Hanjiu Hydraulic

石家庄寒九科技有限公司

SHIJIAZHUANG HANJIU TECHNOLOGY CO.,LTD.

全液压转向器产品手册

Hydraulic Steering Unit

中国 河北 石家庄

Shijiazhuang, Hebei, China

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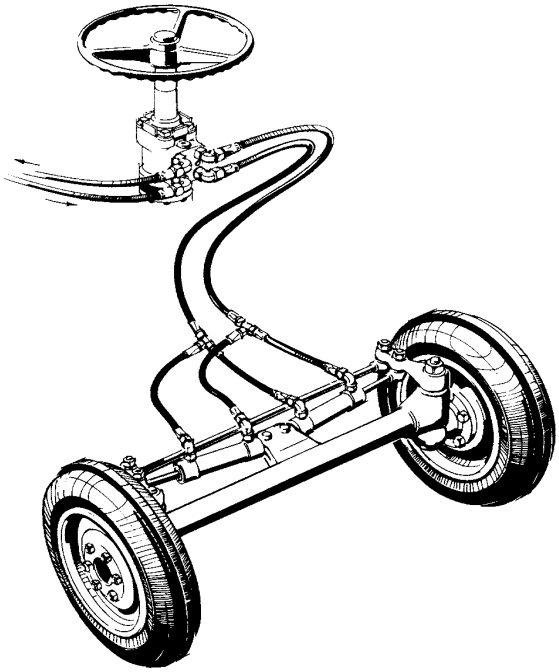


全液压转向器广泛用于工程车辆转向和船舶操舵。驾驶人员通过它可以用较小的操纵力，实现较大的转向力控制，并且在性能上安全、可靠，操纵上轻便、灵活。

BZZ1、BZZ2、BZZ3系列全液压转向器具有下列特点：

消除机械式连动装置，可降低主机成本，提供可靠轻便的结构；

操作灵活省力；

在发动机熄火时，可实现应急人力转向；

可用很小的力矩进行连续无级控制转动；

提供给控制回路以及主机尺寸广泛的选择面；

能和多种转向油泵及液压转向系统连接。

BZZ5系列负荷传感全液压转向器除具有上述特点外，还具备下述特点：

无论负荷压力大小、方向盘转速快慢，均能按转向油路要求，优先分配相应流量，保证转向可靠、灵敏、轻便；

油泵输出的流量，除向转向系统供给所需的流量外，剩余部分可供给辅助油路使用，从而消除转向油路供油过多而造成的功率损失，提高了系统效率。

Hydraulic steering control unit(SCU) is widely used both in the steering system of vehicles and the marine rudder. The operator can obtain bigger steering control force with less steering force, and its function is more safety and reliable, its operation is more smooth and flexible.BZZ1,BZZ2,BZZ3 series SCU offers the advantages as follows:

This kind of SCU series can help you reduce the machinery cost without mechanical linkage device, and can offer reliable and light structure.

This kind of SCU series can operate more flexible with light steering torque.

This kind of SCU series can offer emergent manual steering in case of engine failure.

This kind of SCU series can be steering at the continuous speed with less steering torque.

This kind of SCU series can offer various hydraulic system and different mounting choice.

This kind of SCU series can link various steering pump and hydraulic steering system.

In addition to the advantages mentioned above, BZZ5 series SCU has the features as follows:

BZZ5 series SCU can supply priority relative flow to ensure reliable , sensitive and flexible steering according to the requirement of hydraulic steering system, whether the load pressure is big or small, or the steering wheel rotates quick or slow.

In addition to the necessary flow supply to the steering system, the remaining flow out of the pump can be supplied to subsidiary flow system , so that the system can avoid the power loss caused by surplus flow out of the steering flow system, and the system efficiency can be increased.

BZZ 系列全液压转向器

BZZ Series Hydraulic Steering Control Units (SCU)

通用资料 Genera Description

BZZ 系列转向器的功能 BZZ Series Function	BZZ系列全液压转向器由一对旋转阀组和一对转定子啮合副组成。通过转向柱使转向器连接到车辆的方向盘上，当方向盘转动时，从转向系统供油泵来的油经旋转阀和转定子副流到油缸的左或右腔(取决于转动方向)。 转定子副排出的油与方向盘的转角成正比。如果从转向系统供油泵来的油太少，该转向器则可当手动泵看待。 BZZ series hydraulic steering unit is consisted of one pair of rotary valve and one pair of gerotor. Via the steering column, the steering unit links the steering wheel, when the steering wheel rotates, the oil flows out of the supply pump of the steering system , through the rotary valve and the gerotor , to the cylinder's port left or right (depend upon the rotation direction). The gerotor supplies the oil to the steering cylinder in proportion to the angular rotation of the steering wheel. If the oil flow out of the supply pump of the steering system is too small, the steering unit can work as the manual pump.
开芯系统 In open center system	释放方向盘，转向器中的旋转阀处于中位时，油泵和油箱之间是连通的。在中位开芯型转向系统中，一般使用定量油泵。 Release the steering wheel, the rotary valve stays in the neutral position, the pump and the tank is linked in open circuit. The constant pump is normally used in the open center steering system when the valve stays in the neutral position.
闭芯系统 In closed center system	释放方向盘，转向器中的旋转阀处于中位时，转向器的进油端是关闭的。在中位闭芯型转向系统中，一般使用变量油泵。 Release the steering wheel, the rotary valve stays in the neutral position,the input port is closed.the variable pump is normally used in the close center steering system when the valve stays in the neutral position.
对转向柱的配备要求 Technical requirement for steering column	转向柱的结构必须能保证不传递轴向负载到转向器的输入轴上，安装转向柱时应该使转向器在完成操纵动作以后，能自动回到中位位置。 The structure of the steering column must ensure not to transfer the axial load to the output shaft of the steering unit. While the steering column is mounted, the steering unit should be able to return to the neutral position after its steering operation.
转向柱上的操纵力 Steering torque of the steering column	在正常操纵条件下，动力单元的油泵供给足够的液压油，方向盘的最大输入扭矩不会超过5N·m，如果动力单元的供油泵不能供油或供油量太少，转向器将自动切换成手动泵，在手动转向(即人力转向)状态下，方向盘的输入扭矩将会明显大于5N·m，但最大输入扭矩请勿大于120N·m，否则将会导致转向器内部部分零件损坏。 Under the normal steering, the pump of the power unit supply enough oil , the max. torque of the steering wheel is no more than 5 N.m. If the pump fails to supply oil or supply insufficient oil, hydraulic steering unit will automatically change into manual steering.Under manual steering, the steering torque is obviously more than 5 N.m. However the max. torque cant be bigger than 120 N.m. or it will cause some damages inside the parts of steering unit.

BZZ 系列全液压转向器

BZZ Series Hydraulic Steering Control Units (SCU)

型号说明 Order Code

BZZ □ — E □ □ □ — □ □

其他要求 (见P4表格，LS油口特殊代码见P11表格)
Code for other requirements(see the table on Page 4; see the table of LS special port code on page 11)

油口代码（见P4、P11页表格）
Ports code (see the table on Page 4 and Page 11)

特征标识
Code for special characteristics(see the table on Page 4)

连接型式
Mounting Data

- A:长止口十字块连接 A:Long spigot, cross-block mounting
- B:SAE 渐开线花键连接 B:SAE involute spline mounting
- C:短止口十字块连接 C:Short spigot, cross-block mounting

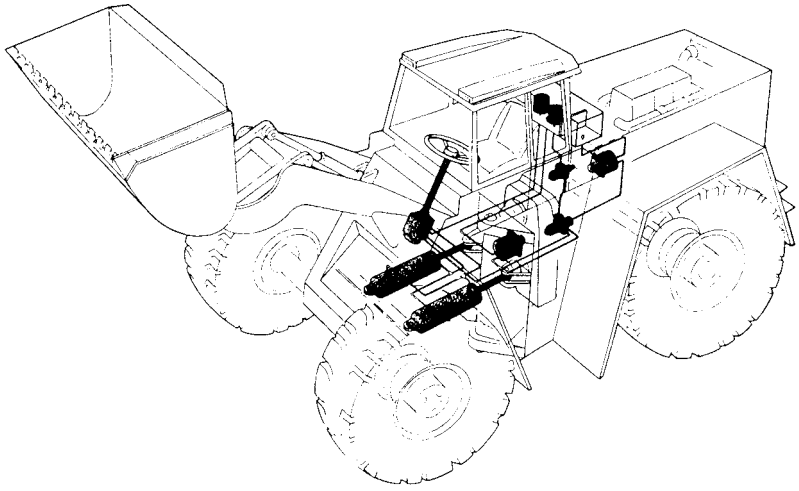
排量 Displacement

压力等级 Pressure grade 16MPa

功能符号
Function Code

- 1:开芯无反应型 1:Open center non-reaction
- 2:开芯有反应型 2:Open center reaction
- 3:闭芯无反应型 3:Closed center non-reaction
- 5:负荷传感型 5:Load sensing

摆线转阀式全液压转向器
Cycloid Rotary Valve Hydraulic Steering Units



BZZ 系列全液压转向器

BZZ Series Hydraulic Steering Control Units (SCU)

类别 Category	符号 Code	含义 Definition	备注 Remark	
特征标识 Characteristic Code	（缺省）（omit）	普通型 Common Type	适合各类转向系统，例如：拖拉机、装载机、压路机等。Fit various steering system, e.g. tractor, loader, and road roller, etc. mainly used in china.	
	D	输入扭矩：Input torque 1.6N·m～2.4 N·m	适合平坦路面的转向系统，例如：叉车。fit steering system of vehicles that driving on flat road , such as forklift.	
	C	输入扭矩：Input torque ≤1.6N·m		
	其他性能特征要求的标识（协议确定）Codes for the requirement of other performance characteristics (should be confirmed in an agreement)		例如：人力转向、终点感、噪音、回位性能等方面，或综合要求。e.g. manual steering, lower terminal steering feeling, noise and back-to-the-neutral-position function etc., or comprehensive requirement.	
油口代码 Ports Code	代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Valve Mounting V
	（缺省）（omit）	M20×1.5	M10	M12
	A	M18×1.5	M10	M12
	B	G1/2	M10	M10×1
	C	3/4-16UNF O-ring	3/8-16UNC	3/8-24UNF
	D	M20×1.5 O-ring	M10	M12
	E	M18×1.5 O-ring	M10	M12
	G	M22×1.5	M10	M12
	Q	M22×1.5 O-ring	M10	M12
	U	G1/2 O-ring	M10	M10×1
	M	3/4-16UNF O-ring	M10	M12
	I	3/4-16UNF O-ring	M10	M10
	N	3/4-16UNF O-ring	M10×1.25	M10
	R	P,T：M22×1.5 A,B：M18×1.5	M10	M12
	S	P,T：M22×1.5 O-ring A,B：M18×1.5 O-ring	M10	M12
其他要求 Other Requirements	主要指协议规定的外观、油漆颜色等方面，协议确定代码。Mainly refers to the appearance, paint color etc. specified by agreement; the code will be listed in the agreement.			

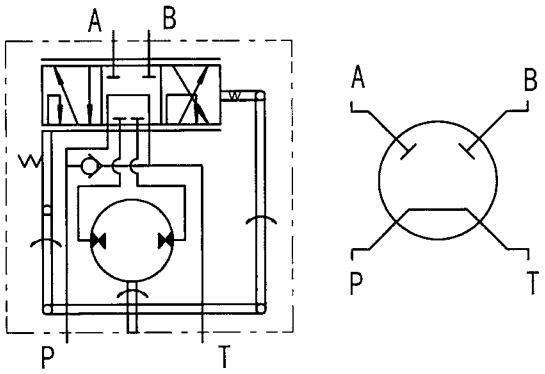
注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。

Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.

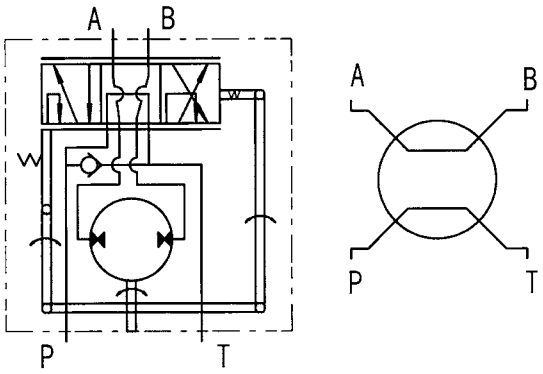
BZZ1、BZZ2、BZZ3 系列全液压转向器
BZZ1, BZZ2, BZZ3 Series Hydraulic Steering Control Units (SCU)

功能符号 Function Code

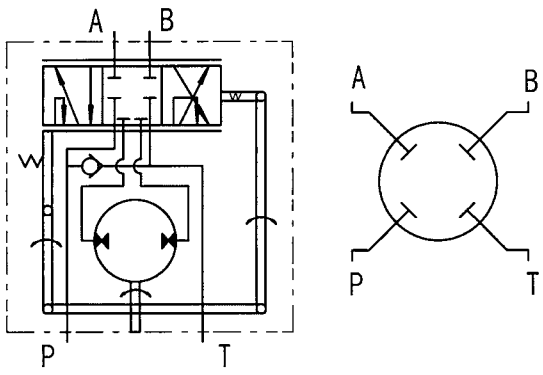
BZZ1
开芯无反应型
Open center non-reaction



BZZ2
开芯有反应型
Open center reaction



BZZ3
闭芯无反应型
Closed center non-reaction



BZZ1、BZZ2、BZZ3 系列全液压转向器
BZZ1, BZZ2, BZZ3 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

型 号 Type	排 量 Displacement (mL/r)	流 量 Flow (L/min)	最大入口压力 Max.input pressure (MPa)	最大连续背压 Max. cont. back pressure (MPa)	重 量 Weight (kg)
BZZ□–E50＊	50	4	16	2.5	4.72
BZZ□–E63＊	63	5			4.85
BZZ□–E80＊	80	6			5.00
BZZ□–E100＊	100	7.5			5.27
BZZ□–E125＊	125	9.5			5.43
BZZ□–E160＊	160	12			5.75
BZZ□–E200＊	200	15			6.08
BZZ□–E250＊	250	19			6.48
BZZ□–E280＊	280	21			6.78
BZZ□–E315＊	315	24			7.13
BZZ□–E400＊	400	30			7.78
BZZ□–E500＊	500	38			8.67
BZZ□–E630＊	630	48			9.72
BZZ□–E800＊	800	60			11.18
BZZ□–E1000＊	1000	75			12.80

注1：□为功能符号；其中BZZ2型转向器有50~200ml/r可供选择，BZZ1型和BZZ3型转向器有50~1000ml/r可供选择。

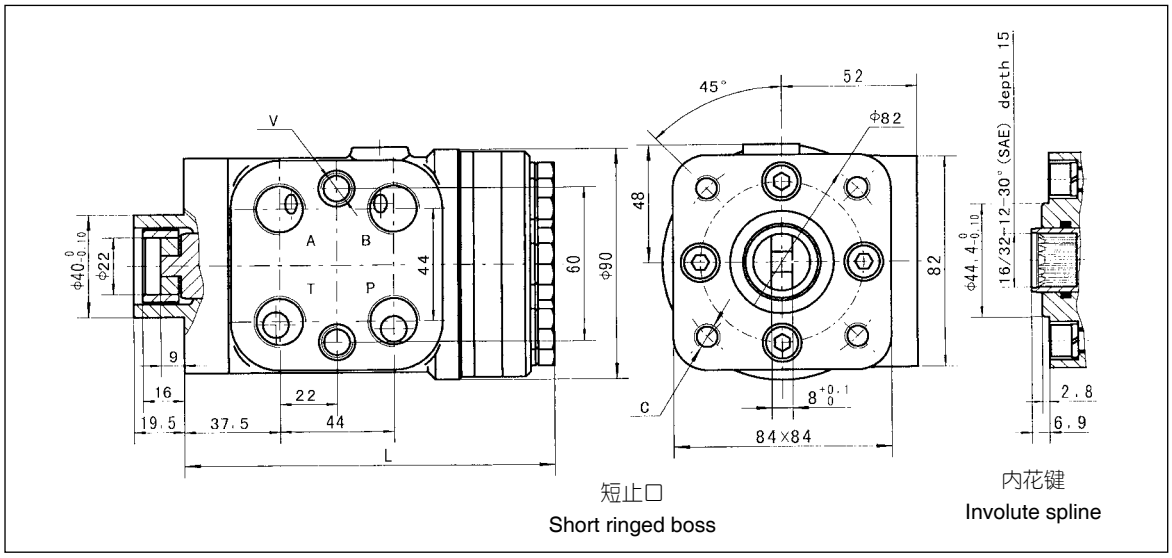
Note 1:□represents Function Code, BZZ2 can be chosen for SCU with the displacement of 50-200mL/r. BZZ1 or BZZ3 can be chosen for SCU with the displacement of 50-1000mL/r.

注2：“流量”是方向盘转速为60r/min的1.25倍时的流量，当系统设计不满足上述条件，允许适量调整。

Note 2: “Flow” that we suggest to use is the flow of 1.25 times as much as that at the steering wheel’s rotation speed of 60 r/min. If the design of the system can't meet the requirements, the flow is allowed to be adjusted a little bit.

BZZ1、BZZ2、BZZ3 系列全液压转向器
BZZ1, BZZ2, BZZ3 Series Hydraulic Steering Control Units (SCU)

连接尺寸 Mounting Data



注1：图示短止口联接形式，长止口联接形式分别将图示 9、16 和 19.5 变为18、25 和 30.5;
Note1: Above is for short ringed boss connection dimension. When dimension is 18, 25, 30.5, instead of 9,16,19.5 long ringed boss connection is available for reference above.
注2：油口尺寸标识选择符合P4"油口代码"。
Note 2: please check Page 4 for the port code .

型 号 Type	长 度 Length L (mm)
BZZ □–E50 *	140
BZZ □–E63 *	141
BZZ □–E80 *	142.5
BZZ □–E100 *	145
BZZ □–E125 *	148
BZZ □–E160 *	153
BZZ □–E200 *	158
BZZ □–E250 *	164
BZZ □–E280 *	169
BZZ □–E315 *	174
BZZ □–E400 *	184
BZZ □–E500 *	197
BZZ □–E630 *	216
BZZ □–E800 *	236
BZZ □–E1000 *	262

注1：□为功能符号；BZZ2型转向器有50~200ml/r可供选择，BZZ1型和BZZ3型转向器有50~1000ml/r可供选择。

Note 1: □ represents Function Code,BZZ2 can be chosen for SCU with the displacement of 50-200mL/r . BZZ1 or BZZ3 can be chosen for SCU with the displacement of 50-1000mL/r.

BZZ5　系列全液压转向器

BZZ5 Series Hydraulic Steering Control Units (SCU)

在负荷传感型的转向系统中，转向系统和工作系统通过优先阀可使用同一个油泵供油或实现系统合流。同时，若使用带负载感应的油泵，负荷传感系统将会体现明显的节能效果。

负荷传感型转向器有一个LS口必须连接到优先阀或负载感应油泵的LS口，使转向器的转向负载压力信号经油管（推荐管道长度≤2m）传送到优先阀或负载感应油泵，用以控制系统供给转向器的供油量。

As for load sensing steering system, the steering system and the operational system may use the same pump through the priority valve or the load sensing system can distribute the surplus oil of the steering system into the operational system. Meanwhile, if the pump with load sensing is used , the load sensing will have obviously productive results.

The LS port of the load sensing steering unit has to connect with priority valve or LS port of load sensing pump, so that the signal of the steering load pressure of the steering unit can be transferred to priority valve or load sensing pump through oil hose (we suggest that the length of the hose is ≤2 m), to control the oil volume supplied to steering unit by the control system.

主要技术参数 Main Specification

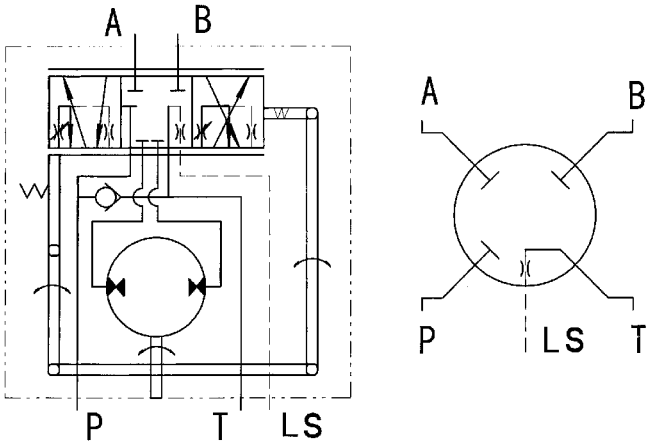
型　号 Type	排　量 Displacement (mL/r)	长　度 Length L(mm)	方向盘允许最高转速 Max. input speed (rpm)	最大入口压力 Max. input pressure (MPa)	最大连续背压 Max. cont. back pressure (MPa)	最大动力转向扭矩 Max. power steering torque (N·m)
BZZ5–E 50*	50	140	100	16	1.6	≤5
BZZ5–E 63*	63	141				
BZZ5–E 80*	80	142.5				
BZZ5–E 100*	100	145				
BZZ5–E 125*	125	148				
BZZ5–E 160*	160	153				
BZZ5–E 200*	200	158				
BZZ5–E 250*	250	164				
BZZ5–E 280*	280	169	75			
BZZ5–E 315*	315	174				
BZZ5–E 400*	400	184				
BZZ5–E 500*	500	197	60			
BZZ5–E 630*	630	216				
BZZ5–E 800*	800	236				
BZZ5–E 1000*	1000	262				

BZZ5　系列全液压转向器

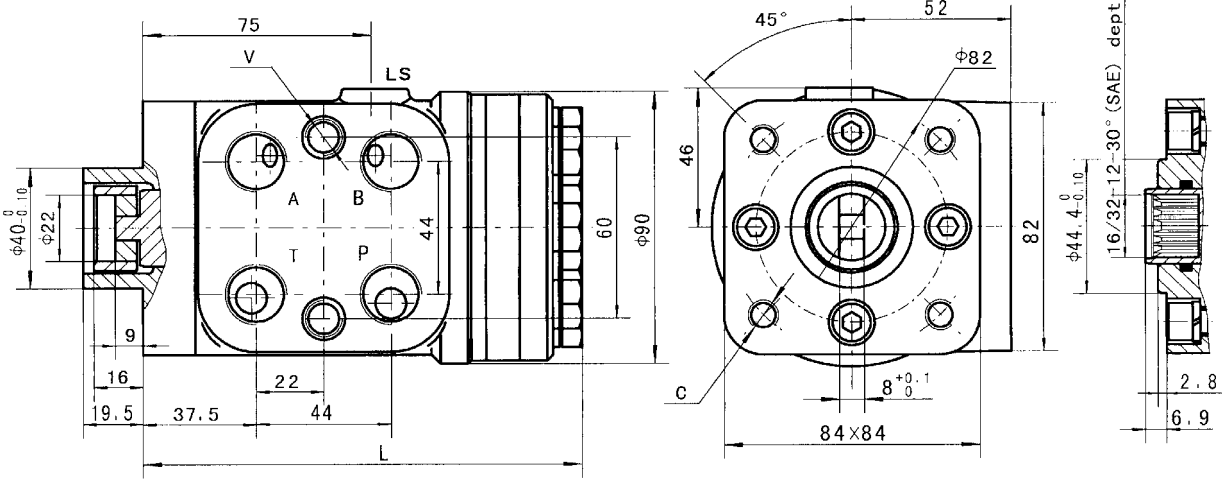
BZZ5 Series Hydraulic Steering Control Units (SCU)

功能符号 Function Code

BZZ5
负荷传感型
Load sensing



连接尺寸 Mounting Data



短止口
Short ringed boss

内花键
Involute spline

BZZ5　系列全液压转向器

BZZ5 Series Hydraulic Steering Control Units (SCU)

油口代码
Ports Code

类别 Category	代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Valve Mounting V	LS油口 Port LS
油口代码 Ports Code	（缺省） （omit）	M20×1.5	M10	M12	M12×1.5
	A	M18×1.5	M10	M12	M12×1.5
	B	G1/2	M10	M10×1	G1/4
	C	3/4-16UNF O-ring	3/8-16UNC	3/8-24UNF	7/16-20UNF O-ring
	D	M20×1.5 O-ring	M10	M12	M12×1.5 O-ring
	E	M18×1.5 O-ring	M10	M12	M12×1.5 O-ring
	G	M22×1.5	M10	M12	M12×1.5
	Q	M22×1.5 O-ring	M10	M12	M12×1.5 O-ring
	U	G1/2 O-ring	M10	M10×1	G1/4 O-ring
	M	3/4-16UNF O-ring	M10	M12	7/16-20UNF O-ring
	I	3/4-16UNF O-ring	M10	M10	7/16-20UNF O-ring
	N	3/4-16UNF O-ring	M10×1.25	M10	7/16-20UNF O-ring
	R	P,T：M22×1.5 A,B：M18×1.5	M10	M12	M12×1.5
	S	P,T：M22×1.5 O-ring A,B：M18×1.5 O-ring	M10	M12	M12×1.5

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm，油口LS的深度12 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm;Port LS Depth:12mm.

当LS油口尺寸不符合上述表格中规定时，在油口代码后面加“－”，按照下面表格选择LS代码。
If the dimension of LS port don't comply with the specifications in the above form, add "－" after the port code and then choose LS code according to the following form.

油口代码 Ports Code	LS油口 Port LS
1	M12×1.5 O-ring
3	G1/4
5	7/16-20UNF O-ring
6	G1/4 O-ring
7	M12×1.5

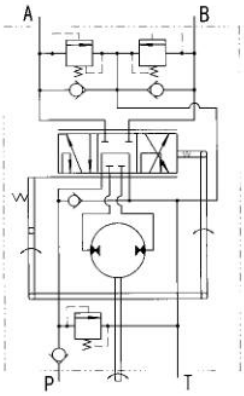
060-1、2、4 系列全液压转向器
060-1,2,4 Series Hydraulic Steering Control Units (SCU)

型号说明 Order Code

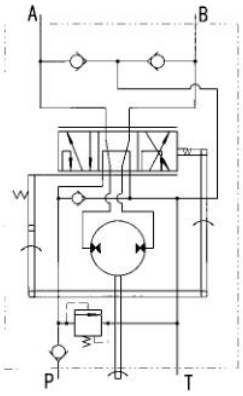
060 — □ — □□□ — □□ — □

- 油口代码 Ports Code
- 安全阀压力设定值 Relief Valve Pressure Settings
- 排量 Displacement
- 功能符号 Function Code
- 060 系列全液压转向器(含集成阀) 060 Series Hydraulic Steering Control Units(with integrated valve)

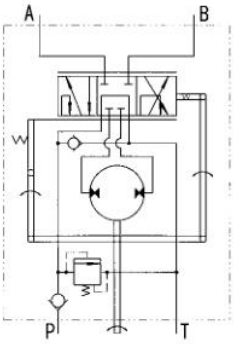
功能符号 Function Code



060-1
开芯无反应
Open Center Non-Reaction



060-2
开芯有反应
Open Center Reaction

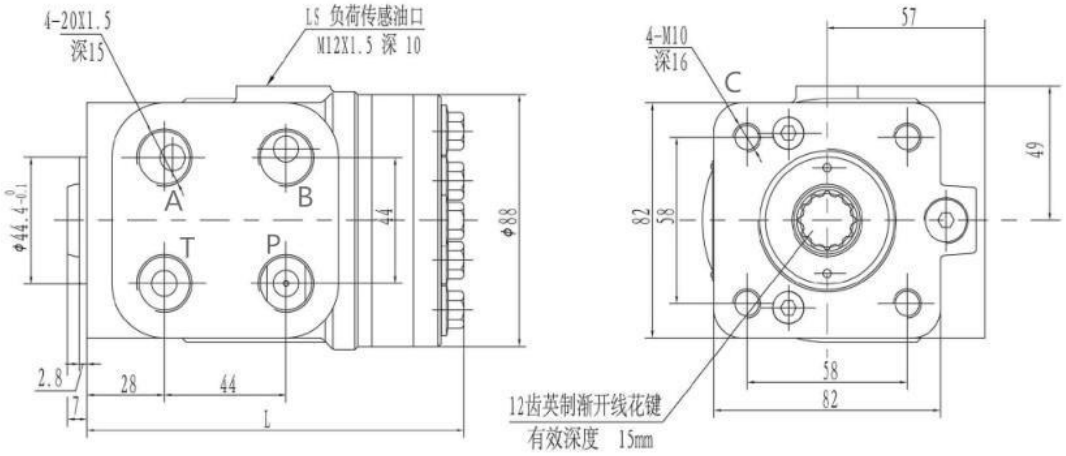


060-4
开芯无反应
Open Center Non-Reaction

060-1、2、4 系列全液压转向器
060-1,2,4 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

Parameters	Type 060-*-***-**-*										
Function Code	1,2,4							1,4			
Displacement(mL/r)	50	63	80	100	125	160	200	250	280	315	400
Rated flow (L/min)	5	6	8	10	12.5	16	20	25	28	32	40
Max. input pressure (MPa)	17.5										
Relief Valve Pressure Settings (MPa)	06,07,08,10,12,14,15,16,17.5										
Shock Valves Pressure Settings (MPa)	12,13,14,16,18,20,21,22,23.5										
Max. cont. back pressure (MPa)	2.5										
Weight (kg)	5.75	5.81	5.89	5.96	6.1	6.3	6.5	6.73	6.91	7.1	7.5
Dimension L (mm)	130	132	134	137	140	145	150	156	161	166	176



油口螺纹 Ports Threads

代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Valve Mounting V
A	M20×1.5	M10	M12
B	M20×1.5 O-ring		
C	M18×1.5		
D	M18×1.5 O-ring		
E	G1/2		M10×1
U	G1/2 O-ring		
M	3/4-16UNF O-ring		M12
F		3/8-16 UNC	3/8-24 UNF
I		M10	M10
N		M10×1.25	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.
注2：其他油口连接方式协议确定代号。
Note 2: The code of other ports dimensions will be listed in an agreement.

060-1、2、4 系列全液压转向器
060-1,2,4 Series Hydraulic Steering Control Units (SCU)

060-1、2、4 产品订货编号 Order Code

	Pos.1		Pos.2		Pos.3		Pos.4
060	–	*	–	***	–	**	–	*

Pos.1 – 功能符号 Function Code

其中：1:开芯无反应 1:Open Center Non-Reaction
2:开芯有反应 2:Open Center Reaction
4:开芯无反应 4:Open Center Non-Reaction

Pos.2 – 排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.3 – 集成阀参数组合 Integrated Valve Parameter

安全阀压力设定值：Relief valve pressure settings (MPa):06、07、08、10、12、14、15、16、17.5
（缓冲阀压力设定值比安全阀压力高6MPa）
Shock valves pressure settings is 6 MPa higher than relief valve

Pos.4 – 油口代码 Ports Code

A、B、C、D、E、U、M、F、I、N

应用举例：

060系列转向器，开芯无反应，排量125mL/r，入口有单向阀，安全阀压力10MPa，缓冲阀压力16MPa，四油口螺纹为G1/2，平面密封，转向柱法兰连接螺纹M10。

转向器订货编号为： 060-1-125-10-E

For example:
Order code
060-1-125-10 - E

- Ports: P ,T ,A, B G1/2;
- Column Mounting Thread C M10
- Relief Valve Pressure Settings: 10Mpa;
- Shock Valves Pressure Settings: 16MPa
- Displacement: 125 mL/r
- Open Center Non-Reaction

10系列全液压转向器
Hydraulic Steering Units 10 Series

10系列全液压转向器的阀体为集成式结构，产品可以集成插装阀，例如：集成系统压力控制阀。

10系列产品广泛应用于多种工农业自行走机械的主机和船舶操舵的转向系统，实现输入较小的力，控制较大阻力的转向油缸的动作；操纵轻便、灵活，安全可靠；集成的单向阀可以防止系统压力油的反向流动，并防止出现操作“打手”现象；集成的压力控制阀，可以实现转向系统的工作压力、缓冲压力的控制。

10系列产品的连接尺寸符合国际标准。10系列产品按照转定子啮合副的结构，可以分为6/7齿结构和4/5齿结构两大系列。

6/7齿结构系列：按照连接尺寸划分为101、102、103系列（其中：102系列的连接尺寸与BZZ系列的连接尺寸一致）；

4/5齿结构系列：定义为109系列，适应特殊用户的需求，派生出119、129系列。

10系列产品均集成入口单向阀；每个系列按照是否集成插装压力阀的情况又可以分为两个系列，即缺省和带S；缺省表示不带集成压力阀，带S表示带集成压力阀，对于开芯无反应型产品，集成安全阀和缓冲阀以代码1表示，仅集成安全阀以代码4表示。

101、102、103系列型号说明见P13，109系列型号说明见P47。

Hydraulic Steering Unit 10 series is integral hydraulic steering unit, the valve body of rotary valve is integral structure, then the steering unit can integrate with cartridge valve, such as the pressure control valve of the integral system.

Hydraulic Steering Unit 10 series is widely used in the steering control system of different kinds of engineering vehicles, such as the steering system of many kinds of industrial and agricultural mobile machinery forklift, loader, road roller, tractor, combine harvester, and the ship helm etc. The steering unit can control the steering cylinder with bigger resistance force by inputting minor force; It's easier , flexible and reliable; The integral check valve can prevent the system pressure oil from anti-vibration , and prevent from “hit-hand” during the steering operation; Integral pressure control valve can control the operation pressure and the shock pressure of the steering system.

The mounting dimensions of Hydraulic Steering Unit 10 series are consistent with the international standard. According to the structure of gerotor set, Hydraulic Steering Unit 10 series can be divided into 2 series: 6/7 teeth structure steering unit and 4/5 teeth structure steering unit.

Hydraulic steering unit with 6/7 teeth structure: according to the size, this series may be divided into 101,102,103 series (among these series, the mounting dimension of 102 series is consistent with that of BZZ series;) Hydraulic steering unit with 4/5 teeth structure: it's defined as 109 series; according to special requirement of special customers, then we develop 119 and 129 series on the base of 109 series.

10 series SCU integrate inlet check Valve;Each series may be divided into 2 series acording to the steering unit integrating cartridge calve or not, SCU without valve and SCU with S,SCU without valve doesn't integrate pressure valve,SCU with s integrates pressure valve As for open center non reaction steering unit,"1" represents the SCU with relief valve and shock valves,"4"represents the SCU with relief valve.

Please consult P13 for the introduction of 101 series,102 and 103 series, while P47 for 109 series.

10系列全液压转向器
Hydraulic Steering Units 10 Series

型号说明 Order Code

10 □ □ – □ – □ – □ – □

- 油口代码 Ports Code
- 安全阀压力设定值 Relief Valve Pressure Settings
- 排量 Displacement
- 功能符号 Function Code
  - 1:开芯无反应型 1:Open center non-reaction
  - 2:开芯有反应型 2:Open center reaction
  - 3:闭芯无反应型 3:Closed center non-reaction
  - 4:开芯无反应型 4:Open center non-reaction
  - 5:负荷传感型 5:Load sensing
- 集成阀标记 Code for integral valve
  - S:带集成阀 S:Integral Valve
  - 缺省:不带集成阀 Omit:Without Integral valve
- 系列特征标记代码 Code for Series
  - 1:第一种连接尺寸型式 1:1st mounting type
  - 2:第二种连接尺寸型式 2:2nd mounting type
  - 3:第三种连接尺寸型式 3:3nd mounting type
  - 9:109连接尺寸型式 9:Mini SCU
- 摆线转阀式全液压转向器 Cycloid Rotary Valve Hydraulic Steering Units

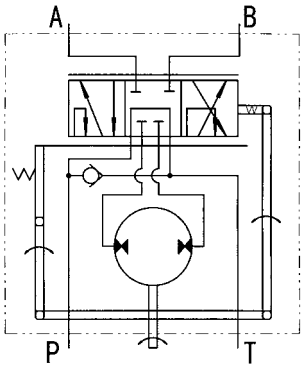
10系列全液压转向器
Hydraulic Steering Units 10 Series

型号说明 Order Code

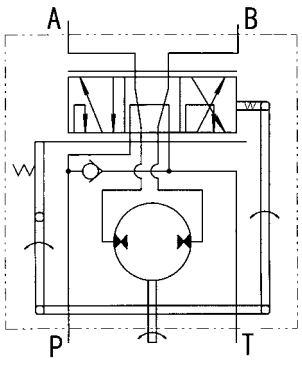
101 — □ — □□□ — □

- 油口代码 Ports Code
- 排量 Displacement
- 功能符号 Function Code
- 101系列全液压转向器(不含集成阀) 101 Series Hydraulic Steering Control Units(without integrated valve)

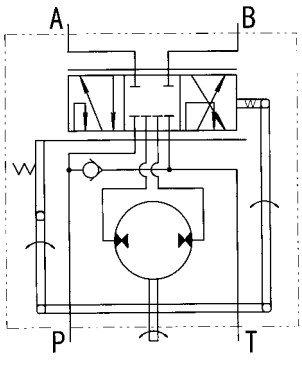
功能符号 Function Code



101-1
开芯无反应
Open Center Non-Reaction



101-2
开芯有反应
Open Center Reaction



101-3
闭芯无反应
Closed Center Non-Reaction

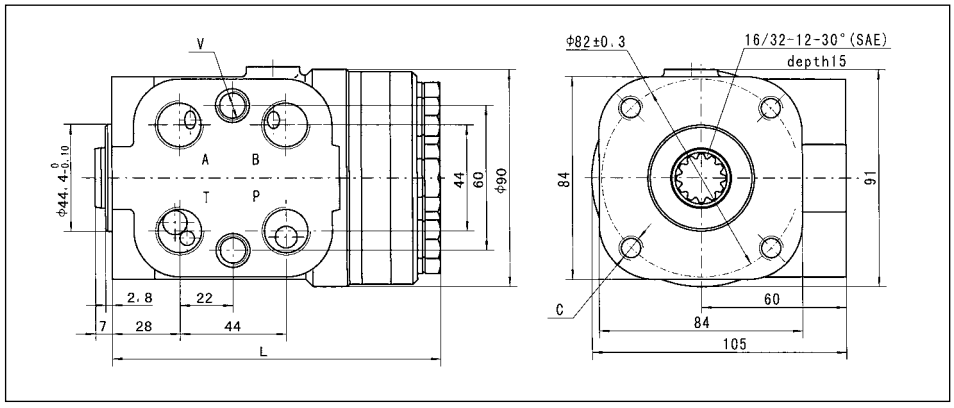
101-1、2、3 系列全液压转向器

101-1,2,3 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

Parameters	Type 101-*-***-*										
Function Code	1,2,3							1,3			
Displacement(mL/r)	50	63	80	100	125	160	200	250	280	315	400
Rated flow (L/min)	5	6	8	10	12.5	16	20	25	28	31.5	40
Max. input pressure (MPa)	17.5										
Max. cont. back pressure (MPa)	2.5										
Weight (kg)	5.70	5.76	5.84	5.91	6.05	6.25	6.45	6.68	6.86	7.06	7.45
Dimension L (mm)	130	132	134	137	140	145	150	156	161	166	176

连接尺寸 Mounting Data



油口螺纹 Ports Threads

代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Valve Mounting V
A	M20×1.5	M10	M12
B	M20×1.5 O-ring		
C	M18×1.5		
D	M18×1.5 O-ring		
E	G1/2		M10×1
U	G1/2 O-ring		
G	M22×1.5		M12
Q	M22×1.5 O-ring		
M	3/4-16UNF O-ring		
F		3/8-16 UNC	3/8-24 UNF
I		M10	M10
N		M10×1.25	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。

Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.

注2：其他油口连接方式协议确定代号。

Note 2: The code of other ports dimensions will be listed in an agreement.

101-1、2、3 系列全液压转向器

101-1,2,3 Series Hydraulic Steering Control Units (SCU)

101-1、2、3 产品订货编号 Order Code

		Pos.1		Pos.2		Pos.3
101	–	*	–	***	–	*

Pos.1 – 功能符号 Function Code

其中：1:开芯无反应 1:Open Center Non-Reaction
2:开芯有反应 2:Open Center Reaction
3:闭芯无反应 3:Closed Center Non-Reaction

Pos.2 – 排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.3 – 油口代码 Ports Code

A、B、C、D、E、U、G、Q、M、F、I、N

应用举例：

101系列转向器，开芯无反应，排量125mL/r，四油口螺纹为G1/2，平面密封转向柱法兰连接螺纹M10。转向器订货编号为：101-1-125-E

For example:
Order code

101-1 – 125 – E

- E: Ports:P,T,A,B G1/2; Column Mounting Thread-C M10
- 125: Displacement: 125 mL/r
- 101-1: Open Center Non-Reaction

101S-1、2、4 系列全液压转向器

101S-1,2,4 Series Hydraulic Steering Control Units (SCU)

101S-1、2、4系列全液压转向器从结构到原理继承了101系列的全液压转向器的转向功能，101S系列转向器特点是在101系列的基础上将安全阀、缓冲阀、补油阀以及入口单向阀根据不同的要求设置在转向器阀体中，这种连接结构更加紧凑，使用更加方便。

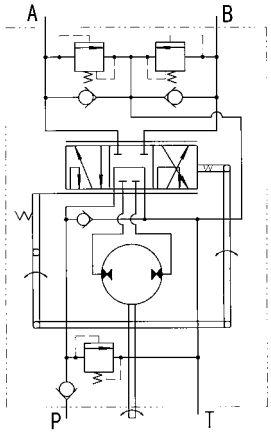
SCU 101S-1,2,4 series inherits the steering function of 101 series both in the structure and in the principle. The feature of 101S series is to have the following valves functions incorporated inside one housing as follows: the relief valve, the shock valves, the suction valves and the check valve according to the different requirement upon the base of the 101 series . This kind of structure is more compact, and it's more convenient in operation.

型号说明 Order Code

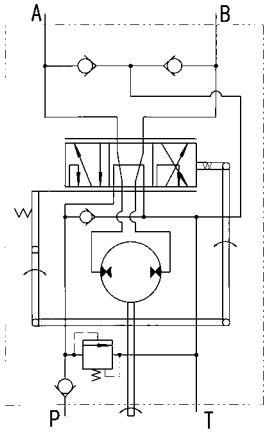
101S — □ — □□□ — □□ — □

- 油口代码 Ports Code
- 安全阀压力设定值 Relief Valve Pressure Settings
- 排量 Displacement
- 功能符号 Function Code
- 101S 系列全液压转向器(含集成阀) 101S Series Hydraulic Steering Control Units(with integrated valve)

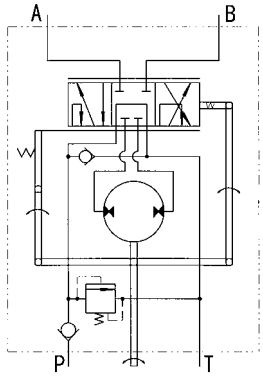
功能符号 Function Code



101S-1
开芯无反应
Open Center Non-Reaction



101S-2
开芯有反应
Open Center Reaction



101S-4
开芯无反应
Open Center Non-Reaction

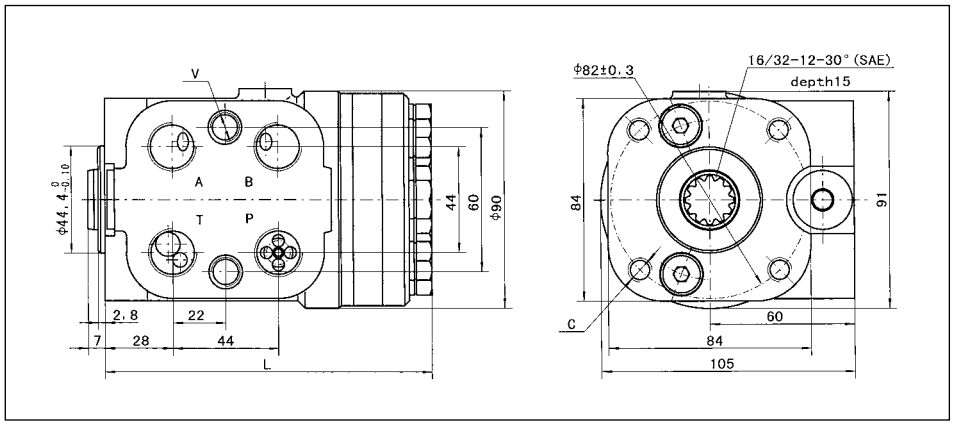
101S-1、2、4 系列全液压转向器

101S-1,2,4 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

Parameters	Type 101S-*-***-**-*										
Function Code	1,2,4							1,4			
Displacement(mL/r)	50	63	80	100	125	160	200	250	280	315	400
Rated flow (L/min)	5	6	8	10	12.5	16	20	25	28	32	40
Max. input pressure (MPa)	17.5										
Relief Valve Pressure Settings (MPa)	06,07,08,10,12,14,15,16,17.5										
Shock Valves Pressure Settings (MPa)	12,13,14,16,18,20,21,22,23.5										
Max. cont. back pressure (MPa)	2.5										
Weight (kg)	5.75	5.81	5.89	5.96	6.1	6.3	6.5	6.73	6.91	7.1	7.5
Dimension L (mm)	130	132	134	137	140	145	150	156	161	166	176

连接尺寸 Mounting Data



油口螺纹 Ports Threads

代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Valve Mounting V
A	M20×1.5	M10	M12
B	M20×1.5 O-ring		
C	M18×1.5		
D	M18×1.5 O-ring		
E	G1/2		M10×1
U	G1/2 O-ring		
M	3/4-16UNF O-ring		M12
F		3/8-16 UNC	3/8-24 UNF
I		M10	M10
N		M10×1.25	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.
注2：其他油口连接方式协议确定代号。
Note 2: The code of other ports dimensions will be listed in an agreement.

101S-1、2、4 系列全液压转向器

101S-1,2,4 Series Hydraulic Steering Control Units (SCU)

101S-1、2、4 产品订货编号 Order Code

		Pos.1		Pos.2		Pos.3		Pos.4
101S	–	*	–	***	–	**	–	*

Pos.1	–	功能符号 Function Code

其中：1:开芯无反应 1:Open Center Non-Reaction
2:开芯有反应 2:Open Center Reaction
4:开芯无反应 4:Open Center Non-Reaction

Pos.2	–	排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.3	–	集成阀参数组合 Integrated Valve Parameter

安全阀压力设定值：Relief valve pressure settings (MPa):06、07、08、10、12、14、15、16、17.5
（缓冲阀压力设定值比安全阀压力高6MPa）
Shock valves pressure settings is 6 MPa higher than relief valve

Pos.4	–	油口代码 Ports Code

A、B、C、D、E、U、M、F、I、N

应用举例：

101S系列转向器，开芯无反应，排量125mL/r，入口有单向阀，安全阀压力10MPa，缓冲阀压力16MPa，四油口螺纹为G1/2，平面密封，转向柱法兰连接螺纹M10。

转向器订货编号为：101S-1-125-10-E

For example:
Order code
101S-1-125-10 - E

- Ports: P ,T ,A, B G1/2;
- Column Mounting Thread C M10 ;
- Relief Valve Pressure Settings: 10Mpa
- Shock Valves Pressure Settings: 16MPa
- Displacement: 125 mL/r
- Open Center Non-Reaction

101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units(SCU)

101(S)-5(T)(TE)(L)(E)(TX)系列全液压转向器用于负荷传感型转向系统。

101S-5、101S-5L、101S-5E系列全液压转向器均为板式连接方式，与PVF*型优先阀采用板式连接后使用。

101S-5L系列全液压转向器在LL接口处引出了LS口的压力信号，将信号传送给电气控制系统；

101S-5E系列全液压转向器在EL接口处引出了A或B油口的压力信号，将信号传送给电气控制系统。

101S-5T、101S-5TE系列全液压转向器为管式连接方式，与PVL*或DYXL、YXL型优先阀采用管式连接后使用。

101S-5TE系列全液压转向器在EL接口处引出了A或B油口的压力信号，将信号传送给电气控制系统。

101-5T系列全液压转向器为管式连接方式，必须和DYXL、YXL型优先阀采用管式连接后使用，并且其系统安全阀设在优先阀上。

101-5TX系列全液压转向器处于中位时,其左右腔和回油是相连的,这种转向器和LFA、LFB型流量放大阀配套使用。

SCU 101(S)-5(T)(TE)(L)(E)(TX) series is used in the load sensing steering system.

SCU 101S-5,101S-5L,101S-5E series adopt modulary mounting type and can only be used with PVF* type priority valve via modulary mounting.

SCU 101S-5L series guides the pressure signal of port LS out of prot LL, and transfers the pressure signal to the electrical control system.

SCU 101S-5E series guides the pressure signal of port A or B out of port EL. and then supplies the pressure signal to the electrical control system.

SCU 101S-5T,101S-5TE series adopts Pipe mounting and via pipe mounting can be used with PVL* or DYXL,YXL type priority valve.

SCU 101S-5TE series guides the pressure signal of the port A or B out of port EL.and then supplies the pressure signal to the electrical control system.

SCU 101-5T series adopts the pipe mounting, it can be used only after the pipe mounted with the DYXL,YXL type priority valve. and the relief valve is integrated in the priority valve.

When the 101-5TX series SCU is in neutral position, both of its left and right cavity are connected with T port. This kind of SCU are used with LFA,LFB type flow amplifiers.

型号说明 Order Code

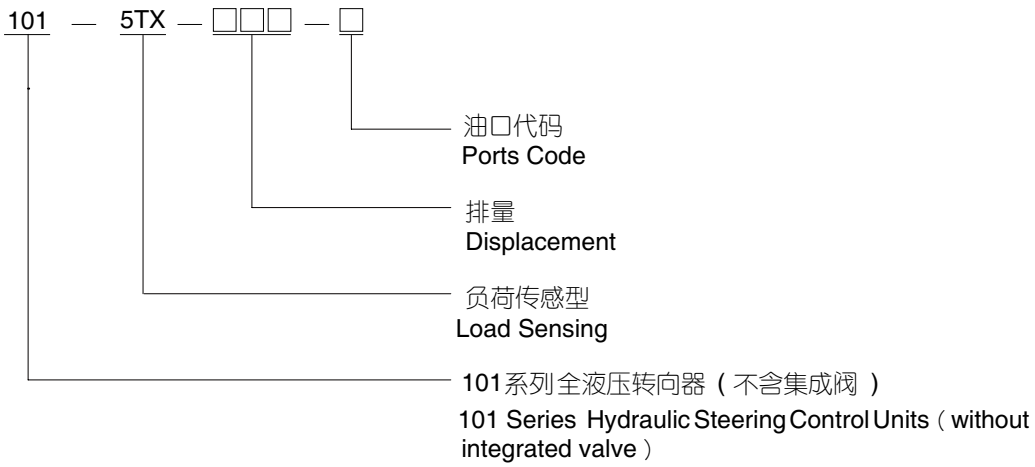
101 — 5T — □□□ — □

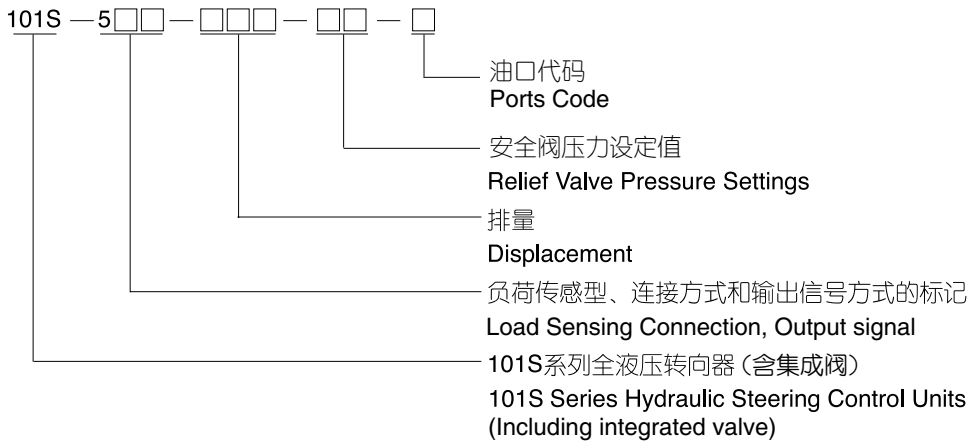
- □ 油口代码 Ports Code
- □□□ 排量 Displacement
- 5T 负荷传感型、管式连接方式 Load Sensing,Pipe Mounting
- 101 101系列全液压转向器（不含集成阀） 101 Series Hydraulic Steering Control Units (without integrated valve)

101(S)-5(T)(TE)(L)(E)(TX)系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units(SCU)

型号说明 Order Code

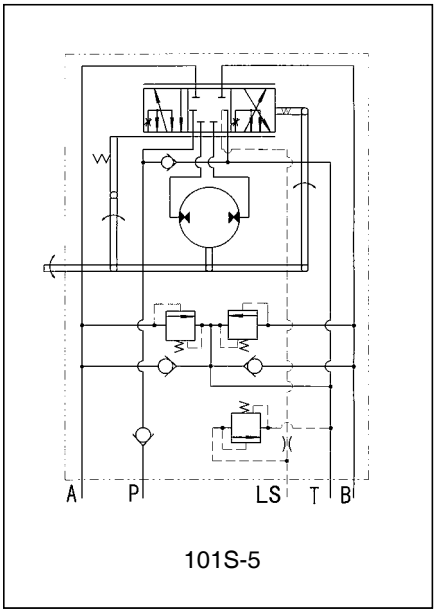




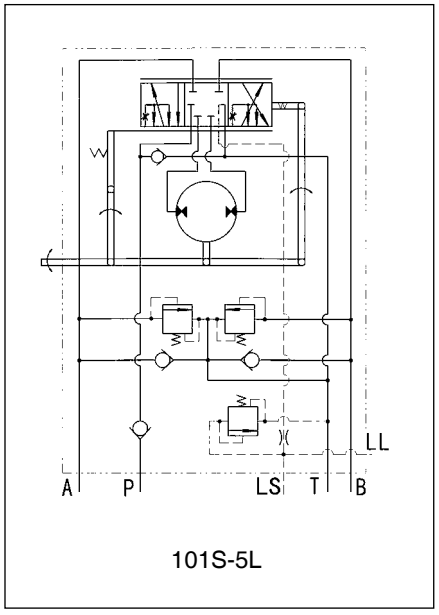
101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

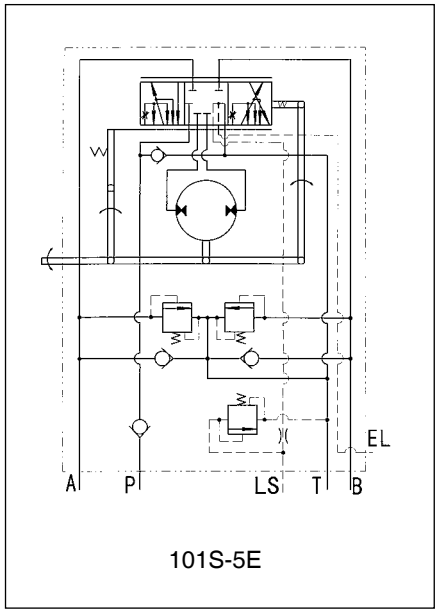
功能符号 Function Code



101S-5



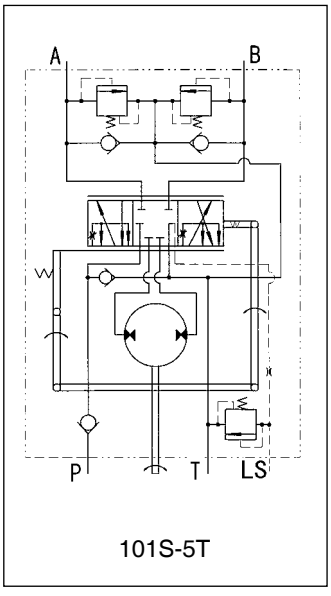
101S-5L



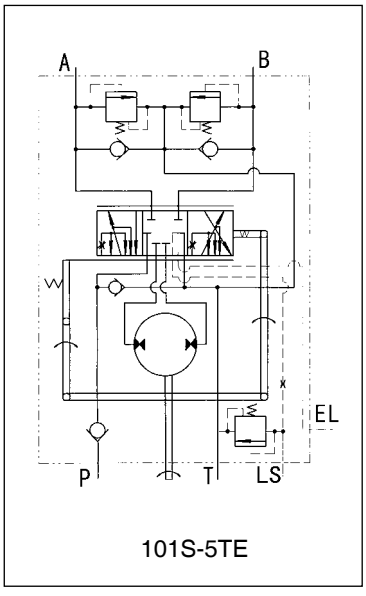
101S-5E

板式连接

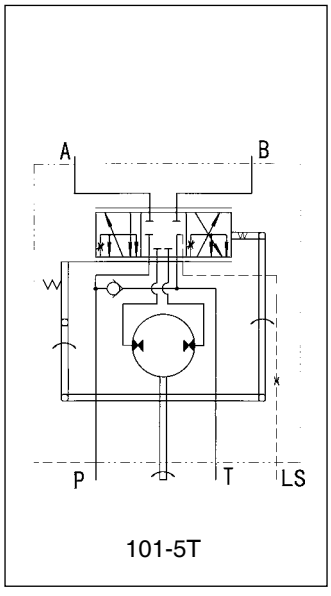
Modulary Mounting



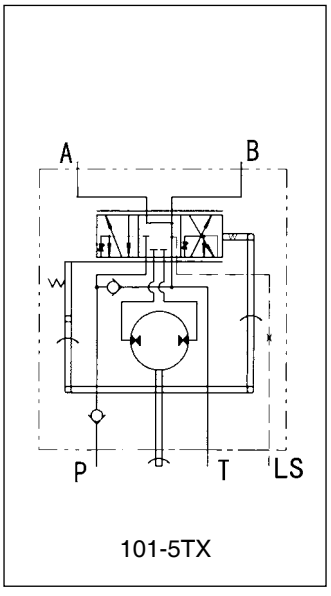
101S-5T



101S-5TE



101-5T



101-5TX

管式连接

Pipe Mounting

101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

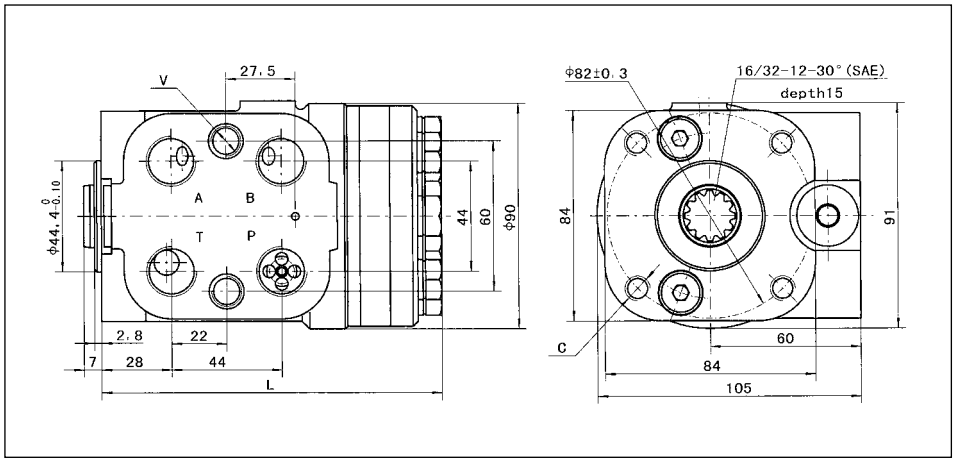
101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

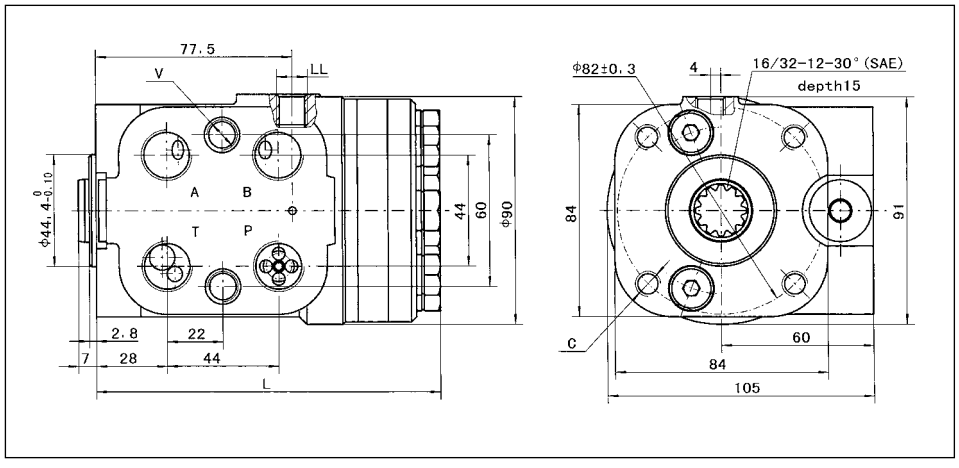
Parameters	Type 101-5T(TX)-***-*，101S-5(T)(TE)(L)(E)-***-**-*										
Displacement(mL/r)	50	63	80	100	125	160	200	250	280	315	400
Max. input speed (rpm)	100								75		
Max. input pressure (MPa)	17.5										
Relief Valve Pressure Settings (MPa)	06,07,08,10,12,14,15,16,17.5										
Shock Valves Pressure Settings (MPa)	12,13,14,16,18,20,21,22,23.5										
Max. Cont. Back pressure (MPa)	2.5										
Weight (kg)	5.75	5.81	5.89	5.93	6.1	6.3	6.5	6.73	6.91	7.1	7.5
Dimension L (mm)	130	132	134	137	140	145	150	156	161	166	176

连接尺寸 Mounting Data

101S-5



101S-5L

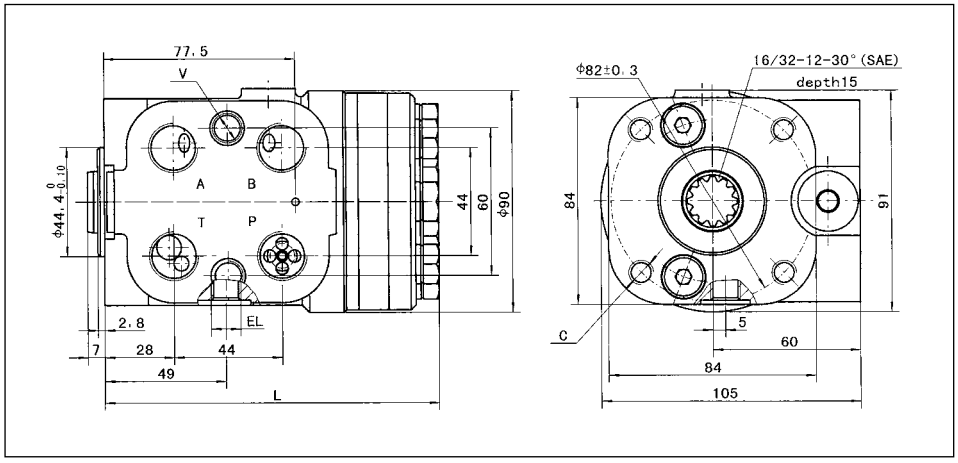


101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

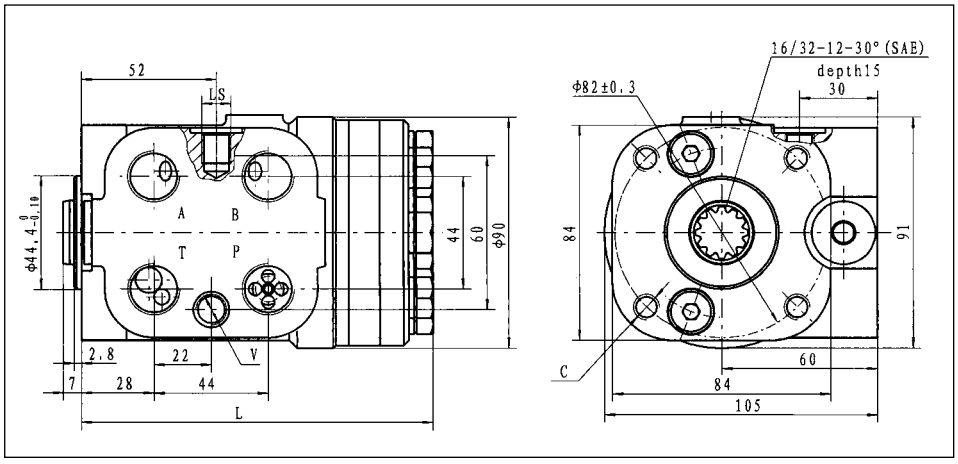
101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

连接尺寸 Mounting Data

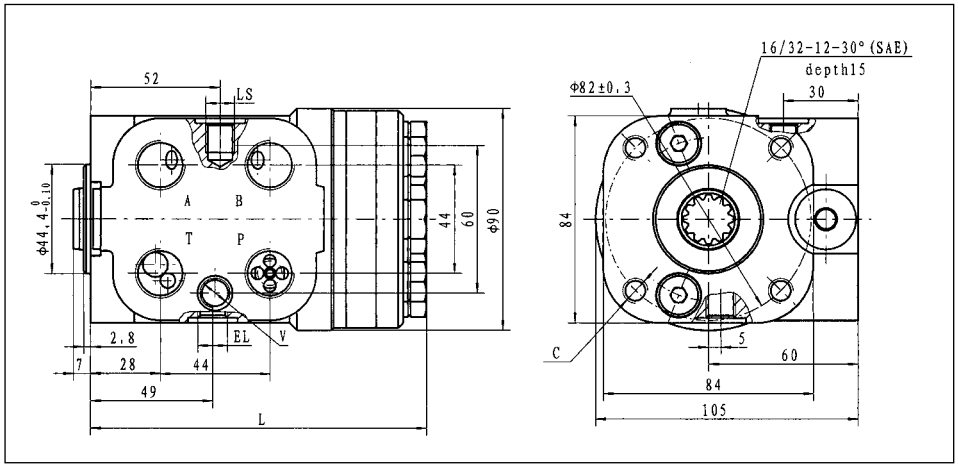
101S-5E



101S-5T



101S-5TE

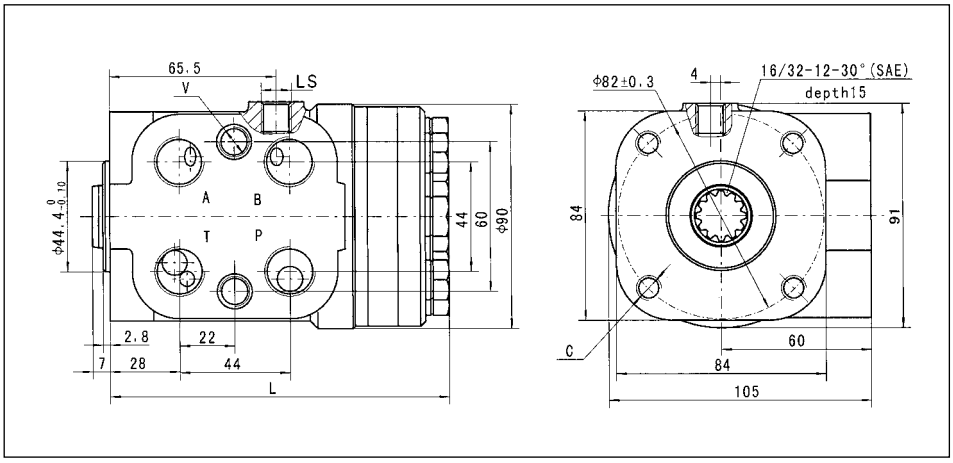


101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

连接尺寸 Mounting Data

101-5T
101-5TX



油口螺纹 Ports Threads

代码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹C Column Mounting C	连接螺纹V Column Mounting V	LS油口 Post LS	LL、EL油口 Ports LL,EL
A	M20×1.5	M10	M12	M12×1.5	
B	M20×1.5 O-ring			M12×1.5 O-ring	
C	M18×1.5			M12×1.5	
D	M18×1.5 O-ring			M12×1.5 O-ring	
E	G1/2		M10×1	G1/4	M10×1
U	G1/2 O-ring			G1/4 O-ring	M10×1 O-ring
M	3/4-16UNF O-ring		M12	7/16-20UNF O-ring	
F		3/8-16 UNC	3/8-24 UNF		
I		M10	M10		
N		M10×1.25			
W	Φ18.5	M10	M12	M12×1.5	
H	Φ18.5	M10	M10	M12×1.5	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm，LS、LL、EL的深度12 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm，LS,LL,EL Depth: 12 mm.
注2：其他油口连接方式协议确定代号。
Note 2: The code of other ports dimensions will be listed in an agreement.

101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

101-5T 产品订货编号 Order Code

		Pos.1	Pos.2		Pos.3		Pos.4
101	–	5	T	–	***	–	*

Pos.1 – 功能符号 Function Code

5:负荷传感型 5:Load Sensing Type

Pos.2 – 优先阀连接形式 Priority Valve Connection

T:管式连接 T:Pipe Mounting

Pos.3 – 排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.4 – 油口代码 Port Code

A、B、C、D、E、U、M、F、I、N

101-5TX 产品订货编号 Order Code

		Pos.1	Pos.2	Pos.3		Pos.4		Pos.5
101	–	5	T	X	–	***	–	*

Pos.1 – 功能符号 Function Code

5:负荷传感型 5:Load Sensing Type

Pos.2 – 优先阀连接形式 Priority Valve Connection

T:管式连接 T:Pipe Mounting

Pos.3 – 转向器中位机能 Neutral Function of SCU

X: 当转向器中位时，转向器左右油口和T油口相连的。

X: When the 101-5TX series SCU is in neutral position, both of its left and right cavity are connected with T port.

Pos.4 – 排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.5 – 油口代码 Port Code

A、B、C、D、E、U、M、F、I、N

101(S)-5(T)(TE)(L)(E)(TX) 系列全液压转向器

101(S)-5(T)(TE)(L)(E)(TX) Series Hydraulic Steering Control Units (SCU)

101S-5 产品订货编号 Order Code

		Pos.1	Pos.2	Pos.3		Pos.4		Pos.5		Pos.6
101S	–	5			–	***	–	**	–	*

Pos.1 – 功能符号 Function Code

5:负荷传感型 5:Load Sensing Type

Pos.2 – 优先阀连接形式 Priority Valve Connection

其中：缺省：板式连接 Omit: Modulary Mounting
T: 管式连接 T:Pipe Mounting

Pos.3 – 电液控制信号连接形式 Electrohydraulic Control Signal Connection

其中：缺省：没有电液信号：Omit: No electrohydraulic signal.
L: LL口引出的是LS口压力信号 L:The pressure signal at LS connection drawn forth from the LL connection.
E: EL口引出的A或B油口的压力信号 E:The pressure signal at the port A or B drawn forth from the EL connection.

Pos.4 – 排量 Displacement mL/r

50、63、80、100、125、160、200、250、280、315、400

Pos.5 – 集成阀参数组合 Integrated Valve Parameters

安全阀压力设定值：Relief valve pressure settings (MPa):06、07、08、10、12、14、15、16、17.5
（缓冲阀压力设定值比安全阀压力高6 MPa）
Shock valves pressure settings is 6 MPa higher than relief valve

Pos.6 – 油口代码 Ports Code

A、B、C、D、E、U、M、F、I、N、W、H

应用举例：

101S系列转向器，负荷传感型，配管式连接的优先阀，电液控制信号从A或B油口引出，排量125mL/r，入口有单向阀，安全阀压力10MPa，缓冲阀压力16MPa，四油口螺纹为G1/2，转向柱法兰连接螺纹M10，LS信号口G1/4，EL信号口M10×1。

转向器订货编号为：101S-5TE-125-10-E

For example:

Order code

101S-5TE－125－10－ E

- E: Ports: P, T,A,B G1/2; Column Mounting Thread C M10; Port: LS G1/4; Port: EL M10x1
- 10: Relief Valve Pressure Settings:10MPa; Shock Valves Pressure Settings:16MPa
- 125: Displacement: 125 mL/r
- 5TE: Pipe Mounting,with an Electrohydraulic Signal

103-1系列全液压转向器

103-1 Series Hydraulic Steering Control Units(SCU)

103-1系列全液压转向器结构更加紧凑，连接尺寸符合国际标准,和101、102系列产品有差异,结构小巧紧凑,适合于狭空间装配,广泛应用于低速车辆的转向控制系统，如叉车、拖拉机、联合收割机，工程或道路建设设备、船舶舵机等，能够通过输入较小的力完成较大输出转向力的场合，操纵上轻便、灵活、可靠。

The structure of 103-1 series Hydraulic SCU is more compact and its connection dimension conforms to the international standard, while it is different from 101 and 102 series which are suitable for assembly in the narrow space. It's widely used in the low-speed vehicles, steering control system, such as forklift, tractor, combined harvester, engineering or road construction machinery,and the marine rudder, etc. It can obtain more powerful output steering force through the input force and it operates easily,flexibly and reliably.

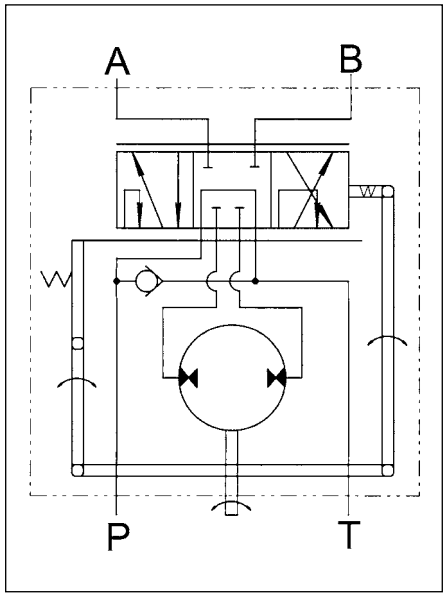
型号说明 Order Code

103 — □ — □□□ — □

- 油口代码 Ports Code
- 排量 Displacement
- 功能符号 Function Code
- 103 系列全液压转向器 103-1 Series Hydraulic Steering Control Units

功能符号 Function Code

103-1
开心无反应
Open Center Non-Reaction



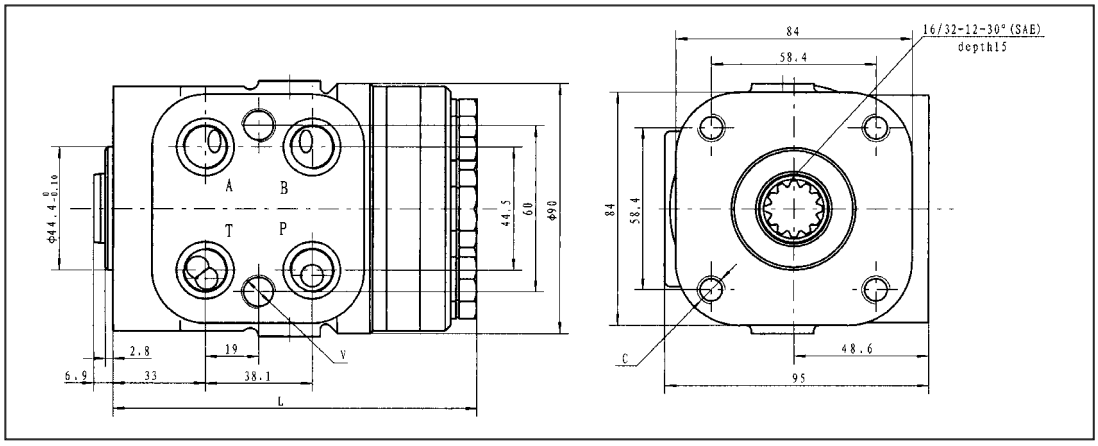
103-1系列全液压转向器

103-1 Series Hydraulic Steering Control Units(SCU)

主要技术参数 Main Specification

Parameters	Type 103-1-****-*							
Function Code	1	1	1	1	1	1	1	1
Displacement(mL/r)	50	63	80	100	125	160	200	250
Rated Flow（L/min）	5	6	8	10	12.5	16	20	25
Max.Input Pressure（MPa）	17.5							
Max.Cont.Back Pressure	2.5							
Weight (kg)	3.85	4.0	4.05	4.10	4.25	4.4	4.6	4.8
Dimension L (mm)	123	125	127	130	133	138	143	149

连接尺寸 Mounting Data



油口螺纹 Ports Threads

代码Code	P、T、A、B 油口 Ports P ,T,A,B	连接螺纹C Column Mounting	连接螺纹V Valve Mounting
A	G3/8-19 O-ring	M10×1.25	M10
B	9/16-18UNF O-ring		
C	M18×1.5	M10	M12
D	M18×1.5 O-ring		
M	3/4-16UNF O-ring		
F		3/8-16UNC	3/8-24UNF
I		M10	M10
N		M10×1.25	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.
注2：其他油口连接方式协议确定代号。
Note 2: The code of other ports dimensions will be listed in an agreement.

103-1系列全液压转向器

103-1 Series Hydraulic Steering Control Units(SCU)

产品订货编号 Order Code

		Pos.1		Pos.2		Pos.3
103	–	1	–	***	–	*

Pos.1	–	功能符号 Function Code

1：开心无反应 1: Open Center Non-Reaction

Pos.2	–	排量 Displacement mL/r

50、63、80、100、125、160、200、250

Pos.3	–	油口代码 Ports Code

A、B、C、D、F、M、I、N

应用举例：

103系列转向器，开心无反应，排量125mL/r，四油口螺纹为M18×1.5，转向柱法兰连接螺纹M10，油口面两连结螺纹M12。

转向器订货编号为：103-1-125-C

For example:

Order code

103-1 – 125 – C

- C — Ports：P, T，A，B M18×1.5；Column Mounting Thread C M10; Valve Mounting Thread V M12
- 125 — Displacement：125 mL/r
- 1 — Open Center Non-Reaction

103S-4 系列全液压转向器

103S-4 Series Hydraulic Steering Control Units (SCU)

103S-4系列转向器除具备103-1系列转向器的功能外，还含有安全阀和入口单向阀的功能。

103S-4 series steering unit contains, in addition to the function of 103-1 series steering unit, also function of relief valve and inlet check valve.

型号说明 Order Code

103S — 4 — □□□ — □□ — □

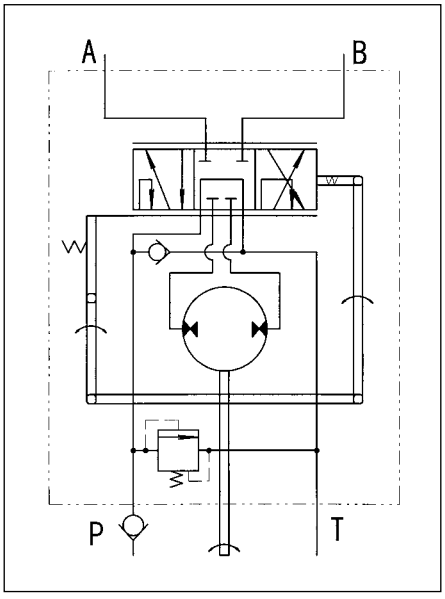
- 油口代码 Ports Code
- 安全阀压力设定值 Relief Valve Pressure Settings
- 排量 Displacement
- 功能符号 Function Code
- 103S-4 系列全液压转向器（含集成阀） 103S-4 Series Hydraulic Steering Control Units (Including integrated valve)

功能符号 Function Code

103S-4

开芯无反应

Open Center Non-Reaction



103S-4 系列全液压转向器

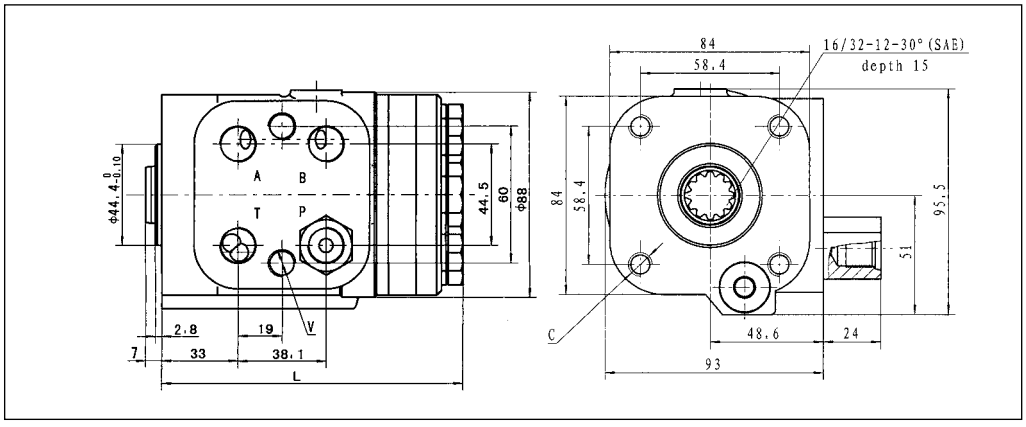
103S-4 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

Parameters	Type 103S-4-***-**-*							
Displacement(mL/r)	50	63	80	100	125	160	200	250
Rated flow (L/min)	5	6	8	10	12.5	16	20	25
Max. input pressure (MPa)	17.5							
Relief valve pressure settings (Mpa)	06,07,08,10,12,14,15,16,17.5							
Max. cont. back pressure (MPa)	2.5							
Weight (kg)	4.75	4.81	4.89	4.96	5.1	5.3	5.5	5.73
Dimension L (mm)	123	125	127	130	133	138	143	149

连接尺寸 Mounting Data

103S-4



油口螺纹 Ports Threads

代 码 Code	P、T、A、B油口 Ports P,T,A,B	连接螺纹 C Column Mounting C	连接螺纹 V Column Mounting V
A	G3/8-19 O-ring	M10×1.25	M10
B	9/16-18UNF O-ring		
C	M18×1.5	M10	M12
D	M18×1.5 O-ring		
M	3/4-16UNF O-ring		
F		3/8-16 UNC	3/8-24 UNF
I		M10	M10
N		M10×1.25	

注1：油口P、T、A、B的深度14 mm，连接螺纹C、V的深度16 mm。
Note 1: Ports P,T,A,B Depth : 14 mm; Column Mounting C & V Depth: 16 mm.
注2：其他油口连接方式协议确定代号。
Note 2: The code of other ports dimensions will be listed in an agreement.

103S-4 系列全液压转向器

103S-4 Series Hydraulic Steering Control Units (SCU)

产品订货编号 Order Code

		Pos.1		Pos.2		Pos.3		Pos.4
103S	–	4	–	***	–	**	–	*

Pos.1	–	功能符号 Function Code

4:开芯无反应 4:Open Center Non-Reaction

Pos.2	–	排量 Displacement mL/r

50、63、80、100、125、160、200、250

Pos.3	–	安全阀压力设定值 Relief Valve Pressure Settings MPa

06、07、08、10、12、14、15、16、17.5

Pos.4	–	油口代码 Ports Code

A、B、C、D、F、M、I、N

应用举例：

103S-4系列转向器，开芯无反应，排量125mL/r，入口有单向阀，安全阀压力10MPa，四油口螺纹为G3/8，转向柱法兰连接螺纹M10x1.25，油口面两连结阀用螺纹M10x1.5。

转向器订货编号为：103S-4-125-10-A

For example:

Order code

103S-4 – 125–10 – A

Ports: P, T, A, B G3/8;
Column Mounting Thread C M10x1.25;
Valve Mounting Thread V M10x1.5
Relief Valve Pressure Settings: 10MPa
Displacement: 125 mL/r
Open Center Non-Reaction

109 系列全液压转向器

109 Series Hydraulic Steering Control Units (SCU)

109系列全液压转向器是整体集成式4/5齿结构的摆线全液压转向器。可以集成单向阀、安全阀、缓冲阀，结构小巧玲，连接尺寸符合国际规范，产品广泛运用于微型非道路车辆，如：微型叉车、小型拖拉机(及其它农机)、微型土方机械、市政养护车辆等。能够通过输入较小的力，获得较大的输出转向力矩，具有操作轻巧、灵活、可靠等特点。

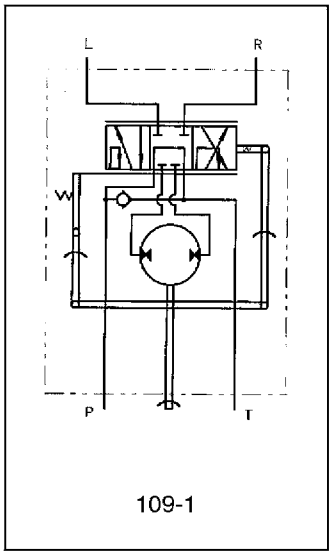
109 series hydraulic steering unit is an integrated orbital steering unit with 4/5 tooth structure.This kind of steering unit has a small and exquisite structure with integrated check valve, relief valve and shock valves and its mounting dimension conforms to international standard.This kind of steering unit is widely used in mini vehicles, such as mini forklift, mini tractor (and other agricultural machinery), mini earthmoving machinery,mini municipal vehicle, etc. It can obtain more steering output torque through input of less power, with features of easy, flexible and reliable operation.

型号说明 Order Code

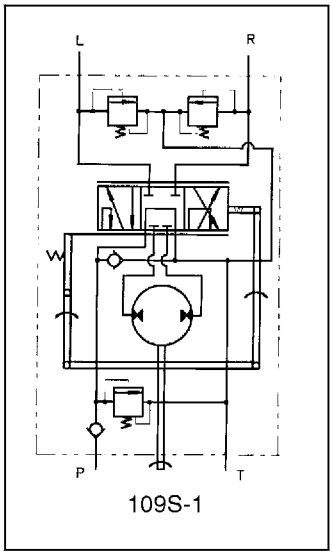
109 □ – 1 – □□□ – □□ – □

- 连接尺寸标记 Mounting Data
- 安全阀压力设定值 Relief Valves pressure settings
- 排量 Displacement
- 功能符号：开心无反应 Function Code：Open Center,Non-Reaction
- 缺省：表示不含集成阀；Omit：Without Integrated Valve
- S：表示含入口单向阀、安全阀、缓冲阀 S：With Check Valve, Relief Valve, Shock Valves
- V：表示含入口单向阀、安全阀 V：With Check Valve,Relief Valve
- R：表示安全阀 R：With Relief Valve
- 109系列全液压转向器 109 Series Hydraulic Steering Control Units

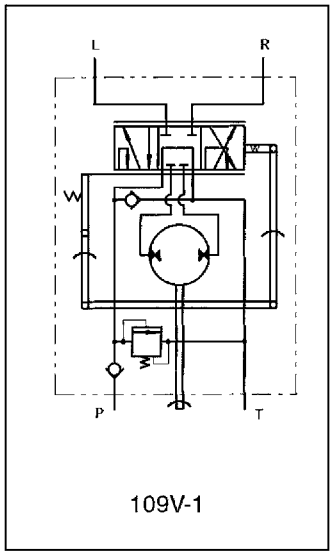
功能符号 Function Code



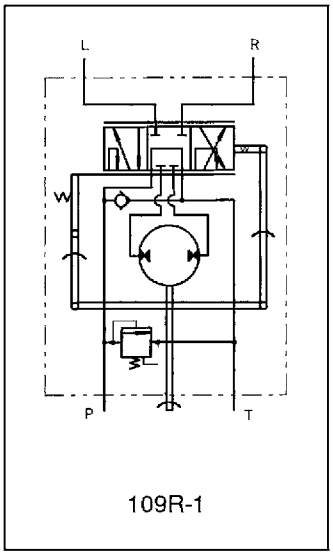
109-1



109S-1



109V-1



109R-1

109 系列全液压转向器

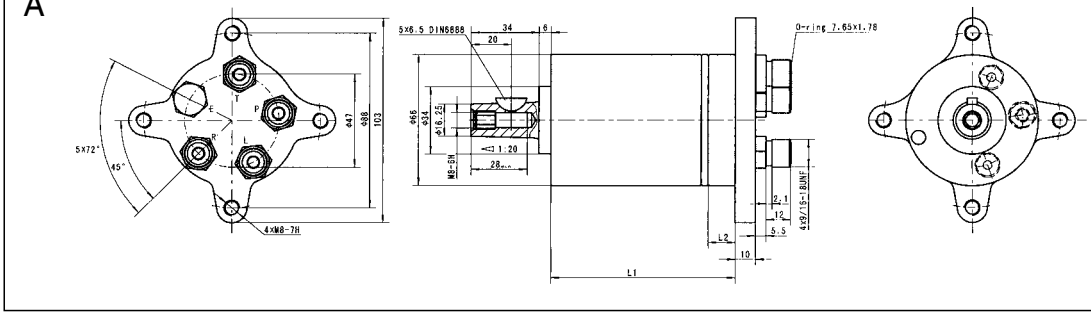
109 Series Hydraulic Steering Control Units (SCU)

主要技术参数 Main Specification

Parameters	Type 109*−1−***−***−*					
Displacement(mL/r)	20	32	40	50	63	80
Rated flow(L/min)	3~20					
Rated Pressure(MPa)	12.5					
Relief Valve Pressure Settings(MPa)	06,07,08,09,10					
Shock Valves Pressure Settings(MPa)	12,13,14,15,16					
Steering Torque(N·m)	⩽1.8					
Max. Cont. Preesure in Line T-P_T(MPa)	1					
Dimension L(mm)	87	92	96	100	105	113

连接尺寸 Mounting Data

A



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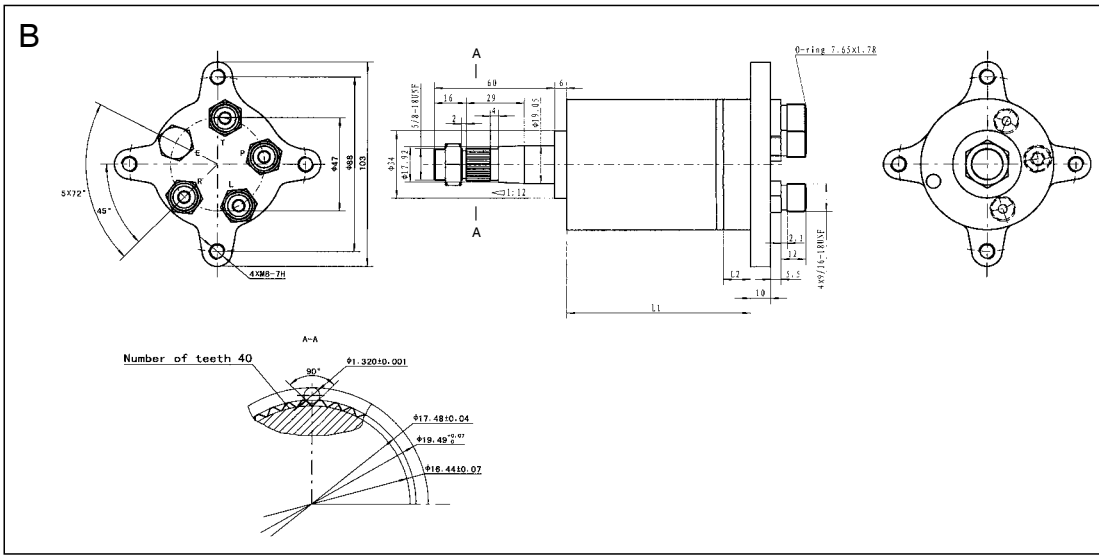
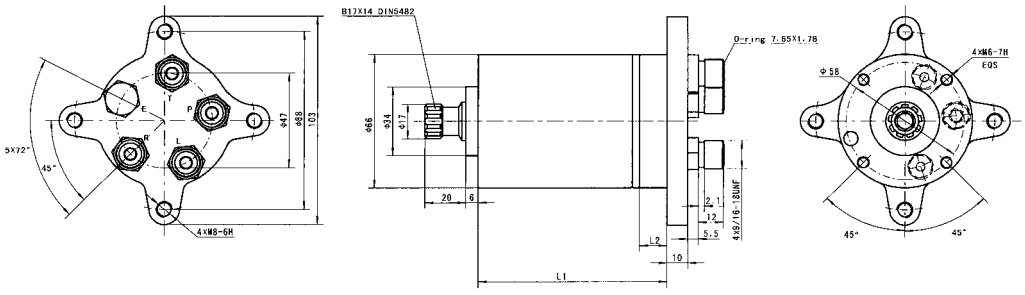


109 系列全液压转向器

109 Series Hydraulic Steering Control Units (SCU)

C



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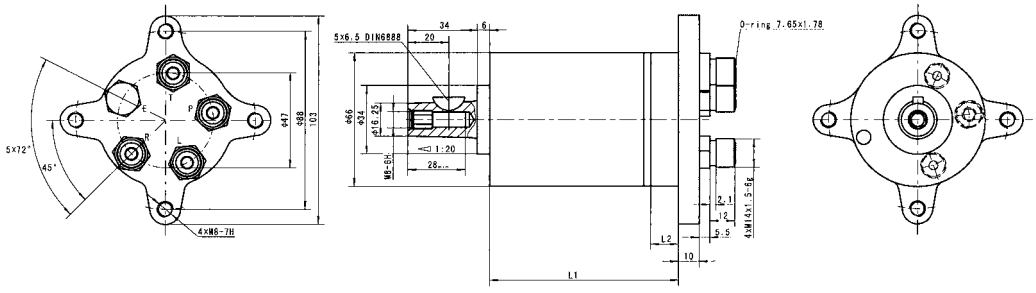

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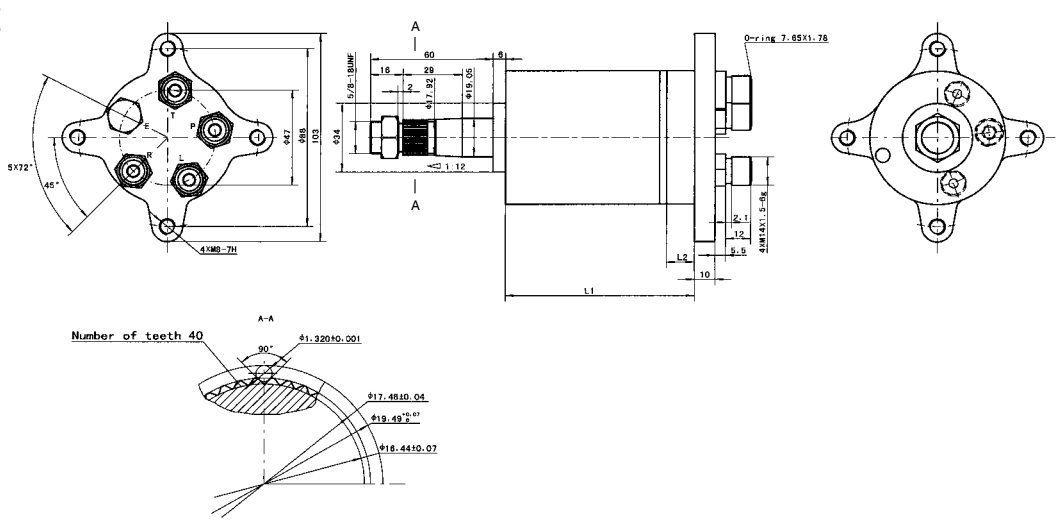

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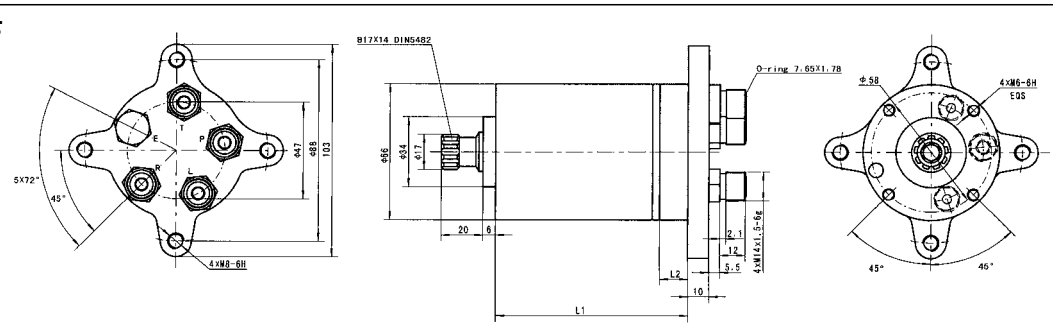


109 系列全液压转向器

109 Series Hydraulic Steering Control Units (SCU)

109 产品订货编号 Order Code

	Pos.1		Pos.2		Pos.3		Pos.4		Pos.5
109	*	–	1	–	***	–	**	–	*

Pos.1 – 集成阀参数组合 Integrated Valve Parameter

其中：缺省：不含阀　　Omit：Without valve
S：含安全阀、入口单向阀、缓冲阀　　S：With Relief Valve,Check Valve,Shock Valves
V：含安全阀、入口单向阀　　V：With Relief Valve,Check Valve
R：含安全阀　　R：With Relief Valve

Pos.2 – 功能符号 Function Code

1:开芯无反应 1:Open Center Non-Reaction

Pos.3 排量 Displacement mL/r

20、32、40、50、63、80

Pos.4 – 集成阀参数组合 Integrated Valve Parameter

安全阀压力设定值：Relief Valve Pressure Settings(MPa):06、07、08、09、10
(缓冲阀压力调定值比安全阀压力高 6 MPa)
Shock Valves Pressure Settings is 6 MPa Higher Than Relief Valve.

Pos.5 – 连接尺寸代号 Mounting Data

A、输入端和输出油口尺寸：A：Tapered 1:20，Key 5×6.5，Ports: 9/16-18UNF；
B、输入端和输出油口尺寸：B：Tapered 1:12，With 11/16 In-40 Serrations and 5/8-18UNF，Ports: 9/16-18UNF；
C、输入端和输出油口尺寸：C：DIN 5482 B17×14，Ports: 9/16-18UNF ；
D、输入端和输出油口尺寸：D：Tapered 1:20,Key 5×6.5，Ports: M14×1.5；
E、输入端和输出油口尺寸：E：Tapered 1:12，With 11/16 In-40 Serrations and 5/8-18UNF, Ports: M14×1.5；
F、输入端和输出油口尺寸：F：DIN 5482 B17×14，Ports: M14×1.5。

应用举例：

109系列转向器，开心无反应，排量32mL/r，含安全阀、入口单向阀、缓冲阀。安全阀压力8MPa，连接尺寸A型。其转向器订货编号为：109S-1-32-08-A。

For example:
Order code

109 S – 1– 32 – 08 – A

- A — Mounting Data: A
- 08 — With Check Valve, Relief Valve Pressure Settings: 8 MPa, Shock Valves Pressure Settings:14MPa
- 32 — With Displacement:32mL/r
- 1 — Open Center Non-Reaction
- S — With Relief Valve, Check Valve, Shack valves
- 109 — 109 Series Hydraulic Steeing Control Units

PV型优先阀

PV Type Priority Valves

PV**-40、60、80型优先阀和负荷传感型转向器配套使用，当系统主油路的油泵供来的液压油通过优先阀时，在系统负载变化或方向盘转速变化的情况下，优先保证转向油路所需流量。

PVF*-40、60、80型优先阀为板式连接方式，与101S-5(L)(E)或102S-5(L)(E)转向器组合成一体使用；PVF*-40、60、80优先阀分为静态信号PVFS-40、60、80和动态信号PVFD-40、60、80；

PVL*-40、60、80型优先阀为管式连接方式，与101(S)-5T(TE)或102(S)-5T(TE)转向器连接使用；PVL*-40、60、80分为静态信号PVLS-40、60、80和动态信号PVLD-40、60、80。

PV**-40、60、80型优先阀中不含LS口油路安全阀。

PV**-40,60,80 type priority valve is matched with the load sensing steering unit. When the hydraulic oil flow to the priority valve , and the load or revolution changed , PVF*-40,60,80 type priority valves is modulary design. matched with the 101S-5(L)(E) or 102(S)-5(L)(E)SCU; PVF*-40,60,80 priority valve has 2 kind signals: PVFS-40,60,80 static signal,PVFD-40,60,80 dynamic signals.

PVL*-40,60,80 type priority valve is pipe design , matched with the 101(S)-5T(TE) or 102(S)-5T(TE) SCU, PVL*-40,60,80 type priority valve has 2 kind signals: PVLS-40,60,80 static signal,PVLD-40,60,80 dynamic signals.

PV**-40,60,80 type priority valve is not inferchanged with the LS inlet pressure control relief valve, the relief valve integrated in the SCU.

型号说明 Order Code

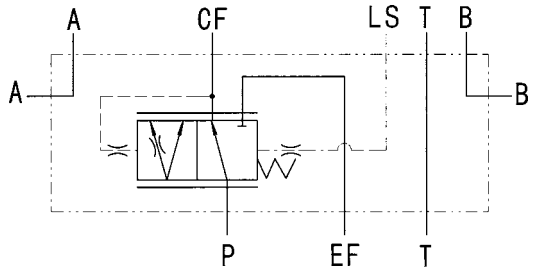
PV □ □—□—□—□

- 油口代码 Ports code
- 控制压力 Control pressure
- 最大入口流量 Max.input flow
- S: 静态信号，D: 动态信号 S: static signal, D: dynamic signal
- F: 板式连接，L: 管式连接 F: modulary mounting, L: pipe mounting
- PV 型优先阀 PV type priority valves

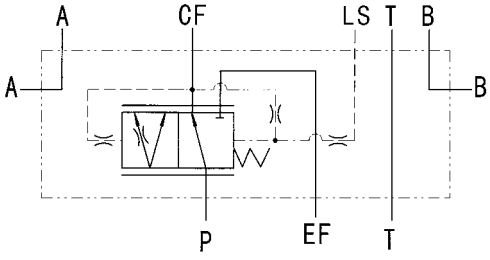
PV型优先阀

PV Type Priority Valves

功能符号 Function Code

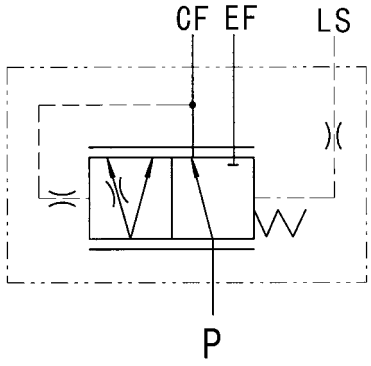


PVFS-40,60,80
静态信号
Static Signal

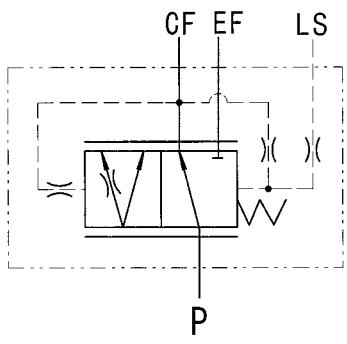


PVFD-40,60,80
动态信号
Dynamic Signal

板式连接 Modulary Mounting



PVLS-40,60,80
静态信号
Static Signal



PVLD-40,60,80
动态信号
Dynamic Signal

管式连接 Pipe Mounting

主要技术参数 Main Specification

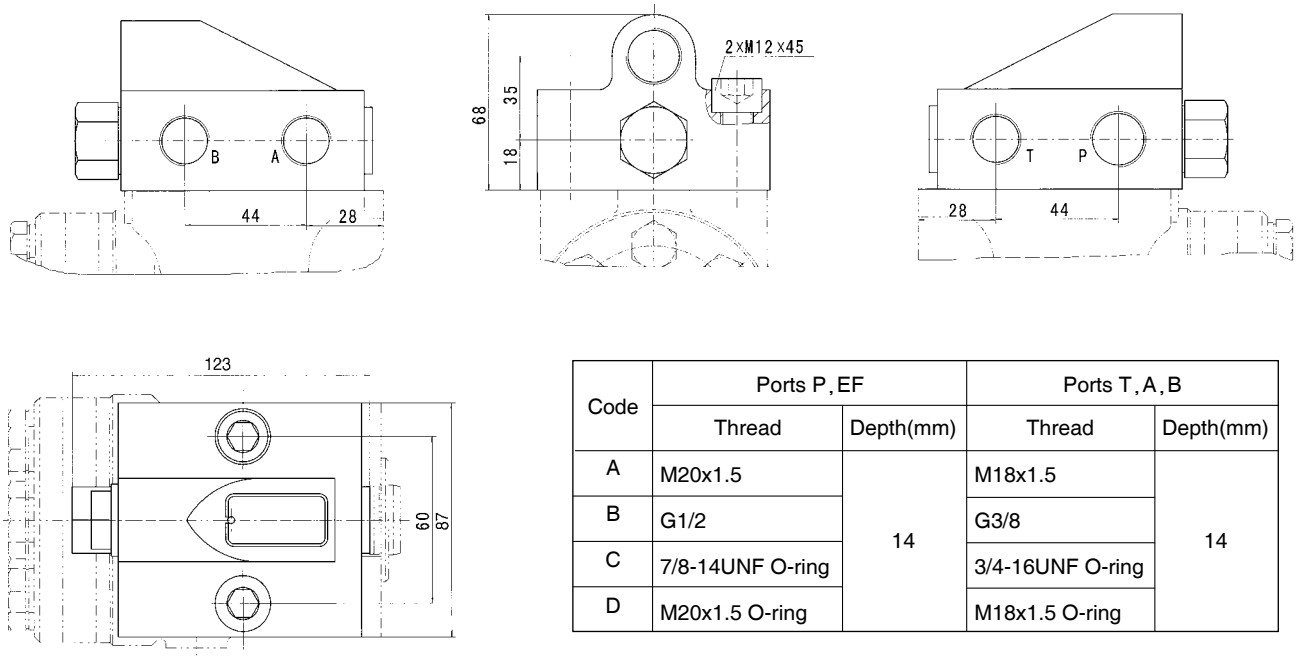
Parameters	Type PVFS(D) , PVLS(D)
Max. Input Flow (L/min)	40,60,80
Control Pressure (MPa)	0.45, 0.7, 1.05
Max. Pressure in Oil: P, EF (MPa)	20
Max. Pressure in Oil: LS, CF (MPa)	16

PV型优先阀

PV Type Priority Valves

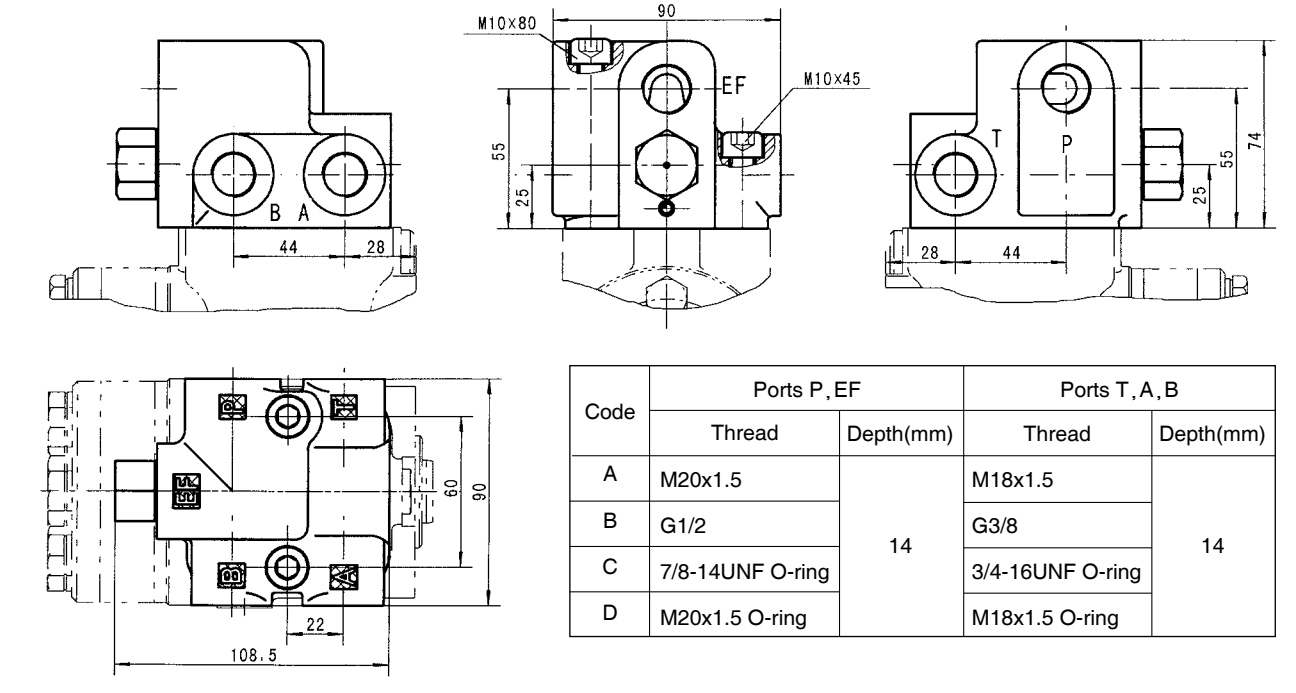
连接尺寸 Mounting Data

PVFS(D)-40、60



Code	Ports P,EF		Ports T,A,B	
	Thread	Depth(mm)	Thread	Depth(mm)
A	M20x1.5	14	M18x1.5	14
B	G1/2		G3/8	
C	7/8-14UNF O-ring		3/4-16UNF O-ring	
D	M20x1.5 O-ring		M18x1.5 O-ring	

PVFaS(D)-60

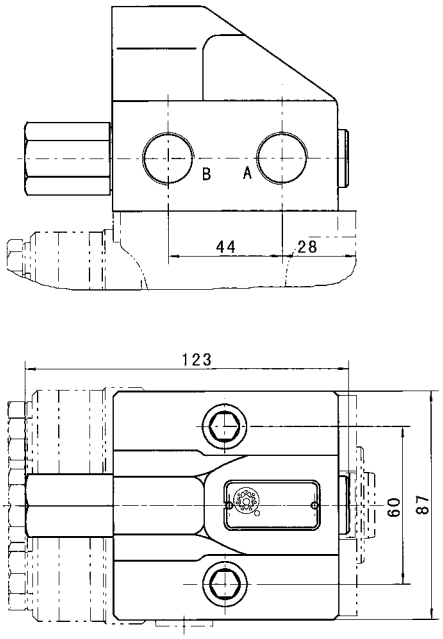


Code	Ports P,EF		Ports T,A,B	
	Thread	Depth(mm)	Thread	Depth(mm)
A	M20x1.5	14	M18x1.5	14
B	G1/2		G3/8	
C	7/8-14UNF O-ring		3/4-16UNF O-ring	
D	M20x1.5 O-ring		M18x1.5 O-ring	

PV型优先阀
PV Type Priority Valves

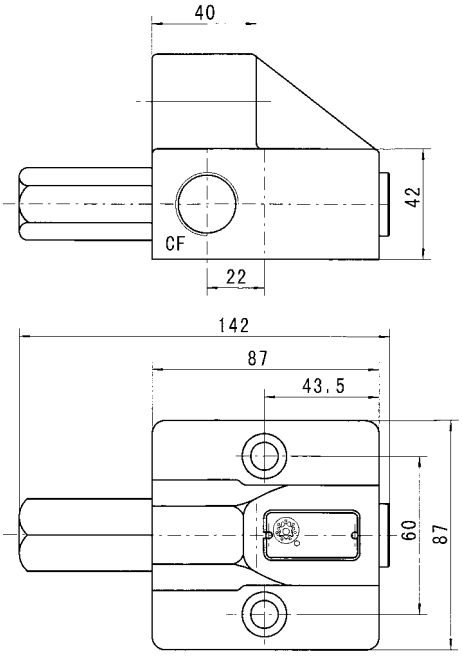
连接尺寸 Mounting Data

PVFS(D)-80



Code	Ports P,EF		Ports T,A,B	
	Thread	Depth(mm)	Thread	Depth(mm)
A	M22x1.5	14	M18x1.5	14
B	G1/2		G3/8	
C	7/8-14UNF O-ring		3/4-16UNF O-ring	
D	M22x1.5 O-ring		M18x1.5 O-ring	

PVLS(D)-80



Code	Ports P,EF		Port CF		Port LS	
	Thread	Depth(mm)	Thread	Depth(mm)	Thread	Depth(mm)
A	M22x1.5	14	M18x1.5	14	M12x1.5	14
B	G1/2		G3/8		G1/4	
C	7/8-14UNF O-ring		3/4-16UNF O-ring		7/16-20UNF O-ring	
D	M22x1.5 O-ring		M18x1.5 O-ring		M12x1.5 O-ring	

PV型优先阀

PV Type Priority Valves

产品订货编号 Order Code

	Pos.1	Pos.2		Pos.3		Pos.4		Pos.5
PV	*	*	–	**	–	***	–	*

Pos.1 – 连接方式 Mounting

其中：F:板式连接 F:Modulary Mounting
L:管式连接 L:Pipe Mounting

Pos.2 – 信号型式 Signal Model

其中：S:静态信号 S:Static Signal
D:动态信号 D:Dynamic Signal

Pos.3 – 最大入口流量 Max.Input Flow (L/min)

40、60、80

Pos.4 – 控制压力 Control Pressure (MPa)

0.45、0.7、1.05

Pos.5 – 油口代码 Ports Code

A、B、C、D

应用举例：

PV 型优先阀，板式连接，动态信号，最大入口流量40 L/min，控制压力 0.7 MPa，油口连接尺寸：P、EF油口为G1/2，T、A、B油口为G3/8。

优先阀订货编号为：PVFD-40-0.7-B

For example:

Order code

PVF D - 40 - 0.7 - B

- B: Ports P,EF G1/2; Ports T, A, B G3/8
- 0.7: Control Pressure: 0.7 MPa
- 40: Max.Input Flow: 40 L/min
- D: Dynamic Signal

全液压转向器安装使用注意事项

一、全液压转向器安装使用注意事项：
1、安装注意事项：
（1）转向器安装，必须保证转向器与转向柱的同轴度要求，同时轴向方向必须有1mm左右的间隙。
（2）紧固转向柱的螺旋旋入转向器连接螺纹孔深度≤15mm。
（3）转向器安装后，必须检查方向盘的回位，确保回位的灵活性。
（4）连接管路：P油口接供油泵，T油口接回油箱，A、B油口分别接转向器的左、右油腔。
2、油流速注意事项：
（1）与P油口相连的供油回路，管内油流速建议≤1.5m/s。
（2）与A、B油口相连的油缸压力回路，管内油流速建议≤4~5m/s。
3、其他注意事项：
（1）方向盘直径不得超过500mm。
（2）在转向器的回油路中应安装过滤精度为30μm的回油过滤器。转向系统的油箱位置一般高于转向器的安装位置，并将回油管插 入油面 以下，这样在人力转向时才可以补油，同时可防止空气进入油路。
（3）转向器用油粘度为17cst~33cst，建议采用低凝液压油。转向器允许正常工作油温为20℃ ~ 80℃， 许可极 限工作油温范围 为-30℃～100℃。提醒：在非正常油温情况下，转向性能将有所下降。
（4）转向系统装配后应试运转：运转前清洗油箱，并注入液压油到最高油面。将转向油缸螺纹接头松开，使油泵 低速运转进行放 气，直 到流出的油中不含泡沫未知。拆除转向油缸活塞杆与转向轮的链接，转动方向盘，使活塞 达到最左或最右的位置 （在两个 极限位置不要 停留），再往油箱加油至规定油面。将所有螺纹链接处拧紧（不要 在有压力情况下拧紧），连接活塞杆，检查转向系 统在各种工作条件下 工作是否正常。
（5）必须保证油液清洁，以防止脏污卡住转向器内部零件，造成转向失灵。为此要经常检查滤清器滤芯和油液的 情况，必要时给予 更 换（将液压油滴一滴到吸墨纸上，如油迹油一黑色中心，即应更换油液）。
（6）转向器在使用中如发现转向沉重或者失灵时，应首先仔细查找原因，不可用力硬扳方向盘，更不要轻易拆开 转向器，以免损坏 零 件。严禁两人同时转动方向盘。

The installation and use of full hydraulic steering note

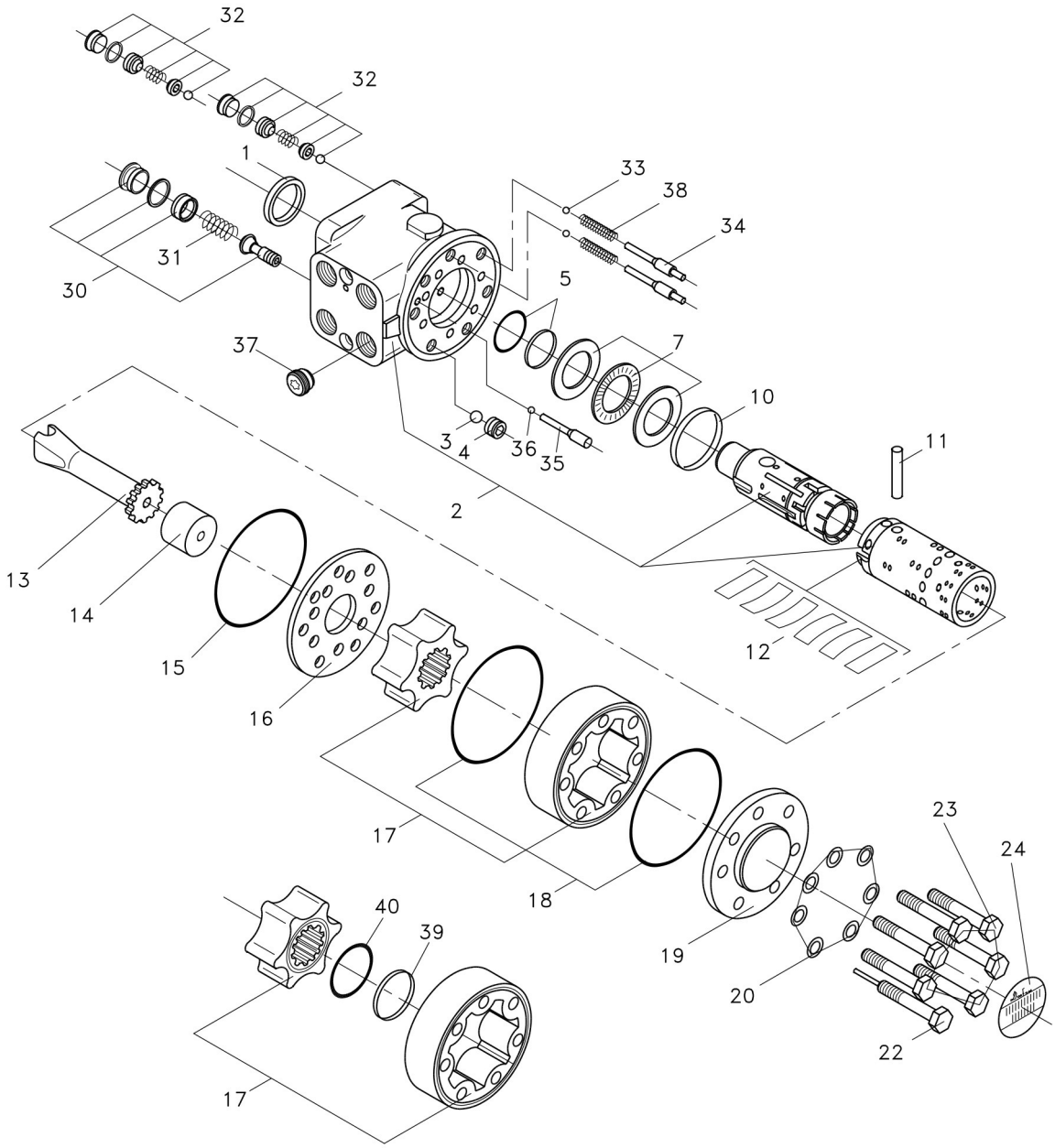
1, installation precautions:
(1) When installation steering gear must ensure coaxiality with column, must have a gap of 1 mm in the axial direction.
(2) The depth of screw connection to the steering column tightening steering column is ≤15mm.
(3) After steering gear installed, must check steering wheel turns to ensure the flexibility of the return position.
(4) Connection pipeline: P oil port connects to the oil supply pump, T oil port connects to the oil tank, and A and B oil ports respectively connect the left and right oil chambers of the steering gear.
2, oil flow rate considerations:
(1) The oil supply circuit connected to the P oil port, the oil flow rate in the pipe is recommended to be ≤1.5m/s.
(2) The pressure circuit of the oil cylinder connected to the A and B ports is recommended. The oil flow rate in the pipe is recommended to be ≤4~5m/s.
3, other matters needing attention:
(1) The diameter of the steering wheel must not exceed 500mm.
(2) A return filter with a filter accuracy of 30 μm should be installed in the return line of the steering gear. The position of tank is generally higher than installation position of steering gear, and return pipe is inserted below oil level, so oil can be filled only when the manpower is turned, and air can be prevented from entering the oil line.
(3) The oil viscosity of steering gear is 17cst~33cst. It is recommended to use low-condensation hydraulic oil. Steering gear allows normal working oil temperature 20°C to 80°C, and the limit working oil temperature range is -30°C to 100°C. Reminder: In case of abnormal oil temperature, steering performance will decrease.
(4) After steering system assembled, it shall be tested: clean oil tank before operation, inject hydraulic oil to the max oil level.Loosen cylinder nipple and allow pump to run at low speed until it is out of oil. Remove link,turn the steering wheel so that the piston reaches left or right position, and then fill the tank to specified level. Tighten all thread connections, connect the piston rod, and check if the steering system is working properly.
(5) It must be ensured that the oil is clean to prevent the dirt to cause steering failure. Always check the condition of the filter element and the oil. If necessary, give a replacement.
(6) If steering failure, must be carefully check the reason first. The steering wheel must not be pulled hard, and the steering gear should not be disassembled to avoid damage to parts. It is forbidden for two people to turn the steering wheel at the same time.

二、常见故障原因及排出方法

故障	发生原因	排除方法
转向器后盖，定子，隔盘和阀体之间的结合面漏油	后盖定子和阀体间的结合部位螺栓松动（或者力不均匀）或组合密封垫圈或结合面的 O 型圈损坏	间隔，均匀拧紧罗酸达到规定值，更换密封圈（专用）
转向器轴颈处漏油	转向器轴颈处密封圈磨损量过大或损坏	更换密封圈（专用）
慢转方向盘时轻，快转方向盘时沉	油泵对于转向器的供油不足	检查油泵工作是否正常（包含液面高度、油泵效率、管路通畅程度等）
油中有泡沫，发出不规则响声、方向盘转动而油缸时动时不动	转向系统中有空气	排出系统中的空气，检查吸油管路是否漏气或者回油管口是否已经在液面以下
转向沉重持续发生	油箱油液低于规定位置	加油至规定高度
	油液年度太大	使用规定油液
快转与满转方向盘均沉重，并且转向无压力	阀体内 P、T 油路件的单向阀失效	如钢球丢失，则装入钢球； 如钢球被脏污卡住，应进行清洗； 两种情况均需检查密封带的恢复有效性。
空负荷或者轻负荷转向轻，增加负荷转向重	系统的溢流阀压力低于转向要求压力值	调整溢流阀压力至规定值（但不得超过 16MPa）
	溢流阀被赃物卡住或者弹簧失效或者密封圈损坏	清洗溢流阀（需检查密封带的恢复有效性），或者更换弹簧或者密封圈
方向盘不能自动回中	弹簧片折断或者产生过量的永久变形	更换弹簧片（禁止使用替代品）
方向盘自传或者自动左右摆动	转子与联动轴相互位置装错	立即停机！ 经联动轴上带冲点的齿与转子内花键的齿槽（端面上看最薄弱处）对齐。
转向转不到极限位置	转向器痛安全阀压力低	适当提高安全法压力（最好在有压力表的条件下进行调节）
转向转到极限位置后，方向盘可轻松转动	双向缓冲阀压力低	适当提高缓冲阀压力
熄火转向时，方向盘转动而油缸不动	转子、定子的径向间隙或轴向间隙过大	更换转子和定子
	油液粘度低	更换油液
车辆跑偏或者转动方向盘时油缸动作迟缓	双向缓冲阀失灵（钢球被赃物卡住或弹簧失效，密封损坏）	清洗双向缓冲阀，更换弹簧或密封
转向系统的压力调不高或调不低	弹簧断裂	更换弹簧
	安全阀阀口密封不好，造成阀总是开启	配研安全阀芯和阀座或者更换零件
	阀芯因毛刺或者有无卡死	拆出、检查、修整
	阀芯动作不良	检查阀芯是否被有无卡住
	弹簧弯曲或者太软	更换弹簧
	油不清洁，阀芯阻尼孔堵塞	更换清洁油液，疏通阻尼孔

2, common causes and troubleshooting

Matter	**Causes**	**Troubleshooting**
Oil leakage between back cover, stator and valves	rear cover stator bolt looseness (or uneven force), or O-rings damaged	Evenly tighten the bolt to the specified value, replace the seal (special)
Oil leakage at steering shaft	shaft seal ring excessive wear or damage	Replace the seal (dedicated)
feels light when turn the steering wheel slowly, feels heavy when turn the steering wheel quickly	steering pump oil supply not enough	Check whether oil pump is working properly, (Including liquid level, pump efficiency, pipeline patency, etc.)
There is foam in the oil, irregular sound, the steering wheel turns and the cylinder does not move	There is air in the steering system	Eliminating the air in the system, Check the suction pipe leaks or not, Or if the return nozzle is below the liquid level
Heavy steering continues to occur	Tank fluid is below the specified position	Add oil to prescribed height
	Heavy oil viscosity	Use oil as required
Feel heavy when turn fast and slow, stressless	Check valve between P,T failure	Check the ball. If the steel ball is missing, then insert the steel ball; If the ball gets stuck dirty, it should be cleaned; In both cases, it is necessary to check the effectiveness of the sealing tape recovery.
Turns light when the load is light, turns heavier when increas the load	relief valve pressure lower than steering requirement	Adjust relief valve pressure to specified value (no more than 16MPa)
	Relief valve stucked by dirt, Or spring failure,Or seal is damaged	Clean relief valve (required to check the effectiveness of seal tape recovery), or replace the spring or seal
steering wheel can't auto back to middle position	Spring broken or deformation	Replacement spring
Steering wheel rotate automatic swing to left or right	Rotor and linkage axes are not positioned correctly	Stop immediately! Align the teeth of the linkage shaft with rotor splines
No end point	Low pressure on relief valve	Appropriately increase relief valve pressure
Steering wheel rotates after turning to the end position	Low pressure on shock valves	Appropriately increase shock valves pressure
when machine is off, turn the wheel, cylinder not move	radial clearance or axial clearance is too large between radial and stator	Replace rotor and stator
	Low viscosity of oil	Change oil
Vehicle deviation Or the cylinder is slow when turning the steering wheel	shock valves failure (ball caught by dirty, or spring failure, or seal damage)	Clean shock valves, replace spring or seal
pressure of Steering system is able to adjust	Spring broken	Change spring
	not good seals at safety valve make the valve always open	replace parts
	Valve core stuck due to burr or oil stain	Remove, inspect, repair
	Poor spool operation	Check if the spool is stuck by dirty
	Spring bent or too soft	Change spring
	Oil is not clean, valve plug orifice is blocked	Replace the cleaning fluid and unblock the orifice



1	Dust seal ring	14	Spacer	24	Name plate
2	Housing, spool and sleeve. Check valve and the seats for relief and shock valves are locktited.	13	Cardan shaft	30	Complete relief valve
		12	Set of springs	31	Spring wire
		15	O-ring	32	Complete shock valve
3	Ball 8.5 mm [0.33 in]	16	Distributor plate	33	Ball $^{3}/_{16}$ in
4	Thread bushing	17	Gearwheel set	38	Spring
5	O-ring used with kin-ring (item 6)	18	O-ring	34	Rolled pin
6	Kin-ring	19	End cover	36	Bushing
7	Bearing assembly	20	Washer	35	Ball
10	Ring	22	Special screw	39	Kin ring
11	Cross pin	23	Screw	40	O-ring

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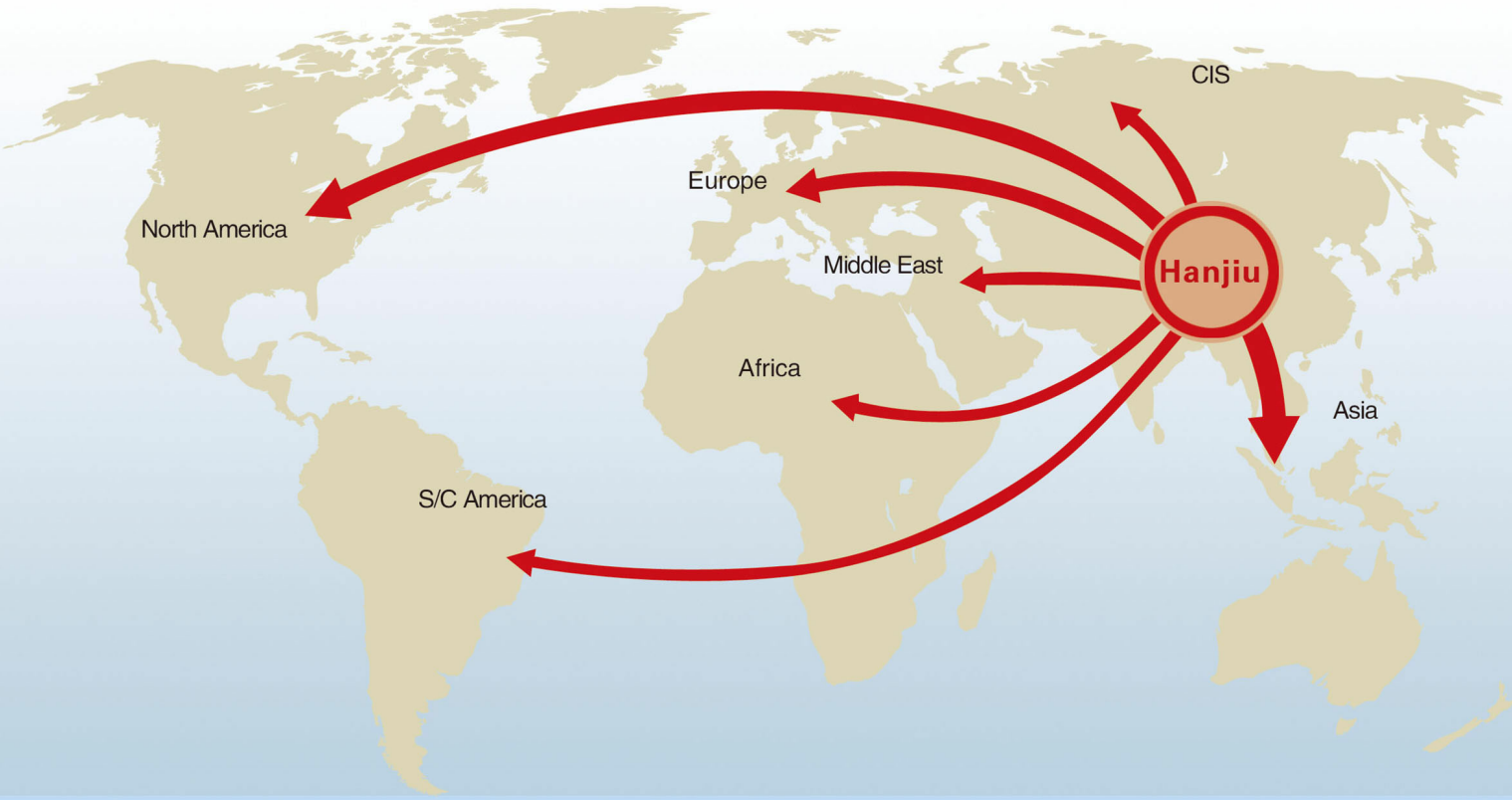

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石家庄寒九科技有限公司

地址： 中国河北石家庄友谊北大街368号

电话： +86（311）68123061

传真： +86（10）- 80115555-568844

邮编： 050000

网址： www.hjhydraulic.com

邮箱： manager@sjzhjsm.com

SHIJIAZHUANG HANJIU TECHNOLOGY CO.,LTD.

Add: No. 368 Youyi Street, Shijiazhuang, Hebei, China

Tel: +86 (311) 68123061

Fax: +86 (10) - 80115555-568844

Post code: 050000

Web: www.hjhydraulic.com

Email: manager@sjzhjsm.com