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GRH POWER

Sectional Valves

片式多路阀

国瑞液压

Company Introduction

公司简介

持续的改进和对液压领域的专注，超过三十年的设计及制造经验，GRH从1986年至今取得了引人注目的成功。

产品的研发和技术创新是GRH前进的动力

TS16949和IS014000的标准是GRH遵守的程序化准则

员工的能力和创造性是GRH不同于竞争对手的主要因素

GRH设计并生产：液压齿轮泵／片式多路阀／整体多路阀／比例多路阀（带负载敏感及压力补偿）／液压齿轮马达／液压分流马达；这些零部件主要应用于工业机械、物料搬运、工程机械、农业和工业领域。GRH充分意识到客户在设计阶段作出的贡献及其产品设计输入的重要性。除了供应GRH目录上的产品，GRH还与客户密切协作提供液压技术的系统解决方案。客户可以依靠GRH在液压元件及系统设计方面的经验及GRH技术专家去实现他们的设想。GRH已关注到电子控制与液压系统集成的重要性，为了优化设计及节约能源，GRH在系统的电子控制及集成化方面正在做出自己的努力。

国瑞液压（上海）– GRH的海外营销中心

国瑞液压（江苏）– GRH的生产制造基地和国内营销中心

GRH专业提供液压元件及液压技术的系统解决方案

GRH愿意与合作伙伴一起，为液压技术的创新提供动力

在液压领域，超过三十年的设计及制造经验

COMPANY INTRODUCTION

GRH is specialized in providing hydraulic components and solutions for hydraulic systems.

With continuous improvement and enthusiasm over the past 30 years, GRH has developed into an emerging power in the fluid power industry since it was established in 1986.

Research and development are the driving force that facilitates GRH's ability to create new products. Standards of TS16949 and ISO14000 are our guiding principles. Employees' capabilities and creativity are major factors that differentiate GRH from our competitors.

GRH designs and produces Hydraulic Gear Pumps & Motors, Monoblock Valves, Sectional Stack Valves, Proportional Valves and Flow Dividers. These products are used on industrial machinery, construction equipment, agricultural equipment and material handling applications. GRH is also willing to work with our customers to develop specialized products for their special needs. Our customers can count on GRH's extensive system design and application experience when they are designing their hydraulic systems.

GRH has designed and developed a series of load sensing proportional stackable valves which provides an improvement in valve operating performance and system efficiency.

GRH (Shanghai) - International Sales Office

GRH (Jiangsu) - Manufacturing Facility & Domestic Sales Office

GRH will work together with the customers to create a better future.

Over 30 years in the design and manufacture of hydraulic equipment

Introduction of GRH Sectional Valves - 国瑞液压片式多路阀简介

GRH Sectional Valves are open center valves. Mainly used in mobile machines such as, agricultural machinery, construction machines, mining equipment, material handling equipment as well as maintenance machines. All valve series adapted modular design. The system designer can choose different modules to design a complex system. Main valve spool is designed to satisfy with the customer's requirements, which provides excellent flow characteristics and very low flow force. With different inlet modules, it can be used in any applications. There are number of different main valve modules to choose from, to satisfy with the customer's needs. Different end sections also provide the customer's needs for return ports or power beyond functions.

GRH Sectional Valves have the following Series:

- ●GKV80 Series，rated flow rate 80L/min.
- ●GKV50 Series，rated flow rate 50L/min.
- ●GKV35 Series，rated flow rate 35L/min.

国瑞液压片式多路阀是一种开式多路阀。主要用于移动式机械，例如：农业机械、建筑机械、矿山机械、装卸机械、维修机械以及其他工程机械。国瑞液压片式多路阀采用模块化设计，系统设计者可选取不同功能的模块来满足各种复杂系统的设计。进油油口和回油油口形式可以根据用户的要求来选择以满足不同的运用场合。工作阀块有几种不同功能的阀块，主阀芯可根据用户的要求提供极佳的流量特性和低液动力。回油也可提供动力外接。

国瑞液压片式多路阀主要有以下系列：

- ●GKV80系列，额定流量80L/min。
- ●GKV50系列，额定流量50L/min。
- ●GKV35系列，额定流量35L/min。

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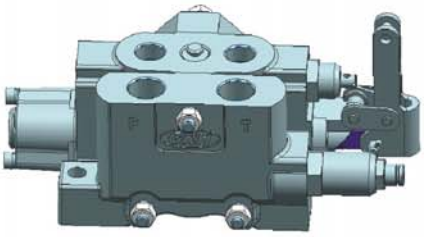

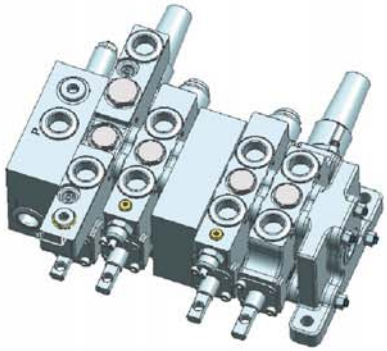

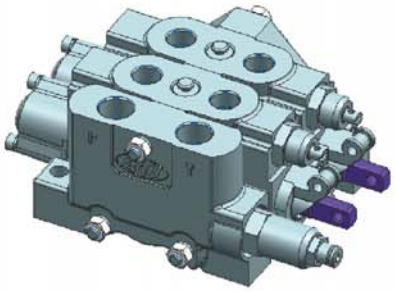

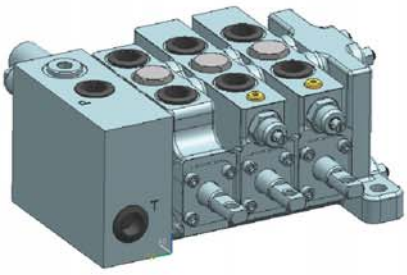

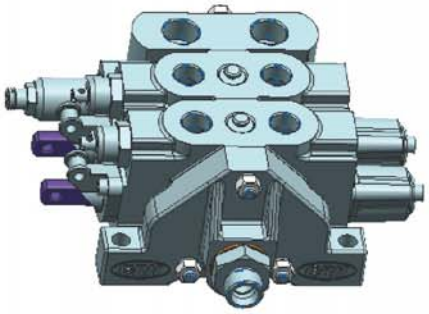

GKV80 Series Sectional Valves - GKV80 系列片式多路阀

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Introduction - 简介

GKV80 series sectional valves are open center valves. Mainly used in mobile machines such as, agricultural machinery, construction machines, mining equipment, material handling equipment as well as maintenance machines. All valve series adapted modular design. The system designer can choose different modules to design a complex system. Main valve spool is designed to satisfy with the customer's requirements, which provides excellent flow characteristics and very low flow force. With different inlet modules, it gives user the freedom for choosing different relief valve and different port locations. There are number of different work section modules to choose from, to satisfy with the customer's needs. Different end sections also provide the customer's needs for return ports or power beyond functions.

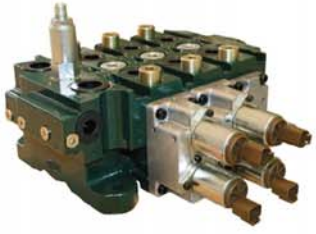
GKV80 Series Sectional Valves Provide the following Functions:

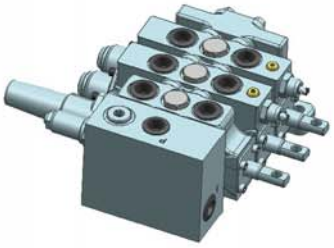
- Inlet module with pilot supply.
- Inlet module without pilot supply.
- A/B Port with overload relief valve on work section.
- A port with overload relief valve on work section.
- B port with overload relief valve on work section.
- A/B ports with P.O. checks.
- A port with P.O. check.
- B port with P.O. check.
- A port with mechanical P. O. check.
- B port with mechanical P. O. check.
- End Section with oil return port.

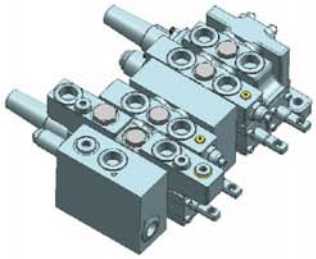
GKV80系列的多路阀是一种模块式开式多路阀。主要用于移动式机械，例如：农业机械、建筑机械、矿山机械、装卸机械、维修机械以及其他工程机械。本系列的多路阀采用模块化设计，系统设计者可选取不同功能的模块来满足各种复杂系统的设计。主阀体可以根据用户的要求选用不同功能的模块以满足不同的运用场合。主阀芯可根据用户的要求提供极佳的流量特性和低液动力。不同的进油联模块可以满足用户不同的进油方式以及溢流阀装配形式。回油联也有不同形式以满足用对回油形式的要求，也可提供动力外接。

该系列的多路阀 可提供如下功能：

- 无先导油源的进油联。
- A/B口有过载阀的主阀块。
- A口有过载阀的主阀块。
- B口有过载阀的主阀块。
- A/B口有 液压锁。
- A口有 液压锁。
- B口有 液压锁。
- A口有机械驱动的液压锁。
- B口有机械驱动的液压锁。
- 可回油的后端盖。
- 不可回油的后端盖。
- 带动力外接的回油联。
- 带动力外接的回油联。
- 也可根据客户要求插装其它阀块。







Main Features - 主要特性

GKV80 series sectional valve provides the following features:

- Cast iron body (inlet section, main section and end section)
- Spring cap, mechanical detent cap, as well as electoral or hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- Parallel circuit. Each section has its own load check valve.
- Each section has load relief option and relief style options.
- Can be changed to series circuit.
- Provides dump valve options for each work port.
- Provides different drive modules (electrical, hydraulic remote, manually control, wire driving).
- Provides power beyond port.
- Can be modified to be a closed center valve.
- Provides mechanical detent.
- Provides options for different relieves and different relief valve locations in the inlet.
- Provides options for P. O. check valve for each work port.
- Provides options for mechanically actuated P. O. check valves to satisfied with the needs for tractors and mobile cranes.
- Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- Provides floating functions for spools.
- Provides excellent flow characteristics and small operating force.
- Can be proportionally controlled without pressure compensation.
- Can be assembled with 8 work sections.

GKV80系列多路阀有以下主要特点:

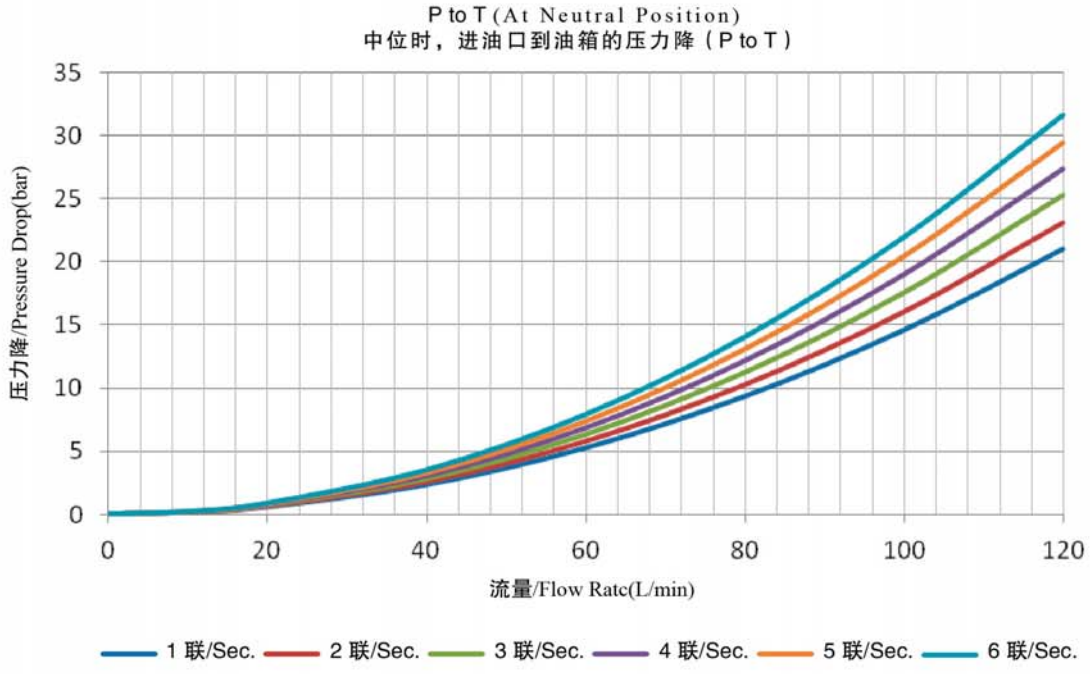
- 阀体为灰口铸铁 (进油联, 工作联, 回油联)。
- 弹簧端盖，机械定位端盖，电和液控驱动模块为铸铝或压铸铝。
- 并联回路, 每个工作联都带负载单向阀, 可选择工作油口带过载保护阀或防止吸空的过载保护阀。
- 能够改变为串联回路。
- 可在工作油口提供截止阀。
- 可提供电、液压遥控、手动和拉线控制模块。
- 可提供动力外接。
- 可以修改为闭式系统。
- 可提供机械定位且定位力可调。
- 进油联可配不同形式的溢流阀(直动式, 先导式) 或改变溢流阀的安装位置V
- 可对每个工作油口提供液压式液压锁。
- 可提供机械式液压锁以适应拖拉机、起重机等的起升机构对重物锁定的要求。
- 提供各种不同的阀芯功能：用于控制双作用油缸、单作用油缸、 油马达的阀芯，以及带浮动功能的阀芯。
- 阀的操作力小，流量特性好。
- 可实现比例控制 (无压力补偿) 。
- 该多路阀可组合成 1 到 8 联。

Major Technical Data - 主要技术参数

Rated flow rate	80 L/min
Maximum flow rate	100 L/min
Minimum flow rate 20 L/min	
Maximum pressure at "P" port	350 bar
Maximum pressure at "A/B" port	350 bar
Maximum pressure at "T" port	25 bar
Internal leakage (@ 70 bar) A/B to T	15-20 CC/min
Internal leakage (@ 70 bar) A/B to T With P.O. check	2-5 CC/min
Spool stroke ("1" / "2" position)	+7/-7 mm
With floating function ("1" / "2" and "F" position)	+7/-7 -10 mm
Solenoid can be either 12 VDC or 24 VDC, corresponding current is 0- 1.5 or 0 - 0.75 Amp.	

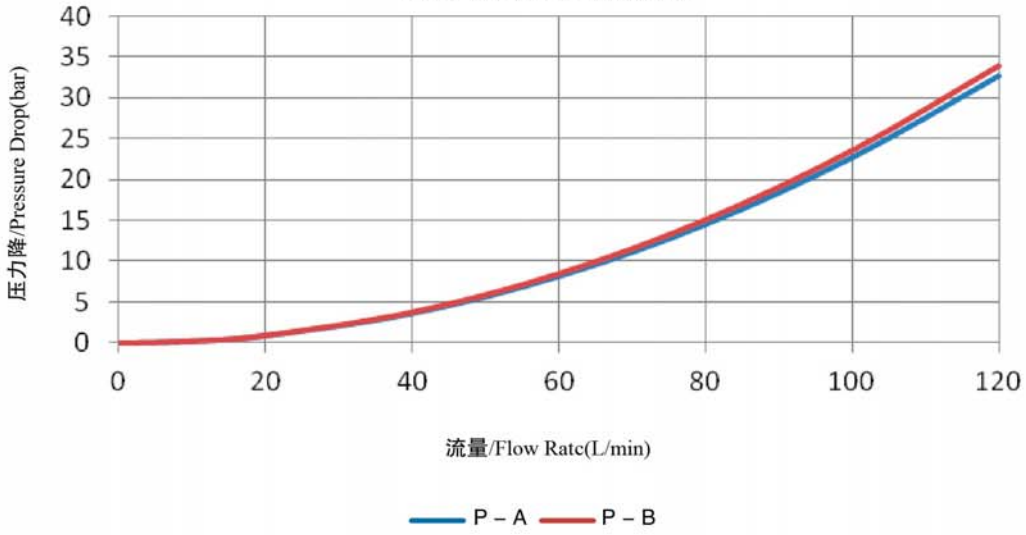
额定流量	80 L/min
最大流量	100 L/min
最小流量	20 L/min
P 口最大压力	350 bar
A/B 口最大压力	350 bar
T 口最大压力	25 bar
内泄漏（ 70 bar ） A/B to T	15–20 CC/min
内泄漏（ 70 bar ） A/B to T 有液压锁	2–5 CC/min
阀芯行程 (位置1 / 2)	+7/–7 mm
带浮动的阀芯行程 (位置1 / 2 和 F 位)	+7/–7 –10 mm
驱动的电磁线圈电压是12VDC 或24VDC，与之相应的电流时 0– 1.5 或0 – 0.75 Amp.	

Performance Data - 性能参数

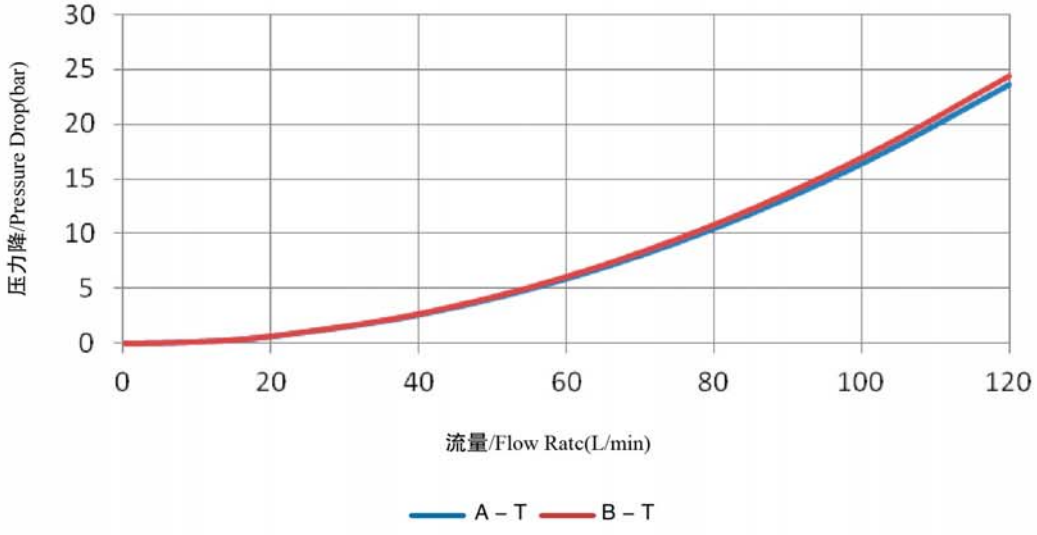


Performance Data - 性能参数

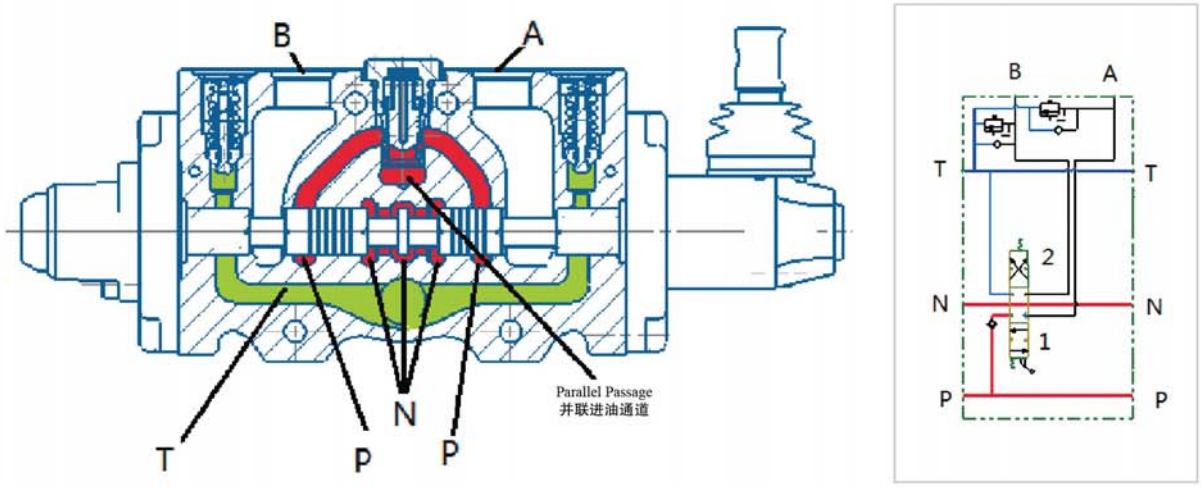
Pressure Drop from Inlet to Work Port
进油口到工作油口的压力降



Pressure Drop from Work Port to Tank
工作油口到油箱压力降

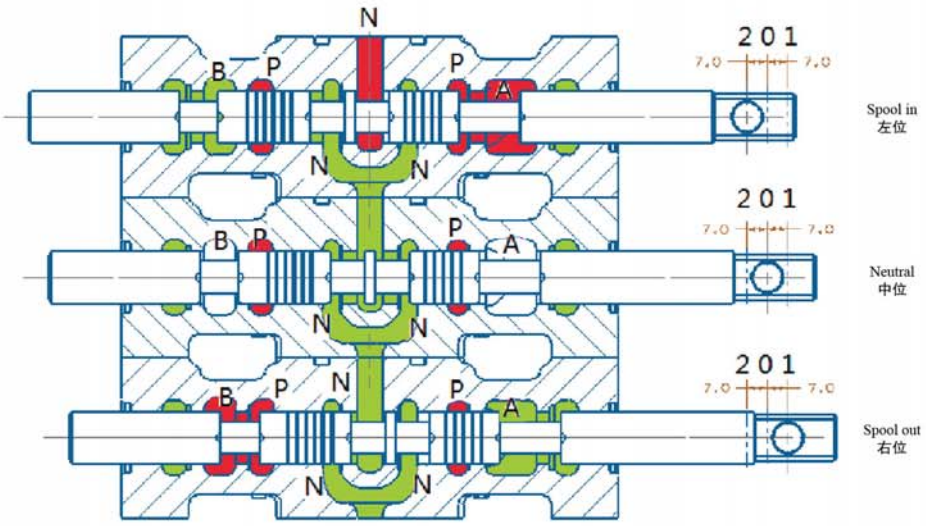


Operation Principle - 工作原理



ZK series sectional valve is an open centered 3 position 4 way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with very low pressure drop. When one of the spool is moved to " 1 "or" 2 "position, the neutral passage is blocked. The flow from pump can only pass though parallel passage to load check valve, then, through the bridge and spool opening to work port "A"or"B".

一般说来，ZK 系列的多路阀是一种开式的 3 位 4 通阀。当阀芯都在中位时，从油泵提供的油液直接经阀芯和阀体之间的中位通道流到油箱，产生很小的压力损失。当其中一个阀芯移动到“1”或“2”时，阀芯和阀体之间的中位通道被逐渐堵死，从油泵来的全部流量经并联油路进入负载单向阀，经阀口节流后进入该阀芯控制的 “A”口或“B”口。

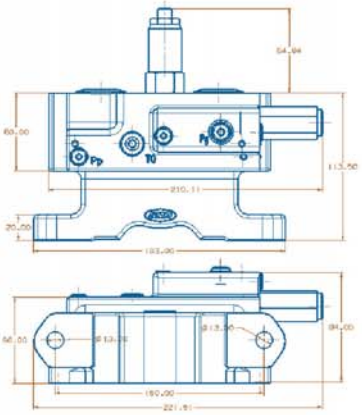


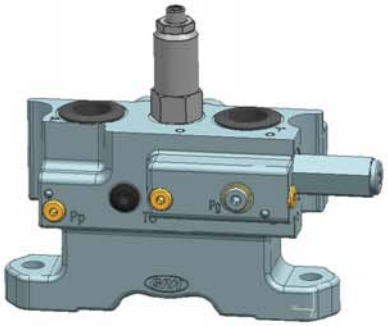
For multi-section valves, if one of the section's spool is in " 1 "or" 2 "position, then, there is no flow in its down stream section's neutral passage. The main throttle occurs on the valve opening between bridge passage and spool . The operator can control more than one spools, but the magnitude of the flow rate for each controlled section is dependent on the load.

对于多联的片式阀，如果其中一联的阀芯在“1”或“2”的位置时，它的后一联的中位通道就没有流量。油液的主要节流发生在桥路通道和阀芯节流口。操作员可以同时控制几个阀芯，其控制元件的速度取决于负载的大小。

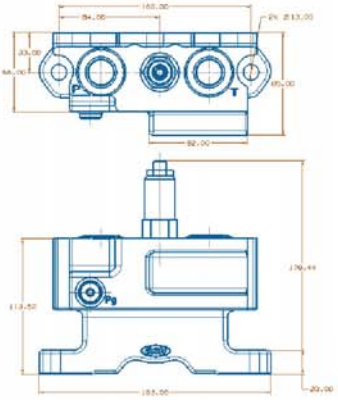
Inlet Dimension - 进油联几何尺寸

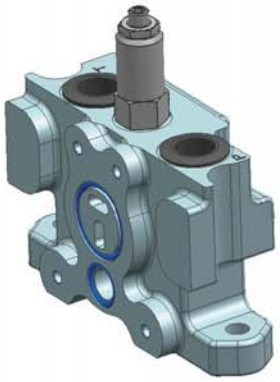
JK01 Inlet - 进油联



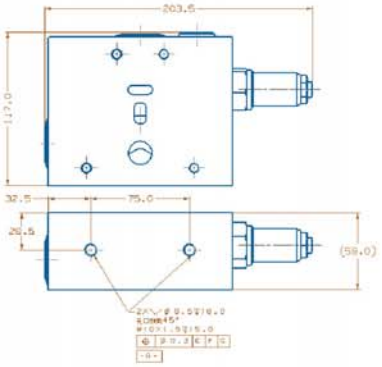


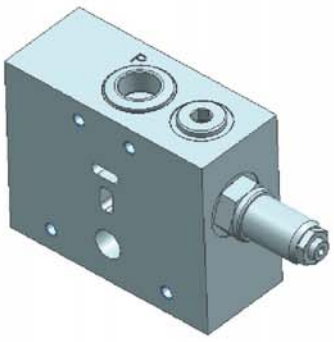
JK02 Inlet - 进油联



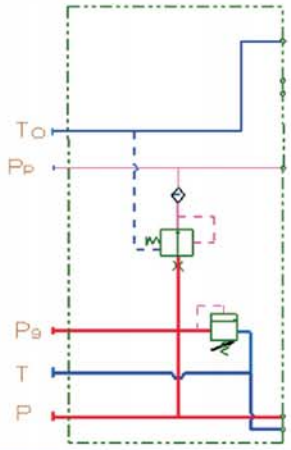
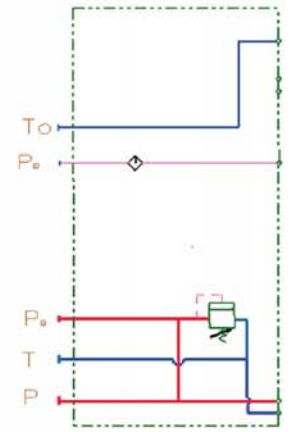
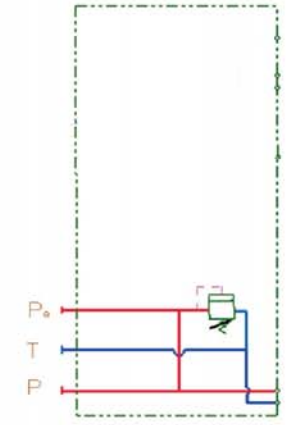


JK03 Inlet - 进油联



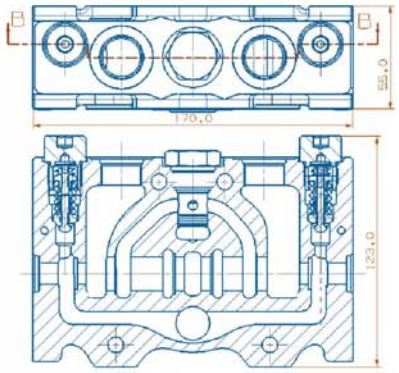


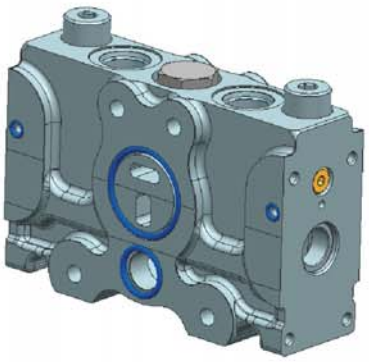
Inlet Hydraulic Schematics - 进油联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
JK01		Inlet section with pilot supply 带先导油源的进油联	
JK02		Inlet section without pilot supply 进油联不带先导油源	
JK03		Basic inlet 基本进油联	

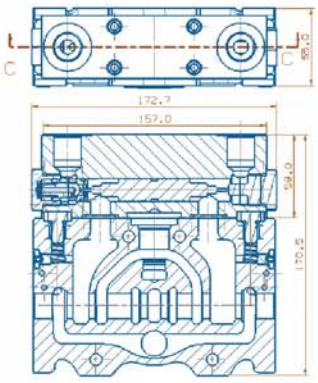
Typical Work Section Dimension - 典型工作联的基本几何尺寸

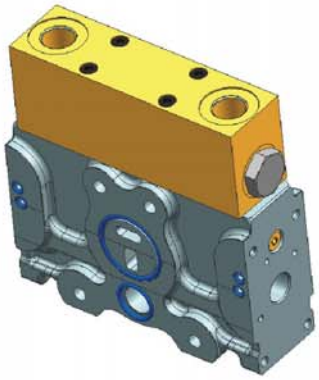
ZK01 Work Section - 工作联



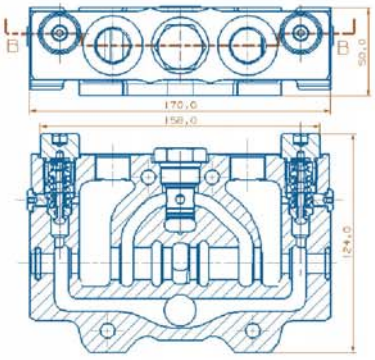


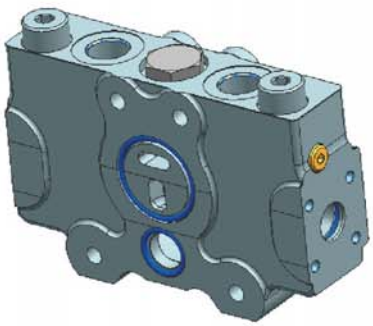
ZK05 Work Section - 工作联





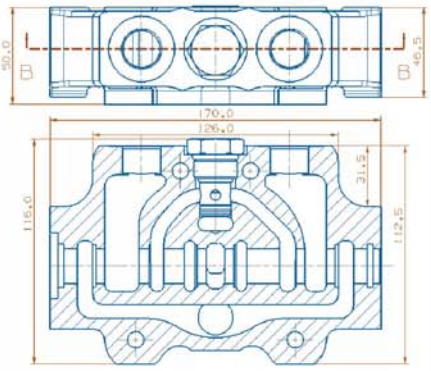
ZK07 Work Section - 工作联

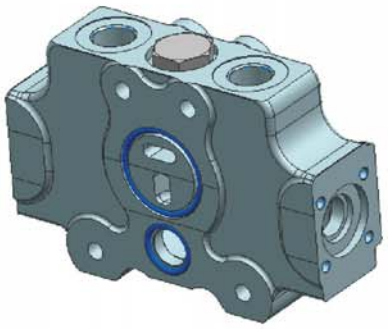




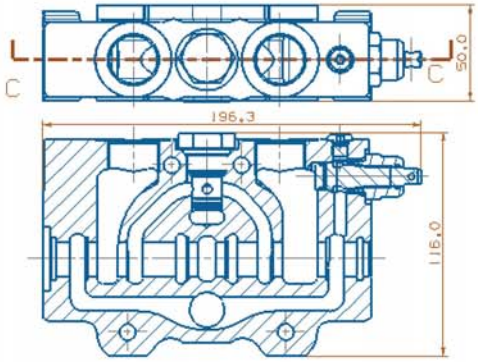
Typical Work Section Dimension - 典型工作联的基本几何尺寸

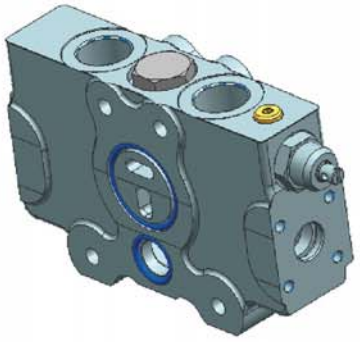
ZK08 Work Section - 工作联



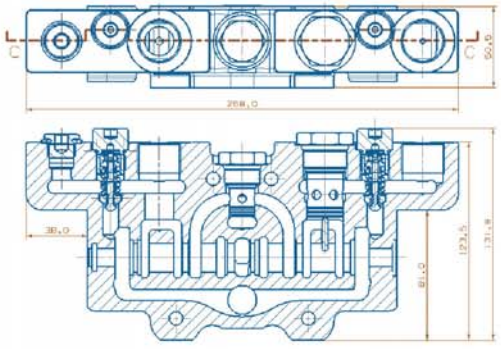


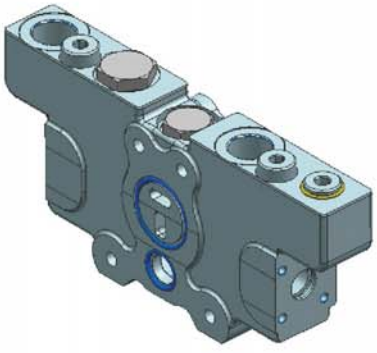
ZK10 Work Section - 工作联



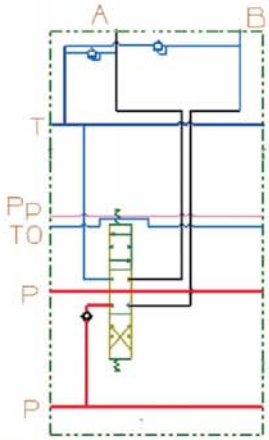
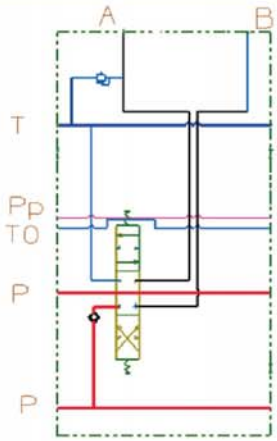
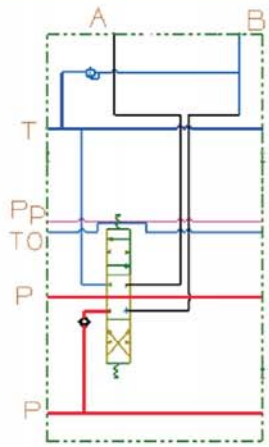


ZK11 Work Section - 工作联

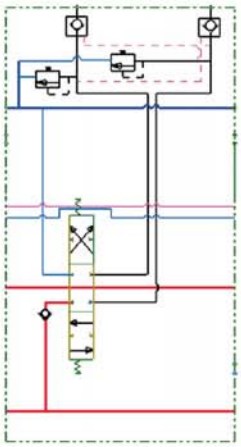
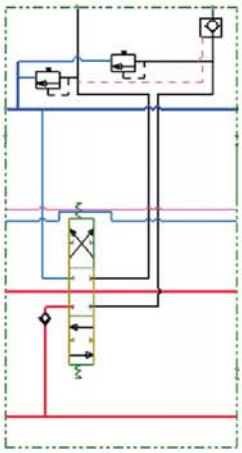
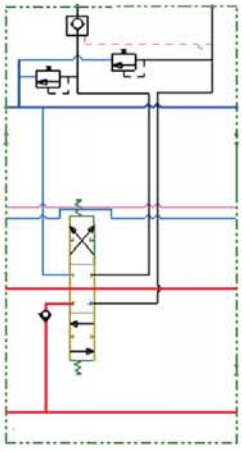




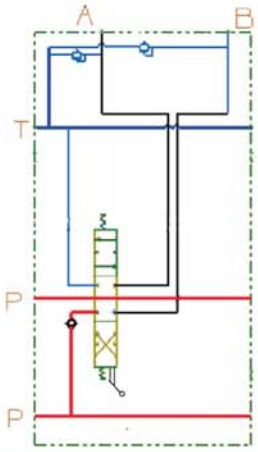
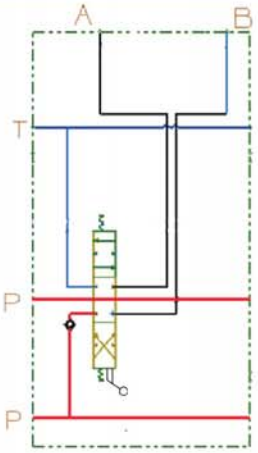
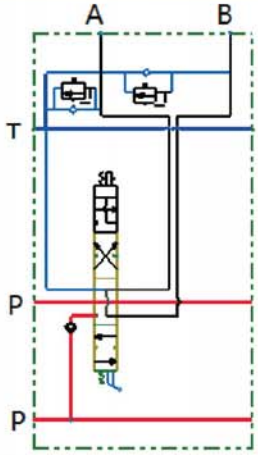
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
ZK01		Load relieves at both at both A and B ports A、B口均有过载阀	
ZK02		Load relief at A port A口有过载阀	
ZK03		Load relief at B port B口有过载阀	

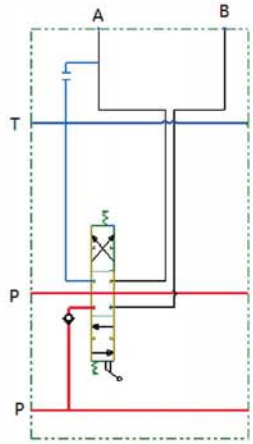
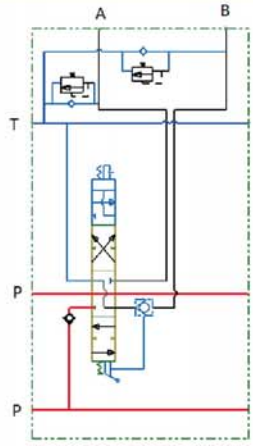
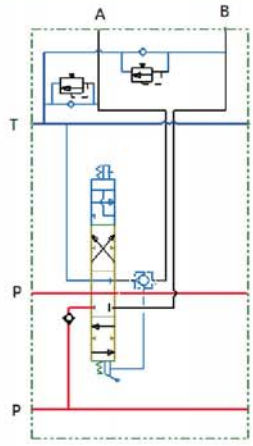
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 液压图形符号	Main Function 主要功能	Notes 备注
ZK04		Load relief valves and PO check at both A and B ports A / B 口均有液压锁和过载保护阀	
ZK05		Load relief valves at both A and B ports and PO check at B port A 口有液压锁，A / B 口均有过载保护阀	
ZK06		Load relief valves at both A and B ports and PO check at A port B 口有液压锁，A / B 口均有过载保护阀	

Work Section Hydraulic Schematics - 工作联液压图形符号

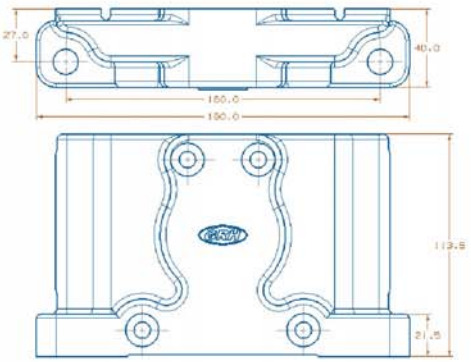
Code 代码	Hydraulic Schematics 液压图形符号	Main Function 主要功能	Notes 备注
ZK07		Load relief valves at both A and B ports and Manually controlled (Section thickness is 50mm) A / B 口均有过载保护阀 手动 (阀体厚度 50mm)	
ZK08		Basic Work Section Manually controlled (Section thickness is 50mm) 基本工作联 手动 (阀体厚度 50mm)	
ZK09		Load relief valves at both A and B ports and Manually controlled 4th position floating (Section thickness is 50mm) 手动 第四位浮动 A / B 口均有过载保护阀和防止吸空阀 (阀体厚度 50mm)	

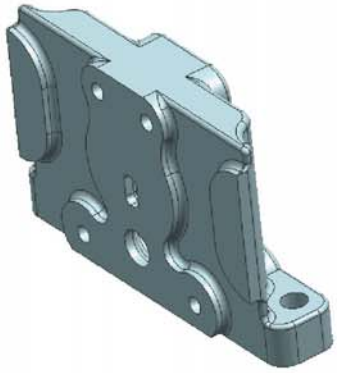
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 液压图形符号	Main Function 主要功能	Notes 备注
ZK10		Basic work section Manually controlled A dump valve at A port (Section thickness is 50mm) 基本工作联 手动 A 口有截止阀 (阀体厚度 50mm)	Agricultural tractor Applications 常用于拖拉机辅助设备控制阀
ZK11		Load relief valves and anti-cavitation valves at both A and B ports Manually controlled 4th position floating Mechanically operated PO check at B port. (Section thickness 50mm) 手动 第四位浮动 A / B 口均有过载保护和防止 吸空的插装阀 B 口带机械式液压锁 (阀体厚度 50mm)	Mobile cranes and tractor hitch applications 常用于举升回路，将重物锁紧在 某一位置，如拖拉机的举升回路。
ZK12		Load relief valves and anti-cavitation valves at both A and B ports Manually controlled 4th position floating Mechanically operated PO check at A port. (Section thickness 50mm) 手动 第四位浮动 A / B 口均有过载保护和防止 吸空的插装阀 A 口带机械式液压锁 (阀体厚度 50mm)	Mobile cranes and tractor hitch applications 常用于举升回路，将重物锁紧在 某一位置，如拖拉机的举升回路。

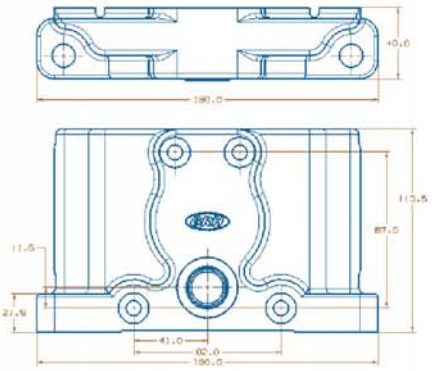
End Section Dimension - 回油联（后端盖）的基本几何尺寸

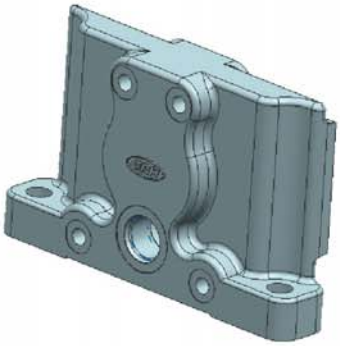
DK01 End Section - 回油联（后端盖）



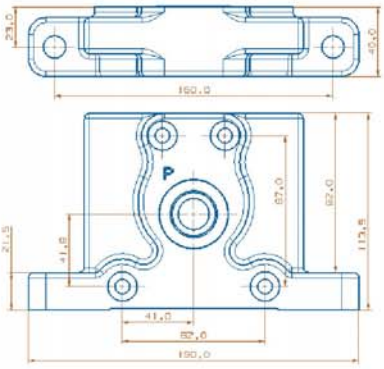


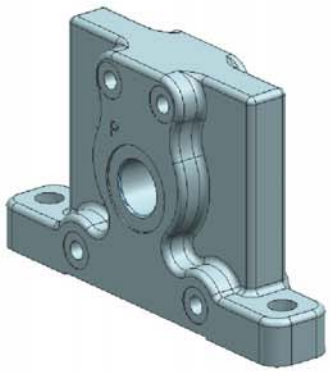
DK02 End Section - 回油联（后端盖）



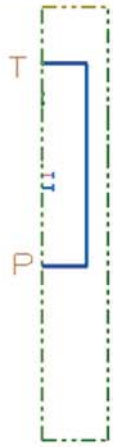
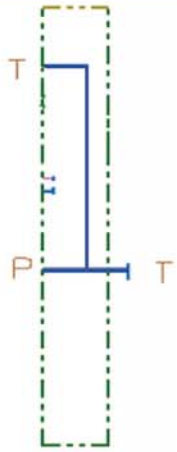
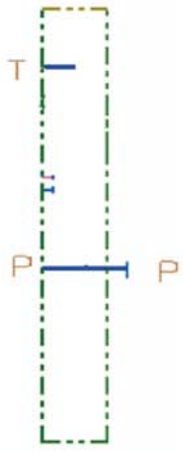


DK03 End Section - 回油联（后端盖）

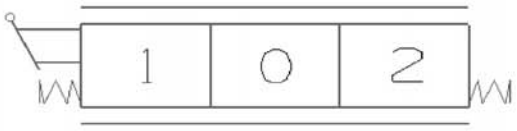
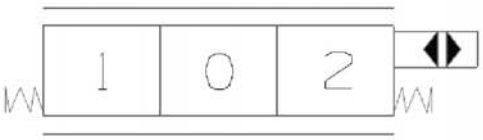
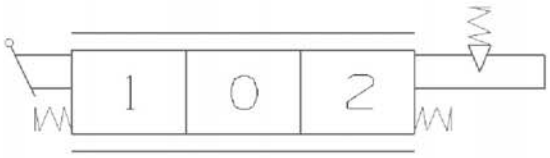
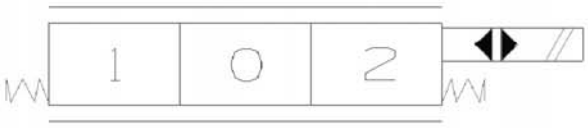
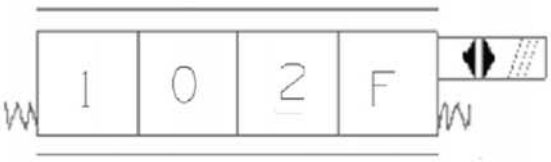
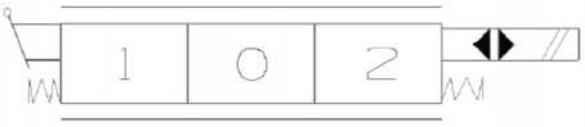




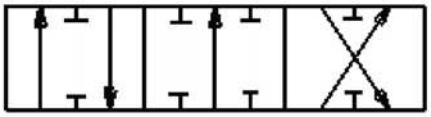
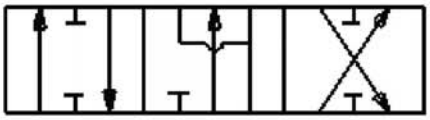
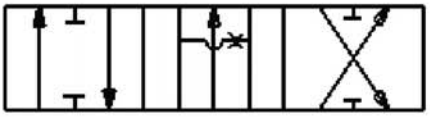
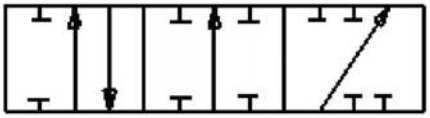
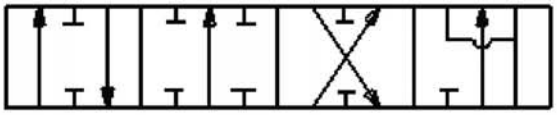
End Section's Hydraulic Schematics - 回油联（后端盖）的液压图形符号

Code 代码	Hydraulic Schematics 液压图形符号	Main Function 主要功能	Notes 备注
DKO1		End section without T port 油液经后端盖再经进油联回油箱	
DKO2		End section with T port 油液经后端盖回油箱	
DKO3		End section with power beyond port 动力外接 从进油联回油	Tractor applications 常用于拖拉机

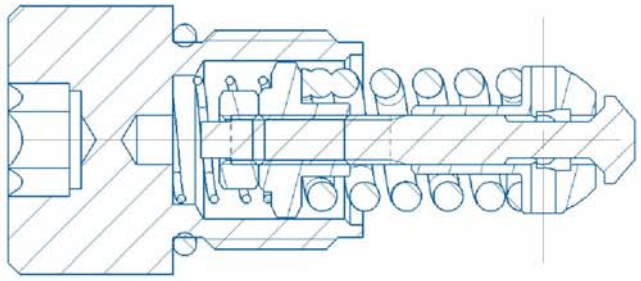
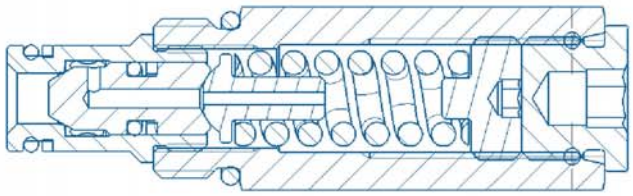
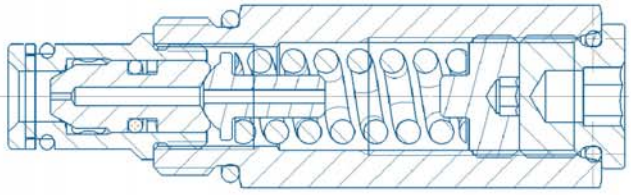
Work Section Drive Styles - 工作联的驱动方式

Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能
KQ1		Standard manually controlled 标准手动
KQ2		Hydraulic remote 液控
KQ3		Manually controlled with mechanical detent 手动带机械定位
KQ4		Manually controlled with 4th position floating and detent 手动，第 4 位浮动带机械定位
KQ5		Electrical actuated (on/off) 电动（开/关控制）
KQ6		Electrical actuated with floating function 电动控制带浮动功能
KQ7		Electrical control (ON/OFF control with option of manually control) 电动（开/关控制，带手动选项）

Typical Spool Functions - 典型滑阀机能

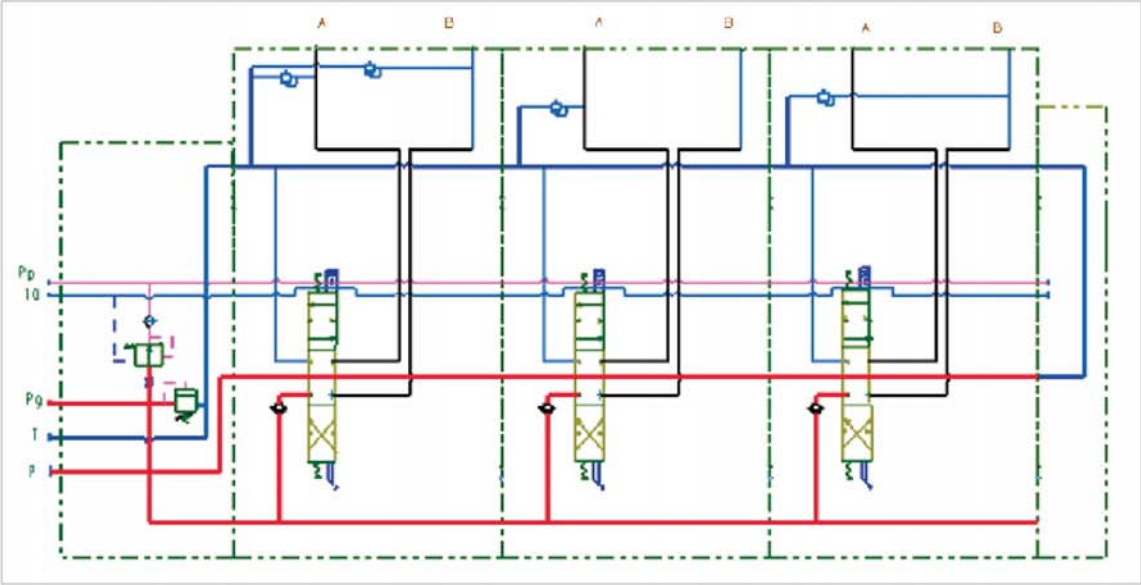
Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能	Notes 备注
FG1		3 position 4 way At neutral: P,T,A,B are all blocked 3位4通 中位P,T,A,B各不相通	Double acting cylinder applications 常用于控制双作用油缸
FG2		3 position 4 way At neutral: P blocked,T,A, Bconnected 3位4通 中位P不通，T，A，B相通	Hydraulic motor applications 常用于控制液压马达
FG3		3 position 4 way At neutral: P,A,B and T all connected 3位4通 中位P，A，B，均与T相通	Hydraulic motor applications 常用于控制液压马达
FG4		3 position 3 way At neutral: P,T,A,B all blocked 3位3通 中位P，T，A，B各不相通	Single acting cylinder applications 常用于控制单作用油缸
FG5		4 position 4 way At neutral: P,T,A, and B are all blocked 4th position floating 4位4通 中位P，T，A，B各不相通 第4位浮动	Double acting cylinder applications 常用于控制双作用油缸
FG6		4 position 4 way At neutral: P blocked,T,A and B are connected 4th position floating 4位4通 中位P不通，T，A，B相通 第4位浮动	Double acting cylinder or hydraulic motor applications 常用于控制双作用油缸或液压马达

Load Relief Valve Types - 过载保护阀型式

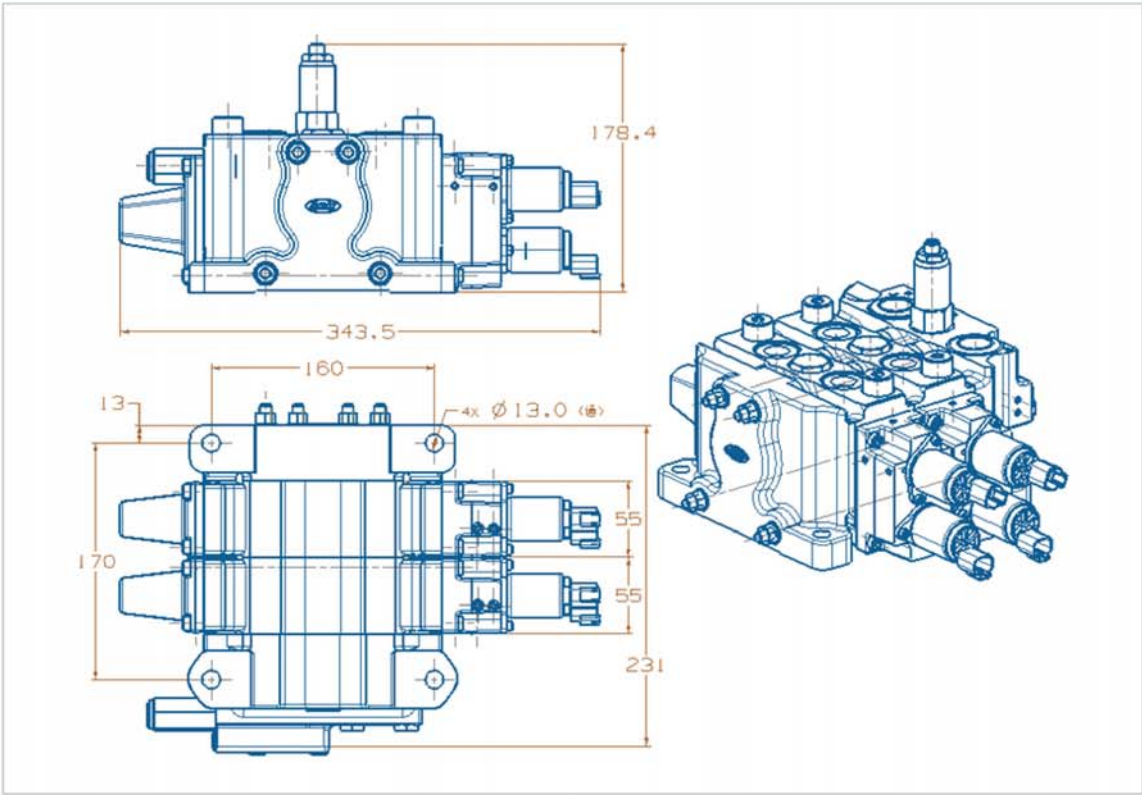
Code 代码	Section drawing 简图	Notes 备注
RF0	Without load relief valve 无过载保护阀	End section without T port 油液经后端盖再经进油联回油箱
RF1		Relief valve with anti-cavitation function 吸油阀的过在保护阀
RF2		Direct acting relief valve 直动式过载保护阀
RF3		Differential pressure relief valve 差动式过载保护阀

Application Example - 运用实例

1. Electro-hydraulic Controlled With manual Override - 电液控制并带有手动选项

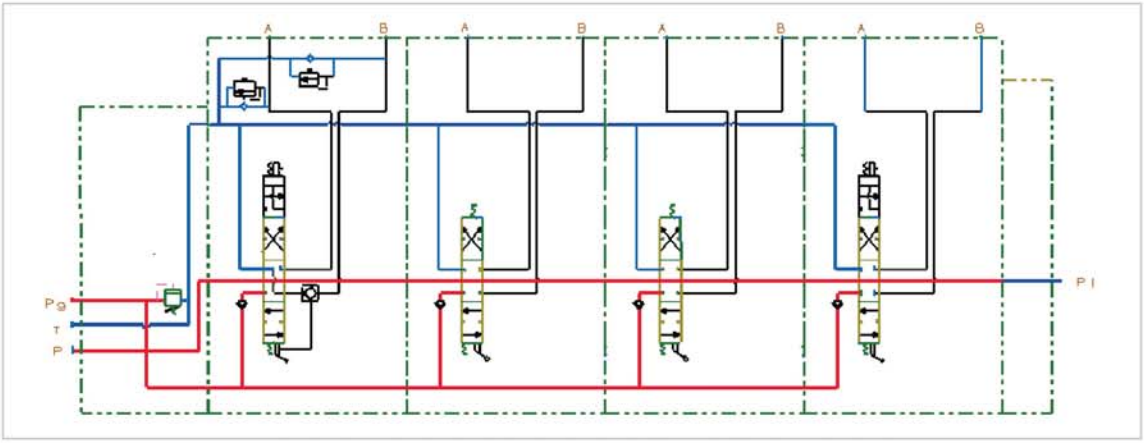


3.Section Stack Valve - 联装外形图

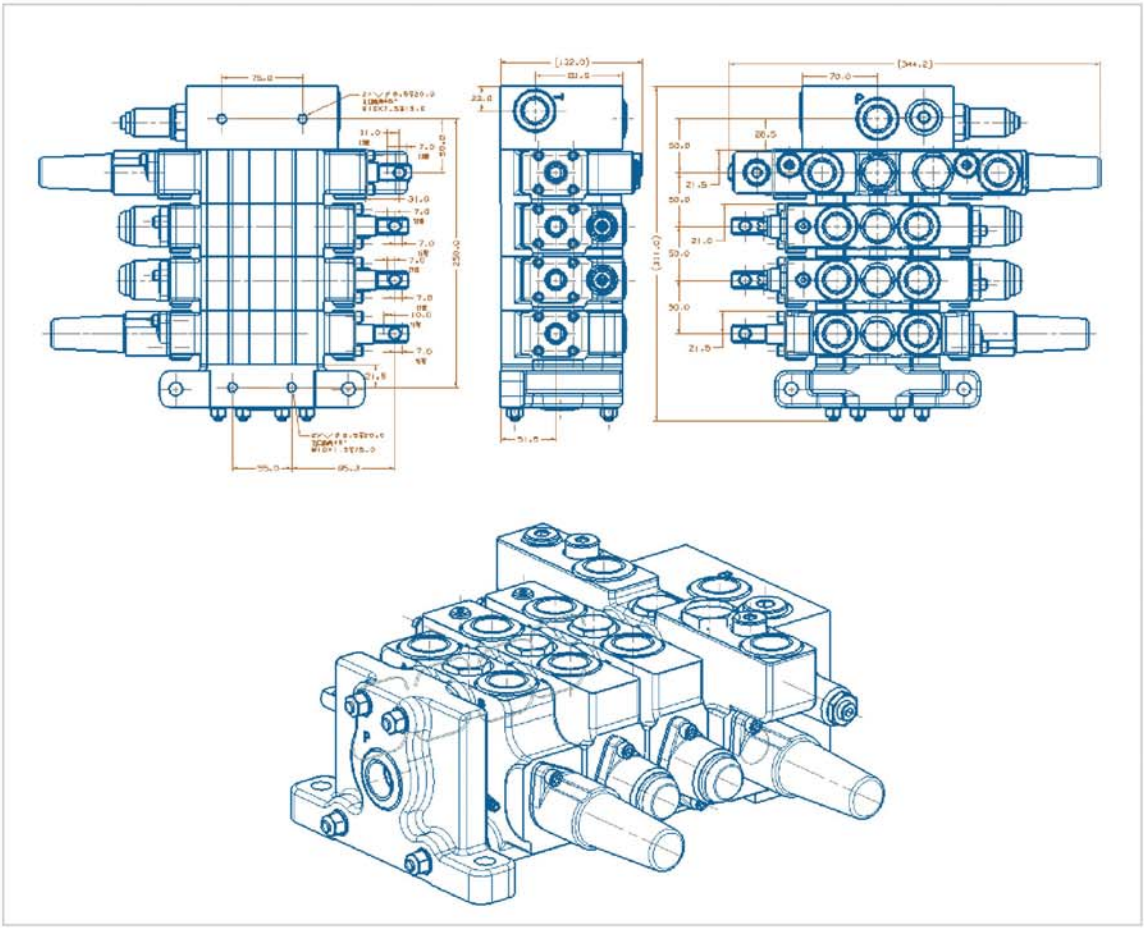


Application Example - 运用实例

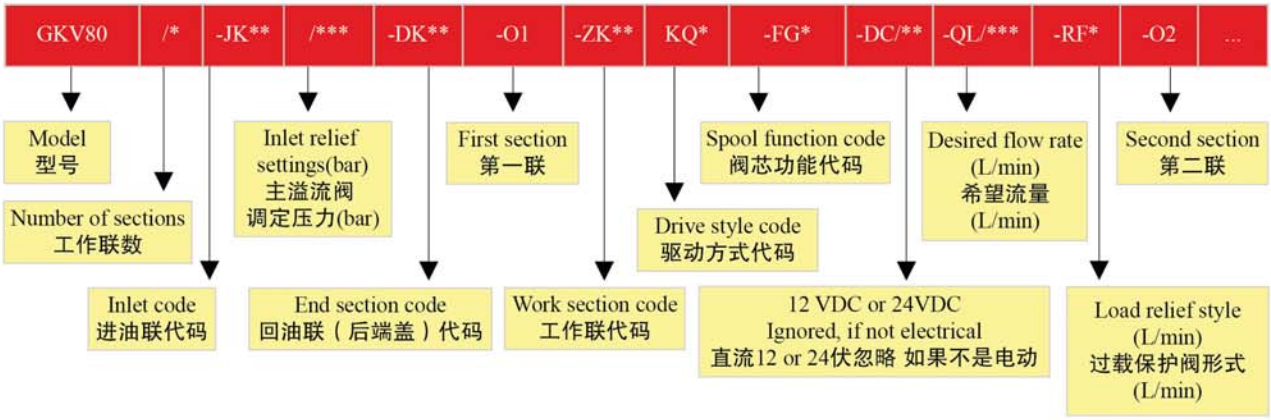
2. Manually Controlled Valves (Tractor Hydraulic System) - 手动控制其中两联有浮动 (拖拉机液压系统)



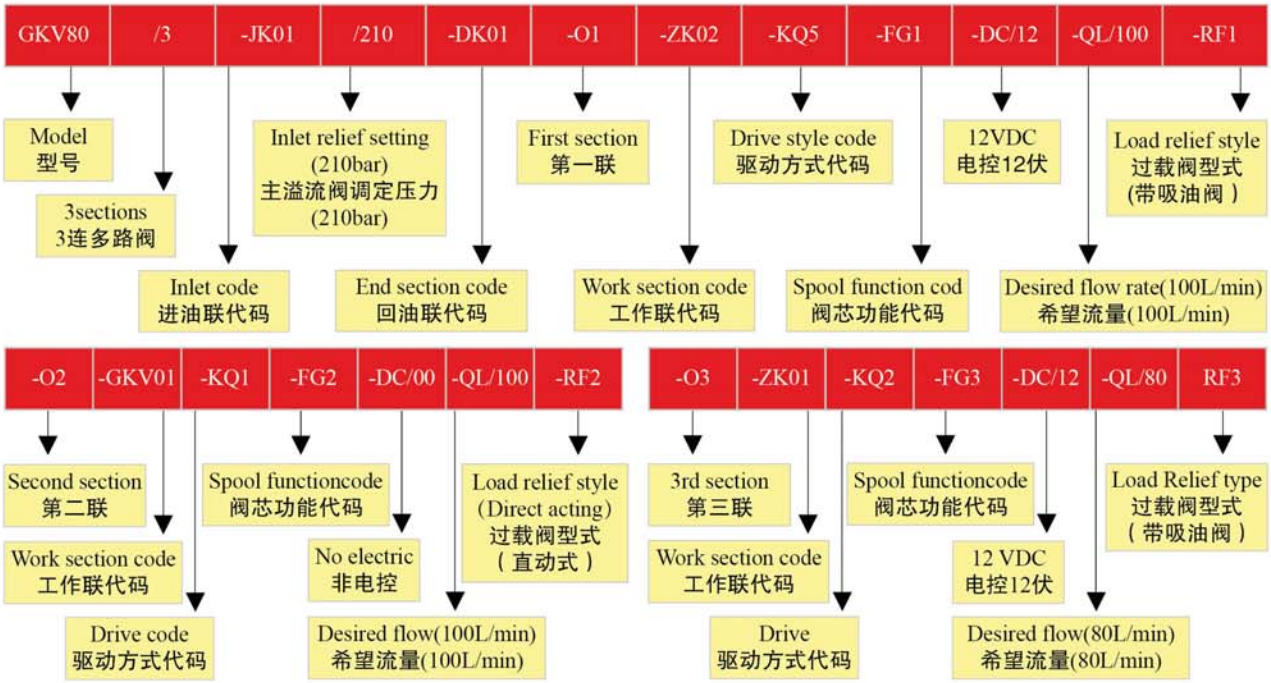
4. Section Stack Valve - 联装配外形图



Ordering Code - 定购代码



Ordering example - 定购实例



Notes

Ordered valve is ZK series with 3 work sections. Inlet relief setting pressure is 210 bar. End section has no "T" port. In the first work section, there is a load relief valve in "A" port. The spool of this section is driven by electrical drive module with 12VDC. The spool function is "O" function. Desired flow rate is 100L/min. The load relief has an anti-cavitation function. The second work section is manually controlled. There are load relief valves on both"A"and"B"ports. Spool function is "Y" function. Desired flow is 100L/min. Load relief is a direct acting relief. The third section is hydraulic remote controlled. There are load relief valves on both"A"and"B"ports. The spool function is "H" function. Desired flow is 80L/min.The load relief valves are differential pressure type.

订购实例说明

所选多路阀位ZK系列，共三联，进油联溢流阀调定压力210bar, 后端盖不回油（回油从进油联）。第一联“A”口有过载保护阀，电动动驱动，12伏直流，滑阀机能为“O”型,要求第一联提供100L/min流量，过载保护阀为带吸油功能。第二联为手动驱动，“A”和“B”口油路均有过载保护阀，滑阀机能为“Y”型，要求提供100L/min流量,过载保护阀为直动式。第三联为液动驱动，“A”和“B”口油路均有过载保护阀，滑阀机能为“H”型，要求提供80L/min流量,过载保护阀为差动式。

GKV50 Series Sectional Valves - GKV50 系列片式多路阀

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Introduction - 简介

GKV50 series sectional valves are open center valves. Mainly used in mobile machines such as, agricultural machinery, construction machines, mining equipment, material handling equipment, as well as maintenance machines. All valve series adapted modular design. The system designer can choose different modules to design a complex system. The spool in work section is designed to satisfy with the customer's requirements, which provides excellent flow characteristics and very low flow force. With different inlet modules, it gives user the freedom for choosing different relief valve and different port locations. There are number of different work section modules to choose from, to satisfy with the customer's needs. Different end sections also provide the customer's needs for return ports or power beyond functions.

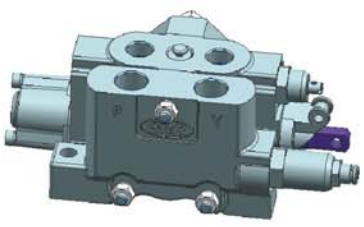
GKV50 Series Sectional Valves Provide the following Functions:

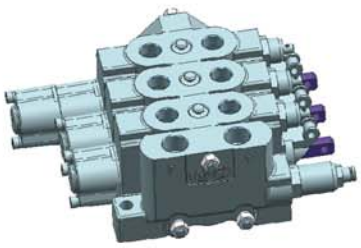
- Inlet module with two stage relief valve.
- Inlet module with direct acting relief valve.
- A/B port with overload valve on main sectionV
- A port with overload valve on work section.
- B port with overload valve on work section.
- A port with dump valve.
- B port with dump valve.
- A port with a mechanical P. O. check.
- B port with a mechanical P. O. check.
- End section with oil return port.
- End section without oil return port.

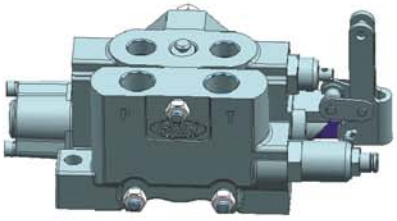
GKV50系列的多路阀是一种模块式开式多路阀。主要用于移动式机械，例如：农业机械、建筑机械、矿山机械、装卸机械、维修机械以及其他工程机械。本系列的多路阀采用模块化设计，系统设计者可选取不同功能的模块来满足各种复杂系统的设计。主阀体可以根据用户的要求选用不同功能的模块以满足不同的运用场合。主阀芯可根据用户的要求提供极佳的流量特性和低液动力。不同的进油联模块可以满足用户不同的进油方式以及溢流阀装配形式。回油联也有不同形式以满足用对回油形式的要求，也可提供动力外接。

该系列的多路阀 可提供如下功能：

- 可自带先导式溢流阀的进油联。
- 可带直动式溢流阀的进油联。
- A/B口均有过载阀的主阀块。
- A口有过载阀的主阀块。
- B口有过载阀的主阀块。
- A口有截止阀的主阀块。
- B口有截止阀的主阀块。
- A/B口有机械驱动的液压锁。
- A口均有机械驱动的液压锁。
- B口有机械驱动的液压锁。
- 可回油的后端盖。
- 不可回油的后端盖。
- 带动力外接的后端盖。







Main Features - 主要特点

GKV50 series sectional valve provides the following features:

- Cast iron body (inlet section, main section and end section)
- Spring cap, mechanical detent cap, as well as electoral or hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- Parallel circuit. Each section has its own load check valve.
- Each section has load relief option and relief style options.
- Can be changed to series circuit.
- Provides dump valve options for each work port.
- Provides different drive modules (electrical, hydraulic remote, manually control, wire driving).
- Provides power beyond port.
- Can be modified to be a closed center valve.
- Provides mechanical detent.
- Provides options for different type of relieves and different relief valve locations in the inlet.
- Provides options for mechanically actuated P. O. check valves to satisfied with the needs for tractors and mobile cranes.
- Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- Provides floating functions for spools.
- Provides excellent flow characteristics and small operating force.
- Can be proportionally controlled without pressure compensation.
- Can be assembled with 8 main sections.

GKV50 系列多路阀有以下主要特点:

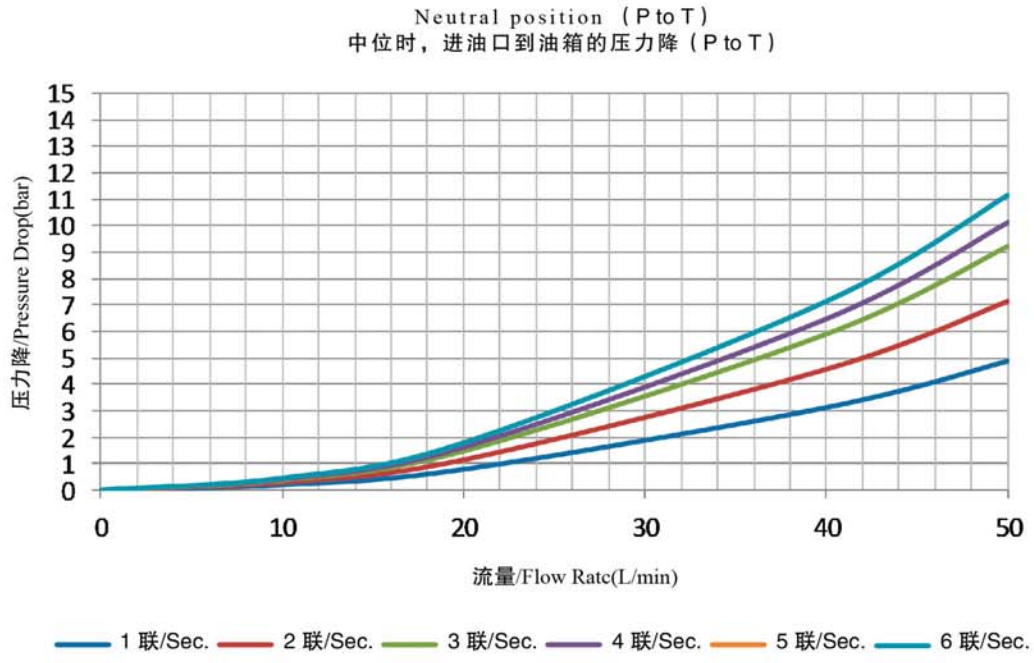
- 阀体为灰口铸铁 (进油联, 工作联, 回油联)C
- 弹簧端盖，机械定位端盖为压铸铝。
- 并联回路, 每个工作联都带负载单向阀, 可选择工作油口带过载保护阀或防止吸空的过载保护阀。
- 能够改变为串联回路。
- 可在工作油口提供截止阀。
- 可提供液压遥控、手动和拉线控制模块。
- 可提供动力外接。
- 可以修改为闭式系统。
- 可提供机械定位。
- 进油联可配不同形式的溢流阀(直动式, 先导式) 或改变溢流阀的安装位置。
- 可提供机械式液压锁以适应拖拉机、起重机等的起升机构对重物锁定的要求。
- 提供各种不同的阀芯功能：用于控制双作用油缸、单作用油缸、 油马达的阀芯，以及带浮动功能的阀芯。
- 阀的操作力小，流量特性好。
- 该多路阀可组合成 1 到 8 联。

Major Technical Data - 主要技术参数

Rated flow rate	50 L/min
Maximum flow rate	60 L/min
Minimum flow rate	20 L/min
Maximum pressure at "P" port	350 bar
Maximum pressure at "A/B" ports	350 bar
Maximum pressure at "T" port	25 bar
Internal leakage (@70 bar) "A/B" to "T"	25-35 CC/min
Internal leakage (@ 70 bar) "A/B" to "T" With P. O. check	2-5 CC/min
Spool stroke ("1" / "2" position)	+7/-7 mm
With floating function ("1" / "2" and "F" position)	+7/-7 -10 mm
Solenoid can be either 12 VDC or 24 VDC, corresponding current is 0 - 1.5 or 0 - 0.75 Amp.	

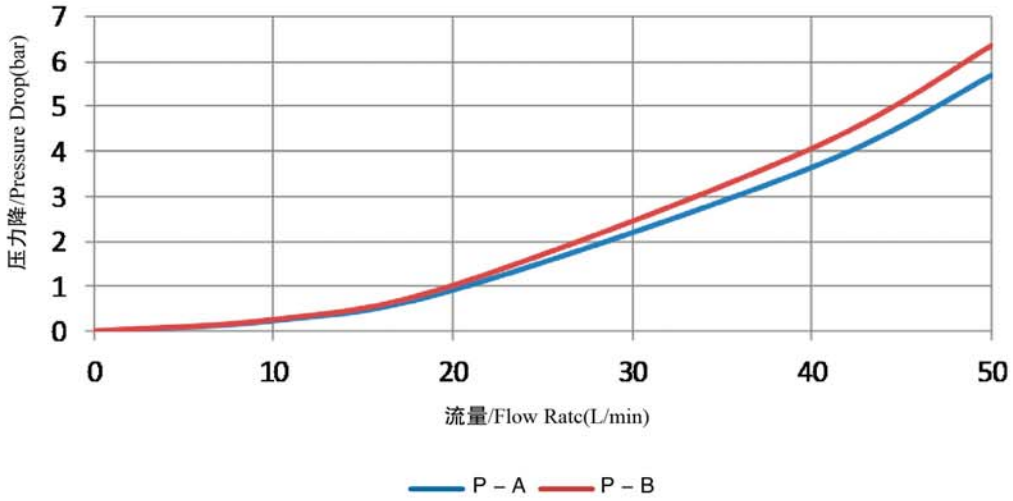
额定流量	50 L/min
最大流量	60 L/min
最小流量	20 L/min
P 口最大压力	350 bar
A/B 口最大压力	350 bar
T 口最大压力	25 bar
内泄漏（ 70 bar ） A/B to T	25–35 CC/min
内泄漏（ 70 bar ） A/B to T 有液压锁	2–5 CC/min
阀芯行程 (位置1 / 2)	+7/–7 mm
带浮动的阀芯行程 (位置1 / 2 和 F 位)	+7/–7 –10 mm
驱动的电磁线圈电压是12VDC 或24VDC，与之相应的电流时 0– 1.5 或0 – 0.75 Amp.	

Performance Data - 性能参数

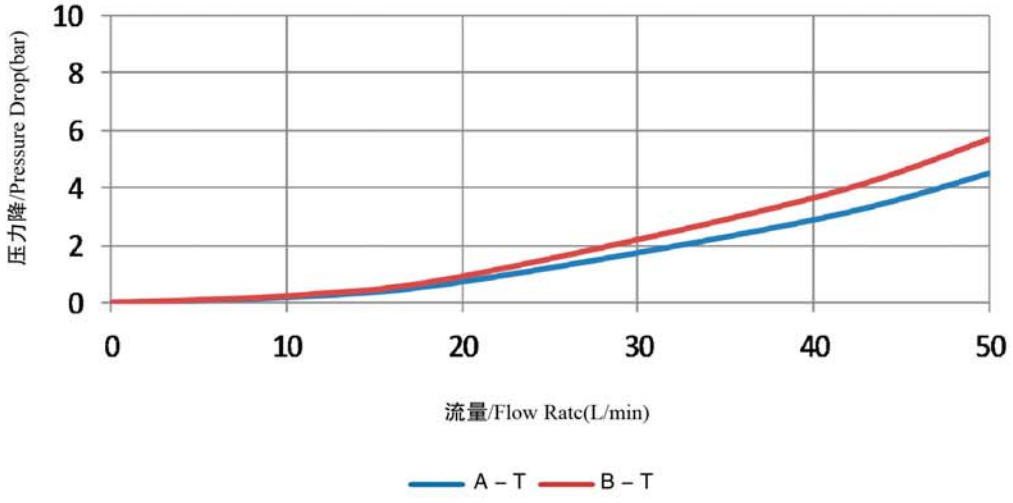


Performance Data - 性能参数

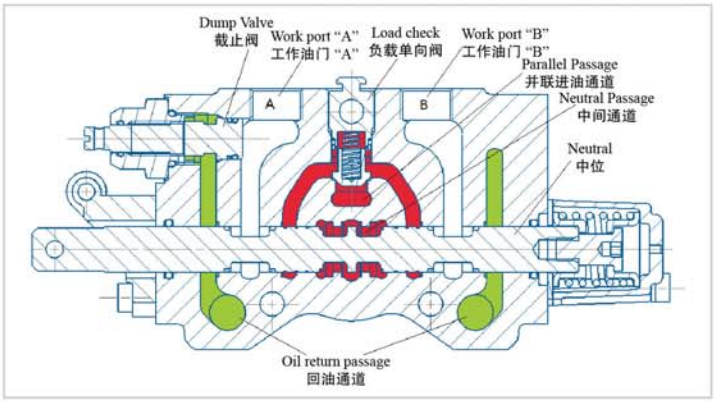
Inlet to Work Port
进油口到工作油口的压力降

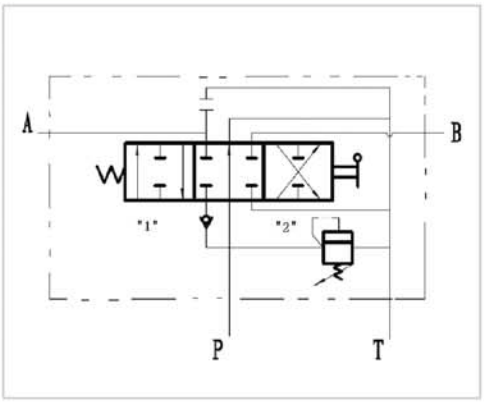


Work Port to Tank
工作油口到油箱压力降



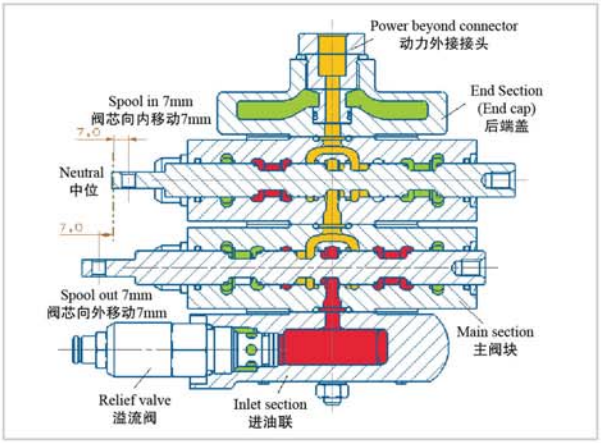
Operation Principle - 工作原理

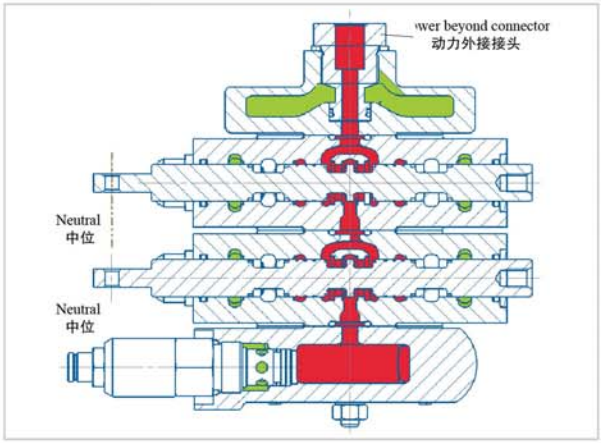




GKV50 series sectional valves is an open centered 3 position 4 way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with small pressure drops. When one of the spool is moved to " 1 "or" 2 "position, the neutral passage is blocked. The flow from pump can only pass the parallel passage to load check valve, then, passes through the bridge and spool opening to work port "A"or"B".

一般说来，GKV50系列的多路阀是一种开式的3位4通阀。当阀芯都在中位时，从油泵提供的油液直接经阀芯和阀体之间的中位通道流到油箱，产生很小的压力损失。压力油经并联通道的供油被阀芯堵死，如图1所示。液压系统图见图2.当其中一个阀芯移动到“1”或“2”时，阀芯和阀体之间的中位通道被逐渐堵死，从油泵来的全部流量经并联油路进入负载单向阀，经阀口节流后进入该阀芯控制的“A”口或“B”口,如图3所示。图1中的工作阀块在“A”口带有截止阀。截止阀打开，“A”口通回油（油箱）。





For multi-section valves, if one of the section's spool is in "Spool in"or"Spool out"position, then, there is no flow in its down stream section's neutral passage. The main throttle occurs on the valve opening between bridge passage and spool . The operator can control more than one spools, but the magnitude of the flow rate for each controlled section depends on the magnitude of the load, as shown in Fig. 3.

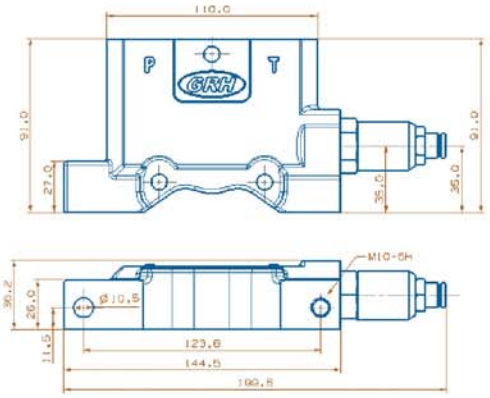
When power beyond function is selected as shown in Fig.4, when all spools are in neutral position, The flow from inlet passes neutral passage to power beyond port to provide source of the flow to other auxiliary functions.

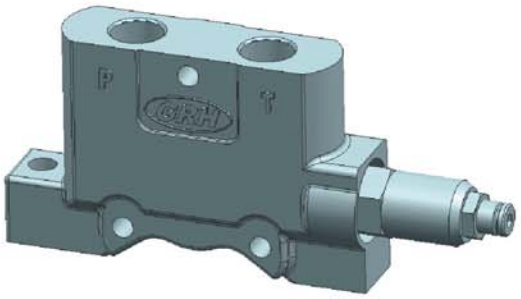
对于多联的片式阀，如果其中一联的阀芯在“1”或“2”的位置时，它的后一联的中位通道就没有流量。油液的主要节流发生在桥路通道和阀芯节流口。操作员可以同时控制几个阀芯，其控制元件的速度取决于负载的大小，如图3所示。

当所有阀芯都在中位时，从油泵输出的油液经工作联的中间通道、后端盖上的动力外接接头向其他辅助装置提供油源，如图4所示。

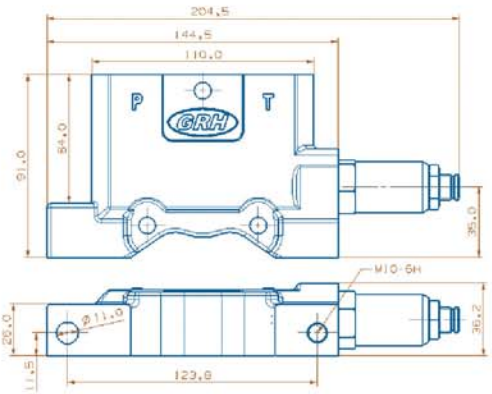
Inlet Dimension - 进油联几何尺寸

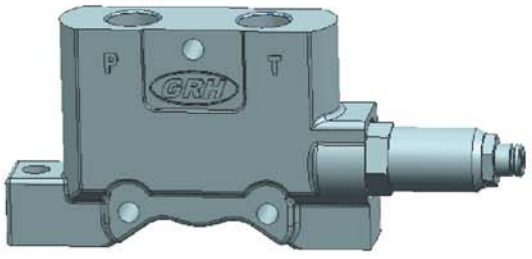
JK01 Inlet - 进油联



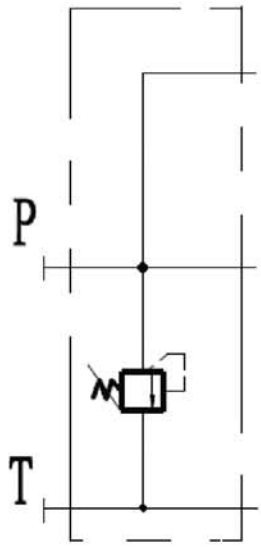
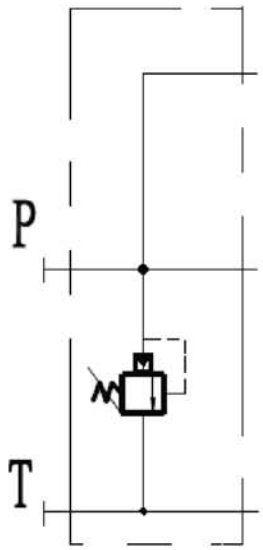


JK02 Inlet - 进油联



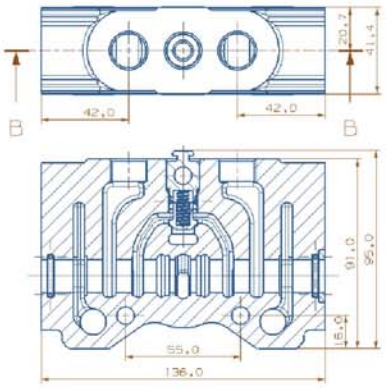


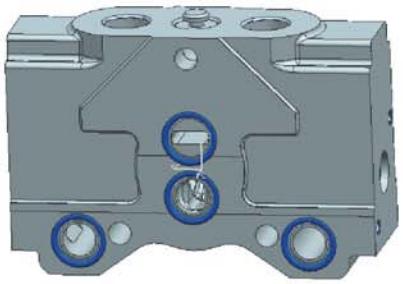
Inlet Section Hydraulic Schematics - 进油联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
JK01		Inlet section with direct acting relief valve 带直动式溢流阀的进油联	
JK02		Inlet section with two stage relief valve 带先导式溢流阀的进油联	

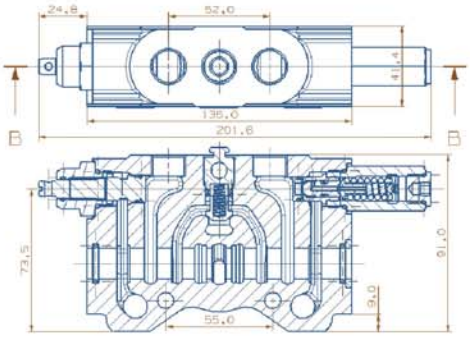
Typical Work Section Dimension - 典型工作联的基本几何尺寸

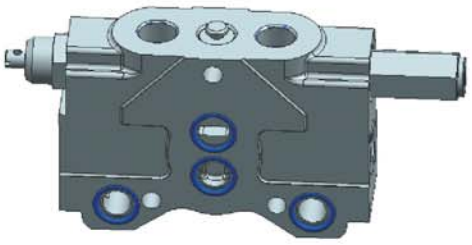
YT01 Work Section - 工作联



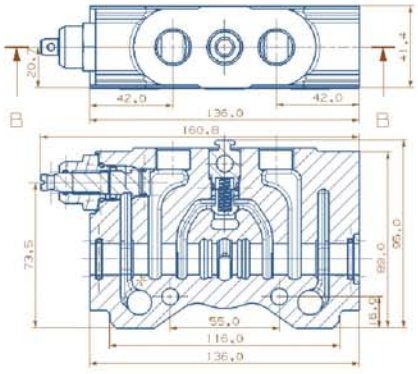


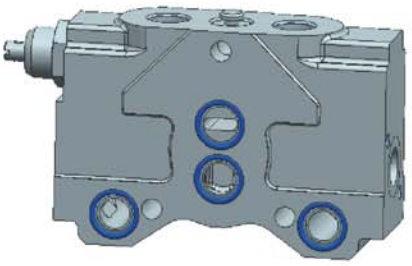
YT06 Work Section - 工作联



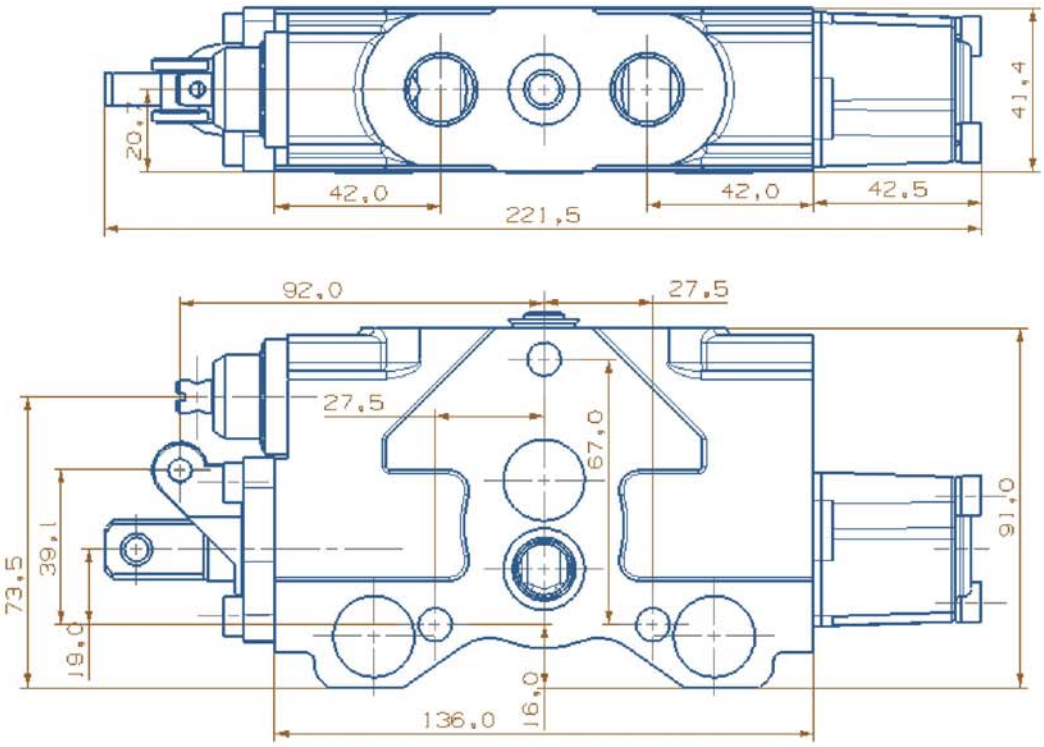


YT07 Work Section - 工作联

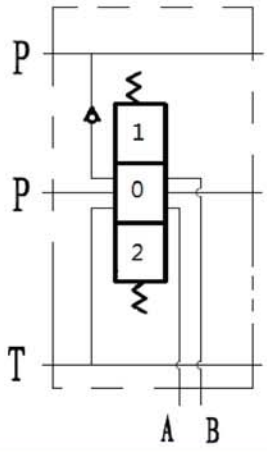
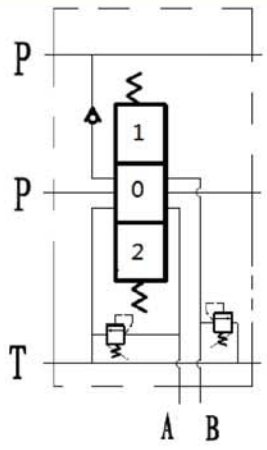
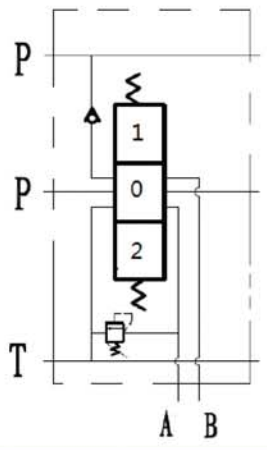




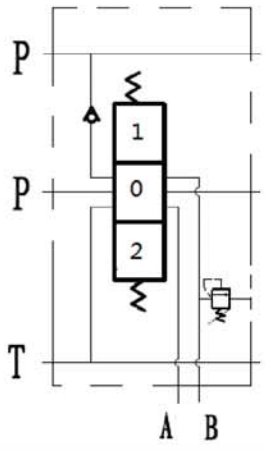
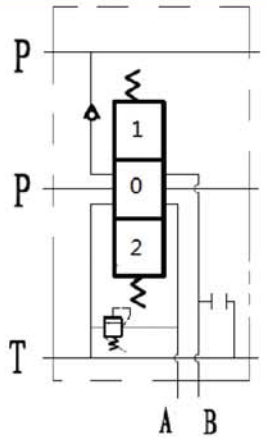
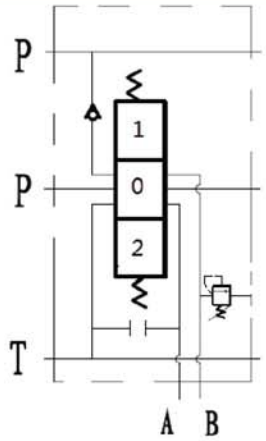
Typical Work Section Dimension - 典型工作联的基本几何尺寸



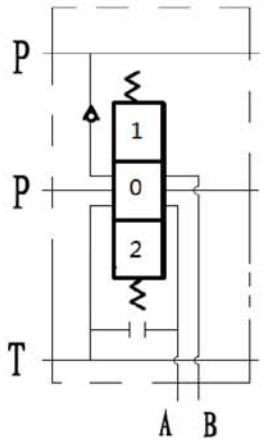
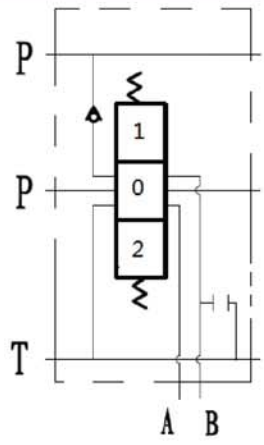
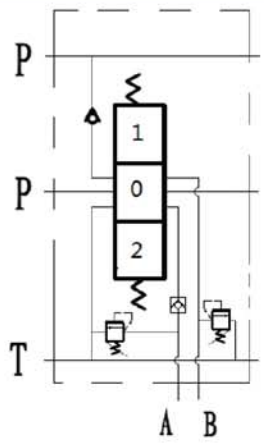
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT01		Standard Section Without over load relief valves at both A and B ports A、B口均无过载阀	
YT02		Both A and B ports have over load relief valves A、B口均有过载阀	
YT03		One over load relief valve on A port A口有过载阀	

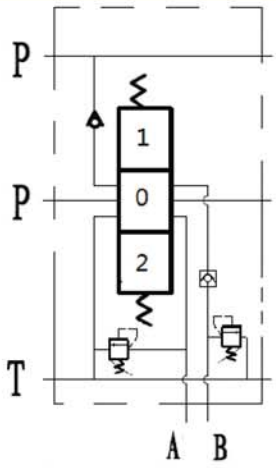
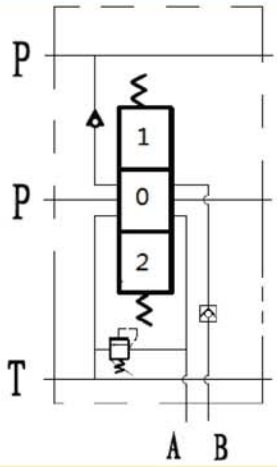
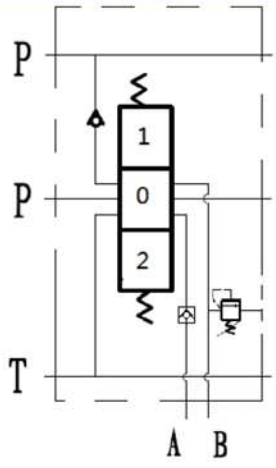
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT04		One over load relief valve on B port B 口有过载保护阀	
YT05		One over load relief valve on A port One dump valve on B port A 口有过载保护阀，B 口有截止阀	Tractor and other auxiliary equipment applications 常用于拖拉机等带辅助装置的机械
YT06		One over load relief valve on B port One dump valve on A port B 口有过载保护阀，A 口有截止阀	Tractor and other auxiliary equipment applications 常用于拖拉机等带辅助装置的机械

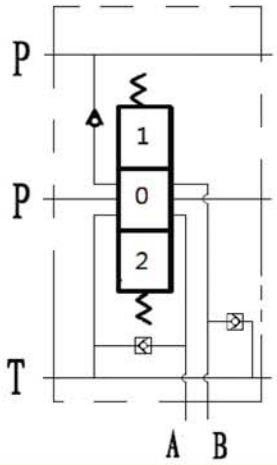
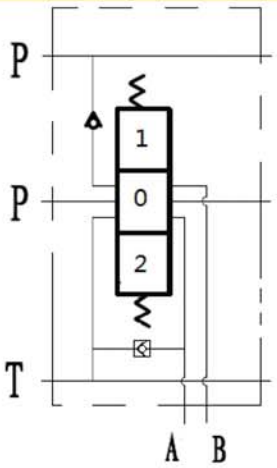
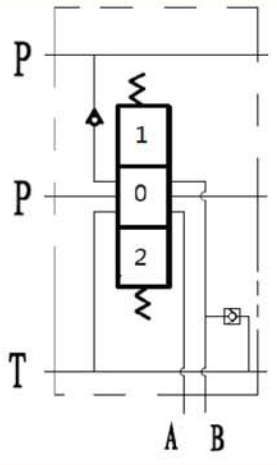
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT07		One dump valve on A port A 口有截止阀	Tractor and other auxiliary equipment applications 常用于拖拉机等带辅助装置的机械
YT08		One dump valve on B port B 口有截止阀	Tractor and other auxiliary equipment applications 常用于拖拉机等带辅助装置的机械
YT09		Over load relief valves on both A and B ports. One mechanically actuated P. O. check on A port. A 口有过载保护阀和机械式液压锁，B 口有过载保护阀	Tractor and other load lifting equipment applications 常用于提升锁紧装置

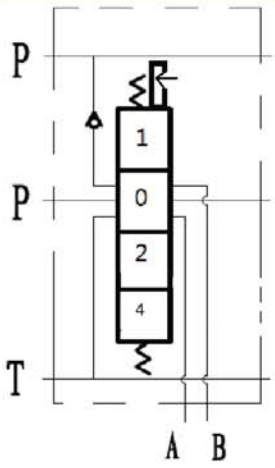
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT10		Over load relief valves on both A and B ports.One mechanically actuated P. O. check on B port. A 口有过载保护阀，B 口有过载保护阀和机械式液压锁	Tractor and other load lifting equipment applications. 常用于提升锁紧装置
YT11		One load relief valves on A port. One mechanically actuated P. O. check on B port. A 口有过载保护阀，B 口有机械式液压锁	Tractor and other load lifting equipment applications. 常用于举升回路，将重物锁紧在某一位置，如拖拉机的举升回路
YT12		One load relief valves on B port. One mechanically actuated P. O. check on A port. B 口有过载保护阀，A 口有机械式液压锁	Tractor and other load lifting equipment applications. 常用于举升回路，将重物锁紧在某一位置，如拖拉机的举升回路

Work Section Hydraulic Schematics - 工作联液压图形符号

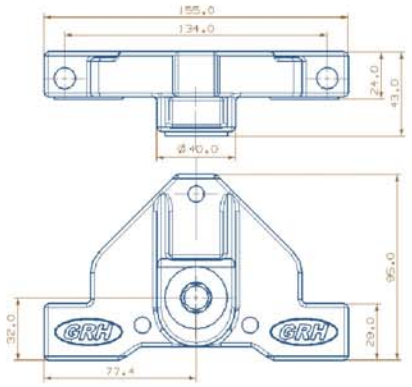
Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT13		Anti-cavitation valves on both A and B ports A、B油路均有吸油阀	Hydraulic motor applications 常用于液压马达控制避免吸空
YT14		Anti-cavitation valves on A port A油路有吸油阀	Hydraulic motor applications 常用于液压马达控制避免吸空
YT15		Anti-cavitation valves on B port B油路有吸油阀	Hydraulic motor applications 常用于液压马达控制避免吸空

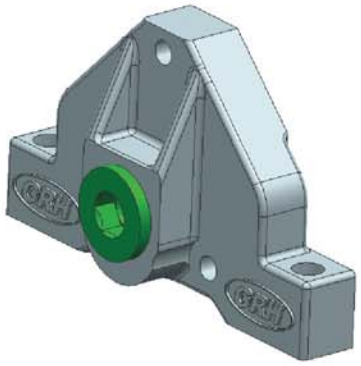
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
YT16		Fourth section has mechanical detent 第4位机械定位	

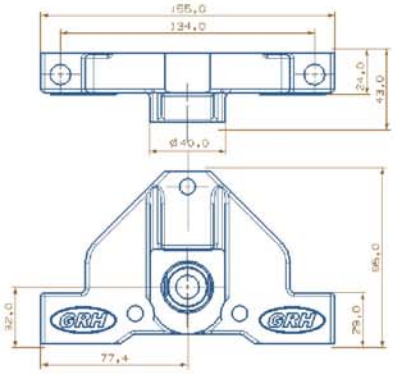
End Section Dimension - 回油联（后端盖）的基本几何尺寸

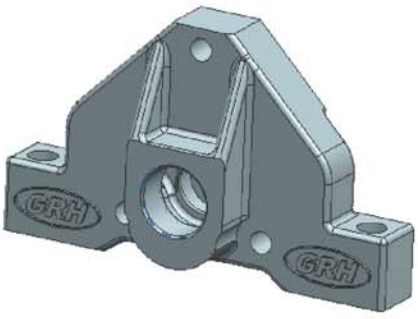
DY01 End Section（End Cap）- 回油联（后端盖）



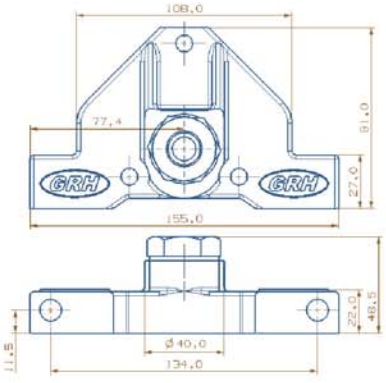


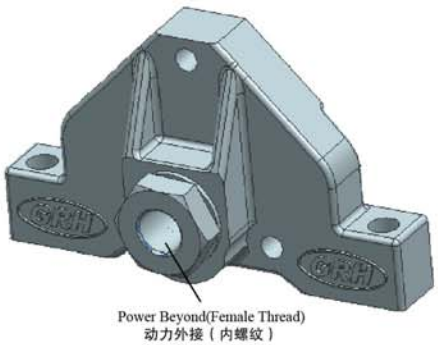
DY02 End Section（End Cap）- 回油联（后端盖）





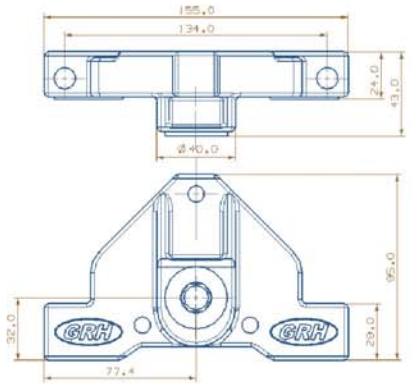
DY03 End Section（End Cap）- 回油联（后端盖）

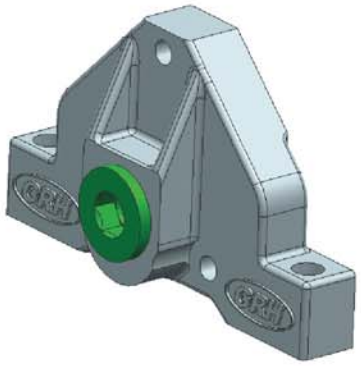




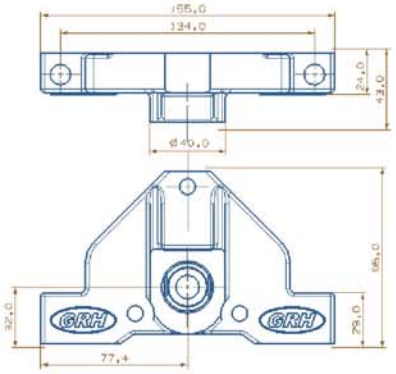
End Section Dimension - 回油联（后端盖）的基本几何尺寸

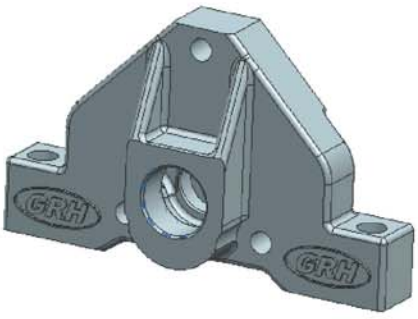
DY01 End Section（End Cap）- 回油联（后端盖）



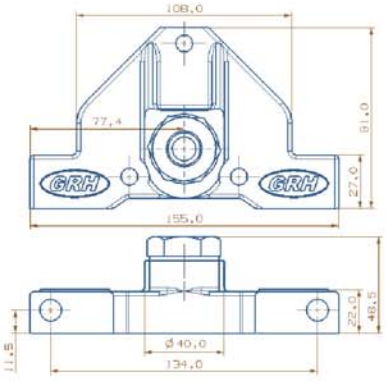


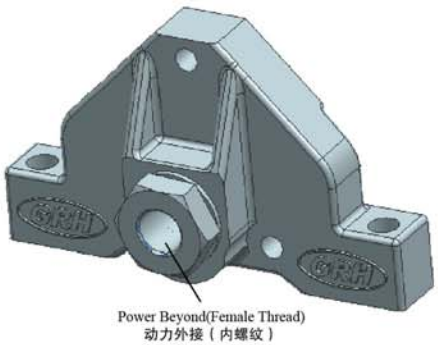
DY02 End Section（End Cap）- 回油联（后端盖）





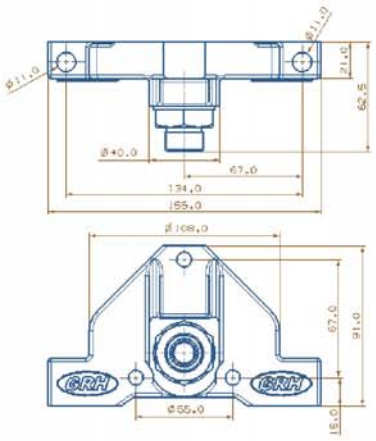
DY03 End Section（End Cap）- 回油联（后端盖）

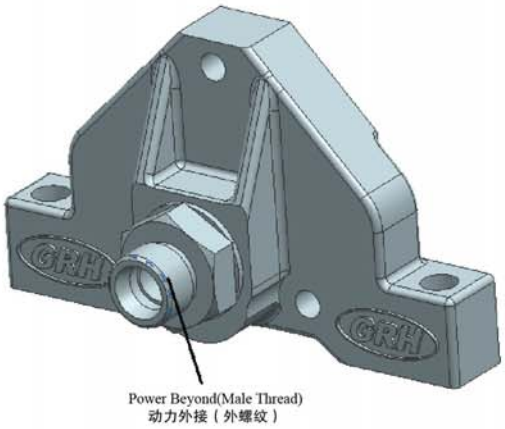




End Section Dimension - 回油联（后端盖）的基本几何尺寸

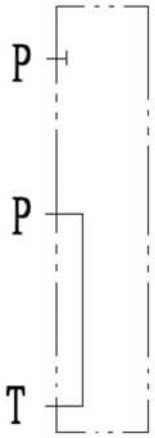
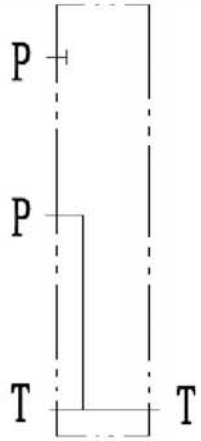
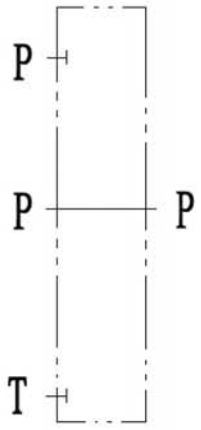
DY04 End Section（End Cap）- 回油联（后端盖）



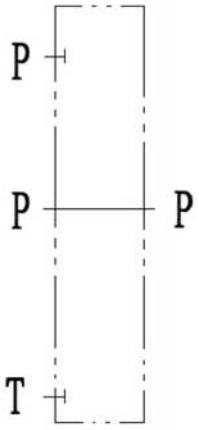


Power Beyond(Male Thread)
动力外接（外螺纹）

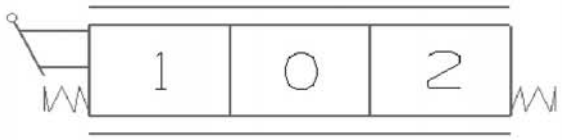
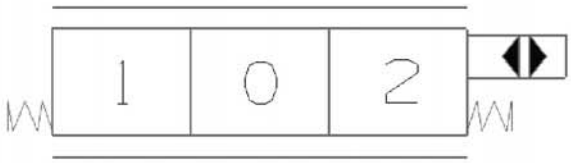
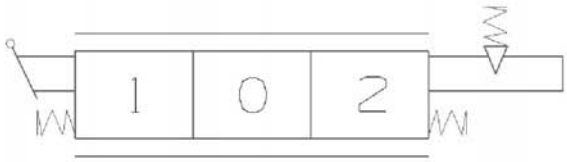
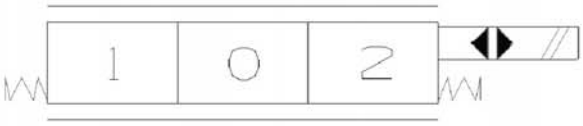
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
DY01		No oil return port 油液经后端盖再经进油联回油箱	
DY02		Oil return port on the end section 油液经后端盖回油箱	
DY03		No oil return port With power beyond port (Internal threaded connector) 油液经后端盖引出回油经进油联回油箱（动力外接接头为内螺纹）	Tractor application 常用于拖拉机

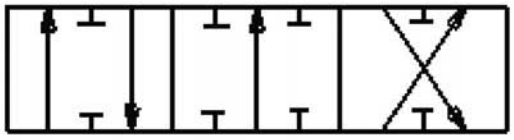
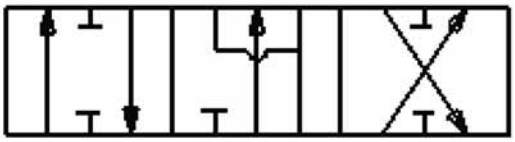
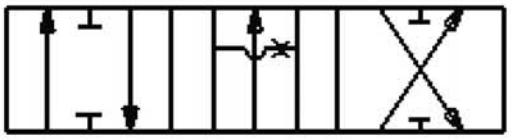
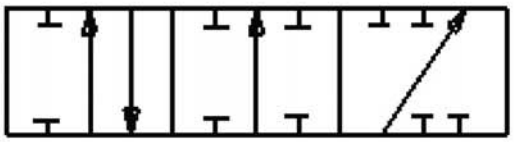
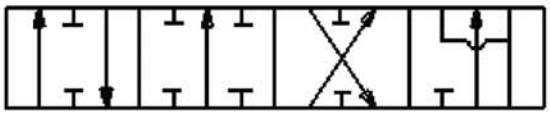
Work Section Hydraulic Schematics - 工作联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
DY04		No oil return port With power beyond port (External threaded connector) 油液经后端盖引出 回油经进油联回油箱 （动力外接接头为外螺纹）	Tractor application 常用于拖拉机

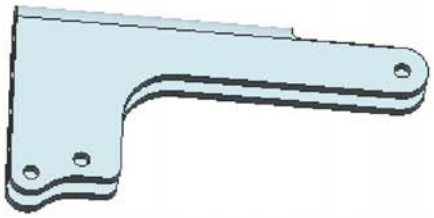
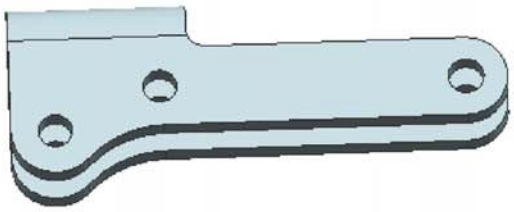
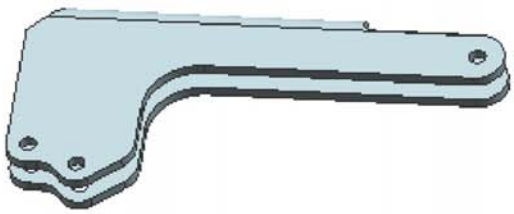
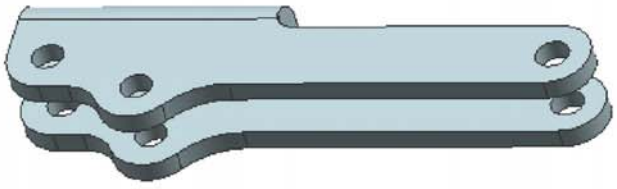
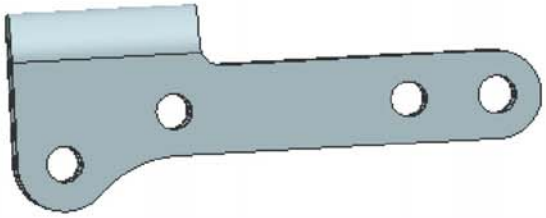
Work Section Drive Styles - 工作联的驱动方式

Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能
KQ1		Standard manually controlled 标准手动
KQ2		Hydraulic remote 液控
KQ3		Manually controlled with mechanical detent 手动带机械定位
KQ4		Manually controlled with 4th position floating and detent 手动，第 4 位浮动带机械定位
KQ5		Electrical actuated（on/off） 电动（开/关控制）
KQ6		Electrical actuated with floating function 电动控制带浮动功能

Typical Spool Functions - 典型滑阀机能

Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能	Notes 备注
FG1		3 position 4 way At neutral: P,T,A,B are all blocked 3位4通 中位P,T,A,B各不相通	Double acting cylinder applications 常用于控制双作用油缸
FG2		3 position 4 way At neutral: P blocked,T,A, Bconnected 3位4通 中位P不通，T，A，B相通	Hydraulic motor applications 常用于控制液压马达
FG3		3 position 4 way At neutral: P,A,B and T all connected 3位4通 中位P，A，B，均与T相通	Hydraulic motor applications 常用于控制液压马达
FG4		3 position 3 way At neutral: P,T,A,B all blocked 3位3通 中位P，T，A，B各不相通	Single acting cylinder applications 常用于控制单作用油缸
FG5		4 position 4 way At neutral: P,T,A, and B are all blocked 4th position floating 4位4通 中位P，T，A，B各不相通 第4位浮动	Double acting cylinder applications 常用于控制双作用油缸
FG6		4 position 4 way At neutral: P blocked,T,A and B are connected 4th position floating 4位4通 中位P不通，T，A，B相通 第4位浮动	Double acting cylinder or hydraulic motor applications 常用于控制双作用油缸或液压马达

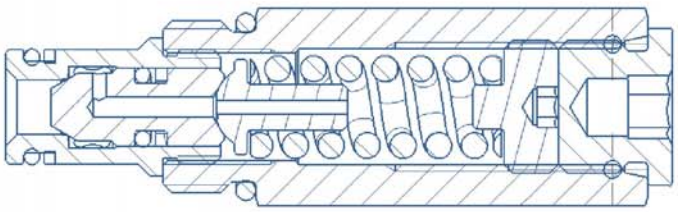
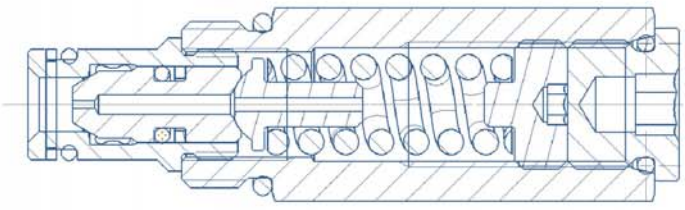
Work Section Drive Styles - 工作联的驱动方式

Code 代码	Drawing 简图	Notes 备注
SL0	Valve without handle bracket 无手柄连杆	
SL1		
SL2		
SL3		
SL4		
SL5		

Handle Type - 手柄杆型式

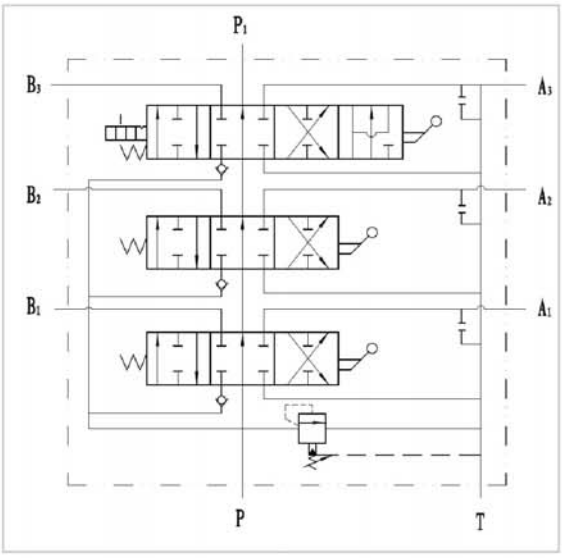
Code 代码	CC	Notes 备注
SB0	No Handle 无手柄	
SB1		
SB2		
SB3		
SB4		Long handle 加长的SB1

Load Relief Valve Types - 过载保护阀型式

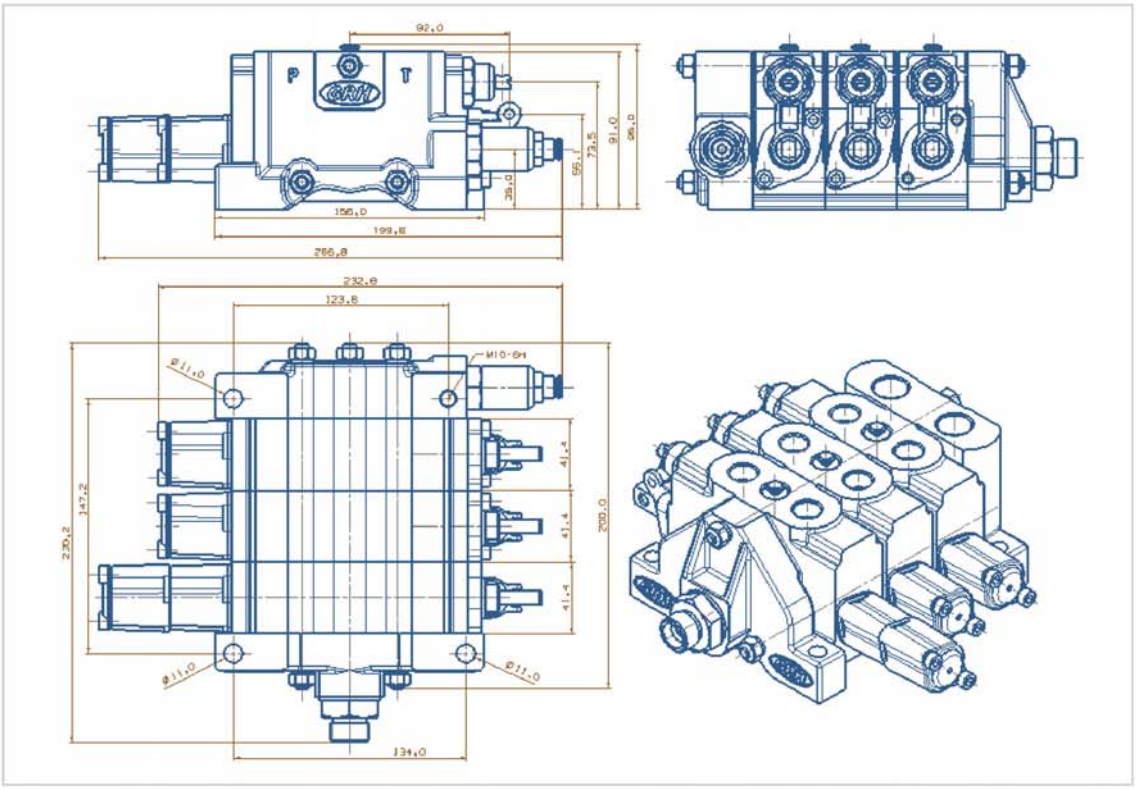
Code 代码	Drawing 简图	Notes 备注
RF0	No over load relief 无过载保护	No over load relief 直动式溢流阀
RF1		No over load relief 直动式溢流阀
RF2		Direct acting relief valve 差动式溢流阀

Application Example - 运用实例

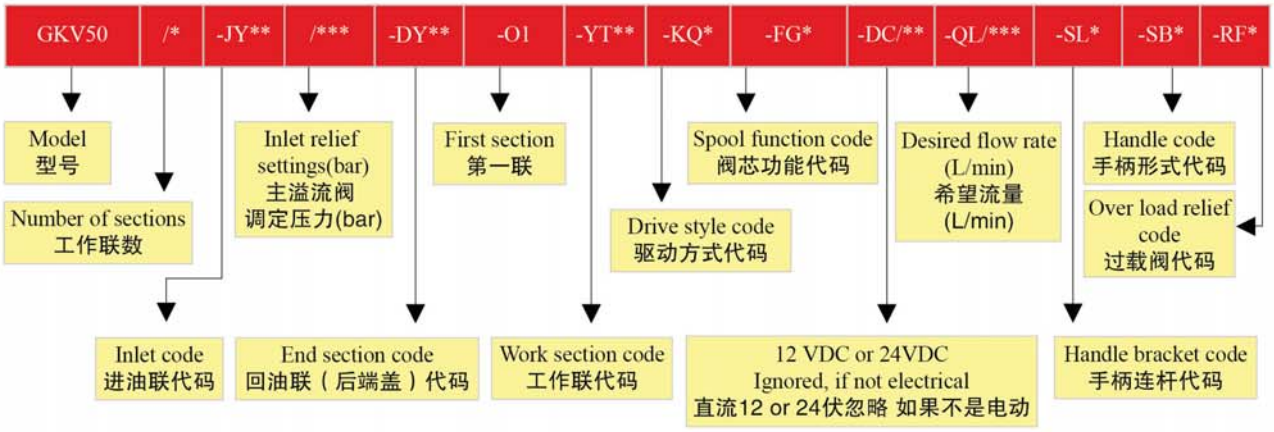
3.Sectional Stack Valve (Third Section Has Mechanical Detent And Floating Function)
片式阀（第三联带机械定位和浮动功能）

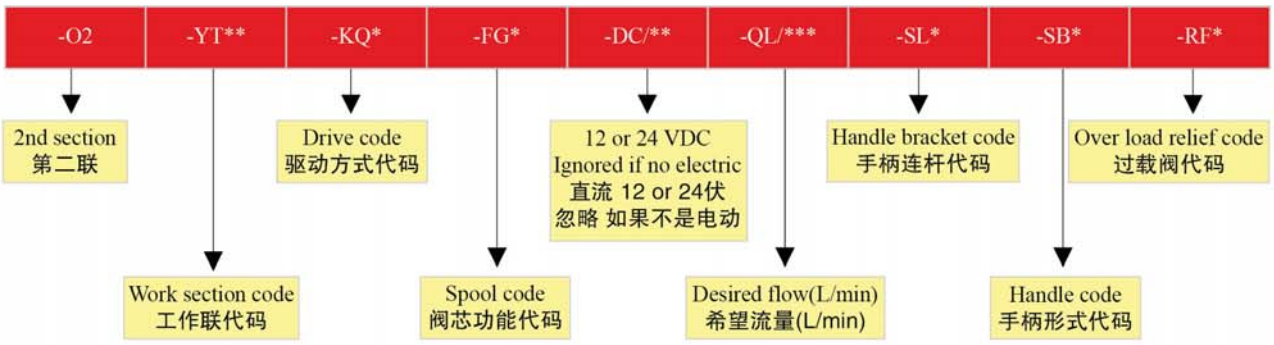


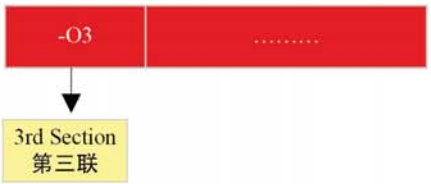
3.Manually Controlled 3 Section Valve - 联装手动外形图



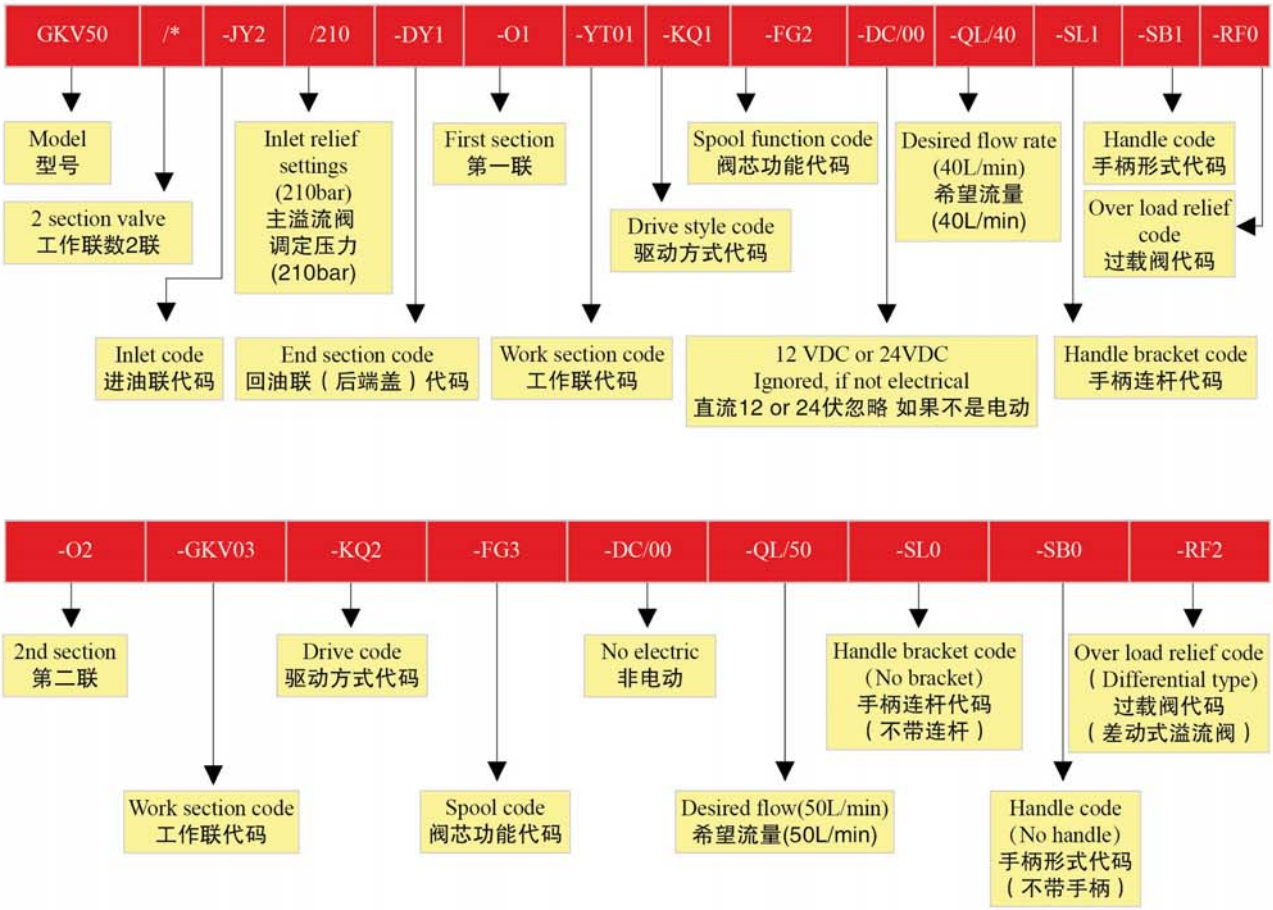
Ordering Code - 定购代码







Ordering Code - 定购代码



Order example notes

ChooseYT50 series sectional valve, with two work sections，Inlet relief valve is set 210 bar. There is no return port on end section of the stack. The first work section is basic standard section without over load relief valves. This section is manually controlled (wire pulling type). Spool is "Y" type. Desired flow rate for the first section is 40L/min. Not required for handle and handle bracket. The second section is hydraulic remote controlled. There is an over load relief on "A" port. Spool is "H" type. Desired flow is 50L/min。Not required for handle and handle bracket. The overload relief is differential type.

订购实例说明

所选多路阀位YT50，共两联，进油联溢流阀调定压力210bar, 后端盖不回油（回油从进油联）。第一联为基本阀块，两工作油口均无过载保护阀，手动驱动，滑阀机能为“Y”型,要求第一联提供40L/min流量，第一联为拉线控制，不提供手柄和手柄连杆。第二联“A”口油路有过载保护阀，驱动方式为液控，滑阀机能为“H”型，要求提供50L/min流量。无连杆和手柄，过载保护阀为差动式。

GKV35 Series Sectional Valves - GKV35 系列片式多路阀

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Introduction - 简介

GKV35 series sectional valves are open center valves. Mainly used in mobile machines such as, agricultural machinery, construction machines, mining equipment, material handling equipment as well as maintenance machines. The valve series adapted modular design. The system designer can choose different modules to design a complex system. Main valve spool is designed to satisfy with the customer's requirements, which provides excellent flow characteristics and very low flow force. With different inlet modules, it gives user the freedom for choosing different relief valve and different port locations. There are number of different work section modules to choose from, to satisfy with the customer's needs. Different end sections also provide the customer's needs for return ports or power beyond functions.

GKV35 Series Sectional Valves Provide the following Functions:

- A/B Port with overload valve on main section.
- A Port with overload valve on main section.
- B Port with overload valve on main section.
- A/B Port with dump valve.
- End Section with Oil Return Port.
- End Section without Oil Return Port.
- End Section with power beyond Port.

GKV35系列的多路阀是一种模块式开式多路阀。主要用于小流量移动式机械，例如：农业机械、建筑机械、矿山机械、装卸机械、维修机械以及其他工程机械。本系列的多路阀采用模块化设计，系统设计者可选取不同功能的模块来满足各种复杂系统的设计。主阀体可以根据用户的要求选用不同功能的模块以满足不同的运用场合。主阀芯可根据用户的要求提供极佳的流量特性和低液动力。不同的进油联模块可以满足用户不同的进油方式以及溢流阀装配形式。回油联也有不同形式以满足用对回油形式的要求，也可提供动力外接。

该系列的多路阀 可提供如下功能：

- A口有过载阀的主阀块。
- B口有过载阀的主阀块。
- A / B口带截止阀的主阀体。
- 可回油的后端盖。
- 不可回油的后端盖。
- 带动力外接的后端盖。
- 也可根据客户要求插装其它插装阀。

Main Features - 主要特点

GKV35 series sectional valve provides the following features:

- ●Cast iron body (inlet section, main section and end section)
- ●Spring cap, mechanical detent cap, as well as hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- ●Parallel circuit. Each section has its own load check valve.
- ●Each section has load relief option and relief style options.
- ●Can be changed to series circuit.
- ●Provides dump valve options for each work port.
- ●Provides different drive modules (hydraulic remote, manually control, wire driving).
- ●Provides power beyond port.
- ●Can be modified to be a closed center valve.
- ●Provides mechanical detent.
- ●Provides options for different type of relieves and different relief valve locations in the inlet.
- ●Provides options for mechanically actuated P. O. check valves to satisfied with the needs for tractors and mobile cranes.
- ●Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- ●Provides floating functions for spools.
- ●Provides excellent flow characteristics and small operating force.
- ●Can be proportionally controlled without pressure compensation.
- ●Can be assembled with 8 main sections.

GKV35 系列多路阀有以下主要特点:

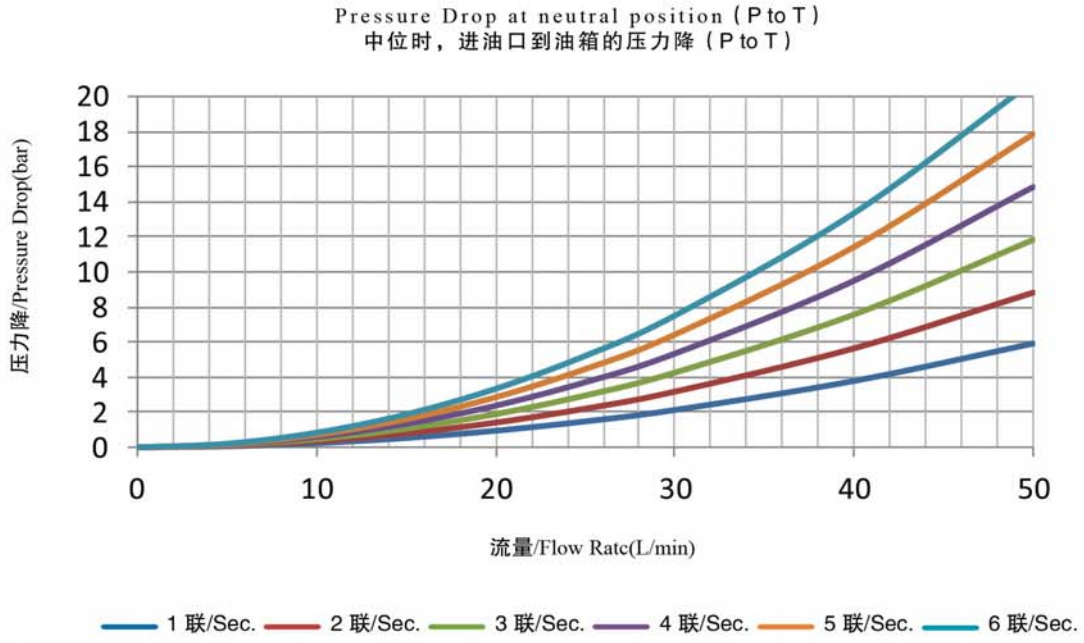
- ●阀体为灰口铸铁 (进油联, 工作联, 后端盖)。
- ●弹簧端盖，机械定位端盖。
- ●并联回路, 每个工作联都带负载单向阀, 可选择工作油口带过载保护阀。
- ●能够改变为串联回路。
- ●可在工作油口提供截止阀。
- ●可提供手动和拉线控制模块。
- ●可提供动力外接。
- ●可以修改为闭式系统。
- ●可提供机械定位。
- ●进油联可配不同形式的溢流阀(直动式, 先导式) 。
- ●提供各种不同的阀芯功能：用于控制双作用油缸、单作用油缸、 油马达的阀芯，以及带浮动功能的阀芯。
- ●阀的操作力小，流量特性好。
- ●该多路阀可组合成 1 到 8 联。

Major Technical Data - 主要技术参数

Rated Flow Rate	30 L/min
Maximum Flow Rate	40 L/min
Minimum Flow Rate	10 L/min
Maximum Pressure at P port	210 bar
Maximum Pressure at A/B port	210 bar
Maximum Pressure at T port	25 bar
Internal Leakage （ at 70 bar） A/B to T	15-20 CC/min
Internal Leakage （at 70 bar） A/B to T With P.O. check	2-5 CC/min
Spool Stroke (1 / 2 position)	+7/-7 mm
With floating function (1 / 2 and F position)	+7/-7 -10 mm
Solenoid can be either 12 VDC or 24 VDC，corresponding current is 0- 1.5 or 0 - 0.75 Amp.	

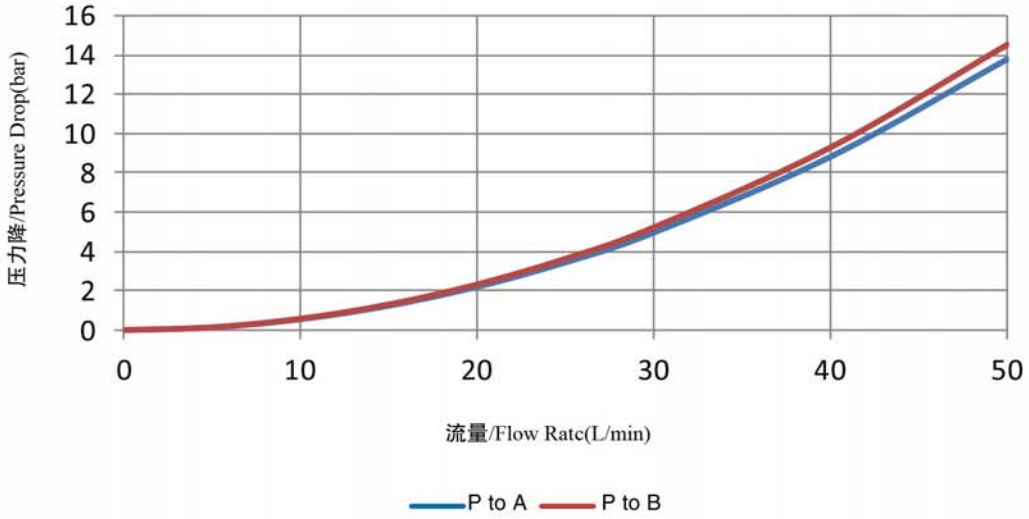
额定流量	30 L/min
最大流量	40 L/min
最小流量	10 L/min
P 口最大压力	210 bar
A/B 口最大压力	210 bar
T 口最大压力	25 bar
内泄漏（ 70 bar ） A/B to T	15–20 CC/min
内泄漏（ 70 bar ） A/B to T 有液压锁	2–5 CC/min
阀芯行程 (位置1 / 2)	+7/–7 mm
带浮动的阀芯行程 (位置1 / 2 和 F 位)	+7/–7 –10 mm
驱动的电磁线圈电压是12VDC 或24VDC，与之相应的电流时 0– 1.5 或0 – 0.75 Amp.	

Performance Data - 性能参数

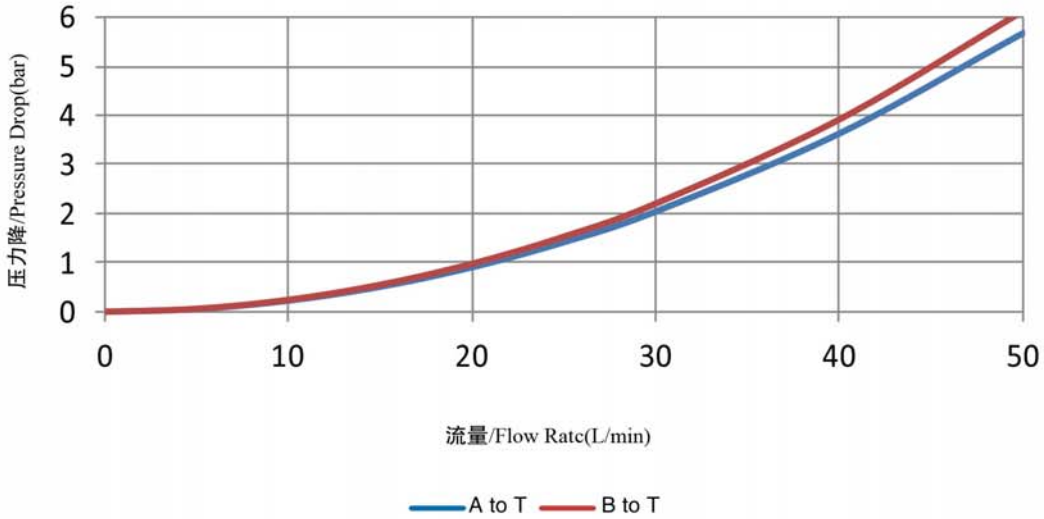


Performance Data - 性能参数

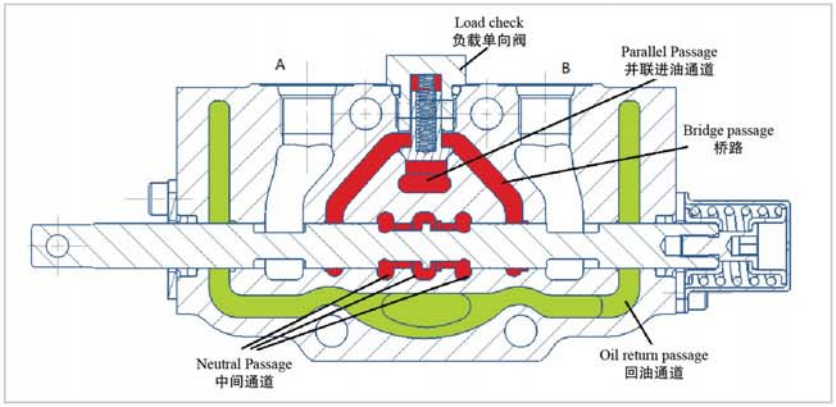
Inlet to Work Port (P to A/B)
进油口到工作油口的压力降

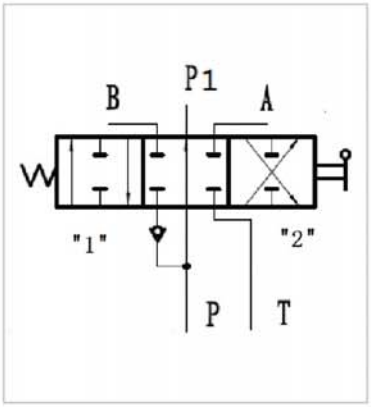


Pressure Drop (A/B to T)
工作油口到油箱压力降



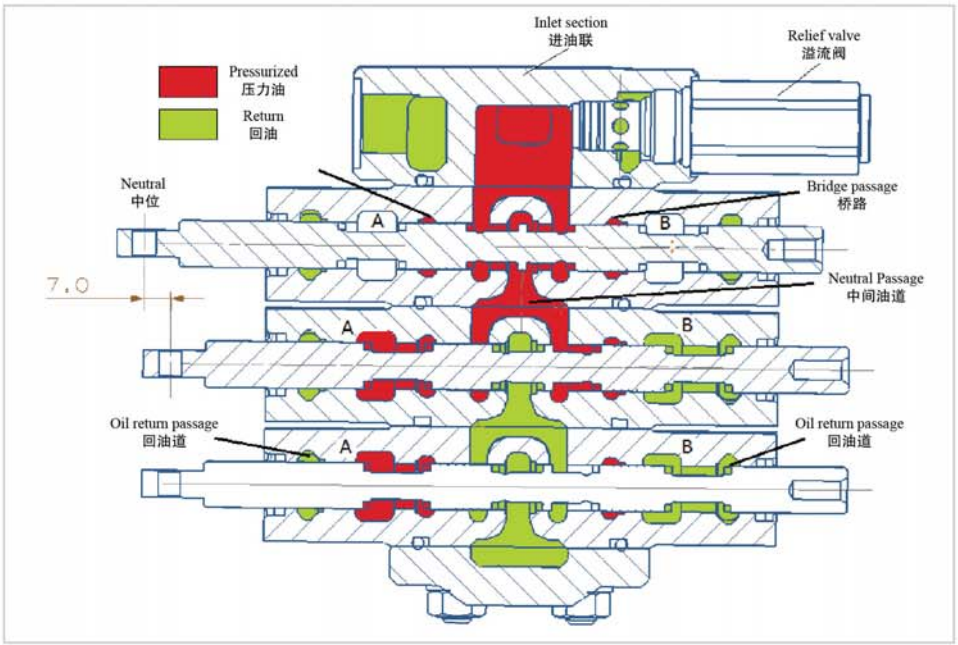
Operation Principle - 工作原理





GKV35 series sectional valve is an open centered 3 position 4 way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with small pressure drops. When one of the spool is moved to " 1 "or" 2 "position, the neutral passage is blocked. The flow from pump can only pass the parallel passage to load check valve. Then, passes through the bridge and spool opening to work port "A"or"B".

GKV35系列的多路阀是一种开式的3位4通阀。当阀芯都在中位时，从油泵提供的油液直接经阀芯和阀体之间的中位通道流到油箱，产生很小的压力损失。当其中一个阀芯移动到“左”或“右”位时，阀芯和阀体之间的中位通道被堵死，从油泵来的全部流量经并联油路进入负载单向阀，经阀口节流后进入该阀芯控制的 “B”口或“A”口。

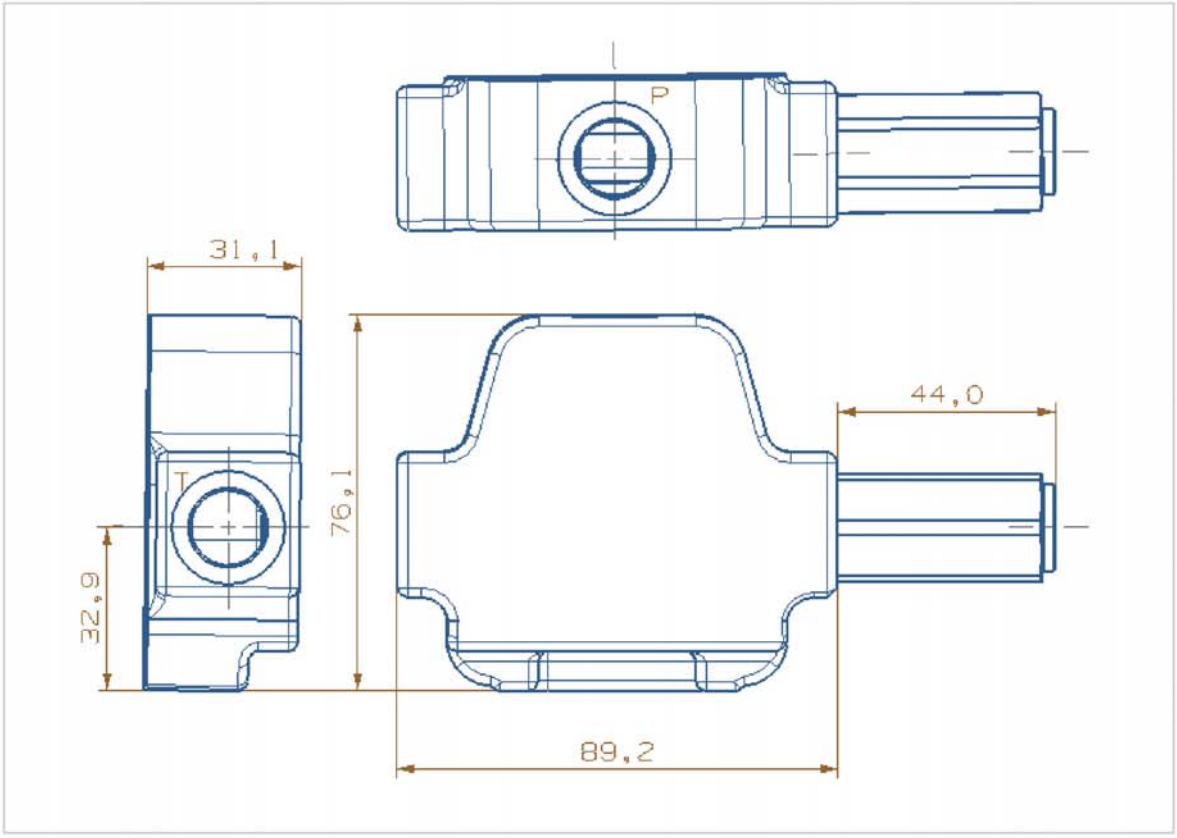


For multi-section valves, if one of the section's spool is in " 1 "or" 2 "position, then, there is no flow in its down stream section's neutral passage. The main throttle occurs on the valve opening between bridge passage and spool . The operator can control more than one spools, but the magnitude of the flow rate for each controlled section depends on the load.

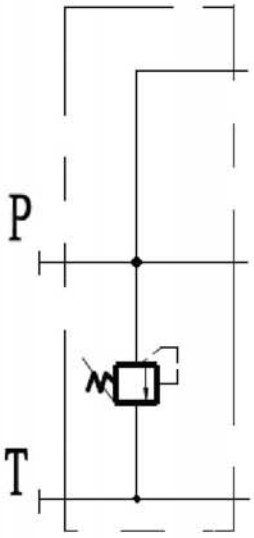
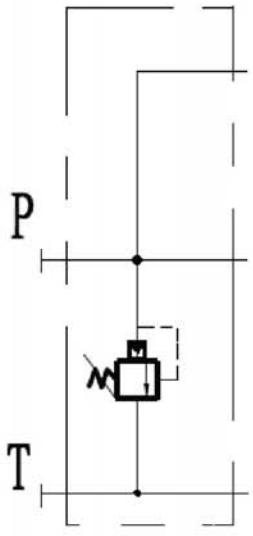
对于多联的片式阀，如果其中一联的阀芯在“左”或“右”位时，它的后一联的中位通道就没有流量。油液的主要节流发生在桥路通道和阀芯节流口。操作员可以同时控制几个阀芯，其控制元件的速度取决于负载的大小。

Inlet Section Dimension - 进油联几何尺寸

JS01 Inlet Section - 进油联

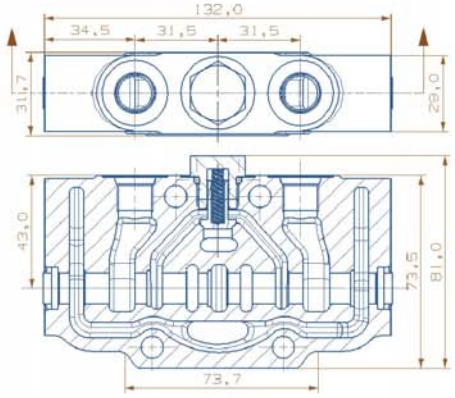


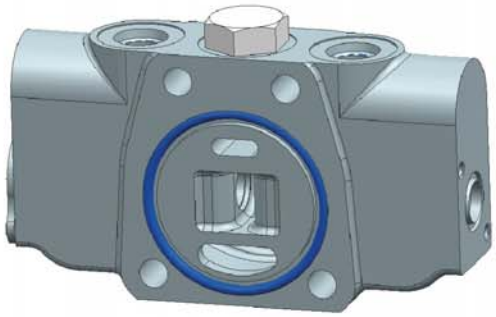
Inlet Section Hydraulic Schematics - 进油联液压图形符号

Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
JK01		Inlet section with direct acting relief valve 带直动式溢流阀的进油联	
JK02		Inlet section with two stage relief valve 带先导式溢流阀的进油联	

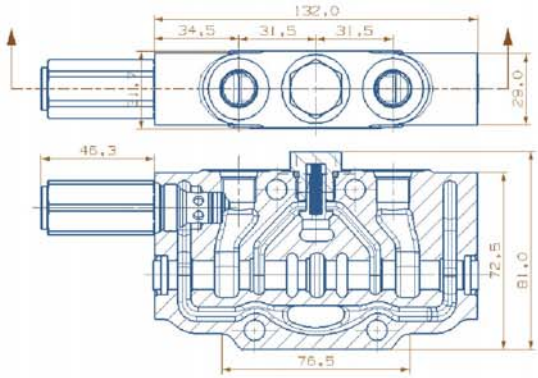
Typical Work Section Dimension - 典型工作联的基本几何尺寸

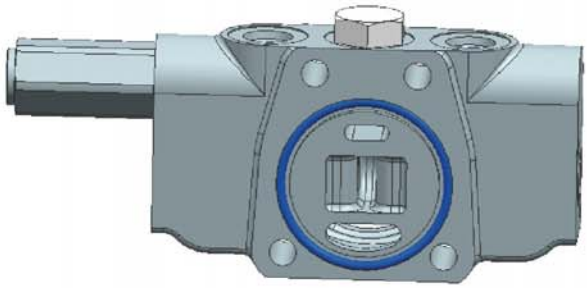
ZS01 Work Section - 工作联



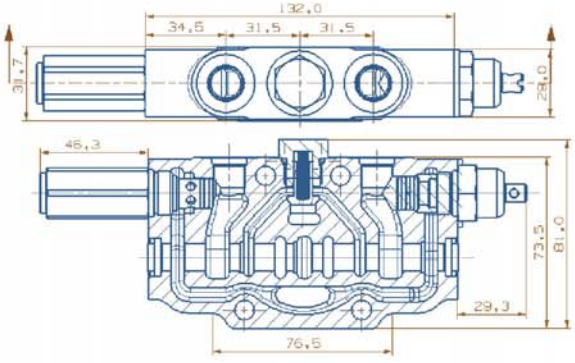


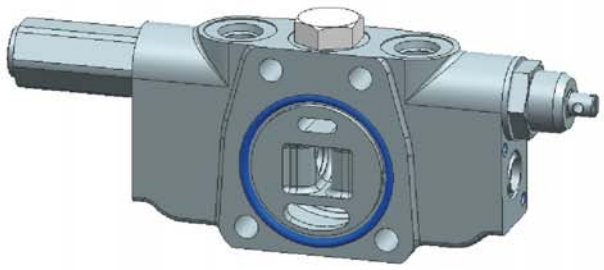
ZS04 Work Section - 工作联



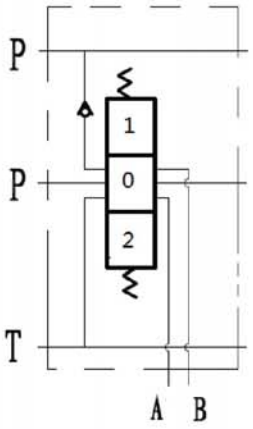
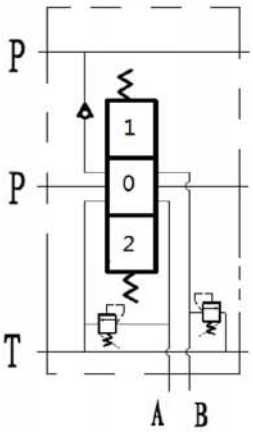
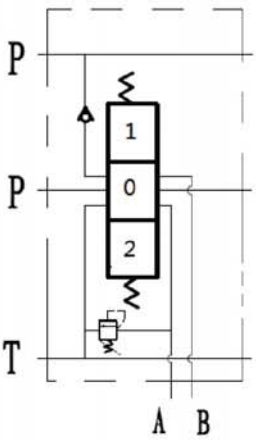


ZS06 Work Section - 工作联

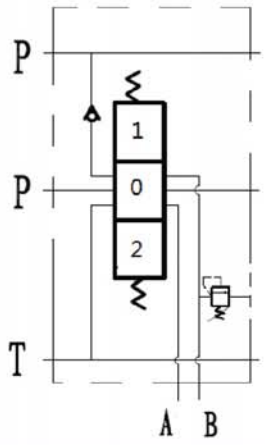
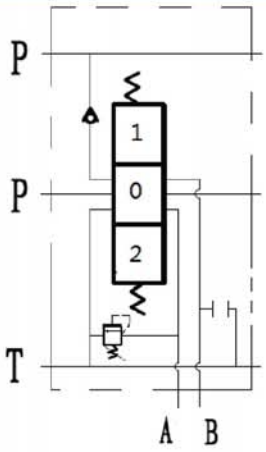
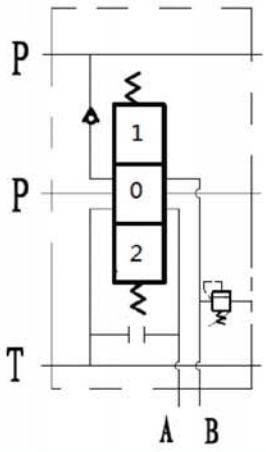




Work Section Hydraulic Schematics - 工作联液压图形符号

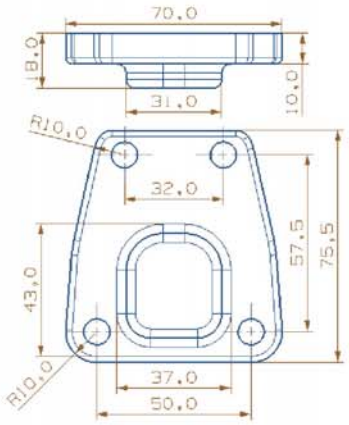
Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
ZS01		Basic section (no over load relief) A、B口均无过载阀	
ZS02		Overload relief valves on both A and B ports A、B口均有过载阀	
ZS03		Overload relief on A port A口有过载阀	

Work Section Hydraulic Schematics - 工作联液压图形符号

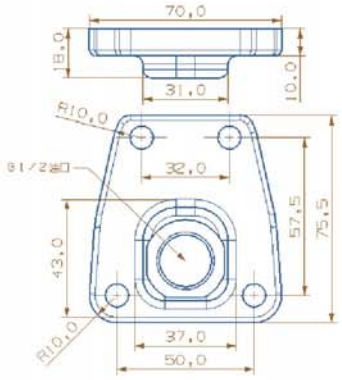
Code 代码	Hydraulic Schematics 图形符号	Main Function 主要功能	Notes 备注
ZSO4		Overload relief on B port B 口有过载保护阀	
ZSO5		Overload relief on A port Dump valve on B port A 口有过载保护阀，B 口有截止阀	Tractor and auxiliary valve application 常用于拖拉机等带辅助装置的机械
ZSO6		Overload relief on B port Dump valve on A port B 口有过载保护阀，A 口有截止阀	Tractor and auxiliary valve application 常用于拖拉机等带辅助装置的机械

End Section (End cap) Dimension - 回油联（后端盖）的基本几何尺寸

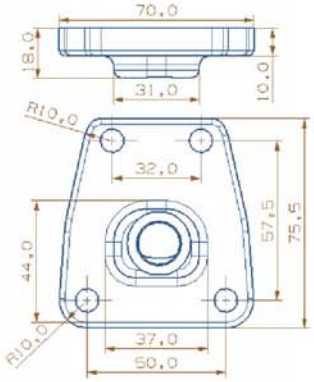
DK01 End Section - 回油联（后端盖）

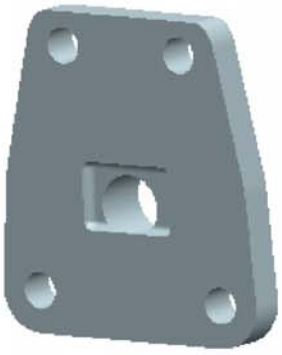


DK02 End Section - 回油联（后端盖）

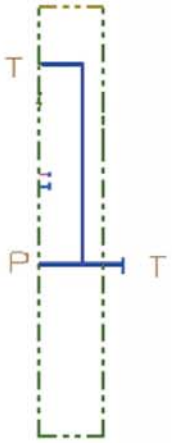
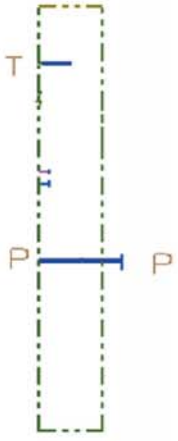


DK03 End Section - 回油联（后端盖）

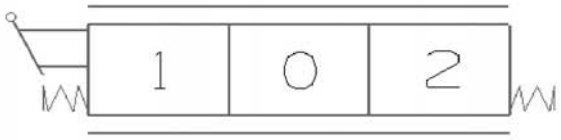
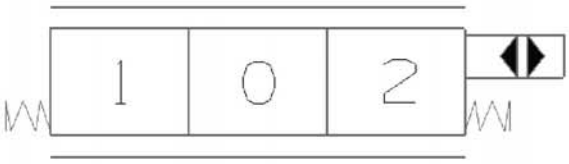
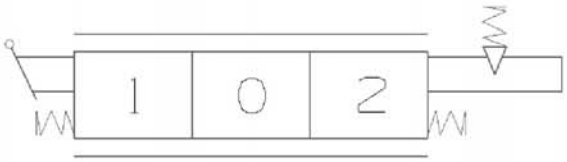
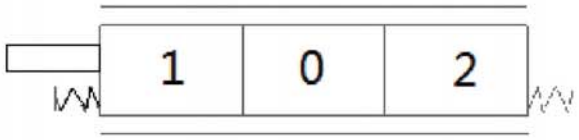




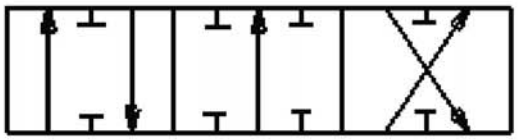
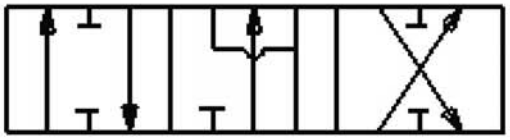
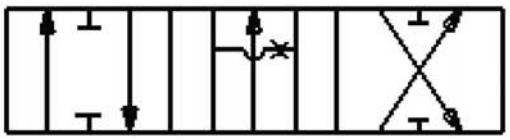
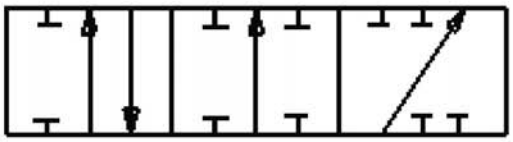
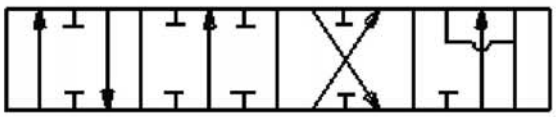
End Section's Hydraulic Schematics - 回油联（后端盖）的液压图形符号

Code 代码	Hydraulic Schematics 液压图形符号	Main Function 主要功能	Notes 备注
DKO1		End section without T port 油液经后端盖再经进油联回油箱	
DKO2		End section with T port 油液经后端盖回油箱	
DKO3		End section with power beyond port 动力外接 从进油联回油	Tractor applications 常用于拖拉机

Work Section Drive Styles - 工作联的驱动方式

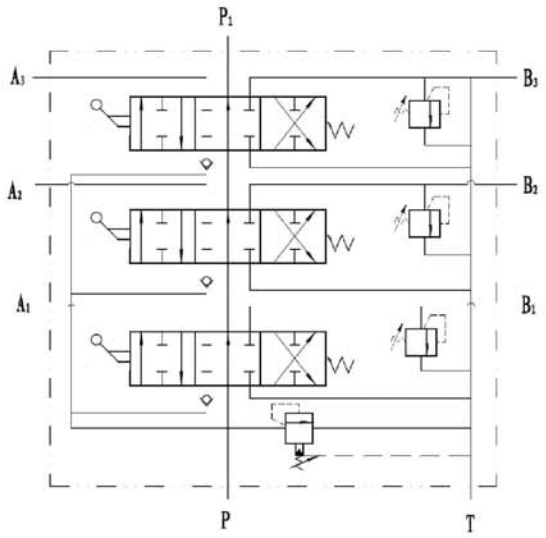
Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能
KQ1		Standard manually controlled 标准手动
KQ2		Hydraulic remote 液控
KQ3		Manually controlled with mechanical detent 手动带机械定位
KQ4		Manually controlled with 4th position floating and detent 手动，第 4 位浮动带机械定位
KQ5		Electrical actuated（on/off） 标准拉线

Typical Spool Functions - 典型滑阀机能

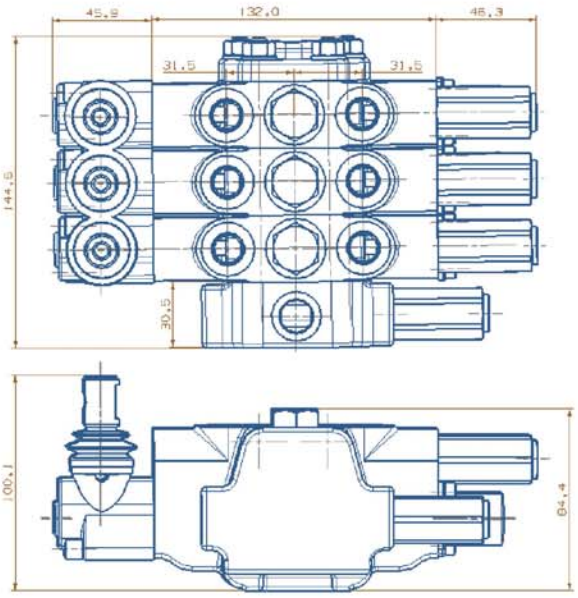
Drive Style Code 驱动方式代码	Hydraulic Schematics 液压图形符号	Function 功能	Notes 备注
FG1		3 position 4 way At neutral: P,T,A,B are all blocked 3位4通 中位P,T,A,B各不相通	Double acting cylinder applications 常用于控制双作用油缸
FG2		3 position 4 way At neutral: P blocked,T,A, Bconnected 3位4通 中位P不通，T，A，B相通	Hydraulic motor applications 常用于控制液压马达
FG3		3 position 4 way At neutral: P,A,B and T all connected 3位4通 中位P，A，B，均与T相通	Hydraulic motor applications 常用于控制液压马达
FG4		3 position 3 way At neutral: P,T,A,B all blocked 3位3通 中位P，T，A，B各不相通	Single acting cylinder applications 常用于控制单作用油缸
FG5		4 position 4 way At neutral: P,T,A, and B are all blocked 4th position floating 4位4通 中位P，T，A，B各不相通 第4位浮动	Double acting cylinder applications 常用于控制双作用油缸
FG6		4 position 4 way At neutral: P blocked,T,A and B are connected 4th position floating 4位4通 中位P不通，T，A，B相通 第4位浮动	Double acting cylinder or hydraulic motor applications 常用于控制双作用油缸或液压马达

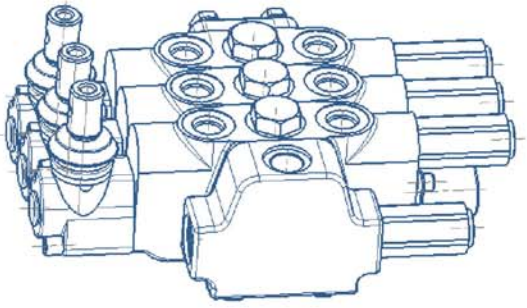
Application Example - 运用实例

Example Of Manually Controlled Sectional Valve - 手动控制实例

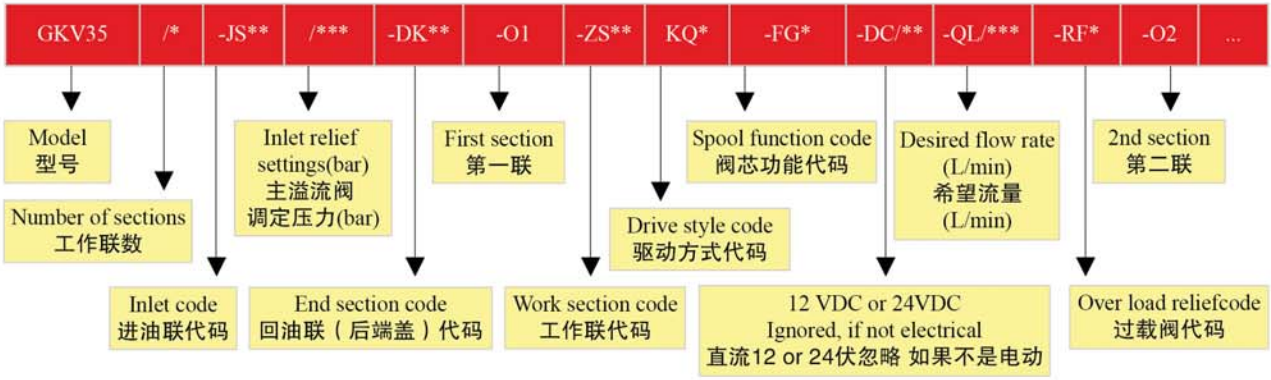


Three Section Valve Dimension - 3联装外形图

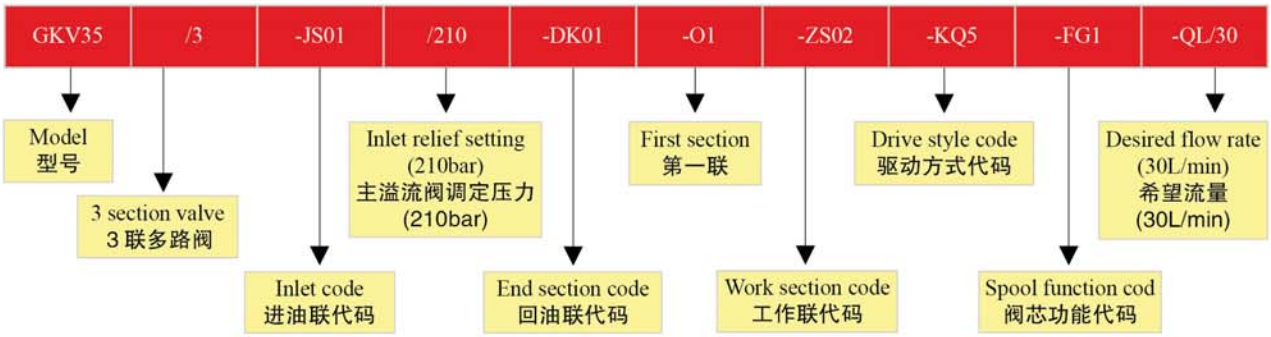




Ordering Code - 定购代码



Ordering example - 定购实例



Notes

Ordered section valve is a three sectional valve. Inlet relief valve setting pressure is 210 bar. There is no return port on the end section. The first section has two load relief valves on it's a/B ports. The section is droved by wire. The spool function is a "O' type. The desired flow for the 30L/min. The overload relief is with anti-cavitation function. The second section is also droved by wire. There is no overload relief on either A or B port. The spool function is"Y"type, The desired flow is 30L/min. The third section is droved by hydraulic remote. No overload relief on either "A"or"B"port. Spool function is"H"type, Desires 30L/min flow。

订购实例说明

所选多路阀位ZS系列，共三联，进油联溢流阀调定压力210 bar, 后端盖不回油（回油从进油联）。第一联“A/B”口均有过载保护阀，拉线驱动，滑阀机能为“O”型,要求第一联提供30L/min流量，过载保护阀为带吸油功能。第二联为拉线驱动，“A”和“B”口油路均无过载保护阀，滑阀机能为“Y”型，要求提供30L/min流量。第三联为液动驱动，“A”和“B”口油路均无过载保护阀，滑阀机能为“H”型，要求提供30L/min流量。

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