PV16

Features 产品特点

- Load-independent flow control
  与负载无关的流量分配系统
- Compact directional valve with low pressure losses
  节能，结构紧凑
- Interchangeable spools
  可互换阀芯
- Wide range of auxiliary valves on the ports A & B
  A - B 油口可有多种辅助阀可选
- Availability of manual, hydraulic, electrohydraulic actuations
  具有手动控制、液压先导控制、电液比例控制

Technical Specification 技术参数

Number of sections 工作片数	1-12 1-12 联
Nominal flow 额定流量	100 L/min (Port A / B with pressure compensator) 125 L/min (Port A / B without pressure compensator) 100 L/min (A / B 口带压力补偿) 125 L/min (A / B 口不带压力补偿)
Operating pressure 最高工作压力	350 bar
Parallel spool stroke 阀芯行程	7 + 7 mm
Spool pitch 阀片间距	48 mm
Spool diameter 阀芯直径	18 mm

Hydraulic Standard Specification 工作介质标准参数

Hydraulic fluid 工作介质	Mineral Oil HL, HLP (DIN 51524) 符合 DIN 51524 规定的矿物油 (HL 和 HLP)
Fluid temperature range 工作油温范围	-20ÁC +80ÁC
Fluid viscosity range 工作介质粘度范围	10~380 cst
Max contamination level 工作介质清洁度等级	9 (NAS 1638) - 20/18/15 (ISO 4406:1999)
Recommended filtration 过滤精度	ß10 > 75 (ISO 16889:2008)

Applications 典型应用领域

- Cranes and aerial platforms, agricultural machines, drilling rigs
  起重机和高空作业平台，农业机械，旋挖钻

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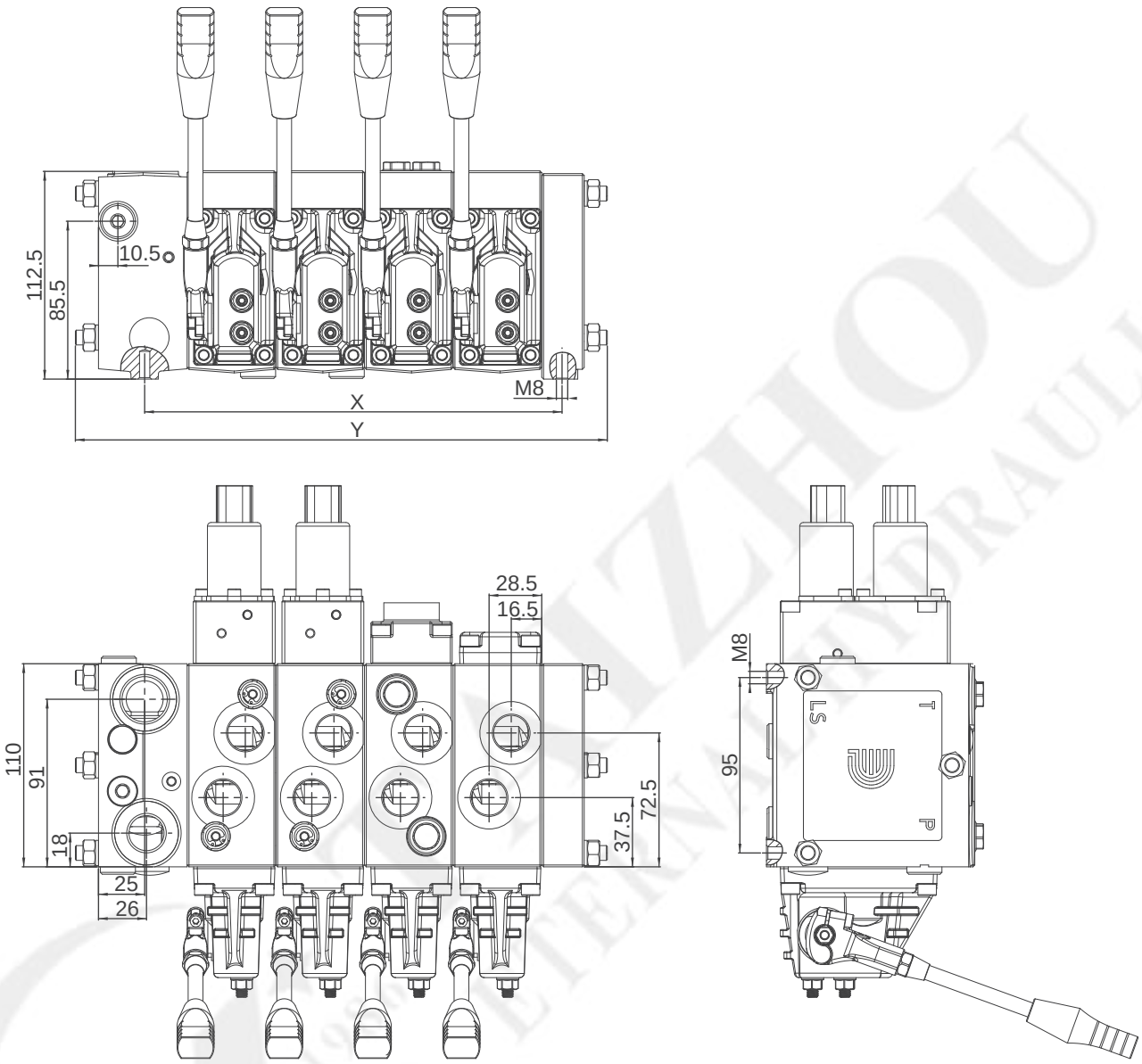
Dimensions 外形尺寸



Sections 工作片数	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	82	130	178	226	274	322	370	418	466	514	562	610
Y (mm)	140	189	238	287	336	385	434	483	527	576	622	670

Ports 油口	Inlet (P)	Ports (A - B)	Outlet (T)	Hydraulic Pilot (a - b)
BSP Thread (ISO 1179-1)	G 1/2 G 3/4	G 1/2	G 3/4	G 1/4
UN-UNF Thread (ISO 11926-1)	7/8-14UNF 1-1/16-12UNF	7/8-14UNF	1-1/16-12UNF	9/16-18UNF

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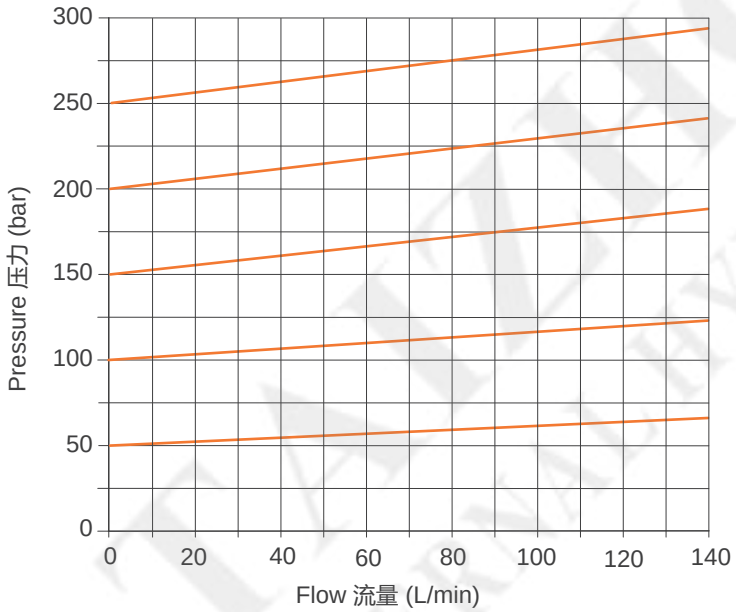
Typical Curves 曲线特性

(Inlet) LS pressure relief valve characteristics:
进油联 LS 溢流阀特性:

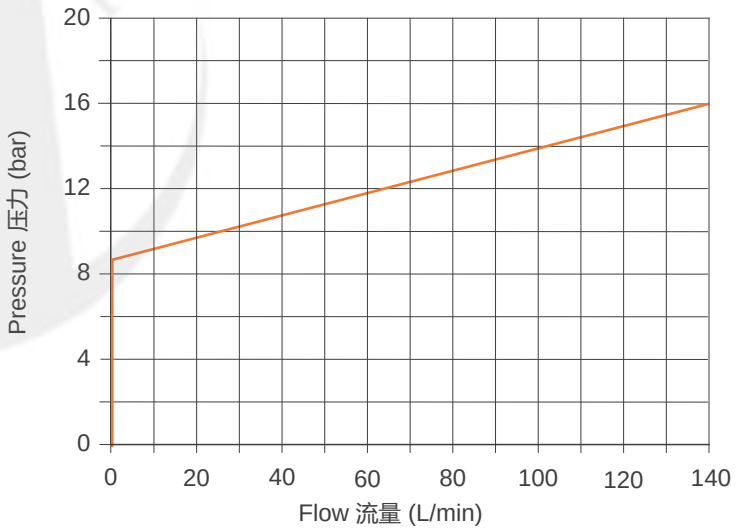
Setting range 压力设定范围 (@15 L/min)

- 30 to 350 bar, with castiron end plate
  30 到 350 bar，带铸铁尾盖板
- 30 to 300 bar, with aluminum end plate
  30 到 300 bar，带铸铝尾盖板

LS pressure relief valve characteristics
LS 溢流阀特性



Neutral flow pressure in open centre (P-T)
开中心（用于定量泵），在初始状态下的压力流量特性（P-T）



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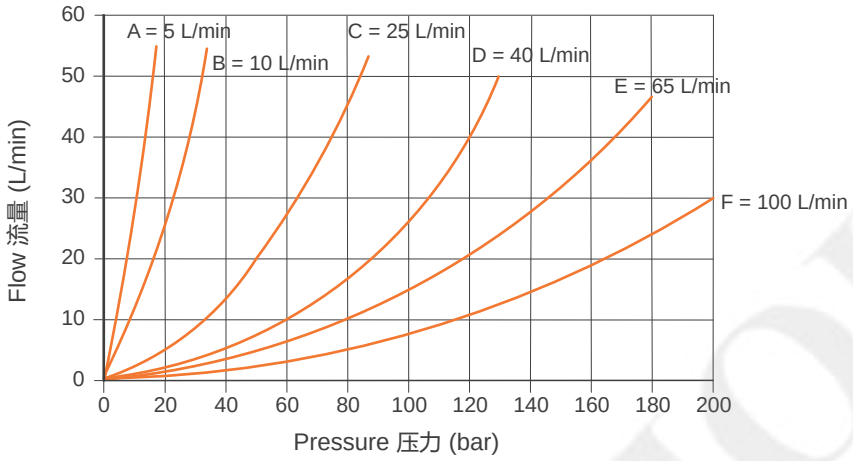
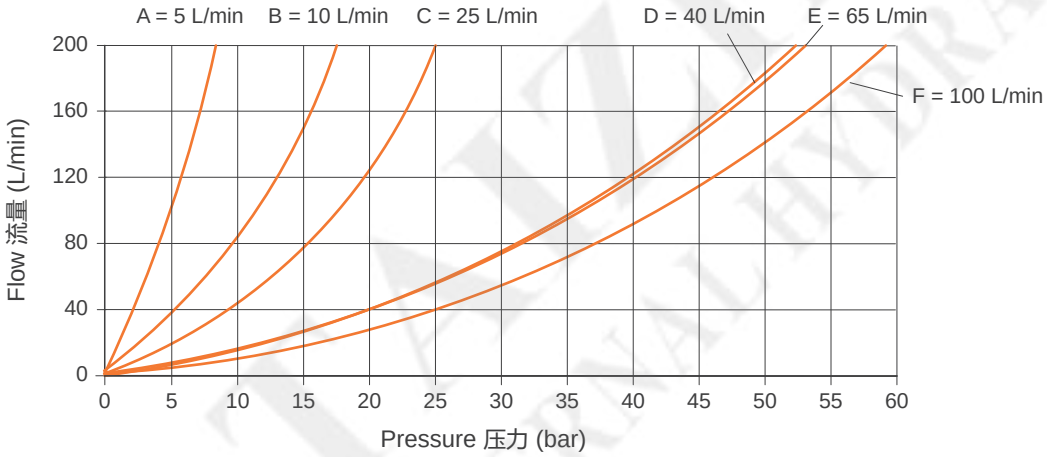
Pressure drop at max. main spool travel (A / B to T)
主阀芯最大行程时的压降（A / B 到 T)

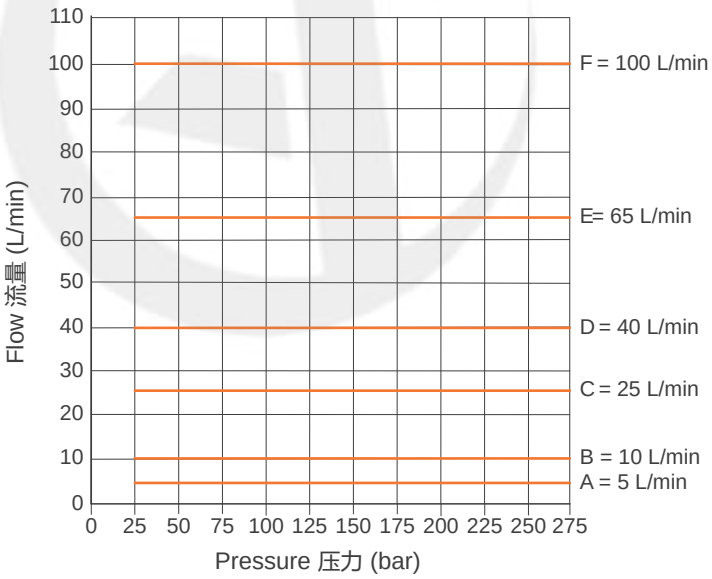


Pressure drop for open spool in neutral position (A / B to T)
开式阀芯在中位时的压降（A / B 到 T)

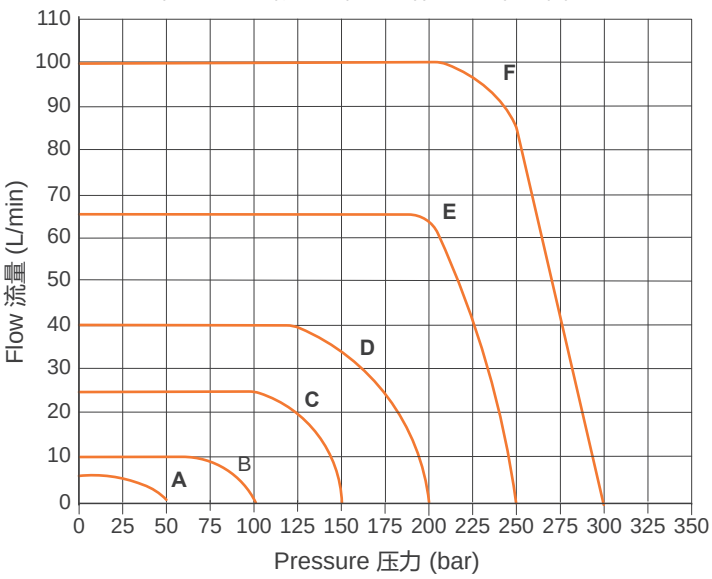


Remarks 备注:
The letters A, B, C, D, E, F denote spool types, represents different spool flow.
字母 A、B 、C、D、E、F 表示阀芯类型，代表不同的阀芯流量。具体参数请参照阀芯的选型表。

Load independent from fluid flow (Pressure compensated)
带压力补偿器，流量与负载无关



With pressure relief valve & pressure compensated
for LS A/B characteristics
带 LS A / B 限压阀和压力补偿器的性能曲线



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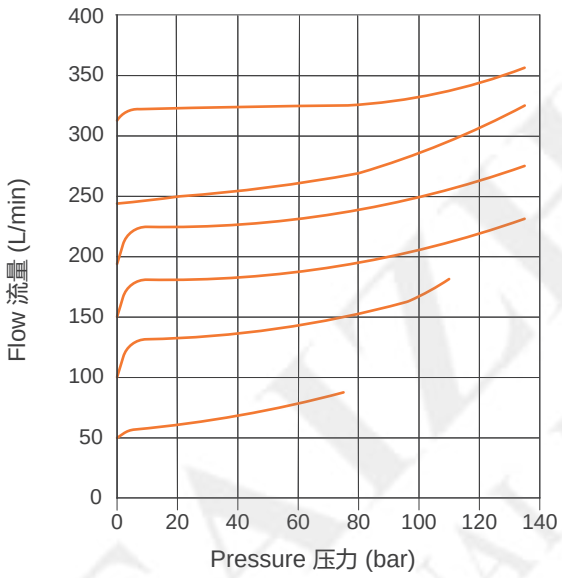
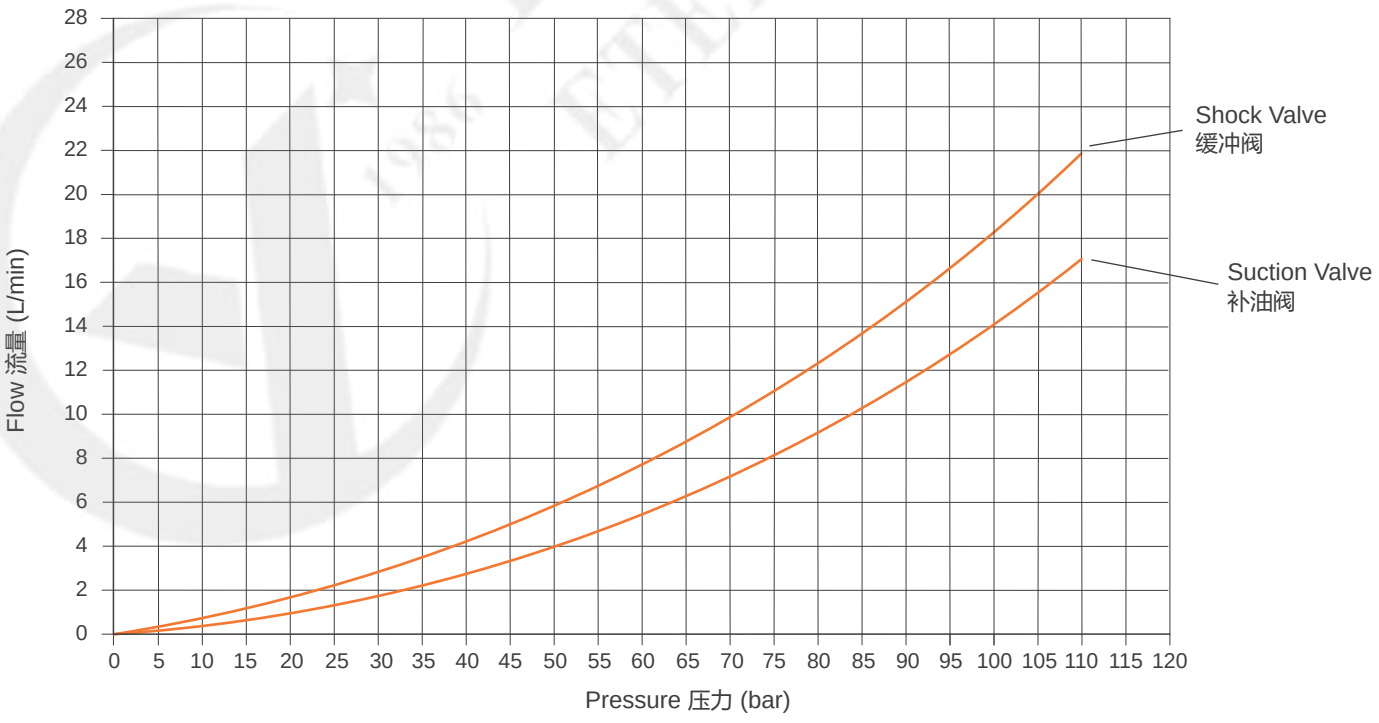
Shock Valve And Suction Valve 缓冲阀和补油阀

The shock valve is setting at oil flow of 10 L/min, it designed to absorb shock effects. Consequently, it should not be used as a pressure relief valve.
If the working function requires the use of a pressure relief valve,a working section with built-in LSA/B pressure limiting valve should be used.
缓冲阀压力设定在 10 L/min，缓冲阀用于吸收系统冲击，因而不能用作溢流阀。
如果系统需要用到溢流功能，可选内置 LS A / B 限压阀的工作片来达到溢流要求。

Characteristics of Shock Valve
缓冲阀性能曲线



Characteristics of Suction Valve
补油阀性能曲线



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Ordering Codes Ω ϕ ˆ Æ

PV16/12 - OP009 - MB007 PA*100 PB*100 SP01A AL01 AH01 - EP01

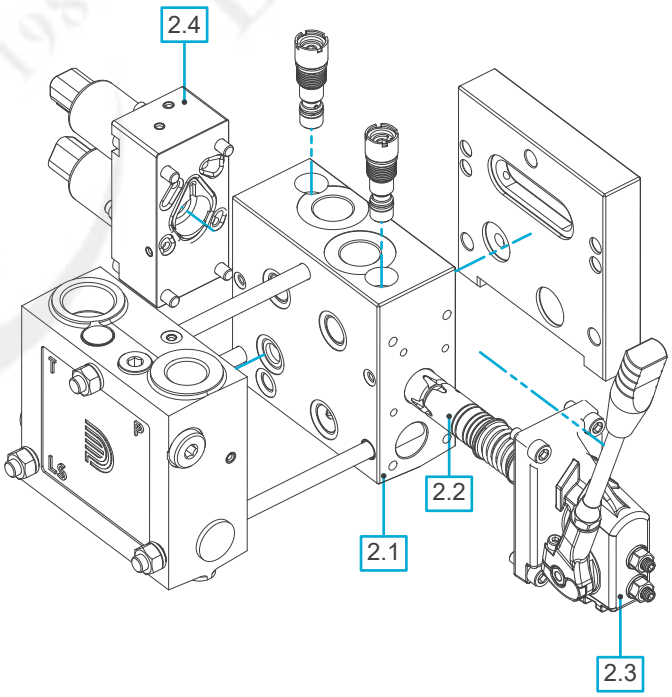
Product Type
产品类别

Number of Sections
工作联数

1. Inlet Section Selections
进油联配置
   - OP: Open centre for pumps with fixed displacement
     开中心，用于定量泵
   - CP: Closed centre for pumps with variable displacement
     闭中心，用于变量泵

2. Working Section Selections
工作联配置
   - 2.1 - MA: Working section without LS A/B pressure relief valve and shock valve
     工作联不带 LS A / B 溢流阀和缓冲阀
     MB: Working section without LS A/B pressure relief valve, with shock valve
     工作联不带 LS A / B 溢流阀，带缓冲阀
     MC: Working section with LS A/B pressure relief valve, without shock valve
     工作联带 LS A / B 溢流阀，不带缓冲阀
     MD: Working section with LS A/B pressure relief valve and shock valve
     工作联带 LS A / B 溢流阀和带缓冲阀
   - 2.2 - SP01A: Spool type and required flow 阀芯类型和要求流量
   - 2.3 - AL01: Mechanical actuation 手动控制
   - 2.4 - RM: Cover for mechanical actuation 手动控制端盖
     AH: Hydraulic actuation 液压控制
     EH: Electrohydraulic actuation 电液比例控制

3. Outlet Section Selections
回油联配置
   - EP01: End plate types
     回油片类型



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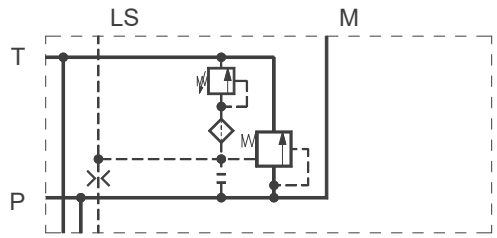
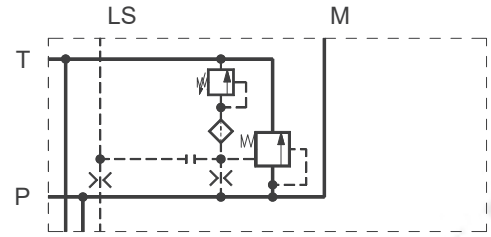
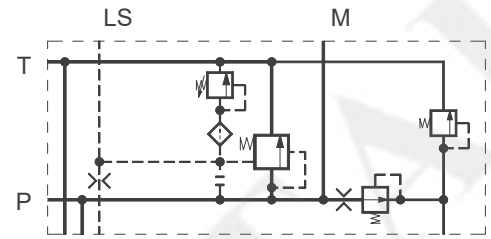
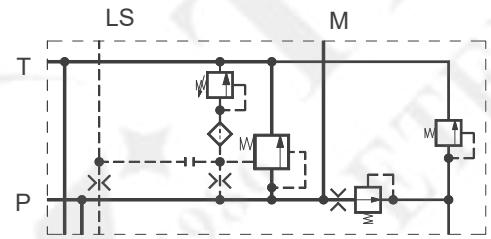
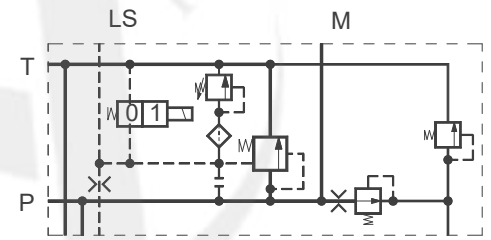
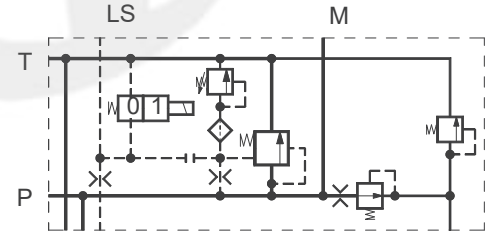
1. Inlet Arrangement 进油联配置

Inlet Arrangement and Code
进油联配置和代码

Code 型号	Symbol 液压符号	Description 描述	Ports 油口
OP001		Open centre for pumps with fixed displacement. For purely mach-anically actuated valve groups. 开中心，用于定量泵系统，仅用于纯机械驱动阀组	P = G1/2 T = G3/4
OP002			P = 7/8-14 T = 1-1/16-12
OP003			P = G3/4 T = G3/4
OP004			P = 1-1/16-12 T = 1-1/16-12
CP005		Closed centre for pumps with variable displacement. For purely machanically actuated valve groups. 闭中心，用于变量泵系统，仅用于纯机械驱动阀组	P = G1/2 T = G3/4
CP006			P = 7/8-14 T = 1-1/16-12
CP007			P = G3/4 T = G3/4
CP008			P = 1-1/16-12 T = 1-1/16-12
OP009		Open centre for pumps with fixed displacement. With pilot oil supply for electrohydraulic actuated valves. 开中心，用于定量泵系统，提供电控模块的先导油源	P = G1/2 T = G3/4
OP010			P = 7/8-14 T = 1-1/16-12
OP011			P = G3/4 T = G3/4
OP012			P = 1-1/16-12 T = 1-1/16-12
CP013		Closed centre for pumps with variable displacement. With pilot oil supply for electrohydraulic actuated valves. 闭中心，用于变量泵系统，提供电控模块的先导油源	P = G1/2 T = G3/4
CP014			P = 7/8-14 T = 1-1/16-12
CP015			P = G3/4 T = G3/4
CP016			P = 1-1/16-12 T = 1-1/16-12
OP017		Open centre for pumps with fixed displacement. With pilot oil supply for electrohydraulic actuated valves. Connection for electrical LS unloading valve. 开中心，用于定量泵系统，提供电控模块的先导油源，可连接电控 LS 卸荷阀	P = G1/2 T = G3/4
OP018			P = 7/8-14 T = 1-1/16-12
OP019			P = G3/4 T = G3/4
OP020			P = 1-1/16-12 T = 1-1/16-12
CP021		Closed centre for pumps with variable displacement. With pilot oil supply for electrohydraulic actuated valves. Connection for electrical LS unloading valve. 闭中心，用于变量泵系统，提供电控模块的先导油源，可连接电控 LS 卸荷阀	P = G1/2 T = G3/4
CP022			P = 7/8-14 T = 1-1/16-12
CP023			P = G3/4 T = G3/4
CP024			P = 1-1/16-12 T = 1-1/16-12

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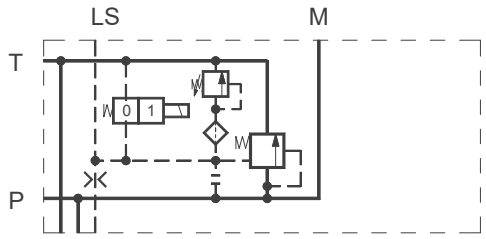
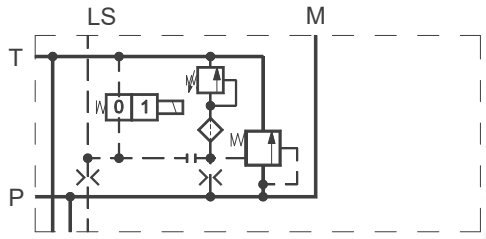
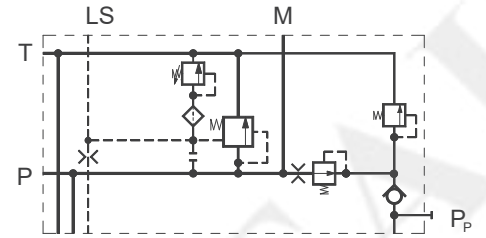
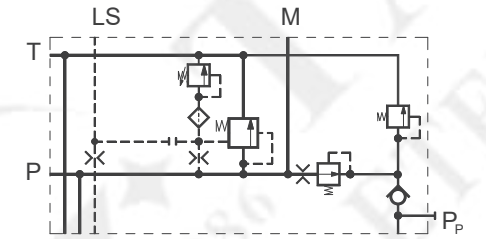
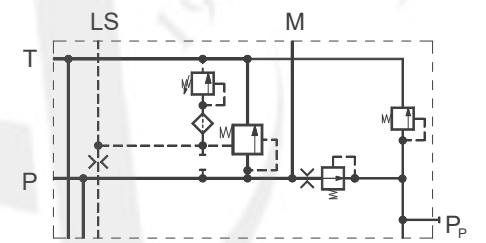
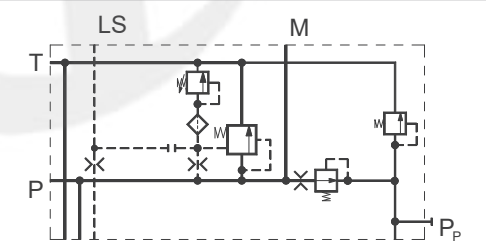
Inlet Arrangement and Code
进油联配置和代码

Code 型号	Symbol 液压符号	Description 描述	Ports 油口
OP025		Open centre for pumps with fixed displacement. For purely mach-anically actuated valve groups. Connection for electrical LS unloading valve. 开中心，用于定量泵系统，仅用于纯机械驱动阀组， 可连接电控 LS 卸荷阀	P = G1/2 T = G3/4
OP026			P = 7/8-14 T = 1-1/16-12
OP027			P = G3/4 T = G3/4
OP028			P = 1-1/16-12 T = 1-1/16-12
CP029		Closed centre for pumps with variable displacement. For purely machanically actuated valve groups. Connection for electrical LS unloading valve. 闭中心，用于变量泵系统，仅用于纯机械驱动阀组，可连接电控 LS 卸荷阀	P = G1/2 T = G3/4
CP030			P = 7/8-14 T = 1-1/16-12
CP031			P = G3/4 T = G3/4
CP032			P = 1-1/16-12 T = 1-1/16-12
OP033		Open centre for pumps with fixed displacement. With pilot oil supply for electrohydraulic actuation and connection for pilot oil pressure. (With Check Valve) 开中心，用于定量泵系统，提供电控模块的先导油源，并有先导油源的输出油口（带单向阀）	P = G1/2 T = G3/4
OP034			P = 7/8-14 T = 1-1/16-12
OP035			P = G3/4 T = G3/4
OP036			P = 1-1/16-12 T = 1-1/16-12
CP037		Closed centre for pumps with variable displacement. With pilot oil supply for electrohydraulic actuation and connection for pilot oil pressure. (With Check Valve) 闭中心，用于变量泵系统，提供电控模块的先导油源，并有先导油源的输出油口（带单向阀）	P = G1/2 T = G3/4
CP038			P = 7/8-14 T = 1-1/16-12
CP039			P = G3/4 T = G3/4
CP040			P = 1-1/16-12 T = 1-1/16-12
OP041		Open centre for pumps with fixed displacement. With pilot oil supply for electrohydraulic actuation and connection for pilot oil pressure. 开中心，用于定量泵系统，提供电控模块的先导油源，并有先导油源的输出油口	P = G1/2 T = G3/4
OP042			P = 7/8-14 T = 1-1/16-12
OP043			P = G3/4 T = G3/4
OP044			P = 1-1/16-12 T = 1-1/16-12
CP045		Closed centre for pumps with variable displacement. With pilot oil supply for electrohydraulic actuation and connection for pilot oil pressure. 闭中心，用于变量泵系统，提供电控模块的先导油源，并有先导油源的输出油口	P = G1/2 T = G3/4
CP046			P = 7/8-14 T = 1-1/16-12
CP047			P = G3/4 T = G3/4
CP048			P = 1-1/16-12 T = 1-1/16-12

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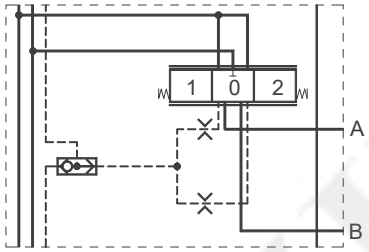
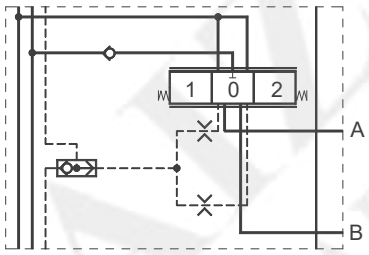
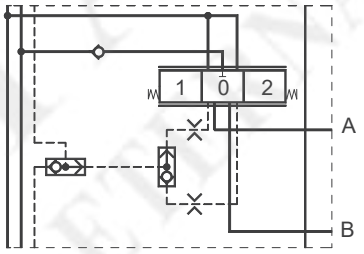
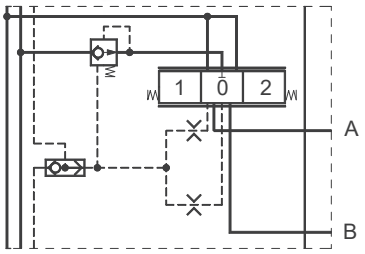
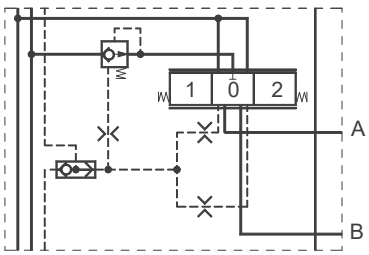
2. Working Section Arrangement 工作联配置

Working Section without LS A / B Pressure Relief Valve
工作联 A / B 油口不带可调节 LS 溢流阀

Code 型号		Symbol 液压符号	Description 描述	Ports 油口 (A / B)
Without Shock and Anti-cavitation Valve A/B口不带缓冲阀	With Shock and Anti-cavitation Valve A/B口带缓冲阀			
MA001	MB001		Without load drop check valve and pressure compensator 无负载失效单向阀和压力补偿器	G1/2
MA002	MB002			7/8-14 UNF
MA003	MB003		Without load drop check valve 带负载失效单向阀	G1/2
MA004	MB004			7/8-14 UNF
MA005	MB005		With load drop check valve and LS A / B shuttle valve. (To be used with float position spools) 带负载失效单向阀及带 LS A / B 梭阀	G1/2
MA006	MB006			7/8-14 UNF
MA007	MB007		With non-damped compensator valve 带无阻尼补偿器阀	G1/2
MA008	MB008			7/8-14 UNF
MA009	MB009		With damped compensator valve 带阻尼补偿器阀	G1/2
MA010	MB010			7/8-14 UNF

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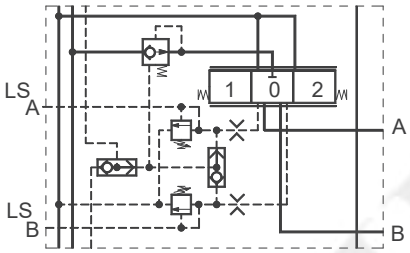
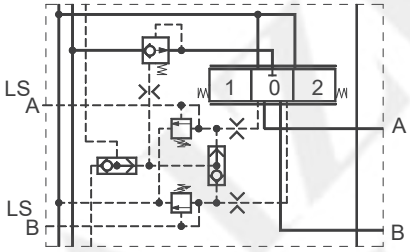
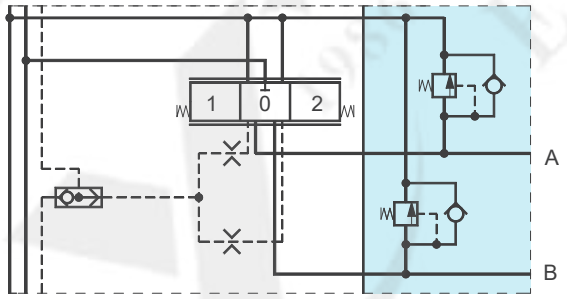
Working Section with LS A / B Pressure Relief Valve
工作联 A / B 油口带可调节 LS 溢流阀

Code 型号		Symbol 液压符号	Description 描述	Ports 油口 (A / B)
Without Shock and Anti-cavitation Valve A/B口不带缓冲阀	With Shock and Anti-cavitation Valve A/B口带缓冲阀			
MC001	MD001		With non-damped compensator valve (External LS connection port A / B) 带无阻尼补偿器及带外部 LS A / B 连接口	G1/2
MC002	MD002			7/8-14 UNF
MC003	MD003		With damped compensator valve (External LS connection port A / B) 带阻尼补偿器及带外部 LS A / B 连接口	G1/2
MC004	MD004			7/8-14 UNF

When ording facilities for shock valves A / B, it is necessary to specify the setting (example: 100 bar).
如工作联选择 A / B 油口带缓冲阀的选项，需要注明缓冲阀压力的设定参数 (例如：100 bar)。

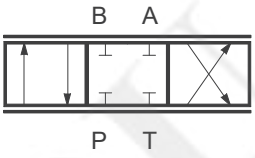
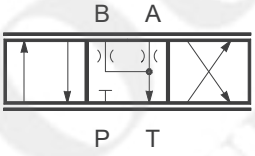
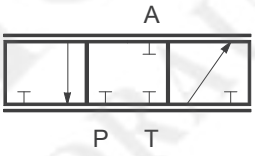
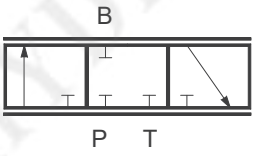
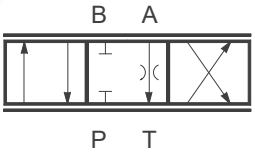
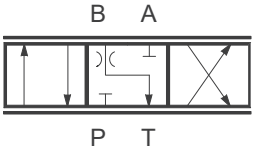
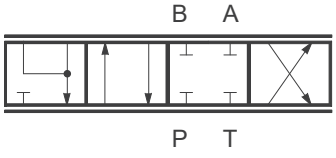
Symbol 符号	Order Example 下单示例
	MB007 PA*100 PB*100 Pressure setting of shock valve for Port A A 油口缓冲阀压力设定 Pressure setting of shock valve for Port B B 油口缓冲阀压力设定

Remarks:
This valve is not adjustable; factory setting is available from 30 to 350 bar.
The pressure setting of the shock and anti-cavitation valve must always be 20 bar higher than LS A / B setting in the same module.

备注:
缓冲阀不可调节，出厂设定压力范围 30 到 350 bar。
在同一工作联，缓冲阀的压力设定值必须高于 LS A / B 设定值约 20 bar。

PV16

Flow Control Spool Types
流量控制阀芯类型

Code 型号	Description 描述	Symbol 符号
SP01	Spool: 3 positions double acting, Closed neutral position 三位双作用阀芯，闭式中位	
SP02	Spool: 3 positions double acting, A / B to tank 三位双作用阀芯，中位 A - B 通 T	
SP03	Spool: 3 positions single acting on A 三位 A 油口单作用阀芯	
SP04	Spool: 3 positions single acting on B 三位 B 油口单作用阀芯	
SP05	Spool: 3 positions double acting, A to tank - B blocked 三位双作用阀芯，中位 A 通 T	
SP06	Spool: 3 positions double acting, A blocked - B to tank 三位双作用阀芯，中位 B 通 T	
SP07	Spool: 4 positions double acting with float in 4th position 四位双作用阀芯，第四位浮动	

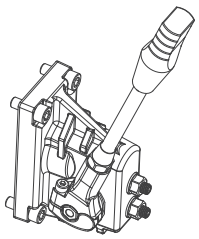
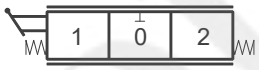
The control characteristic depends on the spool type.
According to the pump flow, there are following available spools:
控制特性取决于阀芯类型。根据泵的流量，可选择下列阀芯：

Code 型号	A	B	C	D	E	F	G
Flow 流量 (L/min)	5	10	25	40	65	100	130

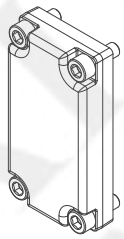
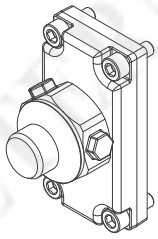
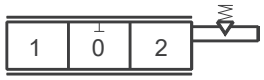
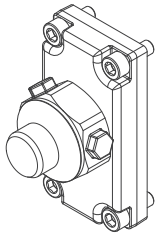
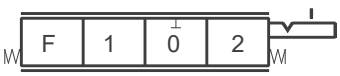
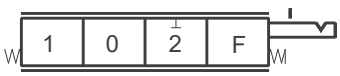
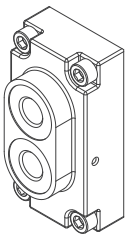
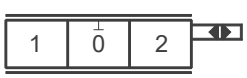
Order Example:
SP01A shown 3 positions double acting spool, closed neutral position, flow 5 L/min.
阀芯选型示例：
SP01A 表示三位双作用阀芯，闭式中位，流量 5 L/min。

PV16

In valve PV16, each working section have one mechanical actuation.
PV16 阀组每一个工作联都配备了手动控制端盖。

Code 型号	Description 描述	Configuration 配置	Symbol 符号
AL01	Spring centered, individual oil flow adjustment to ports A and B. 弹簧复位，可对 A / B 口流量单独进行调节		

Actuation Options:
以下选项为可选驱动方式：

Code 型号	Description 描述	Configuration 配置	Symbol 符号
RM01	Cover for mechanical actuation 机械驱动端盖		–
RM02	Friction detent cover 端盖摩擦定位		
RM03	Mechanical float position cover 端盖带机械浮动位置锁定		
RM04			
AH01	Hydraulic actuation 液控端盖 **G 1/4**		
AH02	Hydraulic actuation 液控端盖 **9/16-18 UNF**		

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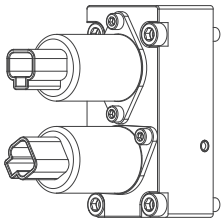
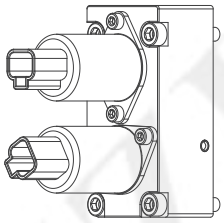
Code 型号	Description 描述	Configuration 配置	Symbol 符号
EH01	Electrohydraulic actuation 电液控制 **12V Deutsch connector**		
EH02	Electrohydraulic actuation 电液控制 **24V Deutsch connector**		
EH03	Electrohydraulic actuation 电液控制 **12V AMP connector**		
EH04	Electrohydraulic actuation 电液控制 **24V AMP connector**		

Technical Data for Hydraulic Actuation 液压驱动技术参数	
Main Spool Spring Control Pressure Range 阀芯弹簧控制压力范围	5 - 15 bar
Maximum Pilot Oil Pressure 最大先导油液压力	30 bar
The hydraulic remote control lever should be connected directly to the tank. 液压远程控制手柄应直接连接油箱。	

Technical Data for Electrohydraulic Actuation 电液比例驱动技术参数		
Supply Voltage 电源电压	12V DC	24V DC
Current Input 电流	0 - 1500 mA	0 - 750 mA
Resistance 电阻	4.75 Ω ± 5 %	20.8 Ω ± 5 %
Response time 响应时间	150 to 200 ms	
PWM frequency PWM 频率	100 to 400 Hz	
Pilot Oil Pressure Range 先导油压力范围	20 - 25 bar	
Temperature Range 温度范围	–20 °C to 80 °C	

PV16

3. End Plate Arrangement 尾联配置

The end plates are made of either aluminum or cast iron material. Cast iron can be able to withstand a higher pressure.
尾联材质可选择铸铁材质或者铸铝材质，铸铁材质能承受更高的压力。

Code 型号	Description 描述	Symbol 符号
EP01	Aluminum, no connections. Max. system pressure 300 bar. 铸铝材料，无外接油口，系统最高压力 300 bar	
EP02	Cast iron, no connections. Max. system pressure 350 bar. 铸铁材料，无外接油口，系统最高压力 350 bar	
EP03	Aluminum, with LX connections. Max. intermitted LX pressure 250 bar Max. system pressure 300 bar. 铸铝材料，带 LX 外接油口，系统最高压力300 bar， LX 连接口最大间歇压力 250 bar	
EP04	Cast iron, with LX connections. Max. intermitted LX pressure 350 bar. Max. system pressure 350 bar. 铸铁材料，带 LX 外接油口，系统最高压力350 bar， LX 连接口最大间歇压力 350 bar	

Lever kits must be ordered separately.
操纵杆需要单独订购。

Code 型号	Configuration 配置	Order Example 下单示例
HA-M8-135		HA-M8-135 Lever Type 操纵杆类型 Lever Thread 操纵杆螺纹 Lever Length 操纵杆长度 (mm)
HA-M8-150		
HA-M8-210		