spool is required, add the flow in L/min after the spool schematic designation. Available flow limited main spools 9 GPM (34 L/min), 25 GPM (95 L/min), 41 GPM (155 L/min). Also consult factory for special customer requirements in main spool design if quantities are justified.

Spool Operation *(_) Please fill in the required DC voltage for proportional solenoids, on-off Solenoids, or magnetic detent.2*

Spring Centered	**A**
Mechanical Detent A and B	**B**
Spring Centered from A Mechanical Detent B	**B1**
Spring Centered from B Mechanical Detent A	**B2**
Spring Centered A and B Mechanical Detent Float	**B3**
Multi-Position Detent	**B4**
Mechanical Detent A, B, and Float	**B5**
Mechanical Detent A and Float Spring Centered from B	**B6**
Hydraulic Pilot Operated	**H**
Hydraulic Pilot with Stroke Limiter *Designate which ports are required; A, B, or A & B.*	**H1**
Hydraulic Pilot with Manual Override *Designate (SL) for stroke limiter*	**H2**
Standard Electrical Proportional Control	**L (_)**
Standard On/Off Control	**M (_)**
Proportional Control with Manual Override	**L2 (_)**
On/Off Control with Manual Handle Override	**M2 (_)**
Proportional Control with Stroke Limiter	**L1 (_)**
On/Off Control with Stroke Limiter	**M1 (_)**

Port Options *(_) Please fill in the required secondary relief setting in bar.*

Anti-cavitation check valve	**E**
Combination pilot operated relief and anti-cavitation check valve	**G (_)**
Combination proportional pilot operated relief and anti-cavitation check valve *Activated by "C" remote port "LS" load sense signal*	**P (_)**
Port machined for secondary valve with plug *(Standard)*	**Q**



Compensator Option

Solid pressure compensator spool available in HB section with standard main spool maximum work port flow 55 GPM	**0**

Section Compensator Pressure Control Option

Standard section with no optional compensator pressure control	**A**
Compensator pressure regulator	**B (_)***
Port for remote control of section pressure compensator	**C***

(__) Indicate setting in bar

End Cover

Standard end cover	**L**
End cover with pressure reducing valve integral for electro-hydraulic controlled sections. *Includes drain port T2 and P2 port is available for remote pilot supply. Pressure reducer maintains approx. 550 psi pilot pressure with valve stack pressure core at +550 psi.*	**Q**
End cover with external supply pressure port for electro-hydraulic controlled sections. *Includes drain port T2 and P2 pressure port. Recommend 350 psi pilot pressure up to 700 psi allowable.*	**R**
End cover with pressure regulator for pilot supply port. *Used in conjunction with remote pilot controller. Includes drain port T2 and P2 pilot supply port.. Pressure reducer maintains approximately 550 psi pilot pressure with valve stack pressure core at +550 psi*	**S**
To add ports P, T to end covers, add catalog code (CP) to end cover codes L, Q, R, S. *Example: L(PT) would be standard end cover with ports P, T.*	**(PT)**
To add ports P, T, LS to end covers, add catalog code (CPL) to end cover codes L, Q, R, S. *Example: L(PTL) would be standard end cover with ports P, T, LS.*	**(PLT)**

* *Compensator pressure options B, C not available in all section assemblies.*

1) *Consult factory if section compensator pressure control option codes B, C are required with any electrical proportional or On-Off controlled section operation codes L, M, N, O.*

2) *All electro-hydraulic sections must be assembled to optional end cover codes Q, R and all must be assembled in line from end cover. When ordering a four stack valve and two sections are electro-hydraulic, these two sections must be sections 3 and 4 assembled next to end cover Q, R.*

Technical Data

MP-22 Specifications

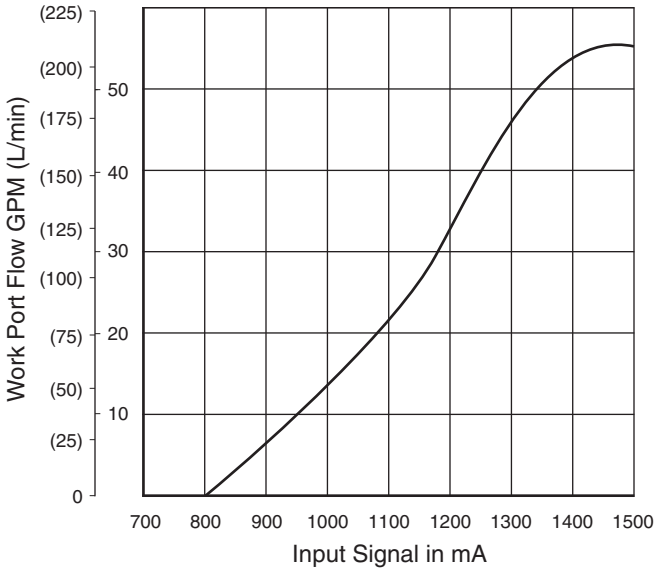
Flow range		GPM (L/min)	55 (208)
Maximum operating pressure	Port T	PSI (bar)	290 (20)
	Port P, A, B	PSI (bar)	5000 (345)
Hydraulic fluid			Petroleum oils (HM, HL, HLP)
Fluid temperature range		° F (° C)	t_{min} = –4° F (–20) t_{max} = 158° F (70)
Viscosity range		SSU (mm²/s)	35–1760 (10–380) (dependent upon fluid)
Cleanliness level			18/15 according to ISO 4406

*For applications outside these parameters, please consult Rexroth

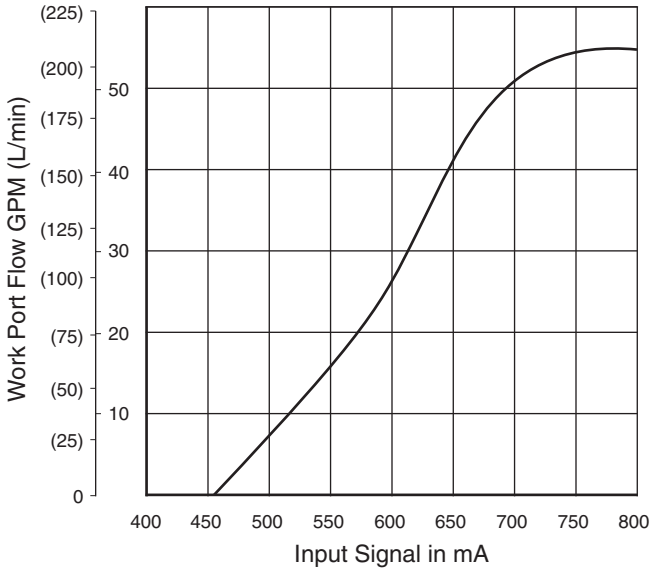
Operating Curves

Measured at n = 190 SSU and t = 122° F (41 mm²/s and 50° C)

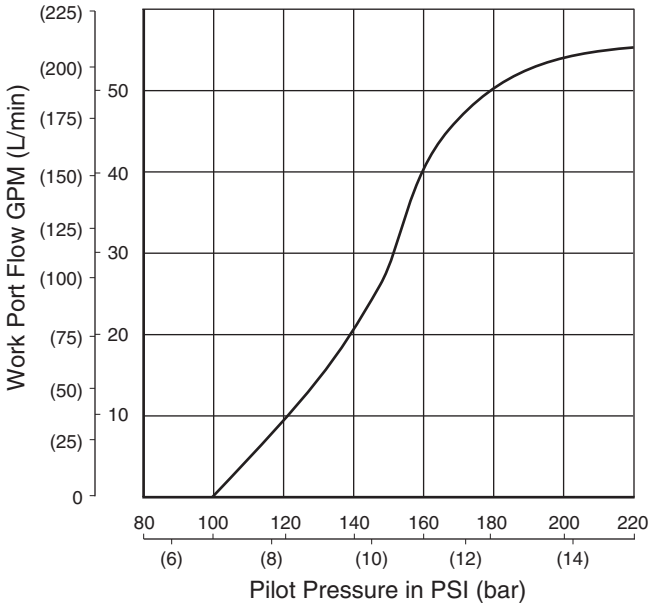
Proportional Solenoid (12 Vdc)
Meter-in (to either cylinder or motor)
Conditioned electrical signal used
180 Hz pulse width modulation
For more information see RA 58031



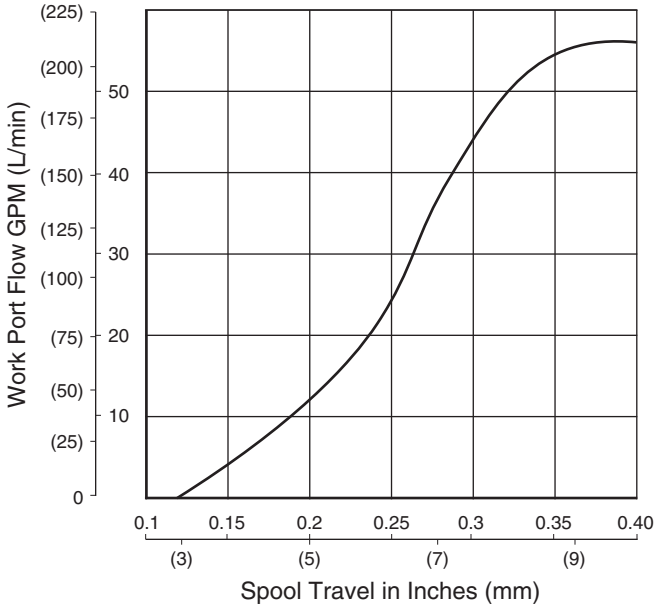
Proportional Solenoid (24 Vdc)
Meter-in (to either cylinder or motor
Conditioned electrical signal used
180 Hz pulse width modulation
For more information see RA 58031



Hydraulic Pilot Operation
Meter-in (to either cylinder or motor)

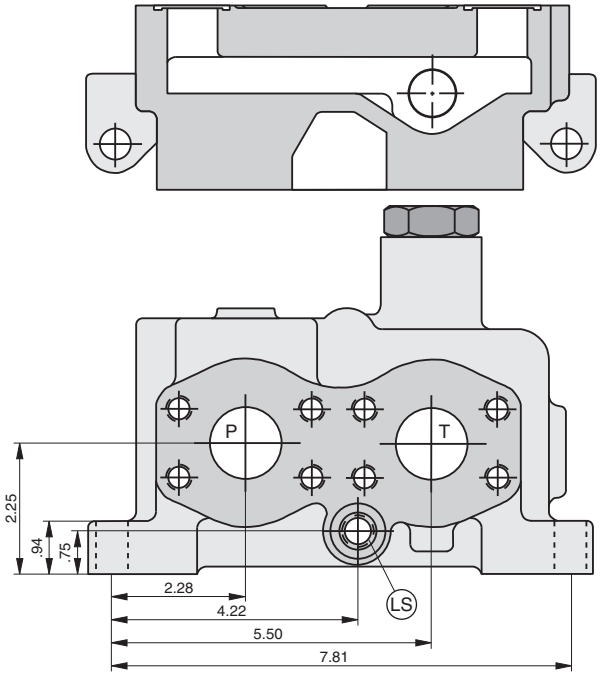


Flow/Main spool travel
Meter-in (to either cylinder or motor)

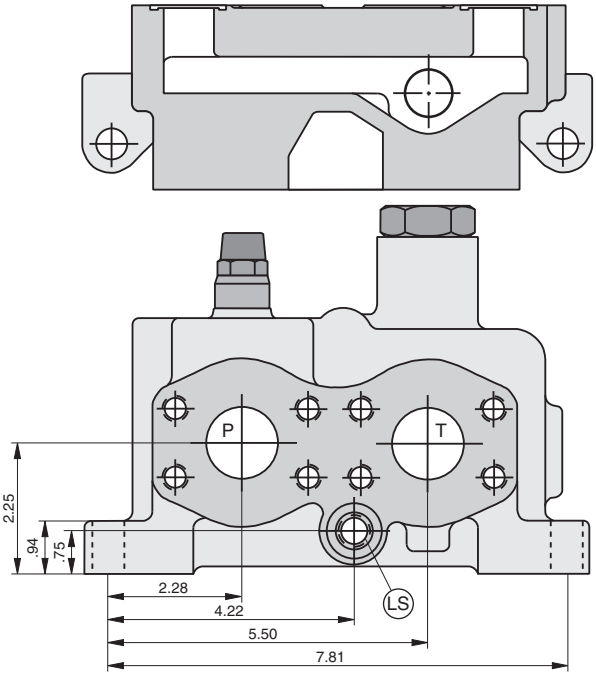


Inlets

Standard closed center inlet.
Code **C**; P & T ports 1¼" code 61, LS port SAE-6



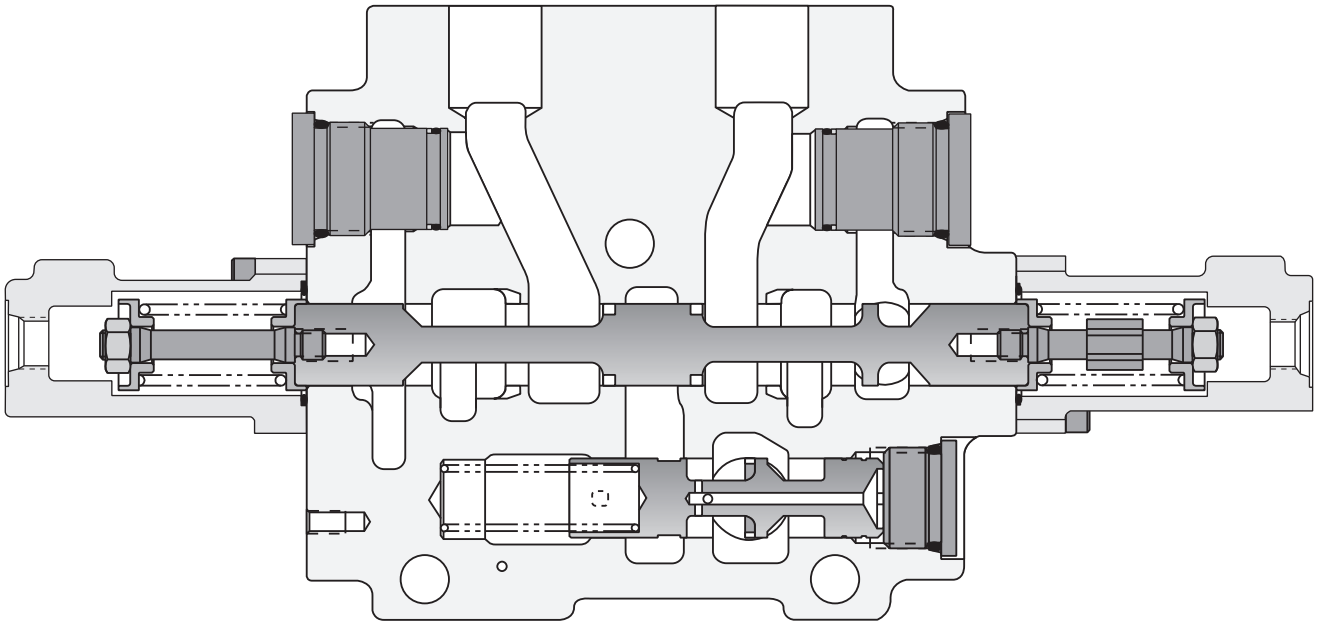
Standard closed center inlet with spike relief.
Code **CG (_)**; P & T ports 1¼" code 61, LS port SAE-6



Number of Directional Control Spools	Overall Length	Bolt Hole Centers	Number of Directional Control Spools	Overall Length	Bolt Hole Centers
1	7.91 (220.8)	6.56 (166.5)	5	17.43 (442.8)	16.08 (408.5)
2	10.29 (261.3)	8.94 (227.0)	6	19.81 (503.3)	18.46 (469.0)
3	12.67 (321.8)	11.32 (287.5)	7	22.19 (563.8)	20.86 (529.5)
4	15.05 (382.3)	13.70 (348.0)	8	24.57 (624.3)	23.22 (590.0)

Sectional View

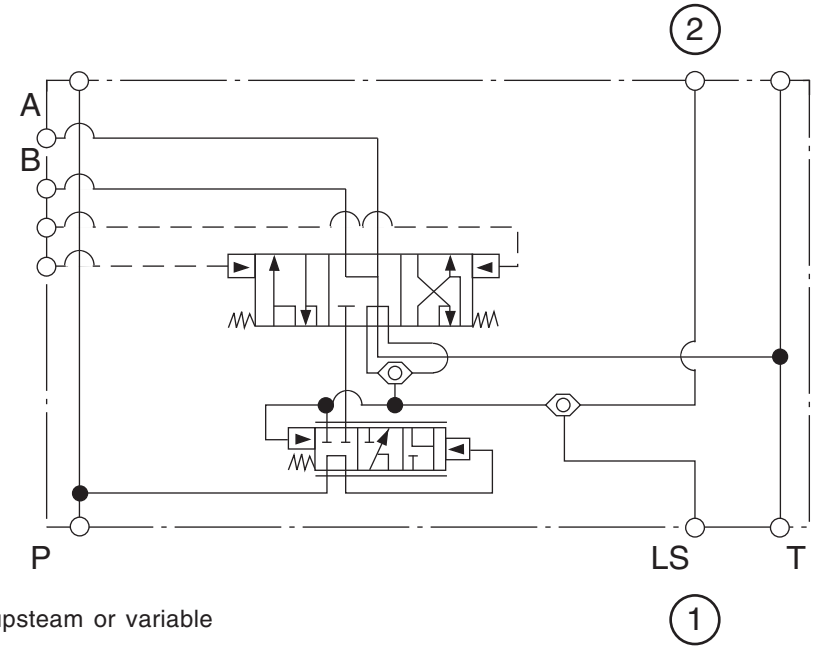
MP22-20 / HB3HQQ0A



High boy section; 4 way, 3 position motor main spool; hydraulic pilot operated; port option plug for both A and B ports; solid pressure compensator; no optional compensator pressure control.

Symbols

(According to ISO 1219)

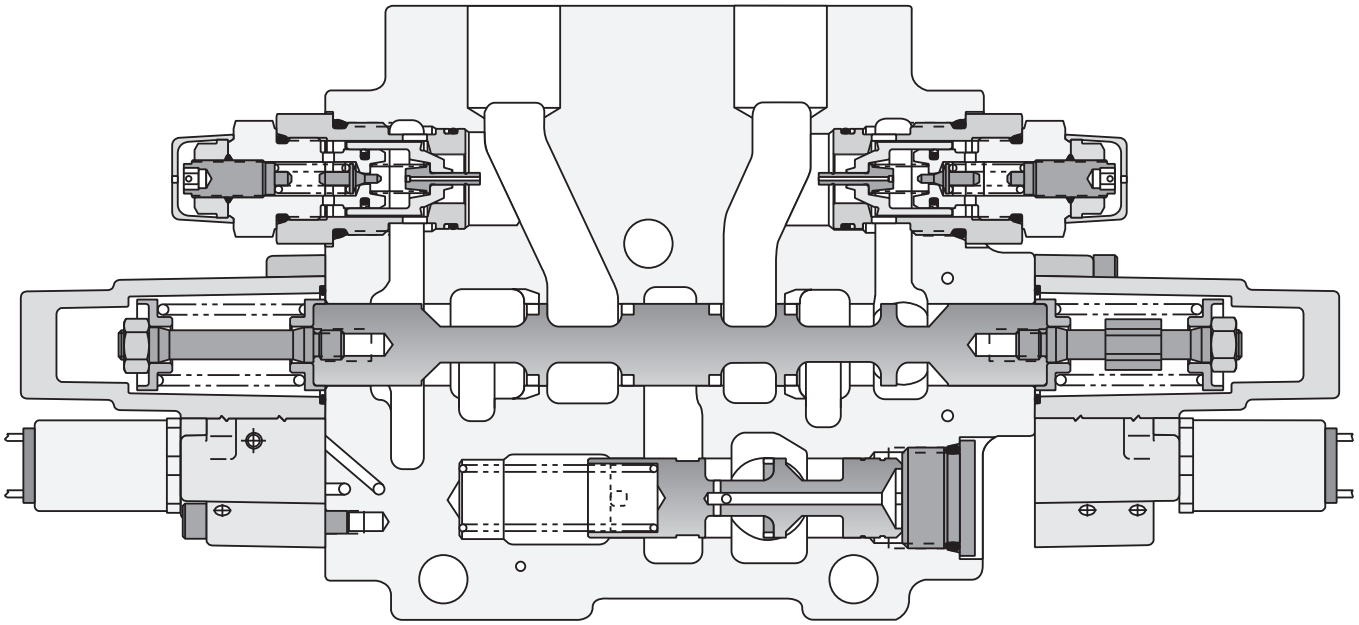


1. Signal to next section upsteam or variable displacement pump.

2. Internal signal from downstream section or vented to tank if last section in stack

Sectional View

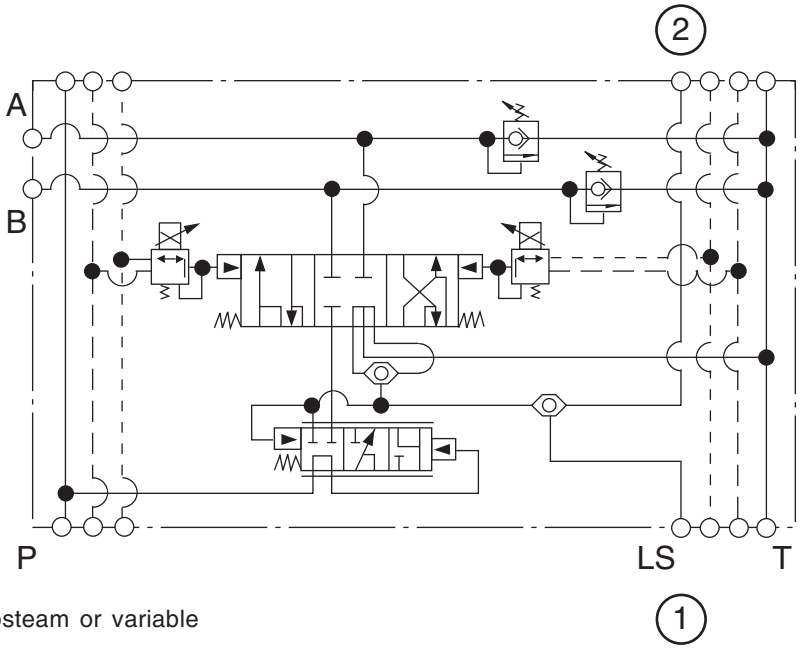
MP22-20 / HB1L(12)G(_)G(_)0A



High boy section; 4 way, 3 position cylinder main spool; proportional solenoid operated 12 Vdc: port option combination pilot operated relief and anti-cavitation check valve both "A" and "B" ports; solid pressure compensator; no optional compensator pressure control.

Symbols

(According to ISO 1219)

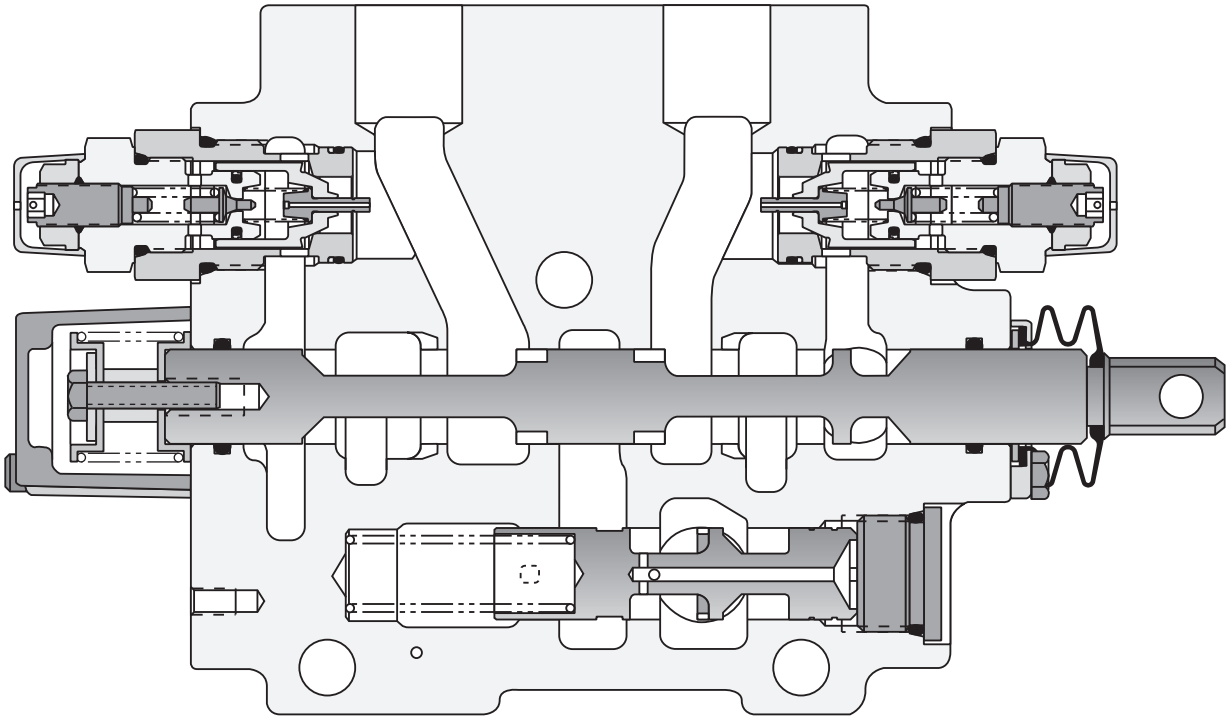


1. Signal to next section upsteam or variable displacement pump.

2. Internal signal from downstream section or vented to tank if last section in stack

Sectional View

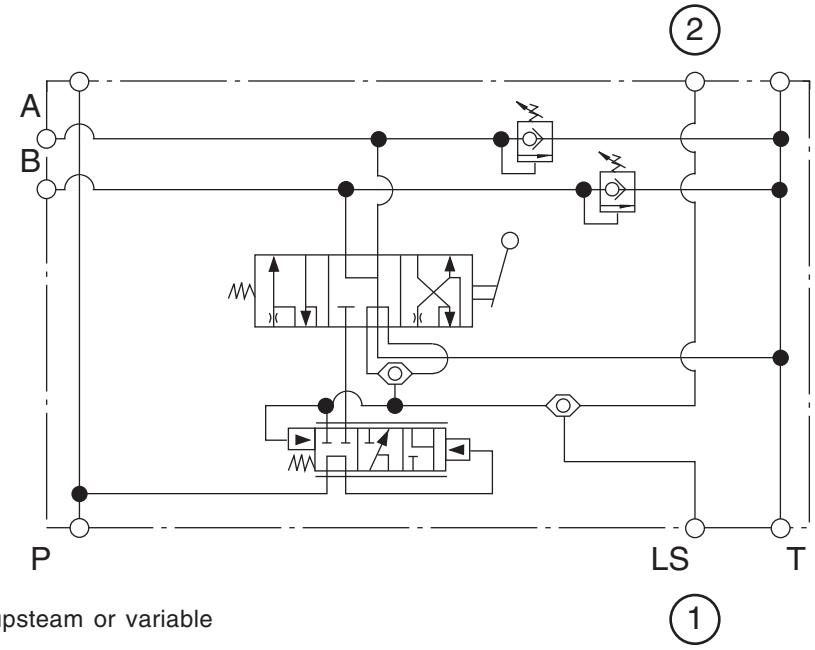
MP22-20 / HB3(_)AG(_)G(_)0A



High boy section; 4 way, 3 position motor main spool; manual spring center operated: port option combination pilot operated relief and anti-cavitation check valve both "A" and "B" ports; solid pressure compensator; no optional compensator pressure control.

Symbols

(According to ISO 1219)



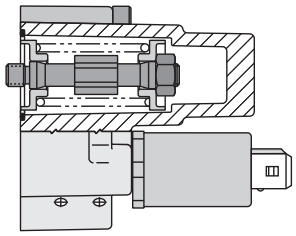
1. Signal to next section upsteam or variable displacement pump.

2. Internal signal from downstream section or vented to tank if last section in stack

Spool Operation

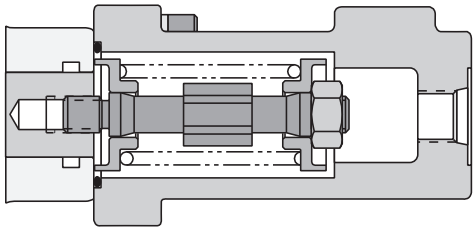
Electrical Proportional and On/Off Control
Main spool operator codes: **L(12), L(24), M(12), M(24)**

3 Position Assembly
Internal assembly typical. Housings are not interchangeable. They must be assembled to their proper ends of the sections.
Assembly for “A” port end of section



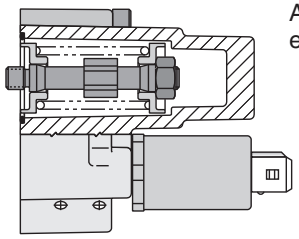
Hydraulic Operated Proportional Control
Main spool operator code: **Code H**

3 Position Assembly
Housings are interchangeable from “A” to “B” end of section.
Assembly for “A” port end of section

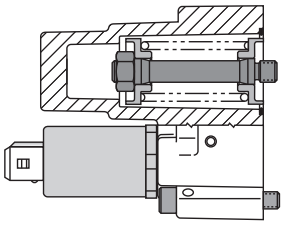


4 Position Assembly

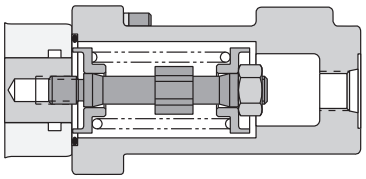
Assembly for “A” port end of section



Assembly for “B” port end of section

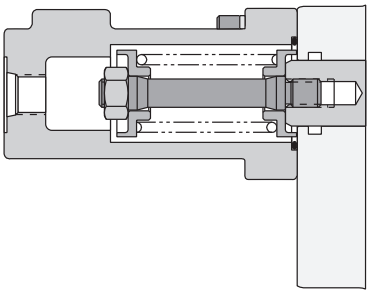


4 Position Assembly

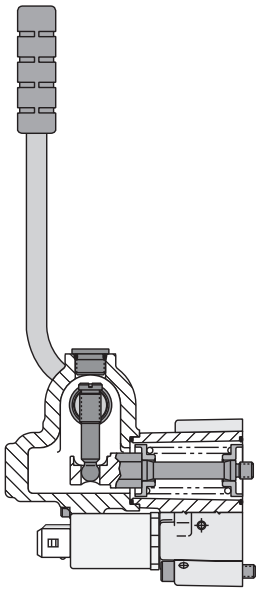


Assembly for “A” port end of section

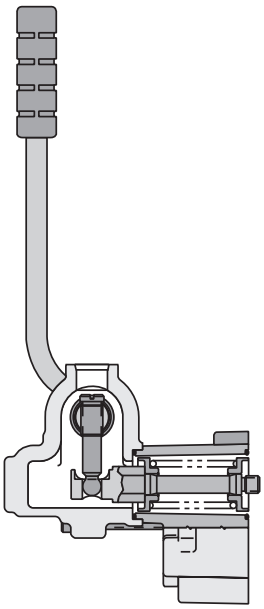
Assembly for “B” port end of section



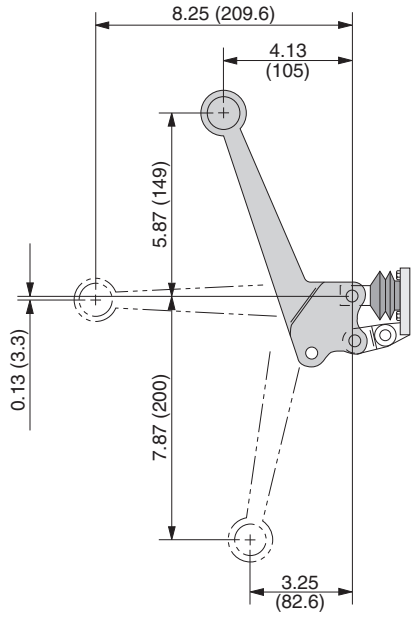
Elect. Proport. and On/Off Control with Manual Override
Main spool operator codes:
L2(12), L2(24), M2(12), M2(24)
“B” port assembly
Kit P/N 1602-635-096



Hyd. Control with Manual Override
Main spool operator code: **H2**
“B” port assembly
Kit P/N 1602-635-097

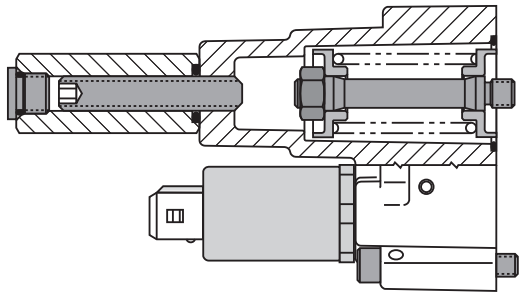


Lever and Dust Boot Assembly
Kit P/N 1601-635-040

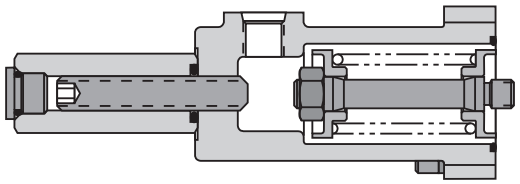


Spool Operation

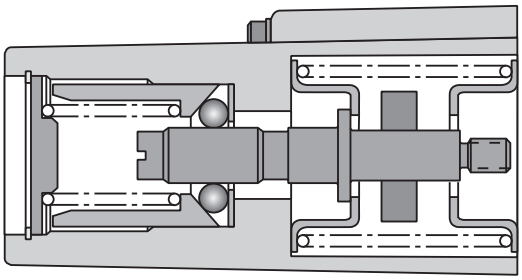
Elect. Proport. & On/Off Control with Stroke Limiter
Main spool operator codes: **L1(12), L1(24), M1(12), M1(24).**



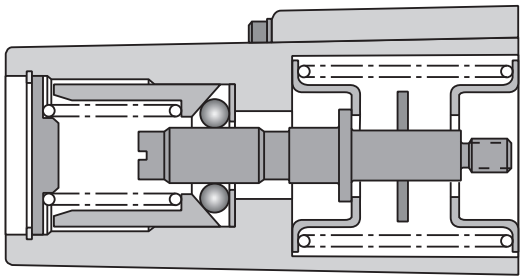
Hydraulic Operated Proportional Control
Main spool operator code: **H1**

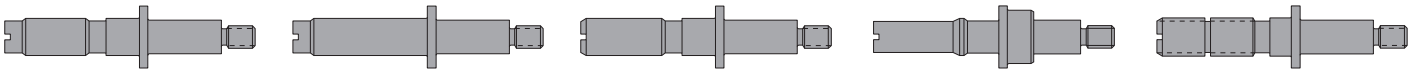


3 Position Mechanical Detent



4 Position Mechanical Detent

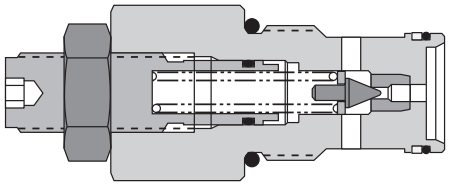




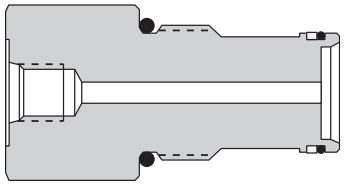
Code **B** Code **B1** Code **B2** Code **B3** Code **B4**

Pressure Comp. Control Option
Standard Port Size

Compensator Pressure Regulator
Code **B (_)**

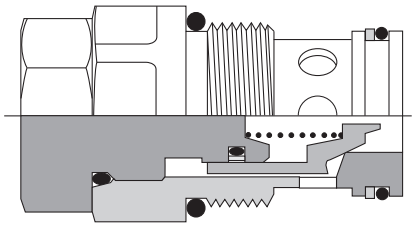


Port for Remote Control of Section
Pressure Compensator
Code **C**

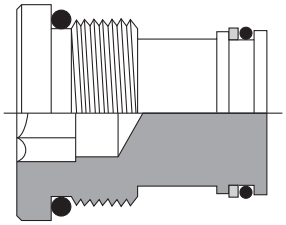


Port Options

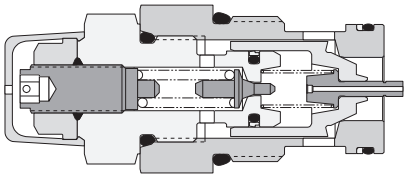
Port Option
Code **E**



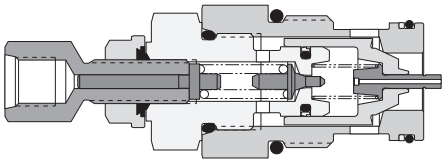
Port Option
Code **Q**



Port Option
Code **G (_)**

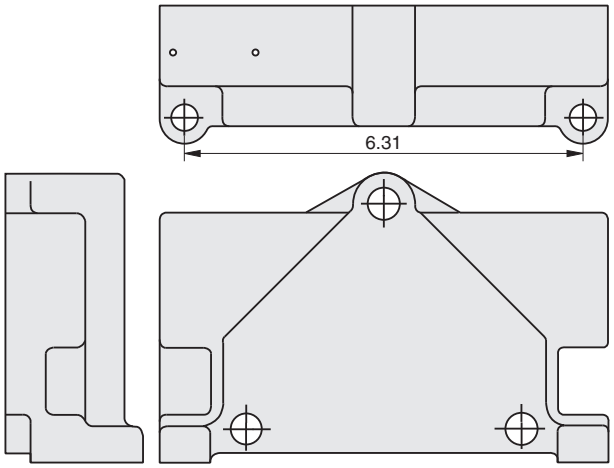


Port Option
Code **P (_)**

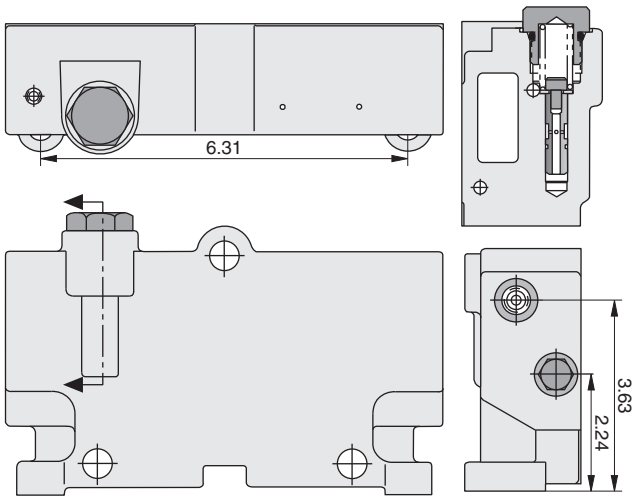


End Cover Options

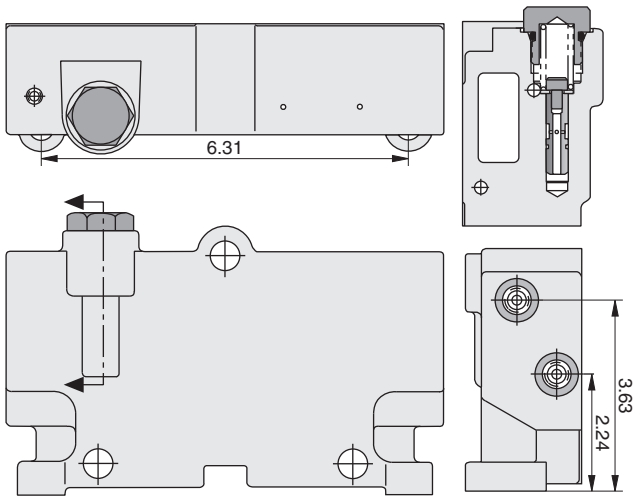
Standard end cover to be used with manual and hydraulic controlled sections.
Code **L**



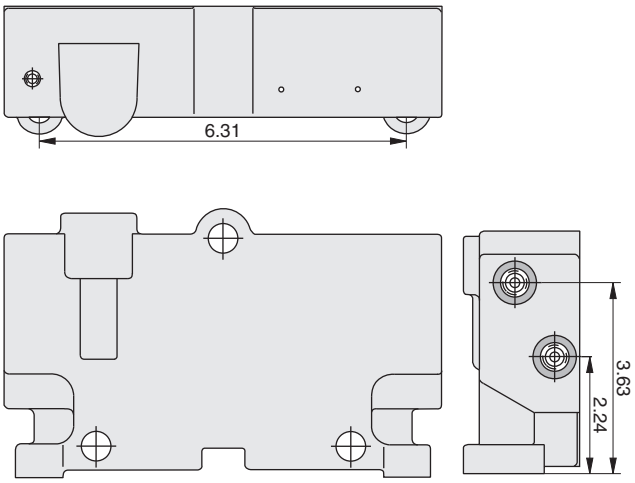
End cover with pressure reducing valve integral for electro-hydraulic controlled sections. (Includes drain port T2 which must run separately to tank.)
Code **Q**



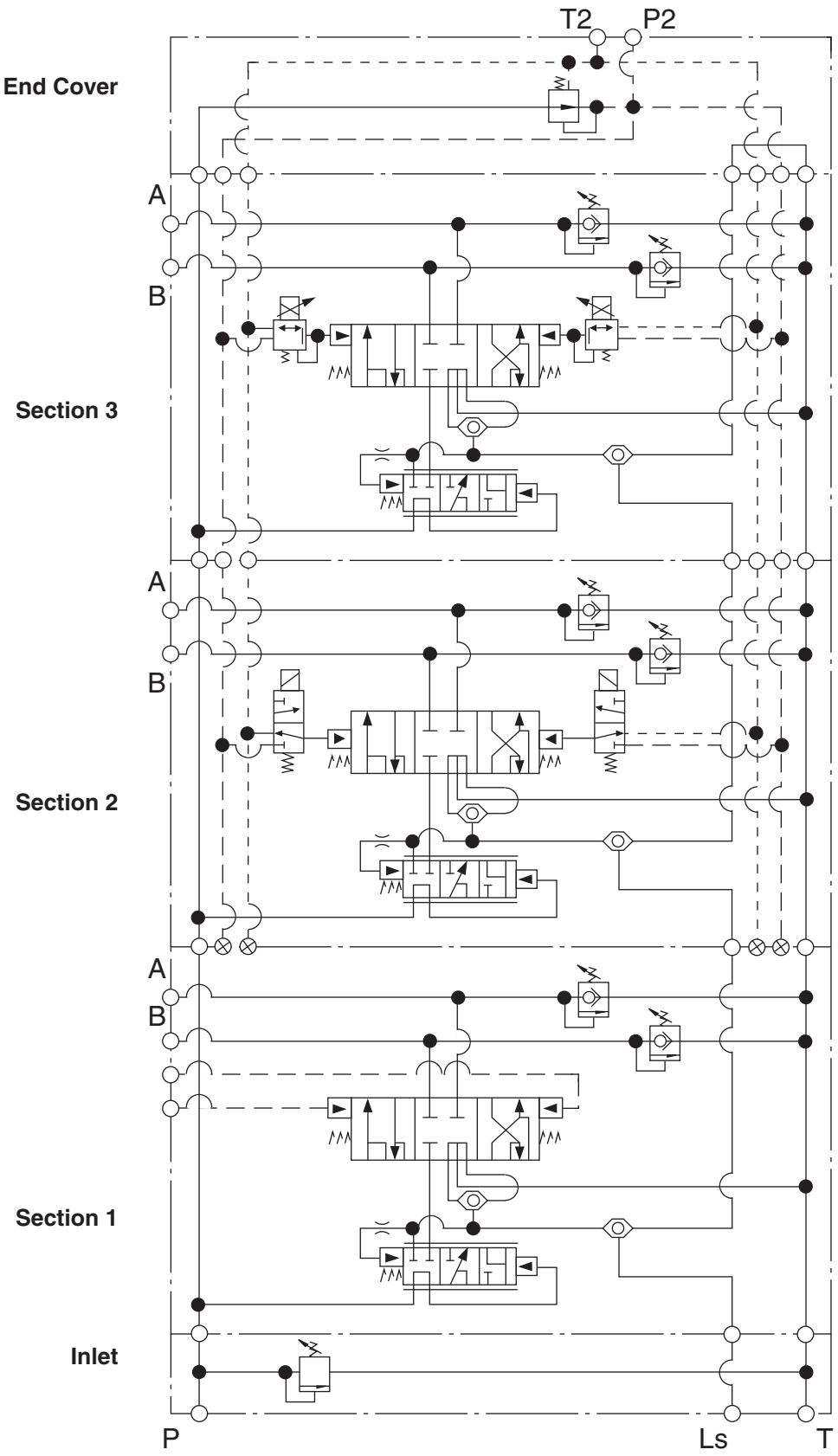
End cover with pressure regulator for pilot controller supply port to be used in conjunction with remote pilot controller. (Includes drain port T2 and controller supply port P2). **Note:** Do not use in conjunction with electo-hydraulic controlled sections.
Code **S**



End cover with external supply pressure port for electro-hydraulic controlled sections. (Includes drain port T2 which must run separately to tank and pressure port P2).
Code **R**



Valve Description



1 Inlet
Standard closed center with pilot operated relief.

2 Section No. 1
Standard section body; 4-way, 3-position cylinder main spool with blocked ports in neutral; hydraulic pilot operated; port option combination pilot operated relief and anti-cavitation check valve in both "A" and "B" ports; standard solid pressure compensator, and standard compensator pressure control with no option.

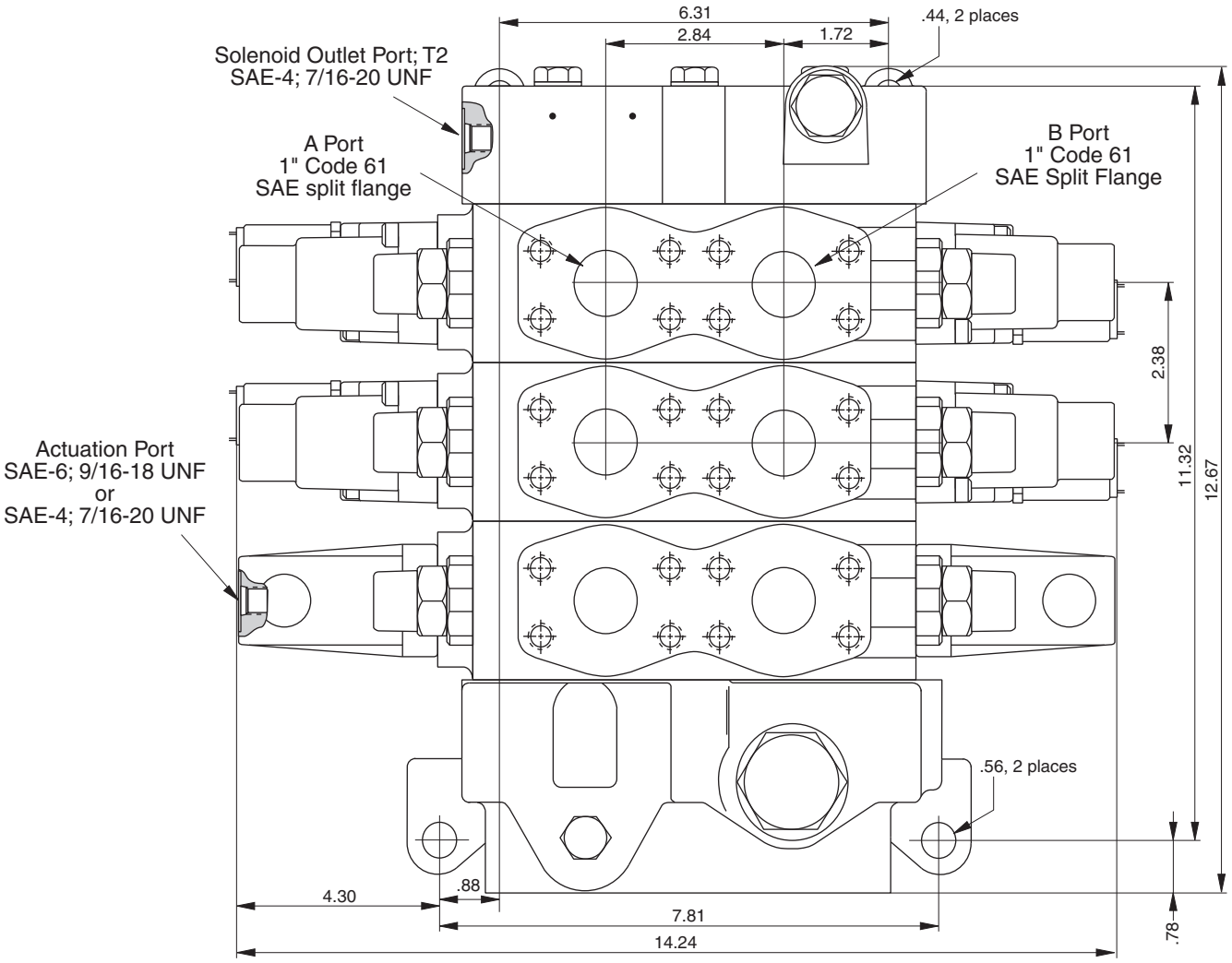
3 Section No. 2
Standard section body; 4-way, 3-position cylinder main spool, blocked ports in neutral; on/off solenoid operated 12 Vdc; port option combination pilot operated relief and anti-cavitation check valve in both "A" and "B" ports; standard solid pressure compensator, standard compensator pressure control, with no option.

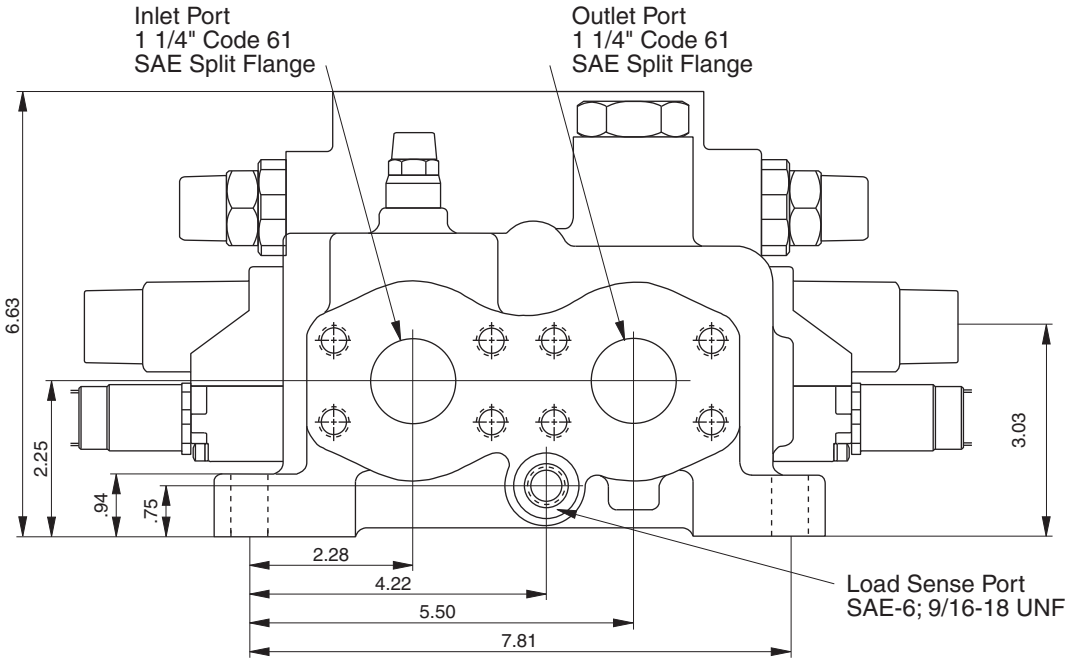
4 Section No. 3
Standard section body; 4-way, 3-position cylinder main spool with blocked ports in neutral; proportional solenoid operated 12 Vdc; port option combination pilot operated relief and anti-cavitation check valve in both "A" and "B" ports; standard solid pressure compensator, and standard compensator pressure control with no option.

5 End Cover
End cover with integral pressure reducing valve, integral for electro-hydraulic controlled sections. Includes drain port T2.

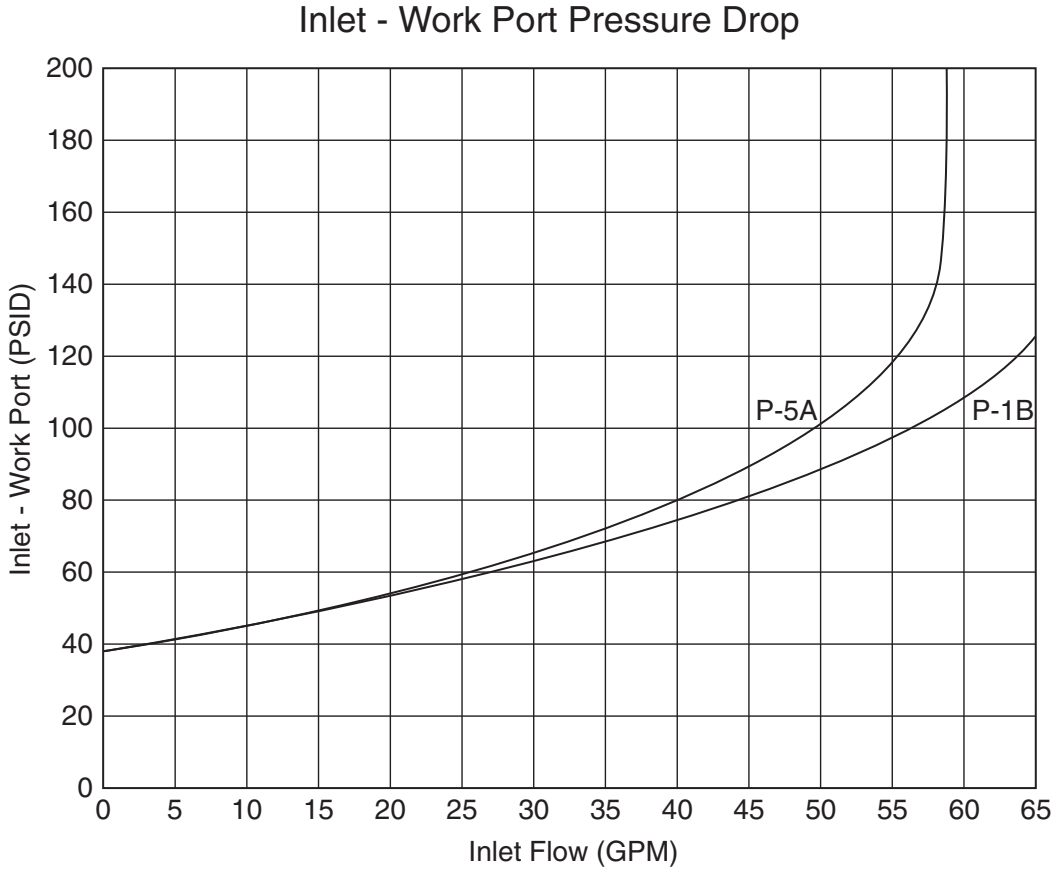
Model Code:
3MP22-20 / CG(_)/
HB1HG(_)G(_)OA/
HB1M(_)G(_)G(_)OA/
HB1L(_)G(_)G(_)OA/
Q

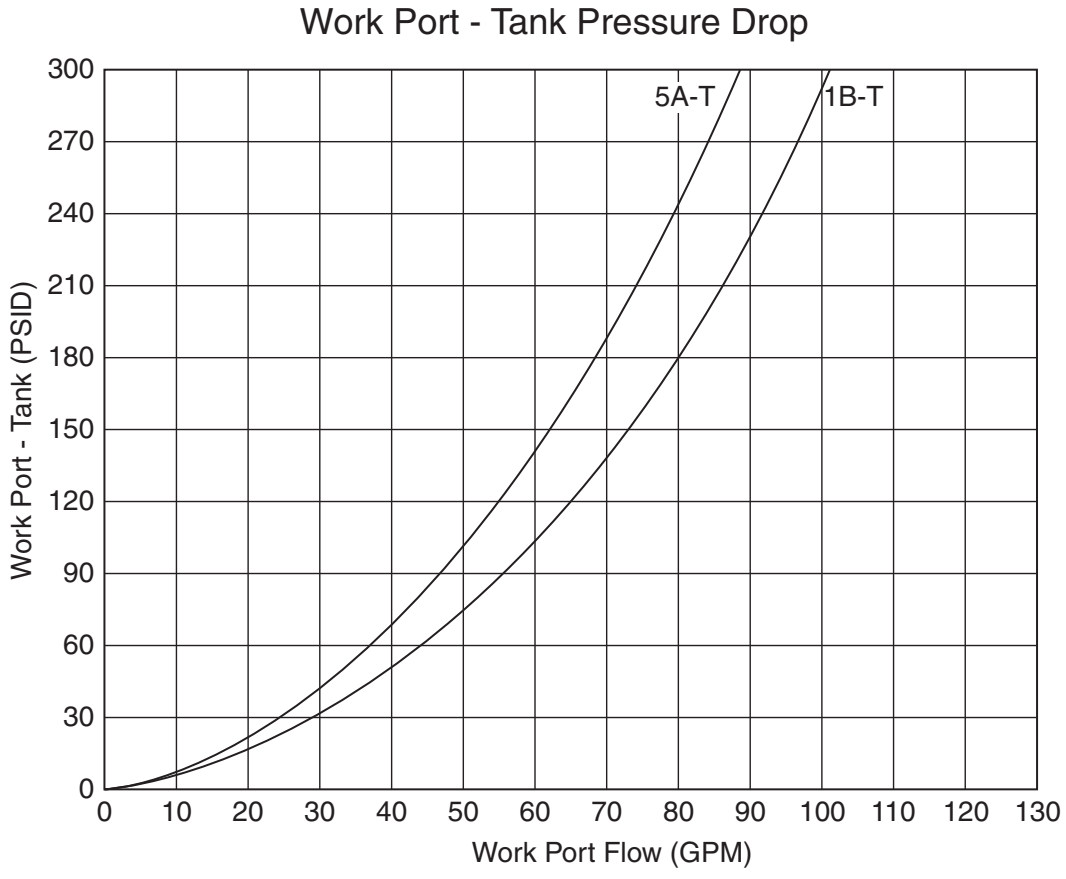
Unit Dimensions





Pressure Drop Curves





Kit Numbers

Closed Center Tie Bolt Kits

Including shims, o-rings, tie-bolts, nuts, and lockwashers.

1603-635-035	1 section
1603-635-036	2 section
1603-635-037	3 section
1603-635-038	4 section
1603-635-039	5 section
1603-035-040	6 section
1603-035-041	7 section
1603-035-042	8 section

1603-635-006	Face seal kit (seal between sections including shims)
1603-635-010	Section seal kit including standard primary and secondary shuttle
1603-635-011	Section seal kit including orifice primary and secondary shuttle
1603-635-012	Seal kit for compensator regulator
1612-635-032	Seal kit for clipper relief valve
1694-430-001	Combination dual stage pilot relief/anti-cavitation port option
1695-430-001	Combination proportional pilot relief/anti-cavitation port option
1697-430-001	Combination pilot relief/anti-cavitation port option 1450-5000 psi
1697-430-002	Combination pilot relief/anti-cavitation port option 300-1400 psi
1601-566-021	Anti-cavitation check valve
19-76202-019	Port option plug
1697-635-001	Seal kit for port options
1601-566-027	"C" compensator option
1603-566-006	"B" compensator option
1601-635-040	MP18 & MP22 Handle & dust boot kit

Operation Mechanical Detent Kits

1601-635-044	"B" detent kit
1601-635-045	"B2" detent kit
1601-635-046	"B1" detent kit
1601-635-047	"B4" detent kit
1601-635-048	"B3" detent kit

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Subject to change.