



GFB回转行星减速机

GFB Planetary Gearboxes For Slew Drives

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减速机规格及最大输出转矩 gear size and max.output torque

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The allowed output speed(not stipulated in this catalogue)will change in practical working conditions. Please consult with technical staffs of our company.

输出转速允许值（样本中未规定）因实际工况的不同而有所变化，请向本公司技术人员咨询。

For version T2 with lower ratio the output torque will be reduced.

T2型号因速比比较低，输出转矩将会降低

The gearbox are available as two(T2) or three stage(T3) units to suits the individual application.

为适应各种应用情况，齿轮箱有两级或三级之分

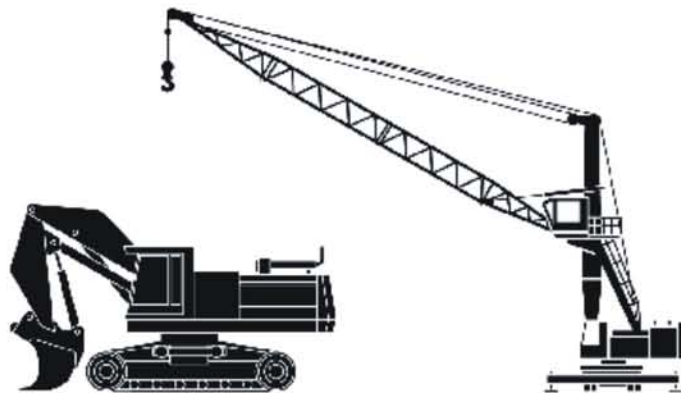
说明 Description

General

The hydrostatic swing gears of types gfb series feature high performance and are ideal driving components that have proven their worth under arduous application conditions in the most unfavorable operating environments. swing gears GFB series are employed in excavators and cranes of all types. In ship unloading equipment, forestry equipment and in all applications where slewing operations have to be performed.

Due to their extremely compact size they are best suited for direct mounting inside the equipment their design provides for ease of mounting and maintenance. The use of case-hardened gearwheels and nitrited annulus gears has resulted in low-noise running characteristics, and nitrited annulus gears has resulted in low-noise running characteristics, and a consistently high manufacturing standard ensures excellent load carrying ability and outstanding operational reliability. The teeth of the gearwheels are optimized on the basis of L+S computer programs and yield highest safety margins. The drives feature an optimum total efficiency.

The gear units described in this bulletin are subject to constant updating and technical advancement. To suit the specific needs of our customers with respect to dimensions and output further variants can be made available on request. We are prepared to give advice and provide assistance whenever needed, even in the project stage. To find the most appropriate application solution for you.



Special features

- High-duty planetary gearbox of modular construction
- compact, space-saving, two- or three-stage planetary gear design
- robust bearing system absorbing the forces exerted by the ring gear
- simple mounting
- integrated multiple-disk holding brake
- low-noise running
- high efficiency, long service life, easy oil change

概述

静液压回转减速机GFB Series 是理想的传动装置。这种装置在最不利的环境下经受了考验, 显示其高性能。回转减速机在各式挖掘机, 起重机, 船舶卸货装置, 林业设备, 以及凡有旋转运动的设备中得到广泛的应用。由于该装置结构形式特别紧凑。所以他特别适于安装到节省到空间的设备中。此装备便于安装和维修。

由于使用了经硬化处理的齿轮和经氮化处理的内齿轮, 同时生产工艺质量很高, 因而保证了该设备非常好的承载能力, 运行可靠和低噪音, 齿轮系统是按L+S计算机程序设计的, 安全可靠。传动装置具有最佳总体效率。

在本表中所列传动装置是经过不断改进和更新的设备。我们可根据特殊要求, 为用户提供各种尺寸和性能和传动装置。因此, 我们向你建议, 在设计方案阶段帮助你们找到最佳传动方案。

结构特点

- 模块化结构的高性能行星减速机
- 紧凑, 省空间的2级或者3级行星齿轮结构
- 轴承系统坚固, 能吸收来自回转支承的力
- 安装简单
- 内装多片式停车制动器
- 低噪声运转
- 效率高
- 寿命长
- 换油方便

Application conditions

The gearboxes have been designed for use at ambient temperatures ranging between -20°C and $+40^{\circ}\text{C}$. environmental influences such as salt water, salty air, sand, dust, overpressure, heavy vibrations, extreme shocks and ambient temperatures, aggressive media and the like will impede the function of the product. To enable a safe design of the winch drive such conditions must be reported to the factory.

Gearbox design

The gearbox design is based on many years of practical application experience.

The maximum output torques $T_{2\max}$ indicated under technical data for crane applications relate to FEM section 1, 3rd edition and section IX (FEM—Federation Europeenne de la Manutention), as well as DIN 15020, collective load class L2, service time category T5 corresponding to driver group M5. The reference output speed is 25 revolutions per minute maximum. If the swing drive is classified in another driver group the required output torque must be converted by applying factor K (see page 4).

Higher torques

For gearboxes transmitting torques higher than indicated in the catalog please contact us.

Hydraulic motors

The gearbox design enables the direct flange attachment of a constant or variable displacement motor. If so requested the hydraulic motor can also be included in the gearbox supply.

Brake

The standard supply scope includes a spring-loaded, hydraulically released multiple-disk parking brake arranged on the input side.

$$T_{Br, \text{sta. min}} = 1.3 \cdot T_1 \text{ (input torque)}$$

The multiple-disk holding brake is not to be used as service brake

The holding torque multiplies with the transmission ratio selected.

Lubrication

The gear teeth and bearings will be splash lubricated. Save for regular oil changes the drive units do not require maintenance. Changing the oil is done very easily. Exclusively the oil brands recommended in the operating manual must be used for this work. The change intervals necessary for the relevant application conditions are also prescribed in the operating manuals. The pinion-like antifriction bearing of the output shaft has been provided with a for life grease filling.

使用条件

减速机是按使用环境温度范围 $-20-40$ 设计的。诸如盐水，含盐空气，沙子，灰尘，过压，大的震动外部冲击负荷。环境温度，腐蚀性介质等环境影响都会损害设备的功能，这些影响必须向用户说明，以保证安全设计。

减速机的设计

减速机的设计是以多年的使用经验为基础的。在技术数据中所指的最大输出扭矩 对应于FEM第3版的第一章和第九章，以及DIN15020中，当载荷级别为L2，运行时间级别为T5时机构工作级别为M5标准输出转速最大为每分钟25转。对于不同的机构工作级别，必须用系数K对所要求的输出扭矩进行换算（请见第4页）。

更大的扭矩

若用户所需的扭矩比我们表中列出的更大，请随时与我们联系。

液压马达

减速机是按定量或者变量马达的直接法兰连接设计的。按用户需求也可提供液压马达。

制动器

按标准，传动装置中装有一个弹簧制动液压释放的多片式停车制动器。

$$T_{Br} \text{ (最小静态制动力矩)} = 1.3 \cdot T_1 \text{ (输入扭矩)}$$

片式停车制动器不能用作动态工作制动器

制动力矩根据所选用的速比进行匹配

润滑

齿轮啮合和轴承需浸渍润滑。
传动装置除定期换油以外，无须维护。
换油也很容易。
必须使用操作指南所指定的润滑油。
换油周期因使用条件而异，此点在操作指南中也有说明。
输出小齿轮的滚动轴承为脂润滑。

运行时间级别/Service time category				T2	T3	T4	T5	T6	T7	T8
假定每天的平均运行时间，以小时计 Assumed average service time per day in hours				0.25-0.5	0.5-1	1-2	2-4	4-8	8-16	>16
理论寿命，以小时计 Theoretic service life in hours				400-800	800-1600	1600-3200	3200-6300	6300-12500	12500-25000	25000-50000
载荷状态分级/Collective Load Class				机构工作级别及K系数/Driver Group With K Factor						
载荷级别/collective groups	L1	轻 Light	经常为轻载荷， 仅偶尔例外最大载荷 Maximum loads occurring in exceptional cases only, slight loads constantly	M1 0.90	M2 0.90	M3 0.90	M4 0.90	M5 0.90	M6 1.05	M7 1.2
	L2	中 Medium	大约在同一时间内为轻， 中等和高载荷 Small, medium and maximum loads about equally distriouted over service time	M2 0.90	M3 0.95	M4 0.95	M5 1	M6 1.15	M7 1.30	M8 1.50
	L3	重 Heavy	经常承受接近最大载荷 Loads always near maximum	M3 1.05	M4 1.05	M5 1.10	M6 1.25	M7 1.40	M8 1.60	M8 1.80
	L4	特重 Very heavy	经常承受最大载荷 always maximum Loads	M4 1.25	M5 1.30	M6 1.45	M7 1.65	M8 1.85	M8 2.10	M8 2.40

Gearbox selection

T₂=output torque
T_{2k}=corrected output torque
K factor according to service time category
and collective group given in the table

减速机选型

T₂=输出扭矩
T_{2k}=已修正的输出扭矩
K-系数 根据运行时间级别和载荷级别在表中可以查到
and collective group given in the table

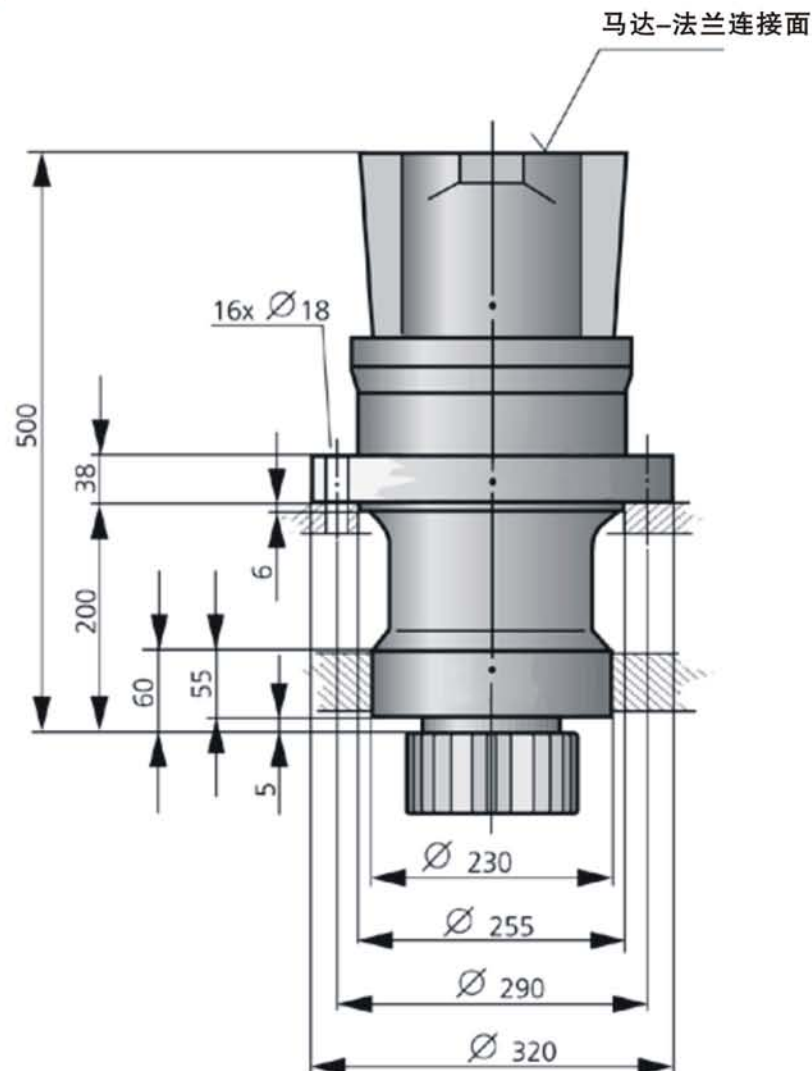
T_{2k}=T₂·K

T_{2k} of the gearbox to be selected must be ≤ T_{2max} T_{2k}=减速机选型时T_{2k} 必须 ≤ T_{2max}(见样本)
(acc.to bulletin)

分级示例 Classifications Examples

起重机类型 (名称) Type of Crance (designation)	工作元件 (1) Component Operated(1)	驱动机构类别 Type of Driver				
		起升 hoisting	回转 swinging	变幅 level luffing	小车行走 trolley travelling	起重机 行走 crane travelling
安装用起重机/erection cranes		M2-M3	M2-M3	M1-M2	M1-M7	M2-M3
装卸桥/loading bridges	Haken/hook	M5-M6	M4	-	M4-M5	M5-M6
装卸桥/loading bridges	抓斗或磁铁 grab or mannet	M7-M8	M6	-	M6-M7	M7-M8
车间用起重机/workshop cranes		M6	M4	-	M4	M5
桥式起重机, 碎铁用起重机, 废钢场起重机 overhead travelling cranes, jam cranes, scrap yard cranes	抓斗或磁铁 grab or mannet	M8	M6	-	M6-M7	M7-M8
卸料平台, 集装箱门式起重机 unloading bridges, container gantry cranes	抓斗或扩张机 hook or spreader	M6-M7	M5-M6	M3-M4	M6-M7	M4-M5
其他门式起重机 (用于小车或旋臂起重机) other gantry cranes (with trolley cranes)	吊车钩 hook	M4-M5	M4-M5	-	M4-M5	M4-M5
卸料平台, 集装箱门式起重机 (用于小车或旋臂起重机) unloading bridges, container gantry cranes(with trolley cranes)	抓斗或磁铁 grab or mannet	M8	M5-M6	M3-M4	M7-M8	M4-M5
船台起重机 船厂起重机, 拆卸起重机 berth cranes, shipyard cranes, dismantling cranes	吊车钩 hook	M5-M6	M4-M5	M4-M5	M4-M5	M5-M6
港口起重机(可旋转, 门式...) 浮式起重机, 浮式桅杆起重机 dockside cranes(siewable, gantry- type,...), floating cranes, floating sheerlegs	吊车钩 hook	M6-M7	M5-M6	M5-M6	-	M3-M4
港口起重机(可旋转, 门型...) 浮式起重机, 浮式桅杆起重机 dockside cranes(siewable, gantry- type,...), floating cranes, floating sheerlegs	抓斗或磁铁 grab or mannet	M7-M8	M6-M7	M6-M7	-	M4-M5
用于大型重物(100吨以上)的浮 式起重机, 浮式桅杆起重机 floating cranes and floating sheerlegsfor very high loads (normally above 100t)		M3-M4	M3-M4	M3-M4	-	-
甲板起重机/shipboard cranes		M4	M3-M4	M3-M4	M2	M3
甲板起重机/shipboard cranes	吊车钩 hook	M5-M6	M3-M4	M3-M4	M4-M5	M3-M4
建筑工地用塔式吊车 tower cranes for construction sites	抓斗或磁铁 grab or mannet	M4	M5	M4	M3	M3
门式起重机/derrick tower gantry		M2-M3	M1-M2	M1-M2	-	-
铁路起重机, 允许用于铁路维修 railroad cranes, approved for service in trains		M3-M4	M2-M3	M2-M3	-	-
汽车起重机/vehicle-mounted cranes	吊车钩 hook	M3-M4	M2-M3	M2-M3	-	-

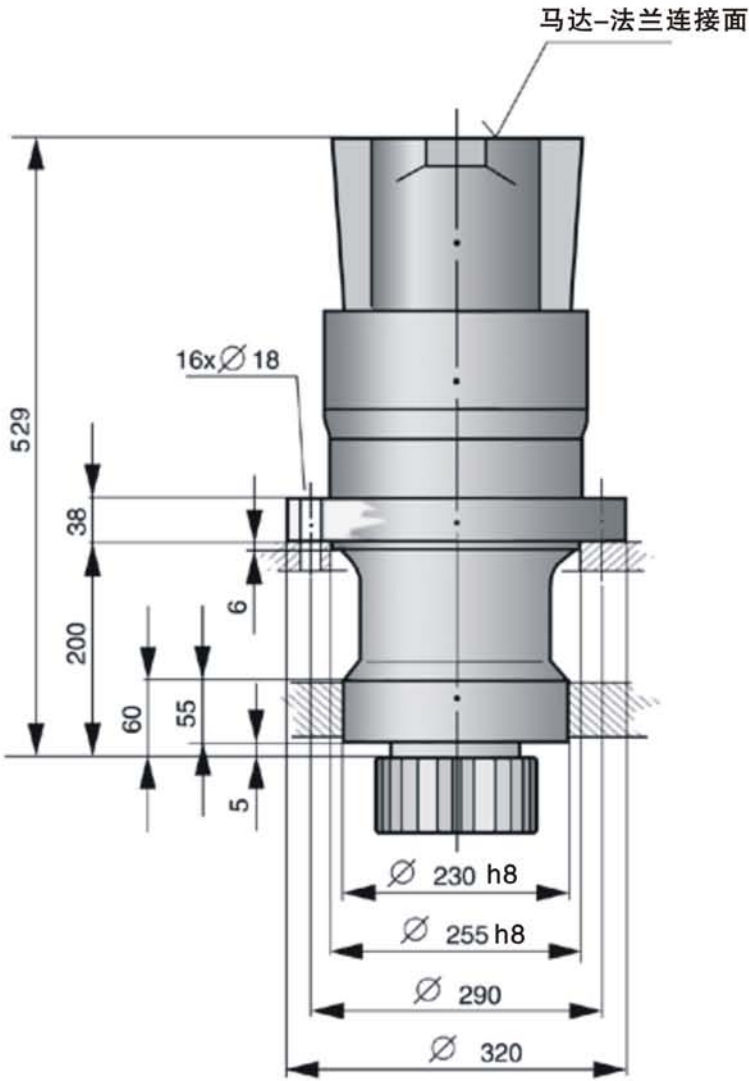
GFB 17 T2



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
7700	12000	27	A2FE45/61W-VZL A2FE56/61W-VZL A2FE63/61W-VZL	8*14*0.5*70 10*12*0.35*80 12*13*0.5*85	390	116
		33				
		39				
		46				
		55				

- 减速机输入转向与输出转向相同。
Gearbox input direction is same with the output direction.
- 输出转速允许值（样本中未规定）因实际工况的不同而有所变化，请向本公司技术人员咨询。
Allowed output speed (not indicated in catalog) is subject to variation with actual application so please consult with our engineers.

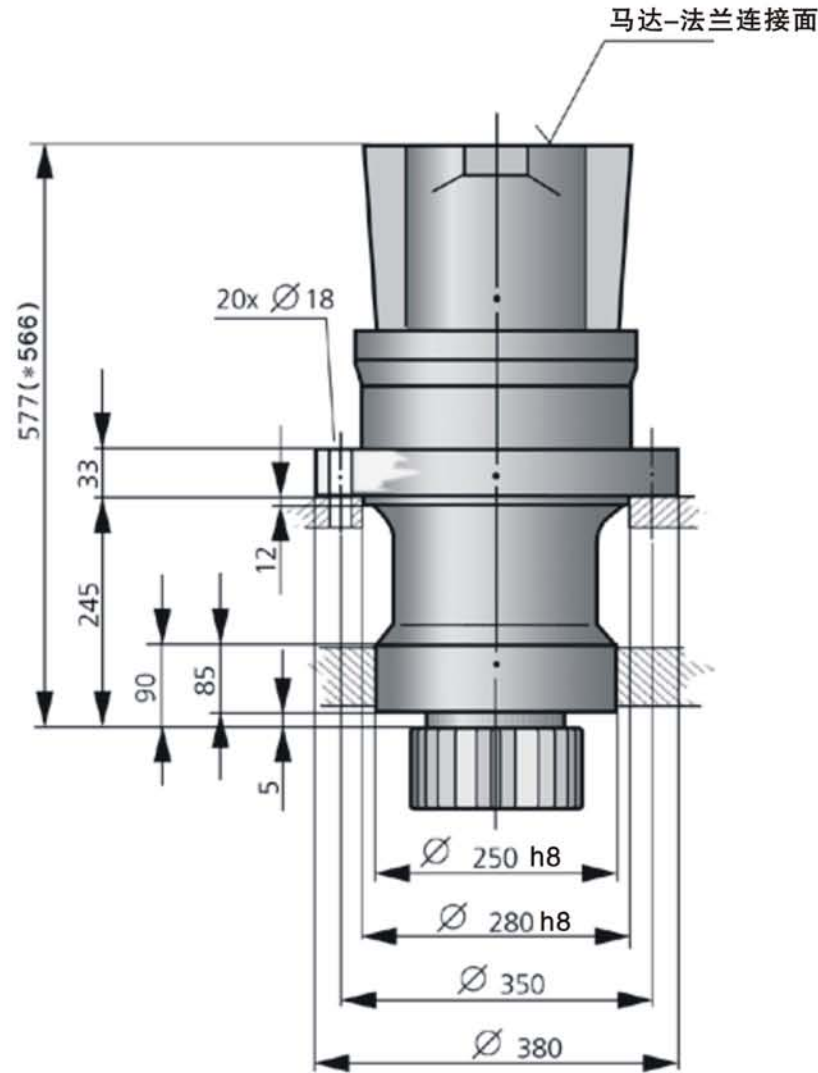
GFB 17 T3



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
7700	12000	79	A2FE45/61W-VZL	8*14*0.5*70	249	140
		89	A2FE56/61W-VZL	10*12*0.35*80		
		104	A2FE63/61W-VZL	12*13*0.5*85		

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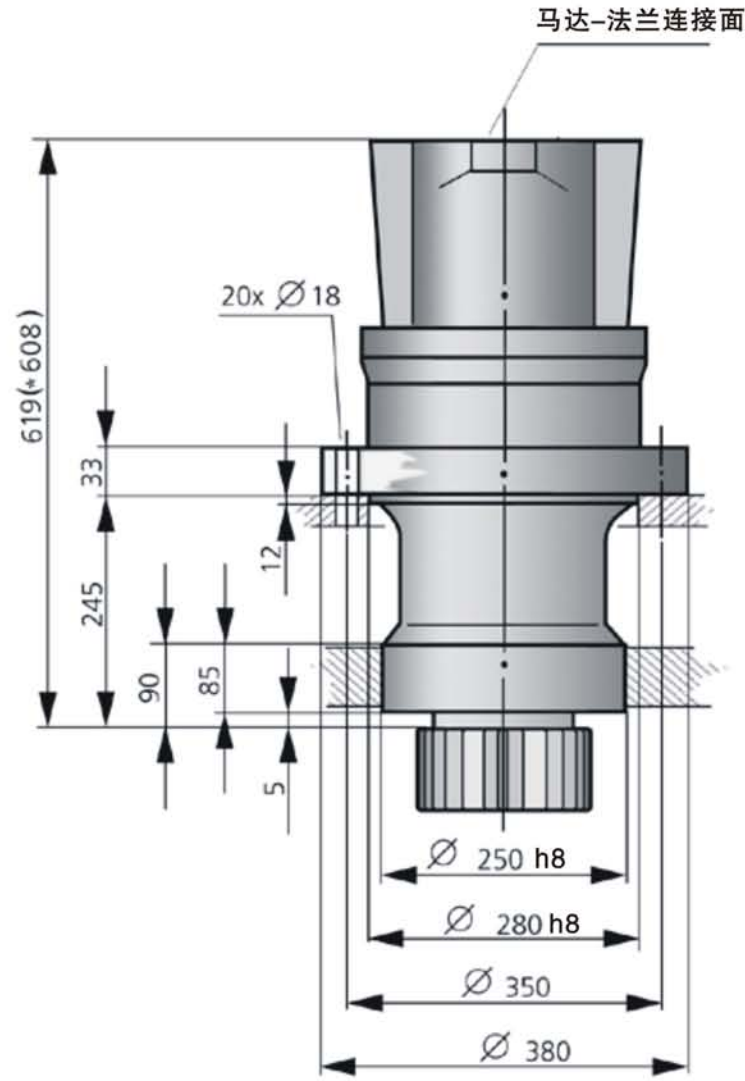
GFB 26 T2



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
10000	16500	38 44 51 63	A2FE56/61W-VZL A2FE63/61W-VZL *A2FE80/61W-VAL *A2FE90/61W-VAL	10*15*0.5*110 12*13*0.5*90 12*16*0.5*120 14*15*0.5*120 16*12*0.5*100	249	140

- 减速机输入转向与输出转向相同。
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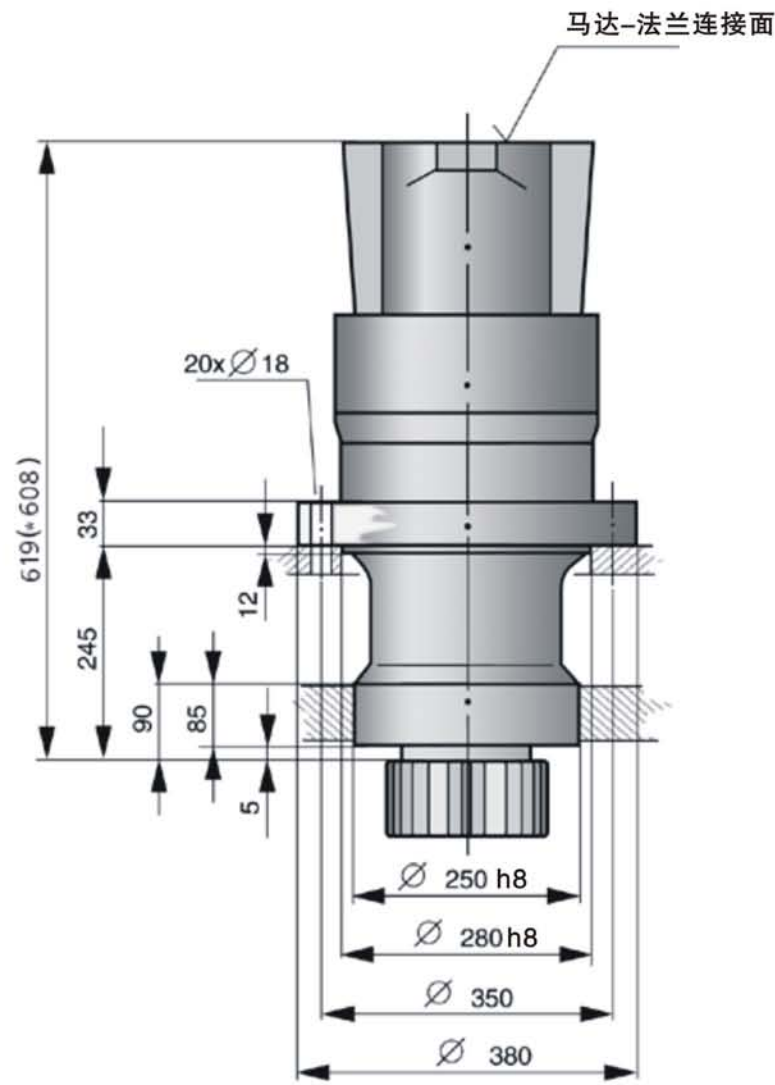
GFB 36 T2



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
16000	26000	24 29	A2FE56/61W-VZL A2FE63/61W-VZL *A2FE80/61W-VAL *A2FE90/61W-VAL	10*15*0.5*110 12*13*0.5*90 12*16*0.5*120 14*15*0.5*120 16*12*0.5*100	390	160

- 减速机输入转向与输出转向相同。
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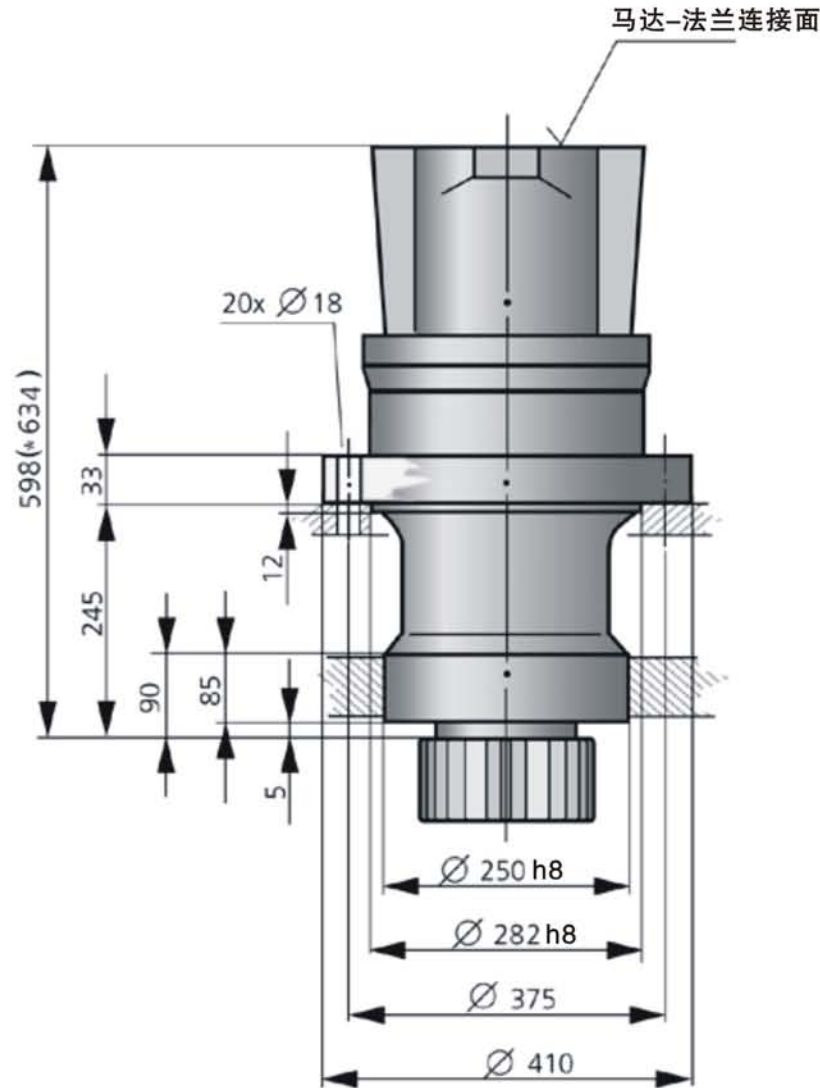
GFB 36 T3



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
16000	26000	68	A2FE45/61W-VZL	10*15*0.5*110	390	160
		80	A2FE56/61W-VZL	12*13*0.5*90		
		101	A2FE63/61W-VZL	12*16*0.5*120		
		118	*A2FE80/61W-VAL	14*15*0.5*120		
		132	*A2FE90/61W-VAL	16*12*0.5*100		

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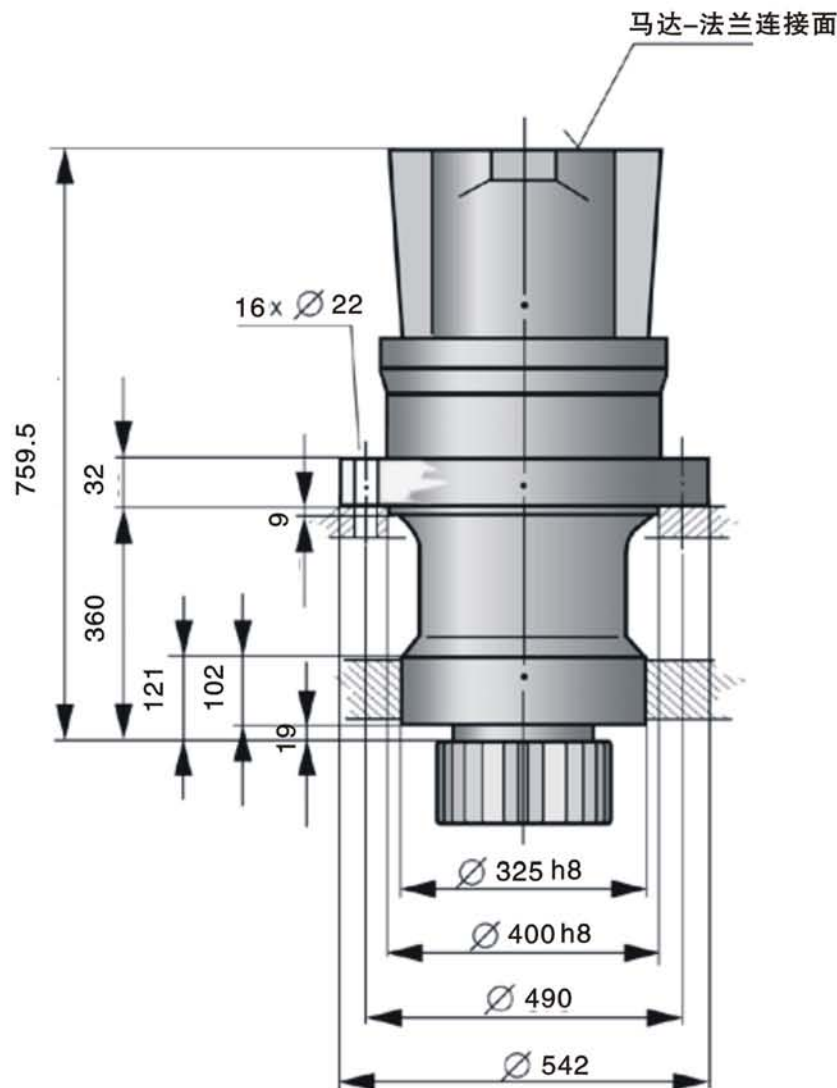
GFB 40 T2



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
18000	29000	36	A2FE80/61W-VAL	12*15*0.5*100	588	210
		42	A2FE90/61W-VAL	12*15*0.5*100		
		49	*A2FE107/61W-VZL	14*13*0.5*100		
		60	*A2FE125/61W-VZL	14*13*0.5*100		

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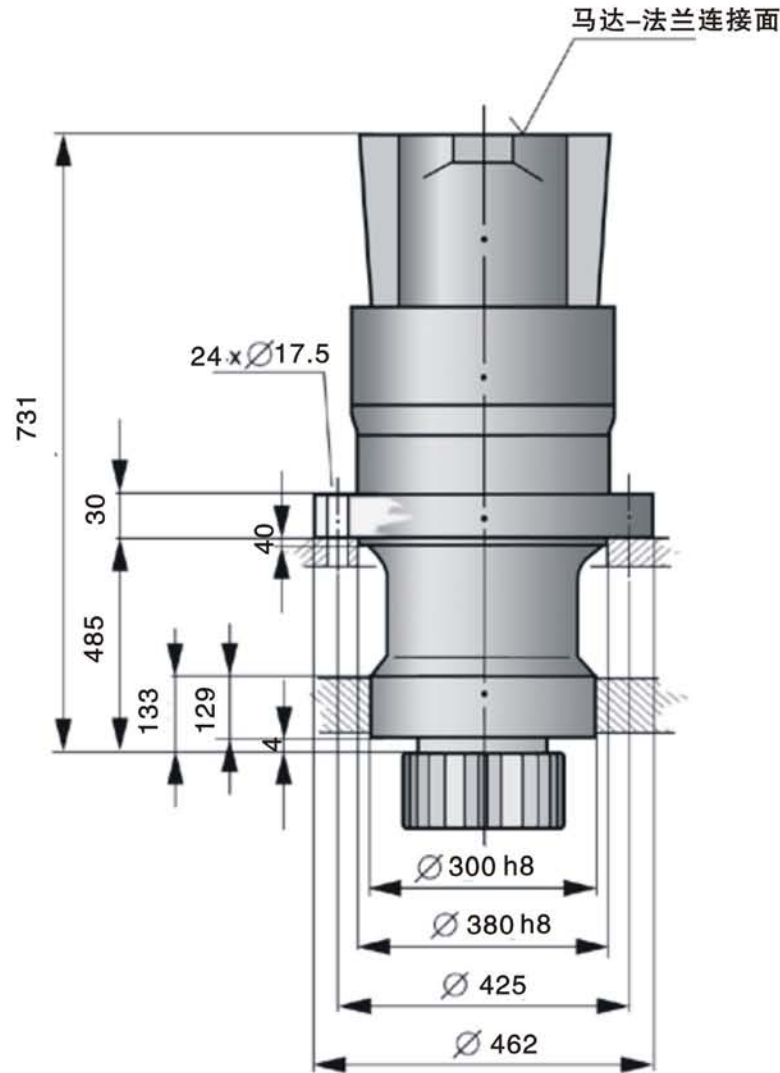
GFB 60 T2



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
25000	45000	34 40	A2FE107/61W-VZL A2FE125/61W-VZL	16*13*0.5*95 16*16*0.5*170 18*14*0.5*170 20*14*0.4*190	613	390

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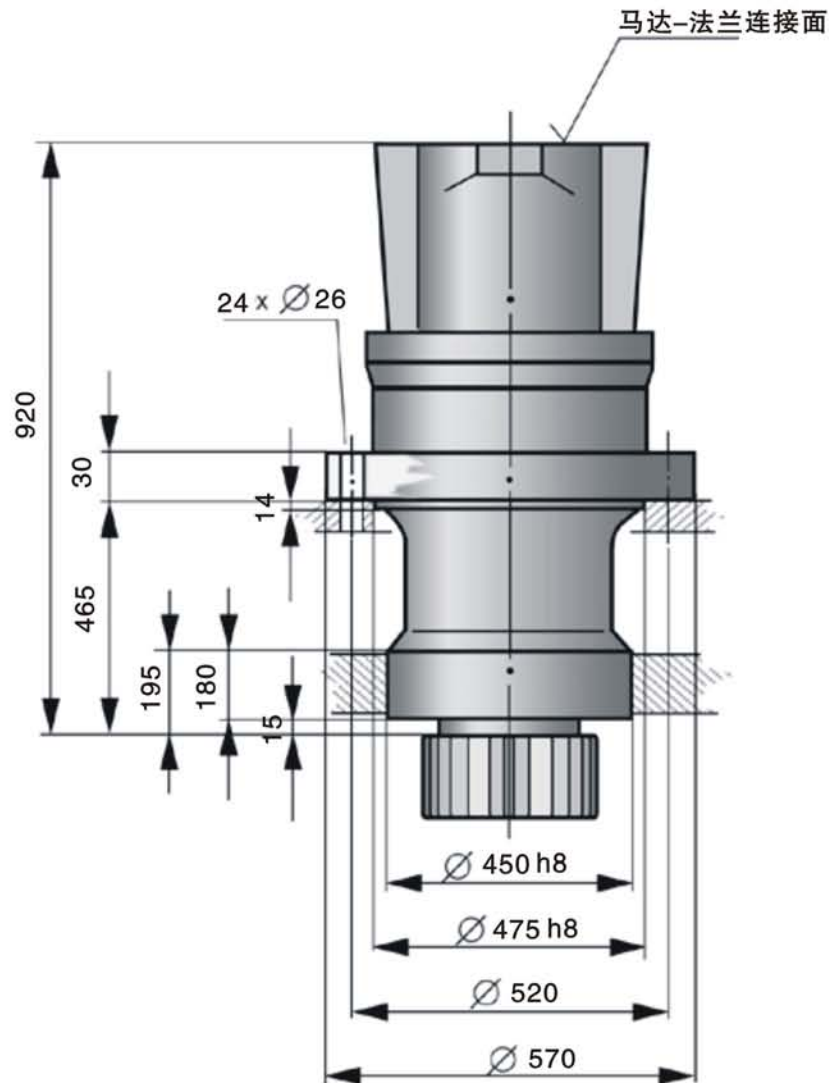
GFB 60 T3



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
25000	450000	87 96 141 171	A2FE80/61W-VAL A2FE90/61W-VAL	16*13*0.5*95 16*16*0.5*170 18*14*0.5*170 20*14*0.4*190	613	420

- 减速机输入转向与输出转向相同。
Gearbox input direction is same with the output direction.
- 输出转速允许值（样本中未规定）因实际工况的不同而有所变化，请向本公司技术人员咨询。
Allowed output speed (not indicated in catalog) is subject to variation with actual application so please consult with our engineers.

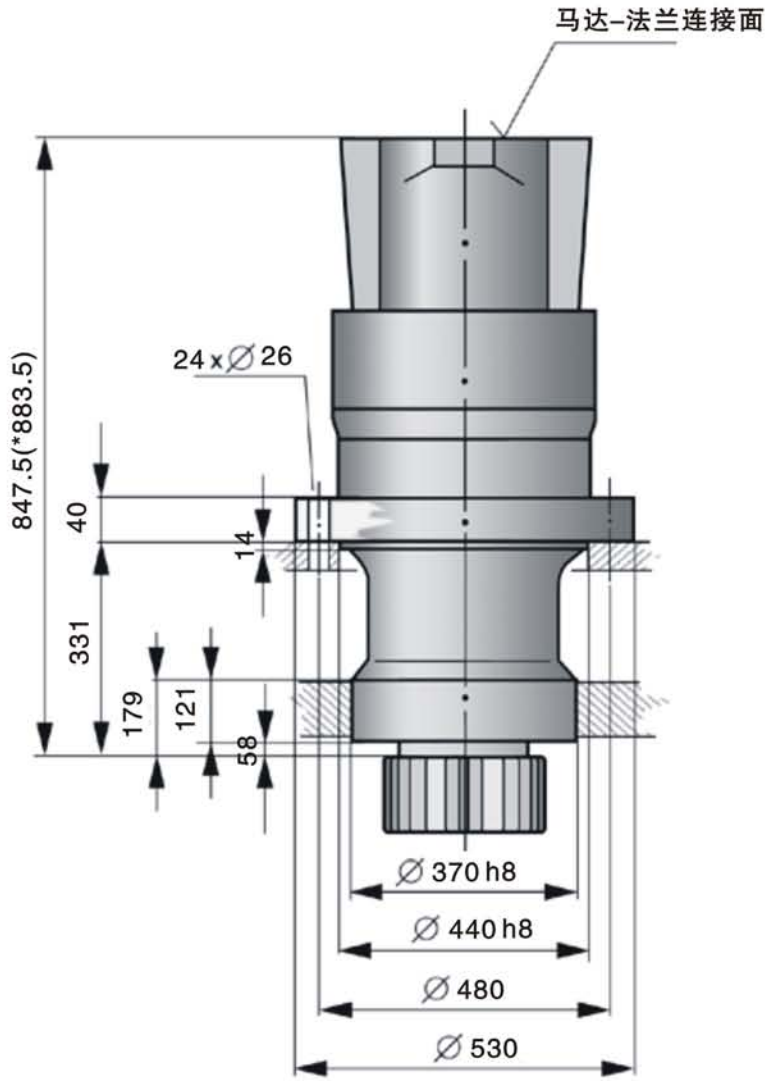
GFB 70 T2



输出转矩 Output Torque T _{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter m*z*x*b	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
30000	55000	21 34 40	A2FE107/61W-VZL A2FE125/61W-VZL	16*13*0.5*95 18*13*0.5*165 18*14*0.5*170 20*14*0.4*190	800	700

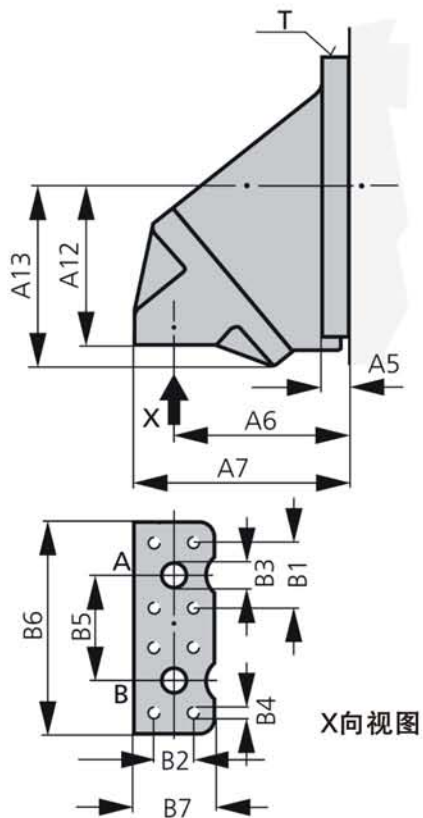
- 减速机输入转向与输出转向相同。
Gearbox input direction is same with the output direction.
- 输出转速允许值（样本中未规定）因实际工况的不同而有所变化，请向本公司技术人员咨询。
Allowed output speed (not indicated in catalog) is subject to variation with actual application so please consult with our engineers.

GFB 80 T3



输出转矩 Output Torque T_{2max} Nm		传动比 Ratio i	液压马达 Hydraulic Motor	输出齿轮参数 Output Gear Parameter $m \cdot z \cdot x \cdot b$	制动力矩 Braking Torque NM	减速机重量 Gearbox weight 约kg/approx
挖掘机 Excavator	起重机 Crane					
37000	66000	62 112 186	A2FE80/61W-VAL A2FE90/61W-VAL *A2FE107/61W-VZL *A2FE125/61W-VZL	16*13*0.5*150 18*14*0.5*190 20*14*0.4*190	970	700

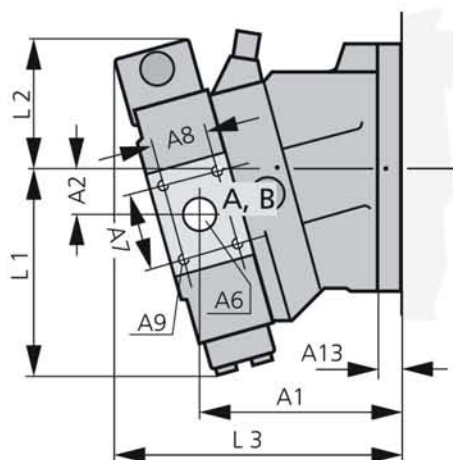
- 减速机输入转向与输出转向相反。
Gearbox input direction is on contray to the output direction.
- 输出转速允许值（样本中未规定）因实际工况的不同而有所变化，请向本公司技术人员咨询。
Allowed output speed (not indicated in catalog) is subject to variation with actual application so please consult with our engineers.



定量马达A2FE

		A5	A6	A7	A12	A13	B1	B2	B3
28	32	16	94	114	91	106	40,5	18,2	13
45		18	109	133	102	119	50,8	23,8	19
56	63	18	122	146	107	130	50,8	23,8	19
80	90	20	127	157	121	145	57,2	27,8	25
107	125	20	143	178	136	157	66,7	31,8	32
160	180	20	169	211	149	188	66,7	31,8	32
250		25	*	230	*	172	*	*	*
355		30	183	231	148	199	66,7	31,8	32

		B4	B5	B6	B7	A / B	T
28	32	M8x15	59	115	40	SAE 1/2"	M16x1,5
45		M10x17	75	147	49	SAE 3/4"	M18x1,5
56	63	M10x17	75	147	49	SAE 3/4"	M18x1,5
80	90	M12x17	84	166	60	SAE 1"	M18x1,5
107	125	M14x19	99	194	70	SAE 1 1/4"	M22x1,5
160	180	M14x19	99	194	70	SAE 1 1/4"	M22x1,5
250		*	*	*	*	*	*
355		M14x22	120	*	*	SAE 1 1/4"	*



变量马达A6VE

	A1	A2	A13	L1	L2	L3
28	91	20	14	162	163	153
55	123	24	16	151	111	179
80	130	28	18	167	116	190
107	137	30	18	175	122	208
107 *	150	30	18	175	122	220
160	171	34	20	200	154	245
250	204	44	25	248	188	302

	A / B	A6	A7	A8	A9
28	SAE 3/4"	19	50,8	23,8	M10x17
55	SAE 3/4"	19	50,8	23,8	M10x17
80	SAE 1"	25	57,2	27,8	M12x17
107	SAE 1"	25	57,2	27,8	M12x17
107 *	SAE 1"	25	57,2	27,8	M12x17
160	SAE 1 1/4"	32	66,7	31,8	M14x19
250	SAE 1 1/4"	32	66,7	31,8	M14x19

其他技术数据见马达样本或咨询我公司