

文魁控股集团

宁波市恒通液压科技有限公司

NINGBO HELM TOWER HYDRAULIC TECHNOLOGY CO.,LTD

样本内容若与本公司正式图纸不符，均以正式图纸为准，如有变更，恕不另行通知

Helm Tower



内曲线径向柱塞低速大扭矩液压马达

输出扭矩大
输出轴转动
径向、轴向承载力大
单级或多级排量

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公司简介

宁波市恒通液压科技有限公司是文魁控股集团旗下一家专业设计与生产液压系统及元器件的国家级重点高新企业，公司位于宁波高新技术区，注册资本3000万元，占地面积1万余平方米。

本着“专注、专业、创新”的精神，恒通科技长期致力于液压系统及元件的研发，是国内著名的船舶、矿山机械、工程机械整体解决方案的提供商，同时也是冶金、农业、园林、环保行业的服务商，在全国大中城市均设有办事处。

人才是公司最大的财富，恒通科技拥有一支超过百人的高素质技术研发队伍，他们由液压行业内的资深博士、硕士、高级工程师、工程师、助理工程师组成，同时也与国内众多高校建立了战略合作关系，在产品研发、技术支持和服务方面，具备强劲的技术实力和竞争优势。

一直以来，恒通科技拥有业界公认的出色管理和服务，公司已通过ISO9001质量体系认证、船级社型式认证、煤矿安全生产许可证，完善的产品研发质量控制体系保证了公司服务市场、服务客户的能力。

秉承“客户第一”和“以人为本”的企业经营理念，恒通科技一直致力于建立有序、具有自我创新能力的持续发展管理体制和发展模式，立志成为中国领先的液压马达制造企业，成为高科技人才圆梦的家园。

Company Brief Introduction

Ningbo Helm Tower Hydraulic Motor Co., Ltd. under the direct management of Wenku holding group is China national key high technology professional manufacture and focus on design variety of hydraulic system and hydraulic components. Our company is located in Ningbo high technology zone, holding \$5 million registered capital, covering area is over 10,000 square meters.

In the spirit of “concentration, profession, innovation”, Ningbo Helm Tower Hydraulic Motor Co., Ltd. is dedicated to the research and development of hydraulic system and hydraulic components for long time, is the famous domestic supplier for whole case, such as marine, coal mine machinery and project machinery, is the service supplier for metallurgy, agriculture, garden, environment protection synchronously, set up office in the big and medium cities of China.

Talent is the most valuable fortune in our company. Ningbo Helm Tower Hydraulic Motor Co., Ltd. possesses over 100 high quality technology staff who consist of senior doctor, master, senior engineer, engineer and assistant engineer in the hydraulic industry. As well as the strategic cooperation with University in our domestically, has powerful technology and competitive advantage in product D&R, technology support and service ..

All of these days, Ningbo Helm Tower Hydraulic Motor Co., Ltd. enjoy the excellent management and service which is acknowledged in hydraulic industry. Our company has past ISO9001, CCS certificate, Coal mine work safety License, perfect product R&D quality control system guarantee the ability to serve to market and customers.

Subservient to the management philosophy of “customer first” and “people oriented”, Ningbo Helm Tower Hydraulic Motor Co., Ltd. is committed to continuable development management system and development pattern which is methodical possess of self innovation ability. Aspire to the advanced hydraulic motor manufacturer in China, become the homeland where the high technology talent come true their dream.



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HMS SERIES HYDRAULIC MOTORS HMS系列液压马达

BRIEF INTRODUCTION

HMS series low speed and high torque hydraulic motors is also called Incurve Multicam Radial-piston. Low Speed HighTorque Hydraulic Motor, Which has many features as follow :

1. Modular design

The entire structure is designed as modular, those parts is consists of hydraulic function unit, machinery brake unit machinery output unit, and forms complete unit, It's combine with afferent main machines easily.

2. High efficiency

The multicam flat distributors technology is adopted to compensate automatically the loss of frictions, low sensibility to pressure and temperature, high volumetric efficiency. The rolling pistons structure are used simultaneously to make transmission easy, less friction, higher mechanical efficiency.

3. High pressure and smooth running even at very low speeds

Peak pressure is up to 40 Mpa. Because of small transmission inertia and piston assemblies is sealed with piston rings, it has high starting efficiency.

4. Permissible Radial and Axial load

Tapered roller bearings capable of transmitting high axial and radial forces.

5. Motor with multi-disc brake(holding brake)

Freeheeling switching to halt displace meat.

6. Motor emission control

Controlled by motor displacement, which divided by single-displacement and double-displacement. The single-displacement is complete displacement output, and the double-displacement controlled by valve to carry out the speed by its complete displacement or half displacement output.



01
PAGE

简介

HMS系列低速大扭矩液压马达是内曲线多作用径向柱塞式马达，具有如下特点：

1. 模块化设计

整体结构按模块化设计，片式叠装，分机械输出模块、液压功能模块、配流模块、机械制动模块四部分，能方便与各种主机优化配套。

2. 效率高

采用平面配流技术，对压力、温度敏感度低，自动补偿配流摩擦副间的磨损，可长期保证马达高容积效率，同时采用滚柱、柱塞结构，传力结构简单，摩擦副少，提高了机械效率。

3. 工作压力高，低速性能好

与QJM 系列马达相比采用滚柱、柱塞替代了钢球、球塞；通过优化定子曲线的设计，在保证输出扭矩，转速无脉动的同时，降低了定子接触应力，并采用新材料、新工艺制造定子从而使液压马达的工作压力大大提高，最高压力可达40MPa，由于传力机构惯量小，柱塞副有密封活塞环，滚柱挡块采用减摩材料，因而起动效率高，低速性能好，最低稳定转速≤0.5rpm。

4. 可承受径向和轴向负荷

采用独立设置机械输出模块，和大直径的输出轴和轴承，马达可承受较大的轴向力和径向力，可直接连接齿轮输出或直接安装在车辆驱动轮上。

5. 可带机械制动器

采用模块化片式机构，可叠加机械制动装置，实现输出轴直接安全制动和停车制动。

6. 马达排量控制

马达分为单排量马达和双排量马达，单排量马达为全排量输出，双排量马达的排量可通过控制阀控制实现全排量和半排量输出，实现速度控制。

NOTICE

Radial Load:

- (1) Different model has different radial load.
- (2) Same model has different radial load if force location is different.
- (3) We provides some HMS model performance curve, this curve is just showing the relation of radial location and radial load. Motor should be in optimal range, it can ensure lifetime of motor.

Performance Curve:

- (1) Maximum immobile load curve means the relation between max immobile and force position under the motor permanent plastic never appear.
- (2) Maximum mobile load curve means the relation between max load and resultant force when all load parts has no bend tired damage under motor normal rotation.
- (3) Lifetime curve means the relation between radial load and resultant force when the rotation bearing life is normal (example : $1 \times 10E+6$ or $4 \times 10E+7$ times round) This is the index which is relevant with bearing inner circle touch stress.
- (4) The load curve of this brochure is not including Axial load, please contact us for any doubt.

Oil contamination:

Polluted oil is the main failed reason of hydraulic system. Whether polluted oil remained in system or another contamination inside. It shorten lifetime and system reliability.

Oil viscosity:

HMS series motor viscosity range: 9cst~2000cst, optimal viscosity range: 20~50cst, oil temperature : -20°C~70°C
Recommended using Hv46 and Hv68 hydraulic oil.

Motor Efficiency:

We marked mechanical efficiency and volumetric efficiency in this catalogue, normal mechanical efficiency be used in 70%~80% when started the power.

Selection Instruction:

- (1) Motors work pressure less than rated pressure.
- (2) Motors output pressure less than Maximum power marked in this catalogue.
- (3) Ensure motors works in high efficiency and reliability, started efficiency less than rated efficiency.
- (4) Motors displacement try to using Code 0 displacement.

Installation:

- (1) The hydraulic motor can be installed at any position. The support frame should have enough strength. The output shaft and connected transmission shaft must ensure to be aligned when installation.
- (2) Leakage: usually drain port should be connected to tank alone. Please contact us if the customer requests to eliminate drain line, but the backpressure of shell should be less than 0.05Mpa
- (3) Before sharing up at the first time, filled the motor casing with hydraulic oil to prevent motors damaged. The maximum position of drain line should be higher than the central line of motor casing to avoid draining off.

注意事项

HMS马达可承受较大的径向载荷，实际使用时请注意以下事项：

- (1) 不同基型的马达，其径向承载能力不同。
- (2) 同一基型的马达，受力位置不同时，径向承载能力不同。
- (3) 产品样本中提供了马达在各种情况下的径向承载力曲线图，该曲线表明了某基型马达所能承受的径向力与马达承载力位置之间的关系。实际使用中，应使马达在最佳区域内承受径向载荷，由此获得设计的使用寿命。

样本中一般提供3种载荷曲线，并标明了相应的工作压力。

- (1) 最大静载曲线：表示马达不产生永久塑性变形所允许的最大静态载荷与受力位置的关系。
- (2) 最大动载曲线：在马达旋转工作时，各受力部件（除轴承外）不致出现弯曲疲劳破坏的最大载荷与加载合力作用点的关系。
- (3) 寿命曲线：表示马达中的滚动轴承在一定寿命（例如 $1 \times 10E+6$ 或 $4 \times 10E+7$ 次旋转）所对应的许用径向载荷与载荷合力作用点的关系。这是与轴承内循环接触应力有关的一项指标。
- (4) 产品样本中提供的承载曲线图不包括轴向载荷的因素，如实际使用中，马达同时承受轴向载荷，请向本公司咨询。

油液的污染度

油液污染是造成液压马达失效的主要原因之一，无论是马达内部残留，还是从外部进入马达的污染物，都将严重影响马达的可靠性和元件的使用寿命。HMS系列液压马达对所用油液的污染度要求为：不大于ISO4406中的18/13等级。一般要求在系统中设置一个名义过滤精度优于 $10\mu m$ （绝对过滤精度约 $25\mu m$ ）的精滤器。

油液的粘度

HMS系列液压马达所用油液粘度范围为9cst~2000cst，最佳粘度范围为20~50cst，油温范围：-20°C~70°C。除特殊气候条件，一般推荐：固定设备上的HMS系列液压马达使用HV46号或HV68 抗磨液压油；行走机械上的HMS系列液压马达使用相同的牌号，粘温特性更佳的低温液压油。

马达的效率

HMS系列液压马达的机械效率和容积效率都标于其产品样本上。实际使用时应注意马达在带载起动时的效率，其通常为额定工况下机械效率的70%至80%。

选用原则

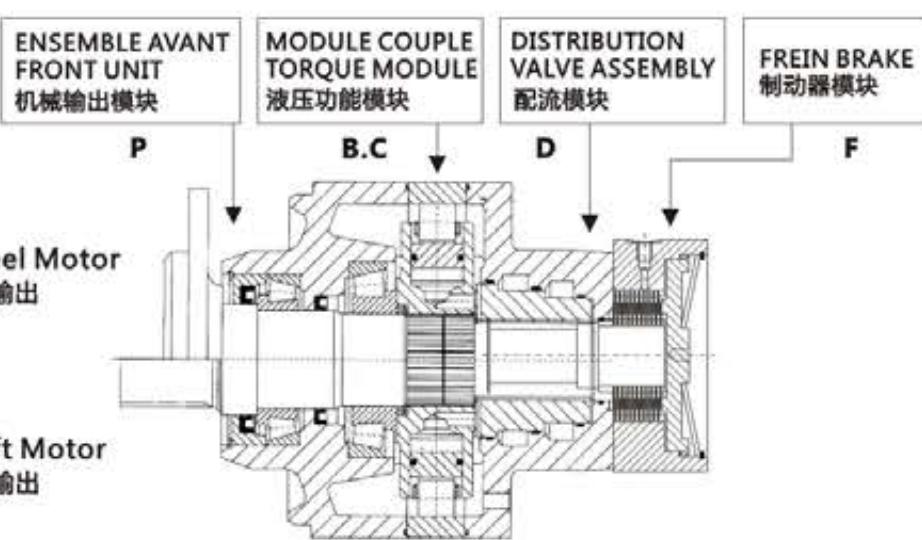
- (1) 马达长期工作压力低于额定压力。
- (2) 马达实际输出功率小于样本上所标的马达最大的功率。
- (3) 为使马达长期可靠地工作，最好将马达的工况选定在高效区（见样本特性曲线），并注意马达的起动效率比额定工况下的效率要低。
- (4) 马达排量应尽量选用各基型中的0组排量。

安装要求

- (1) 液压马达有多种安装方式，安装马达的支架必须有足够的刚性，安装时应保证液压马达所连接的传动轴与输出轴同心。
- (2) 泄漏：泄油口应单独连接回油箱，一般情况下壳体允许最大压力为0.05MPa，如用户有自由轮工况要求时，向本公司咨询，特殊订购。
- (3) 液压马达首次启动前，必须向马达壳体内注满洁净液压油，以防损坏马达，同时泄油管的最高水平位置应高于马达壳体的最高水平位置，以防马达内的油液排空。

TECHNICAL SPECIFICATIONS

技术明细图



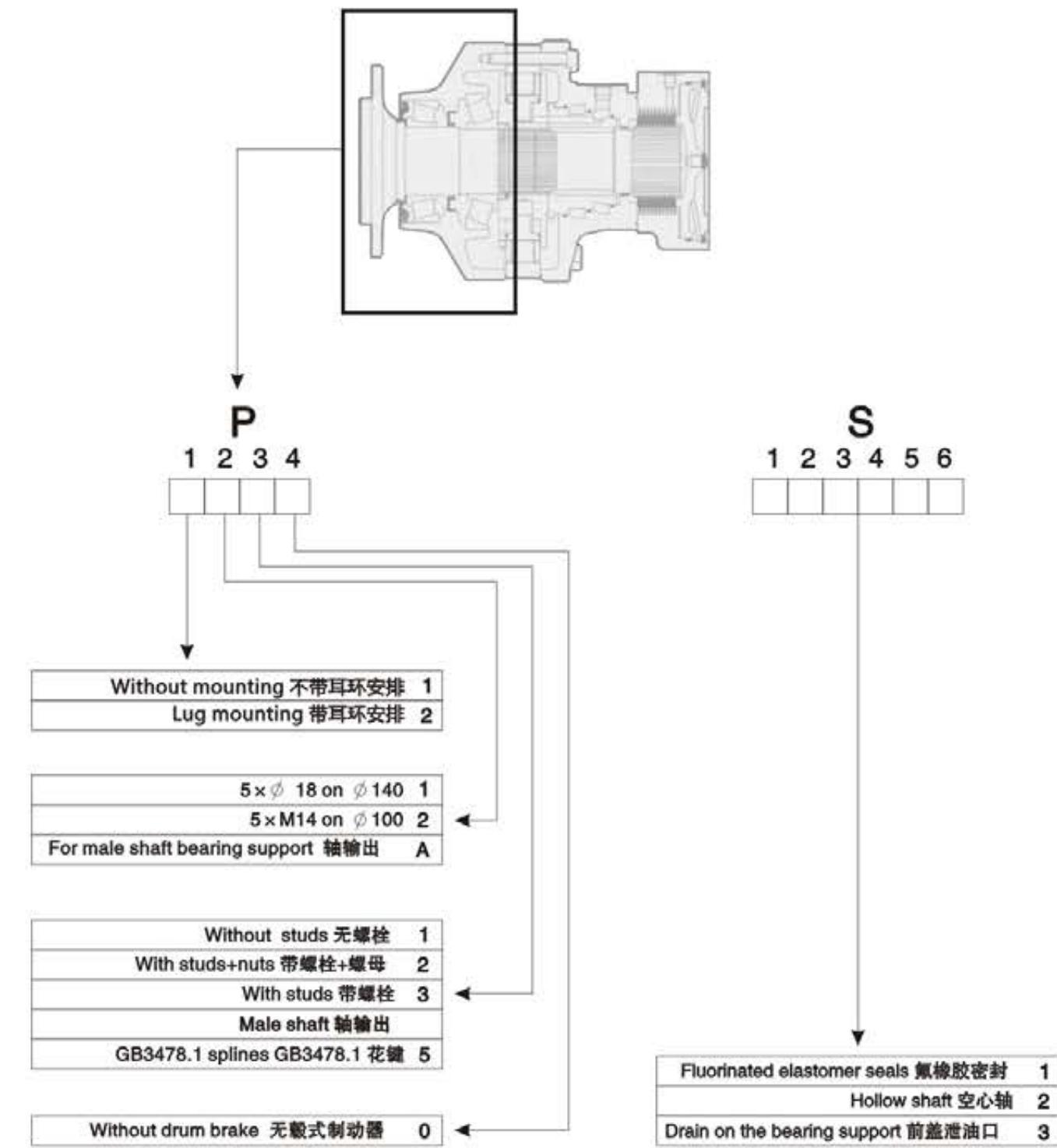
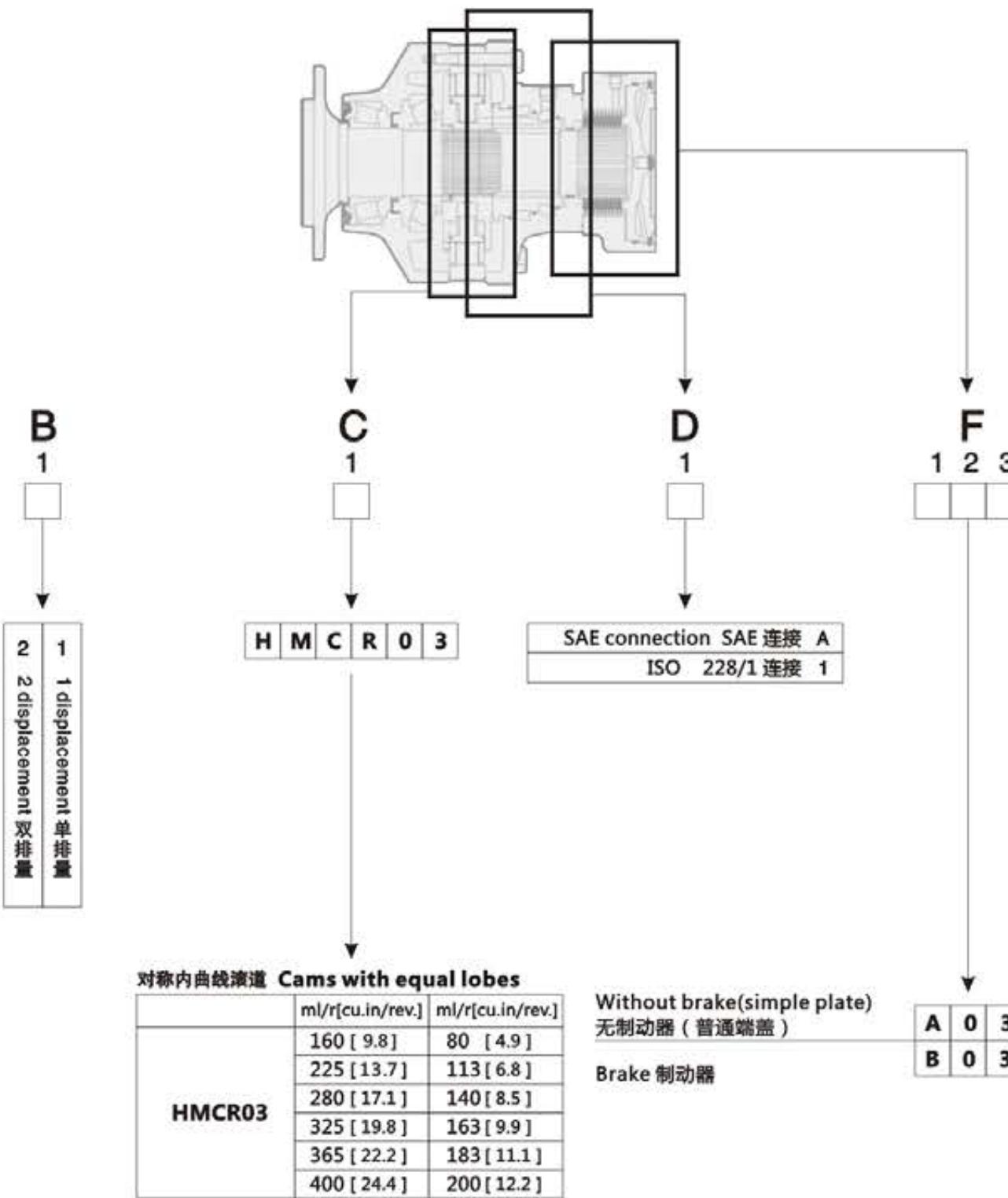
HMCR03

HYDRAULIC MOTORS

HMCR03

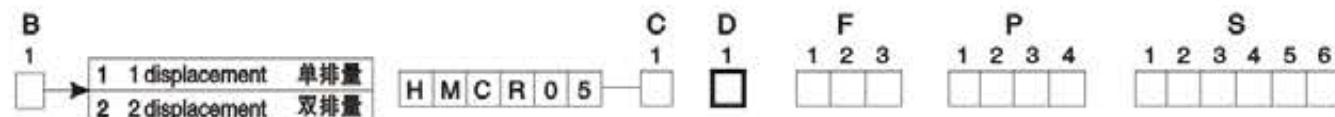
HYDRAULIC MOTORS

MOTOR NUMBER 马达编号



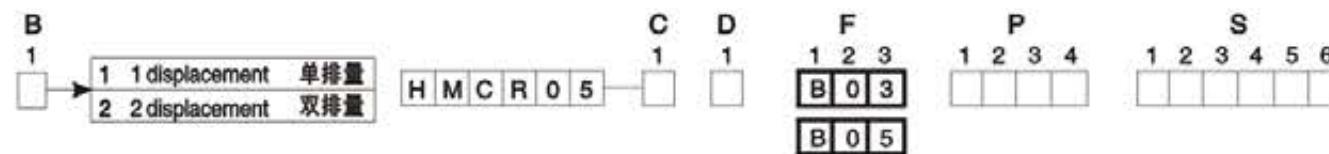


HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Powersupply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ514	ISO11926-1	1 1/16 "-12UNF	3/4 "-16UNF	3/4" -16UNF	9/16 "-18UNF
	ISO228/1	G3/4	G1/4	G1/2	G1/4
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]

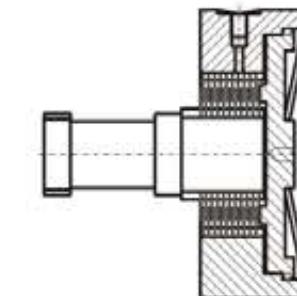
BRAKES 制动器



REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.



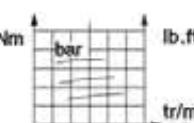
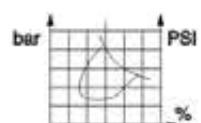
常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。

EFFICIENCY 效率

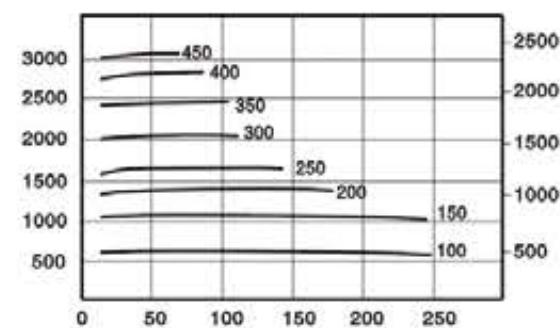
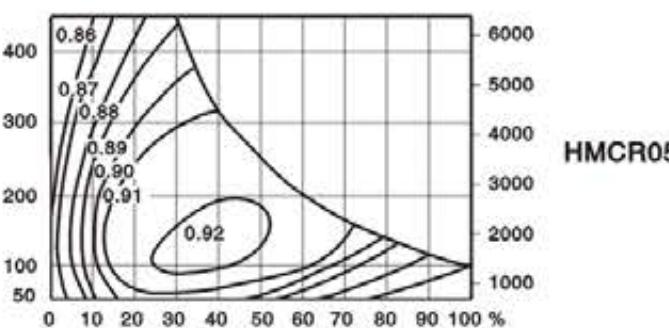
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭矩



C	B 0 3	B 0 5
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	2200Nm [1618 lb.ft]	952Nm [700 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	1430 Nm [1052 lb.ft]	620Nm [455 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	1650Nm [1213 lb.ft]	714Nm [525 lb.ft]
Min. Brake release pressure 最小自动开启压力	15 bar [217 PSI]	15 bar [217 PSI]
Oil capacity 油量	100 cm³ [6.7 cu.in]	100 cm³ [6.1 cu.in]
Volume for brake release 制动开启量	23 cm³ [1.4 cu.in]	23 cm³ [1.4 cu.in]
Max. Energy dissipation 最大能耗数	38179 J	

* After emergency brake has been used
* 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

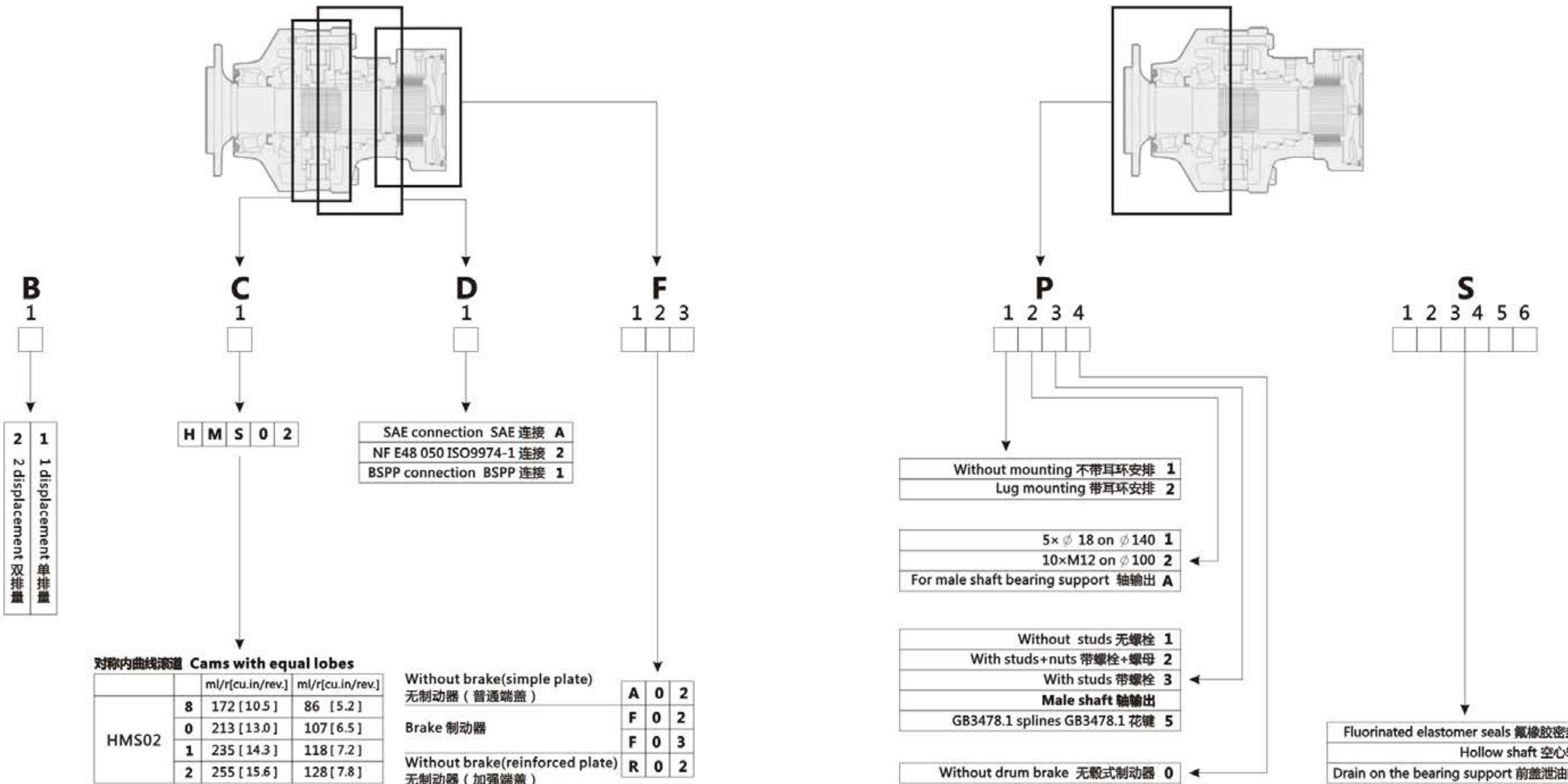
A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm Tower Hydraulic application engineer.

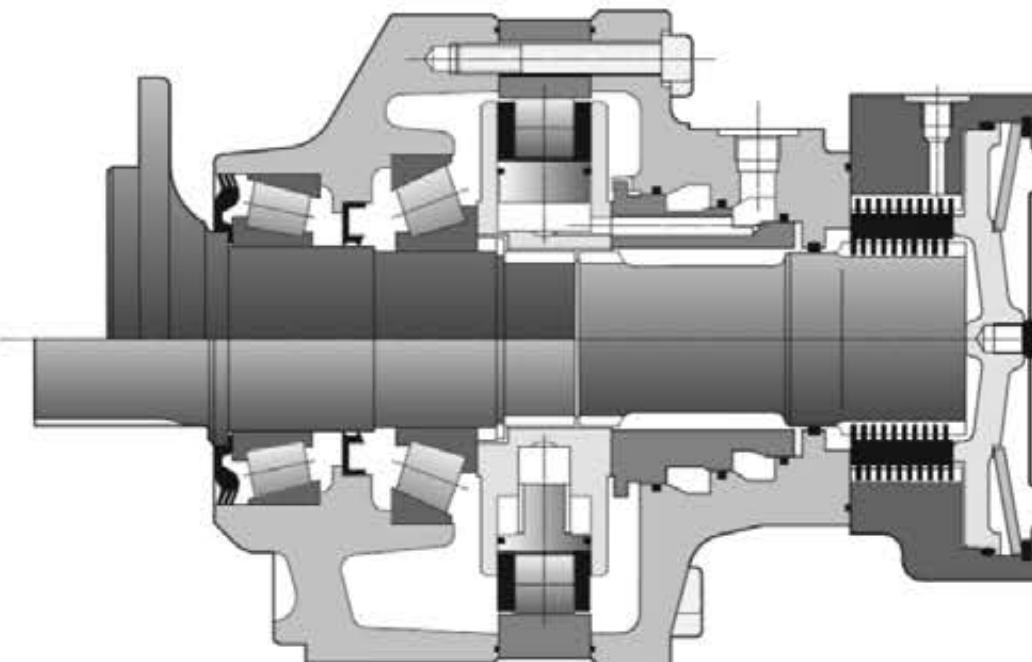
每当驻车制动器作为辅助制动(或者紧急制动)使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

MOTOR NUMBER 马达编号

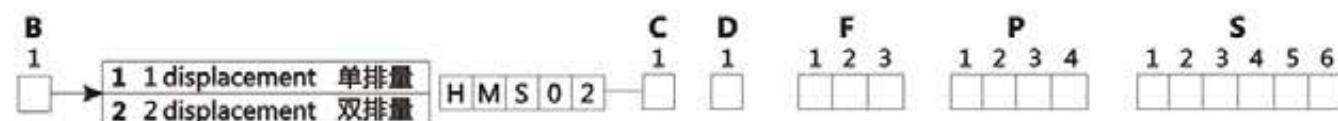




马达惯量 = 0.01 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS02 液压马达技术参数

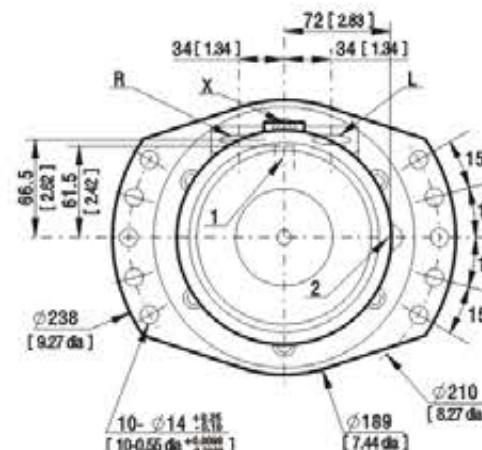
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	172				213		235	118	255	
最大功率 Max Power (kw)	16				16		16		16	
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	273				340		351		405	
额定扭矩 Rated torque (N.m)	643				796		878		953	
额定压力 Rated pressure (MPa)	25				25		25		25	
最高压力 Max Pressure (MPa)	40				40		40		35	
额定转速 Rated speed (r/min)	140				140		140		120	
转速范围 Speed range (r/min)	0-310				0-310		0-310		0-260	



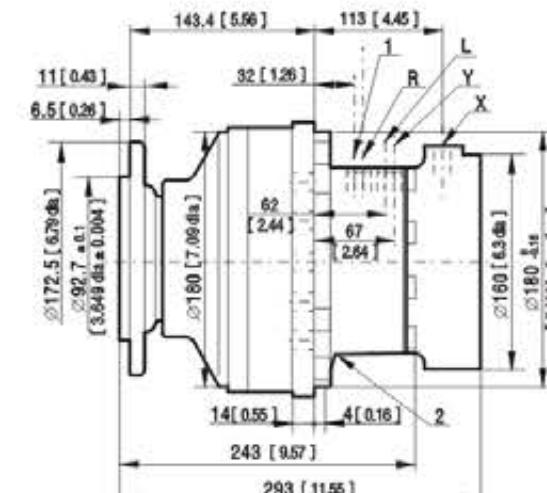
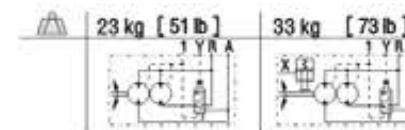
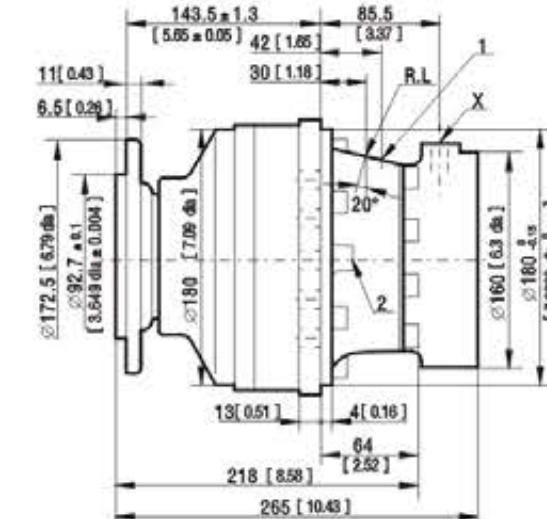
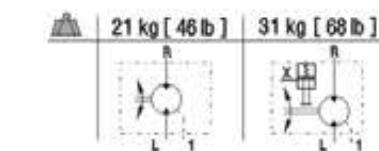
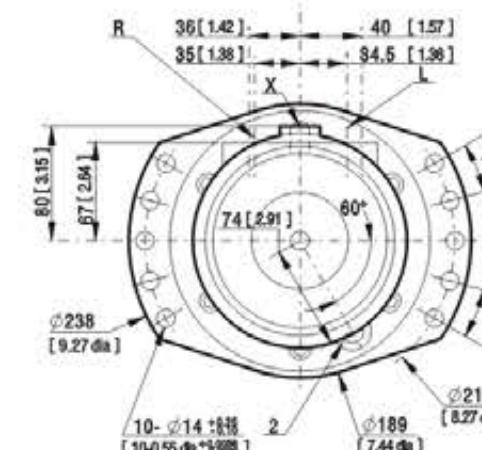
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸

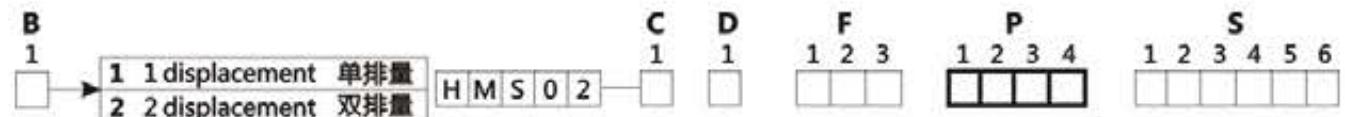


Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸

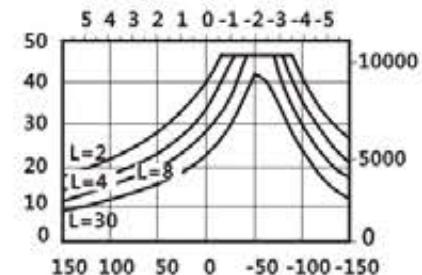
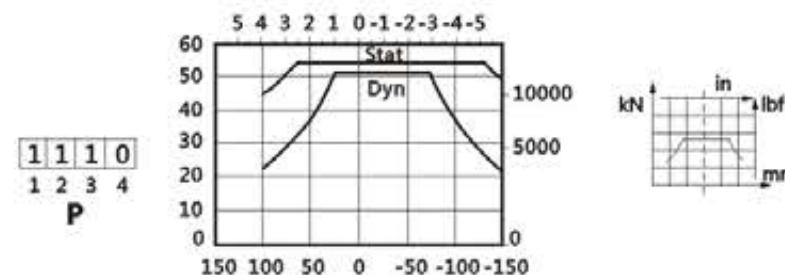




SUPPORT TYPES 前盖类型

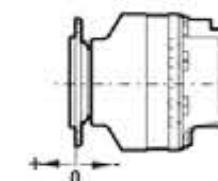


C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 1 2 3 4 P	φ 92.7 [3.65dia.]	φ 140 [5.51dia.]	φ 169 [6.65dia.]	143.4 [5.56]	φ 179.5 [7.07dia.]	φ 18 [0.71dia.]	5×M14*1.5 [0.43]	11 [0.43]

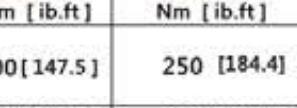
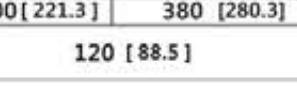


The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



STUDS 螺栓

	Screws	P mm [in]	Cmin mm [in]	Cmax mm [in]	D mm [in]	Class 等级	Torque (1) 扭距(1) Nm [ib.ft]	Torque (2) 扭距(2) Nm [ib.ft]
Various Studs 各式螺栓	M14×1.5	45 [1.77]	5 [0.20]	18 [0.71]		12.9	200 [147.5]	250 [184.4]
	M14×1.5	50 [1.97]		23 [0.91]			300 [221.3]	380 [280.3]
	M14×1.5	62 [2.44]		33 [1.30]				
	M16×1.5	50 [1.97]		23 [0.91]				
Screws 螺纹	M12×1.75		10.9	21 [0.83]		10.9	120 [88.5]	
	1/2"-20 UNF						8.8	

(#)The tightening torques are given for the indicated loads.

(#)指上述负载的预紧扭距

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭距 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭距(Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭距

Service life of bearings 使用寿命

Test conditions 检测条件

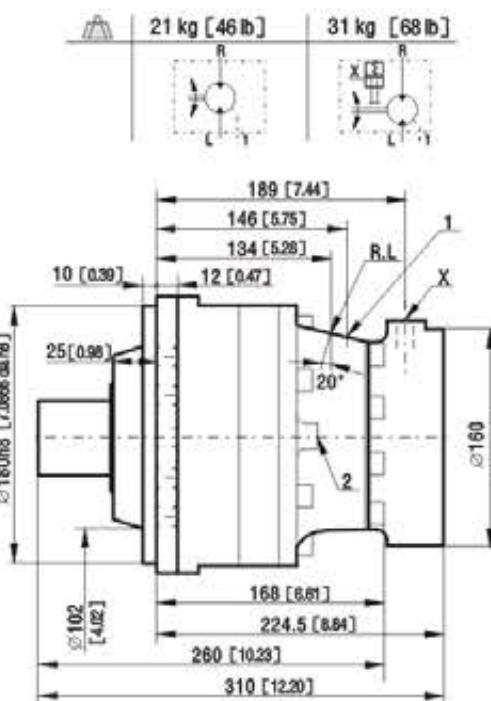
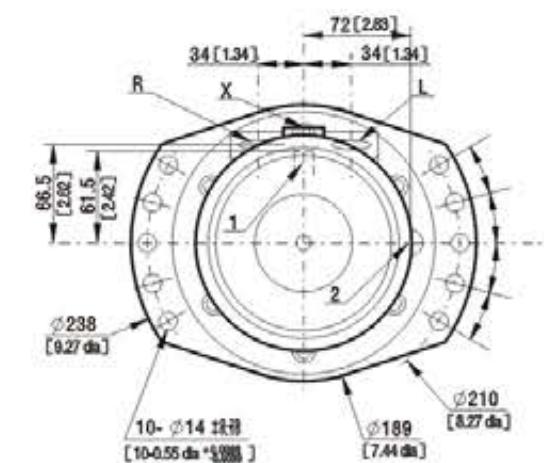
L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement,

without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar ,

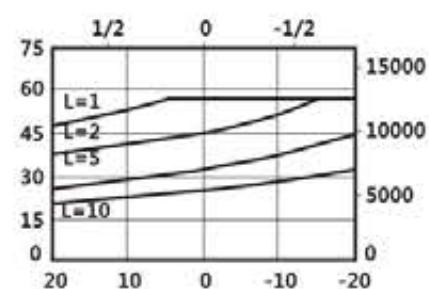
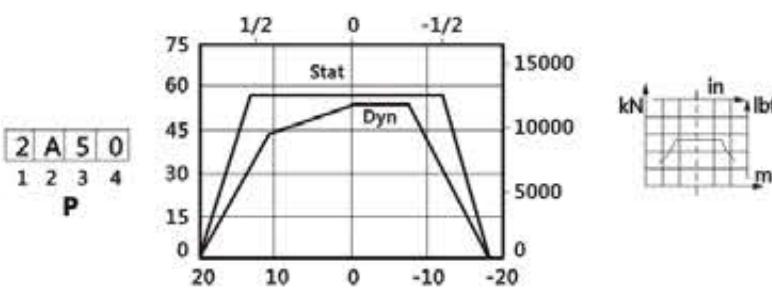
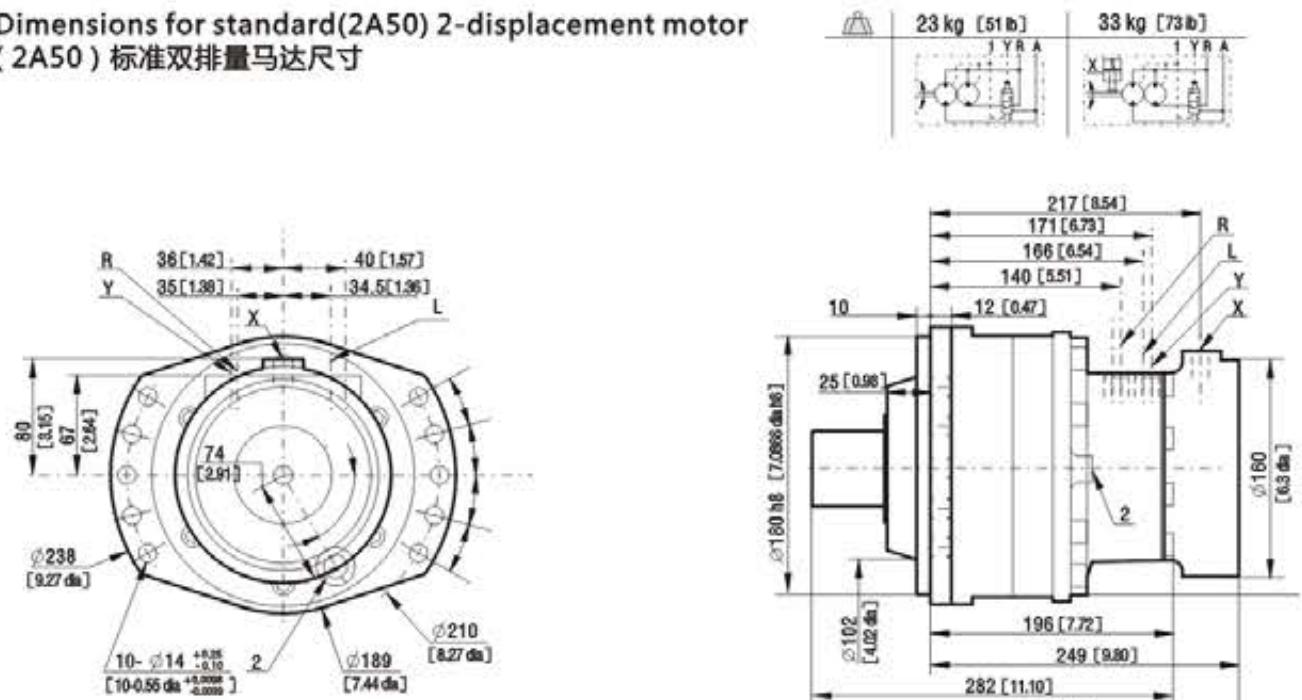
工作寿命为B10 100万次

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸





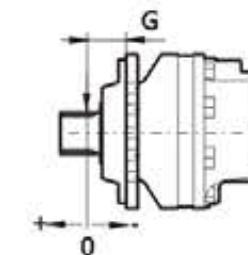
Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸



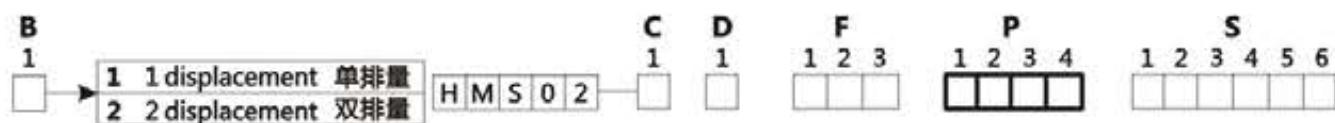
C G
2 A 5 0 66.45 [2.62]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

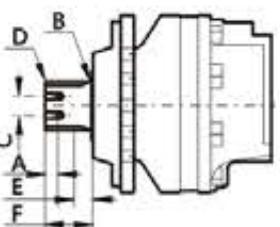
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



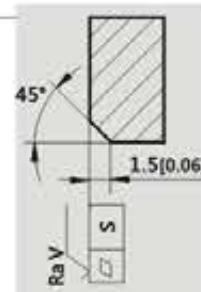
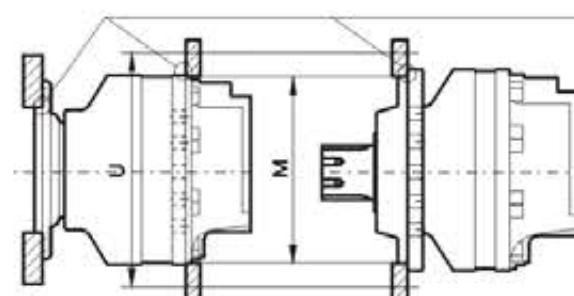
SUPPORT TYPES 前盖类型



C		A	B	C	D	E	F
2 A 5 0	GB 3478.1 spline 花键	15	R2.5	23.8	2xM10	22	60
1 2 3 4	Module 模数	[0.59]	[0.10]	[0.94]		[0.87]	[2.36]



CHASSIS MOUNTING 支架安装



⚠ 安装时注意清洁 Take care over the immediate environment of the connections

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement,

without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，

工作寿命为B10 100万次

$\phi M(1)$	ϕU	S	Ra V	Studs 螺栓	Class 等级	Torque 扭距 *
180.25 [7.10]	240 [9.45]	0.2 [0.008]	12.5μm [0.49μin]	10 M12×2	10.9	120Nm [89lb.ft]

(1) +0.3 [+0.012]

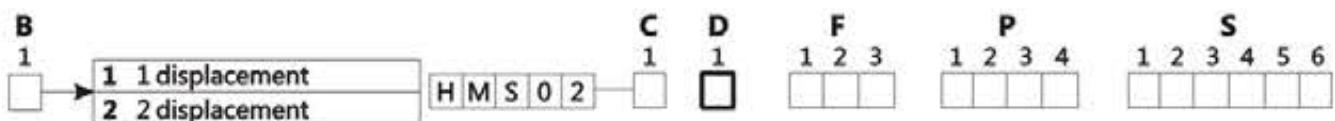
+0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭距及负载的最小值

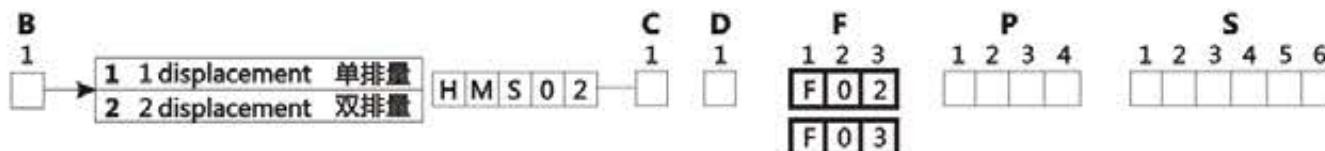


HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAE J514	ISO 11926-1	7/8"-14UNF	9/16"-18UNF	9/16"-18UNF	9/16"-18UNF
1 BSPP	ISO 1179-1	Ø 21 [1/2"dia]	Ø 13 [1/4"dia]	Ø 13 [1/4"dia]	Ø 13 [1/4"dia]
2 NFE48 050	ISO 9974-1	M22×1.5	M10×1	M14×1.5	M14×1.5
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]

BRAKES 制动器

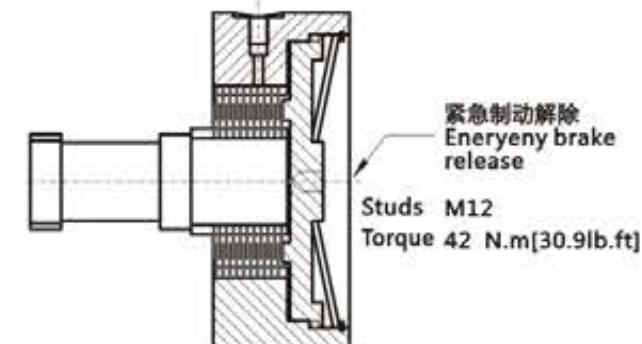


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。

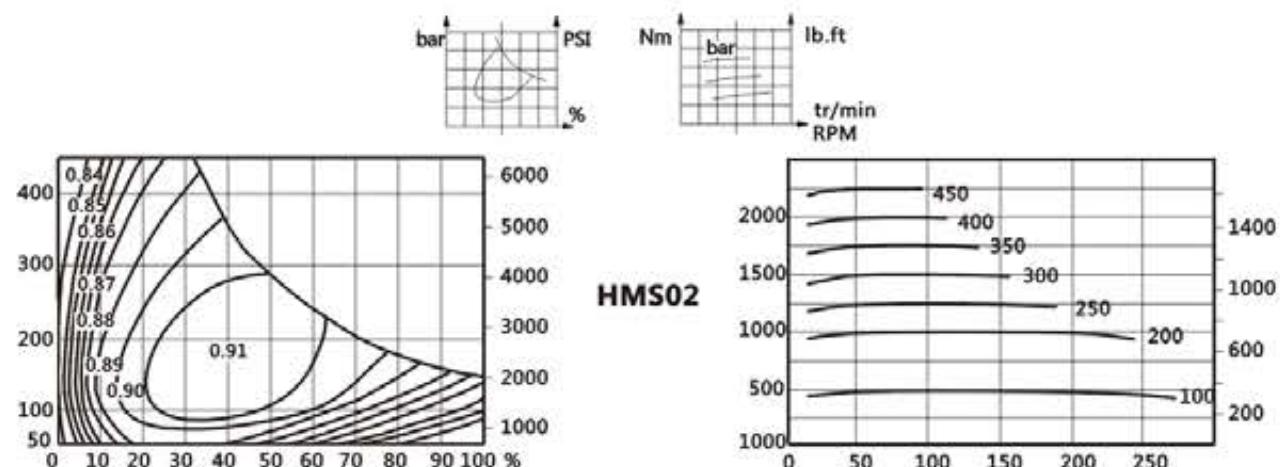


EFFICIENCY 效率

Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

C	F 0 2	F 0 3
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭矩(新制动器)	1400Nm [1030 lb.ft]	2500Nm [1840 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭矩(最多使用10次紧急制动)	910 Nm [670 lb.ft]	1625Nm [1200 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭矩	1050Nm [770 lb.ft]	1875Nm [1380 lb.ft]
Min. brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]
Oil capacity 油量	100 cm³ [6.1 cu.in]	100 cm³ [6.1 cu.in]
Volume for brake release 制动开启量	16 cm³ [1.0 cu.in]	16 cm³ [1.0 cu.in]
Max. energy dissipation 最大能耗数	38179 J	

* After emergency brake has been used
* 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

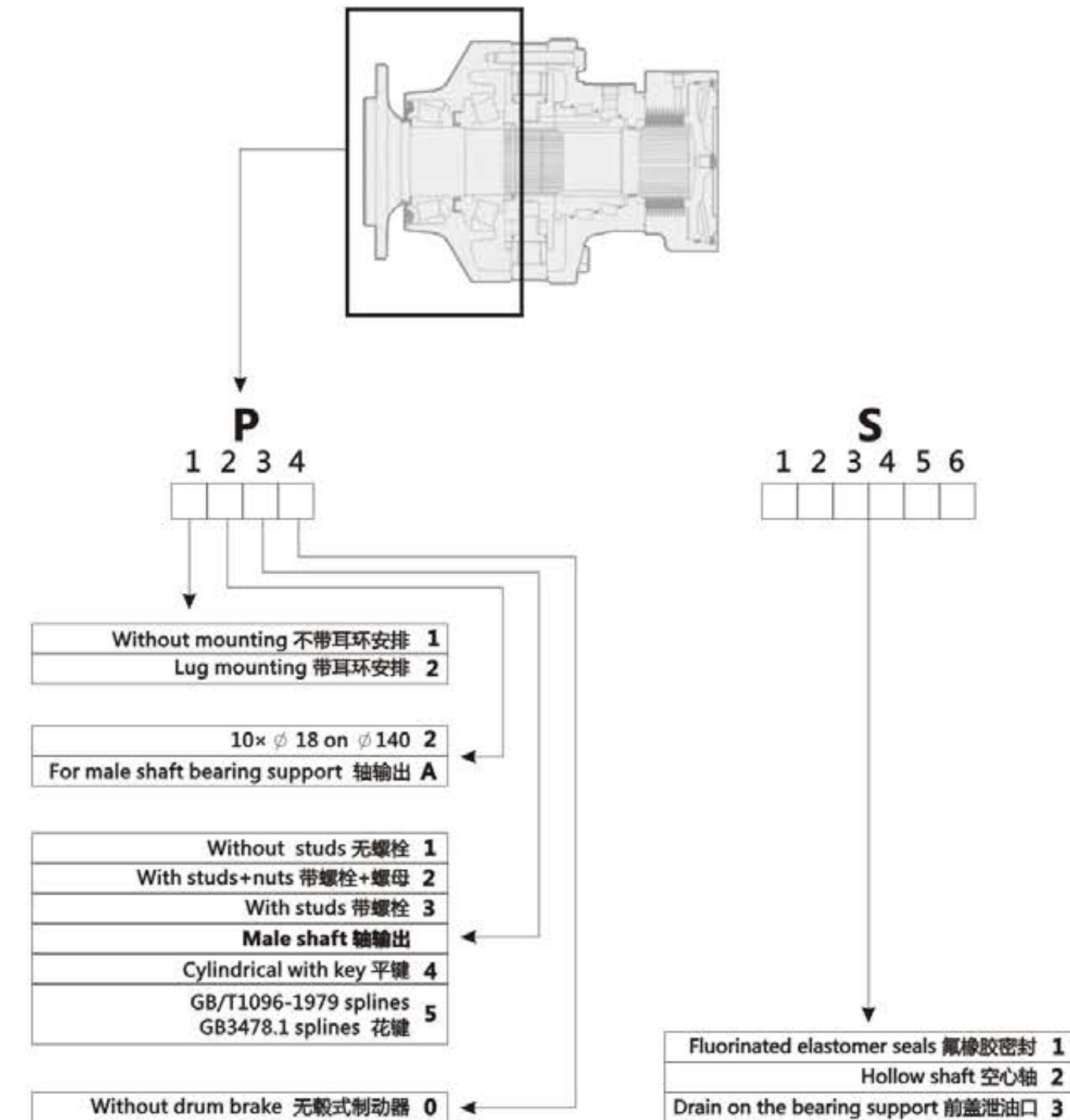
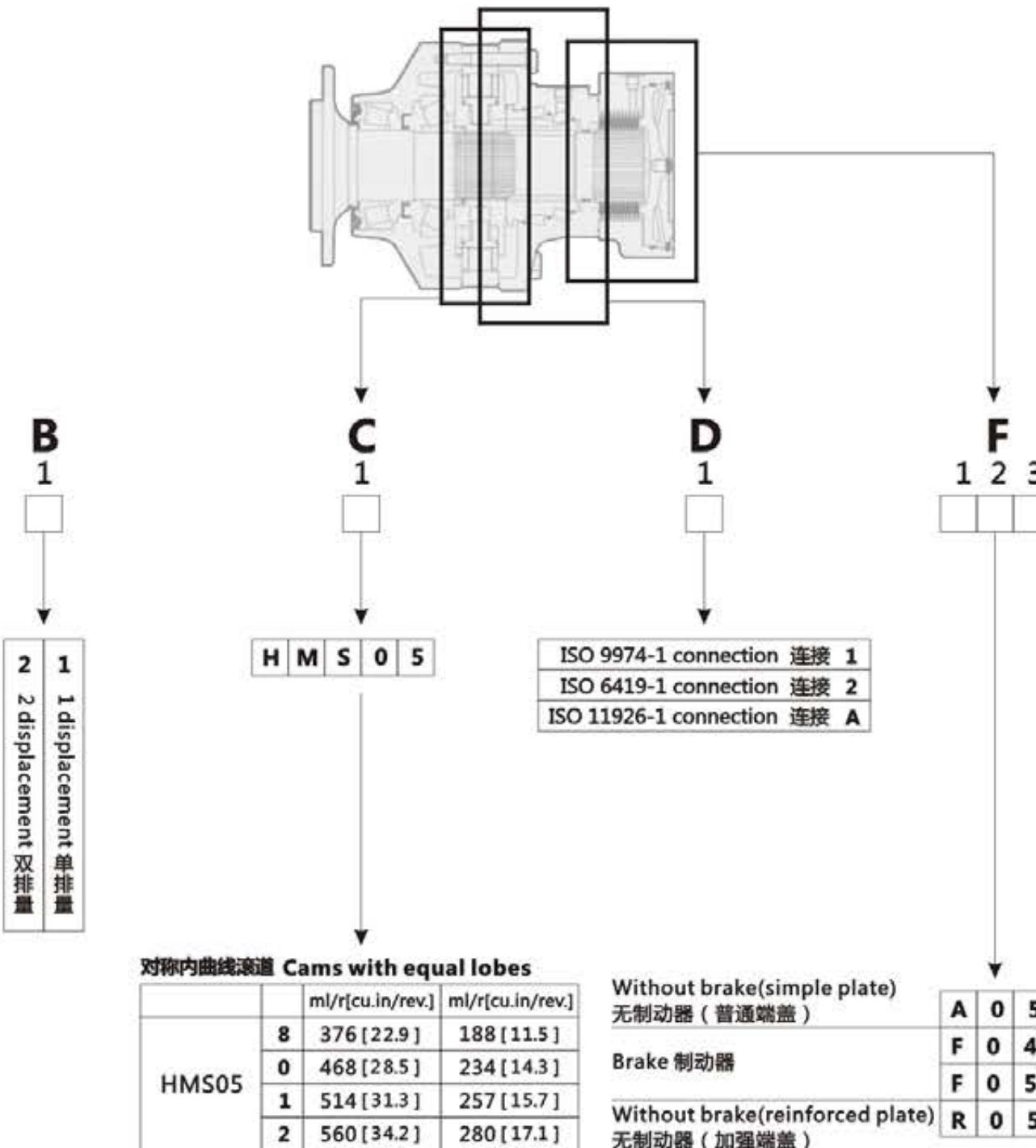
A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

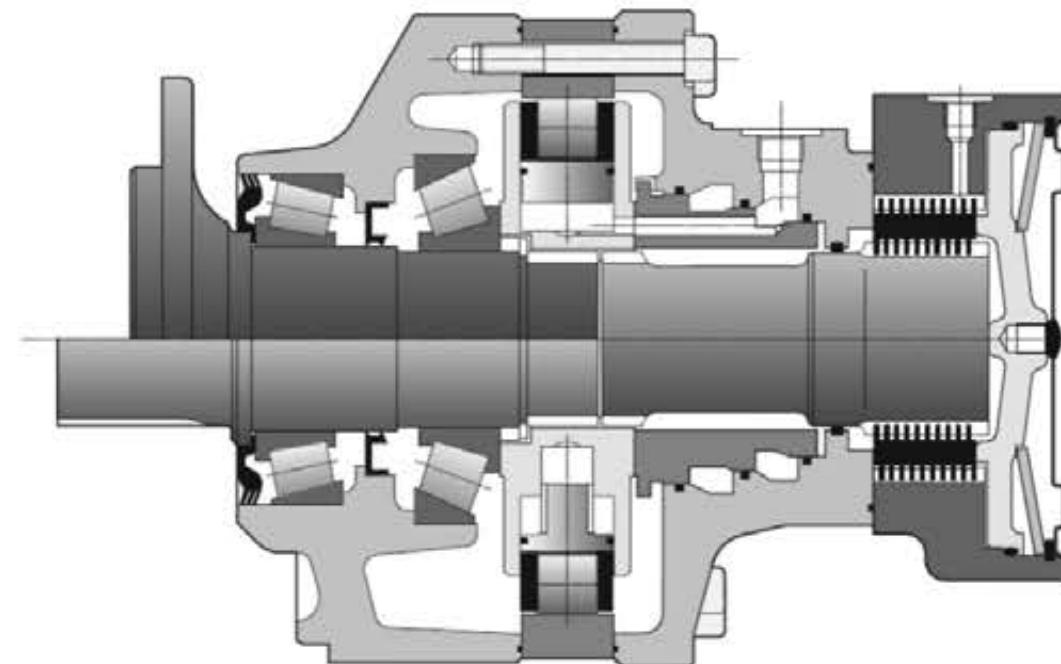
34

PAGE



35

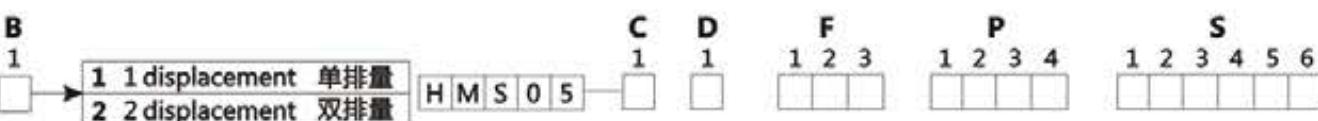
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马达惯量 = 0.03 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS05 液压马达技术参数

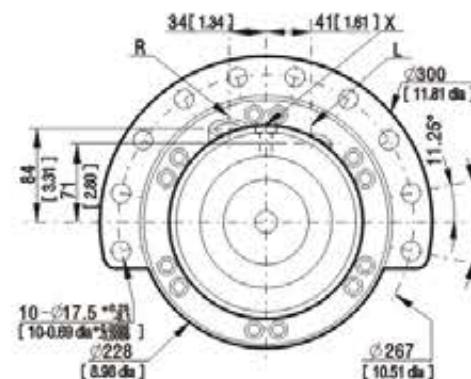
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	376	188			468	234	514	257	560	280
最大功率 Max Power (kw)	25	17			25	17	25	17	25	17
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	562	275			699	343	768	376	837	410
额定扭矩 Rated torque (N.m)	1405		1749		1921		2092			
额定压力 Rated pressure (MPa)	25		25		25		25			
最高压力 Max Pressure (MPa)	40		40		35		35			
额定转速 Rated speed (r/min)	90		90		85		80			
转速范围 Speed range (r/min)	0-200		0-200		0-190		0-180			



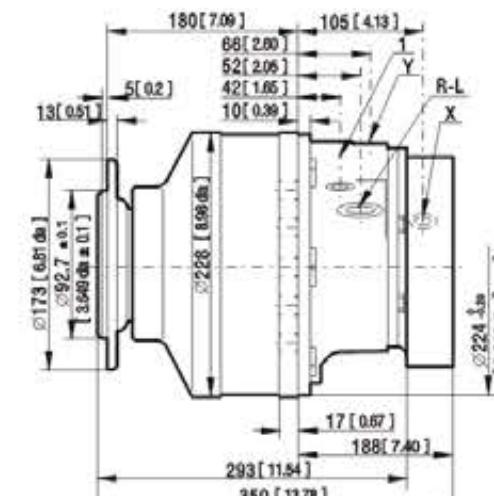
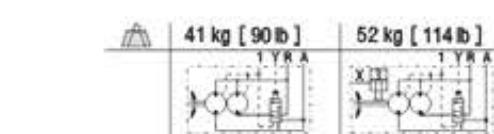
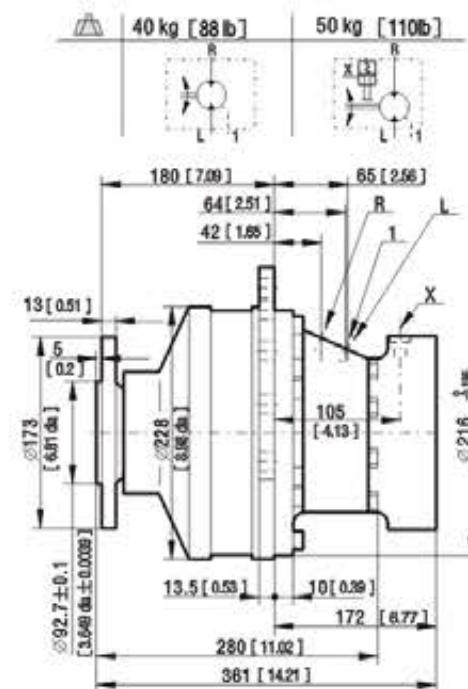
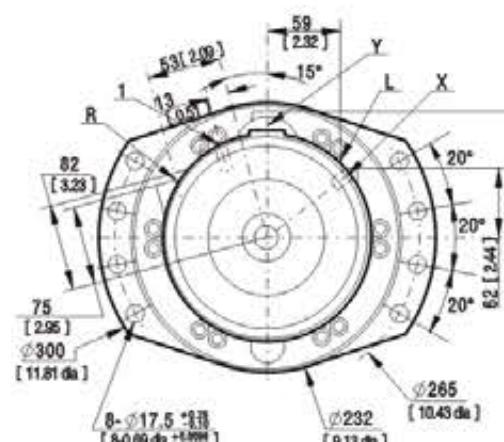
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(1210) 1-displacement motor
(1210) 标准单排量马达尺寸

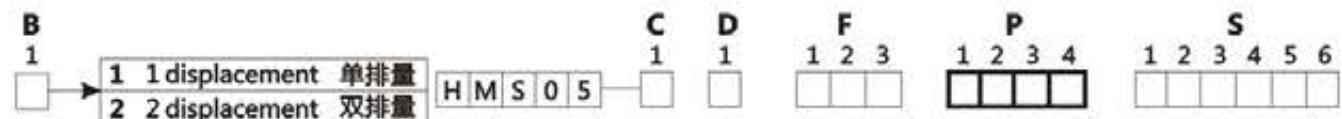


Dimensions for standard(1210) 2-displacement motor
(1210) 标准双排量马达尺寸





SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 2 1 0	φ92.7	φ140	φ170	178.6	φ228	φ18	10×M14*1.5	11 [0.43]
1 2 3 4	[3.65dia.]	[5.51dia.]	[6.69dia.]	[7.03]	[8.98 dia.]	[0.71dia.]		



STUDS 螺栓

	Screws	P mm [in]	Cmin mm [in]	Cmax mm [in]	D mm [in]	Class 等级	Torque(1) Nm [lb.ft]	Torque(2) Nm [lb.ft]
Various Studs 各式螺栓	M14×1.5	45 [1.77]	5 [0.20]	18 [0.71]	P	12.9	200 [147.5]	250 [184.4]
	M14×1.5	50 [1.97]		23 [0.91]			420 [309.8]	550 [405.7]
	M14×1.5	62 [2.44]		33 [1.30]				
	M18×1.5	65 [2.56]		28 [1.10]				
Screws 螺纹	M12×1.75			23 [0.91]	D C	10.9	120 [88.5]	120 [88.5]
	1/2"-20 UNF						8.8	

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭距

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭距 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭距(Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM],code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

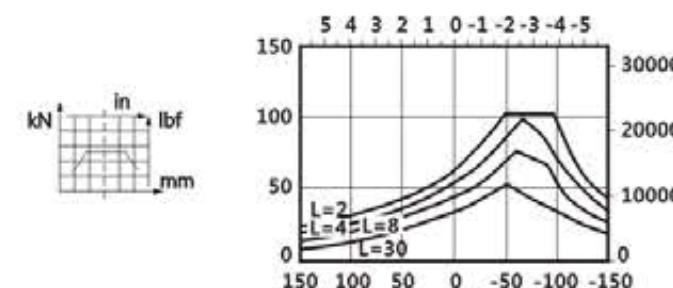
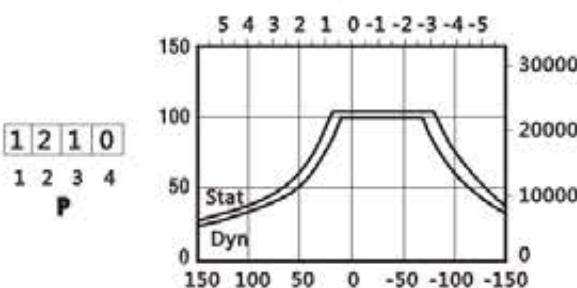
0组排量，无轴向力最大扭距

Service life of bearings 使用寿命

Test conditions 检测条件

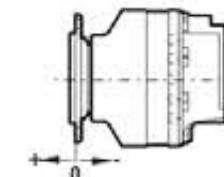
L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

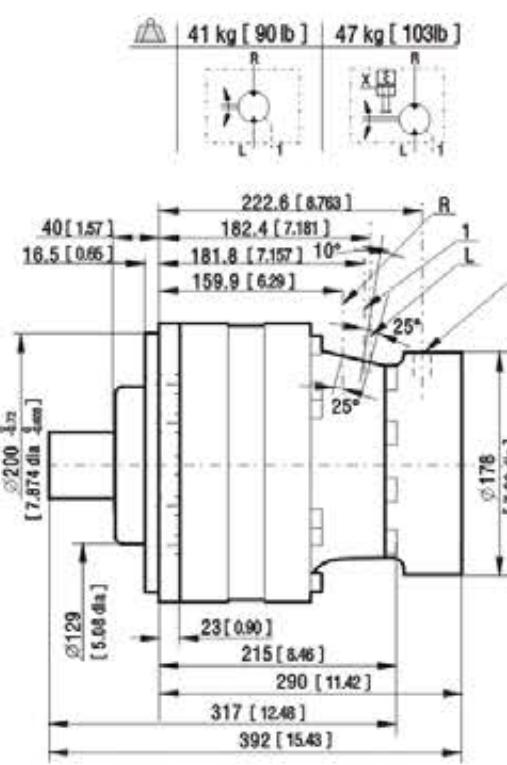
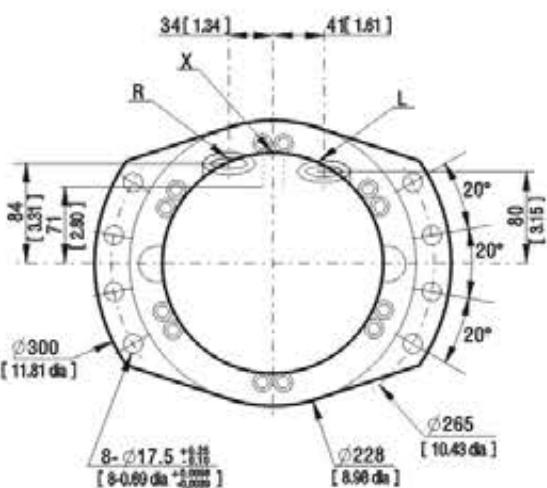
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



SHAFT MOTOR 轴式马达

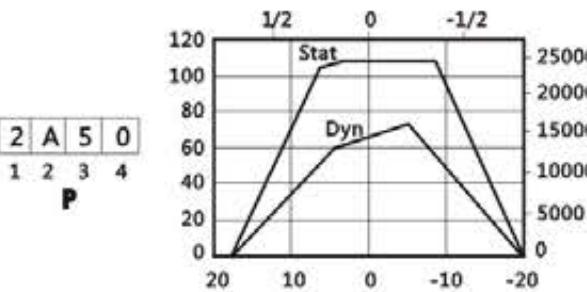
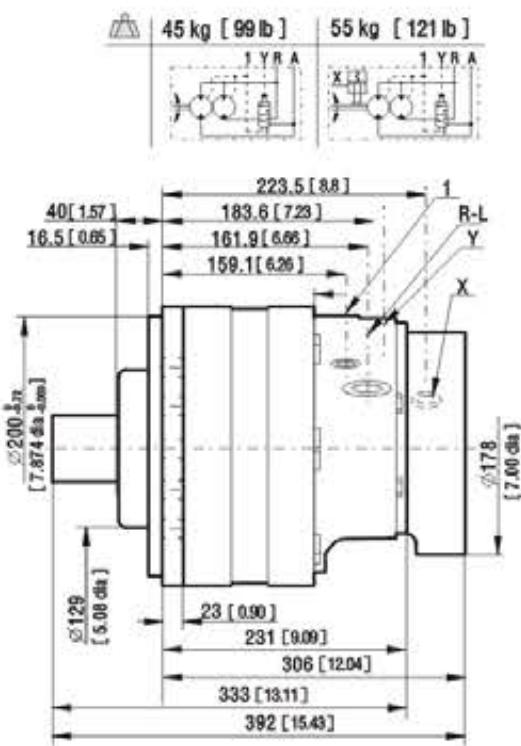
The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor (2A50) 标准单排量马达尺寸





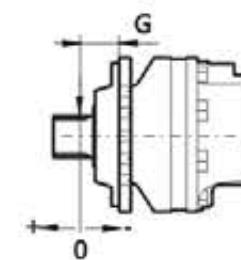
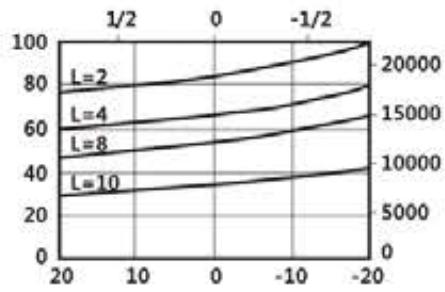
Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸



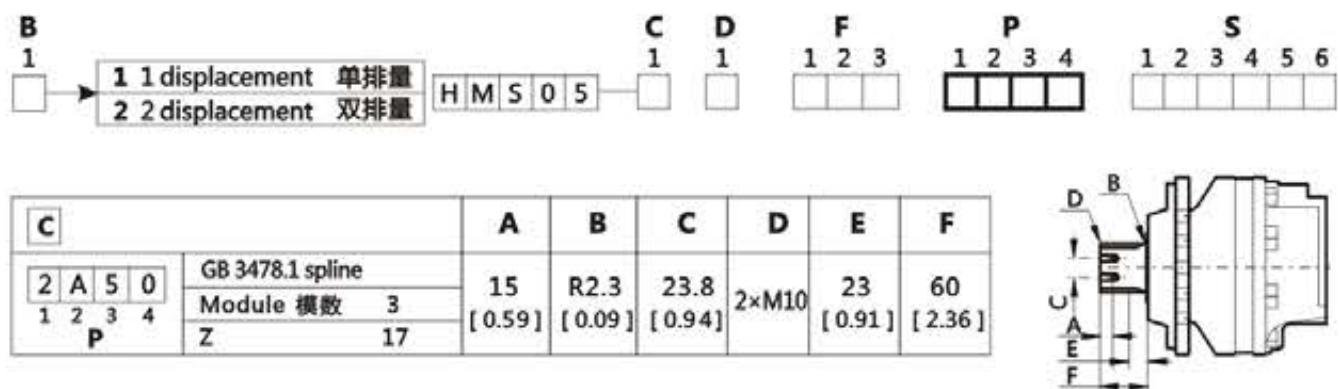
C G
2 A 5 0 81.75 [3.22]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

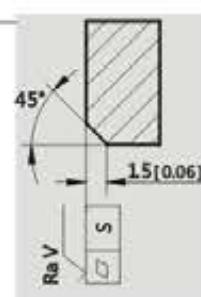
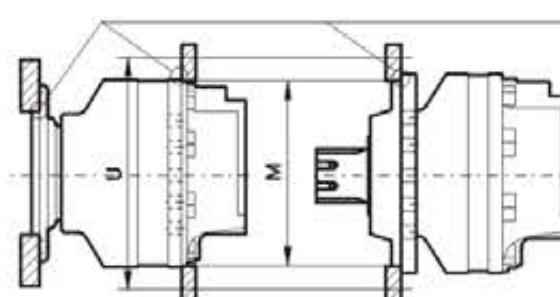
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



SUPPORT TYPES 前盖类型



CHASSIS MOUNTING 支架安装



▲ 安装时注意清洁 Take care over the immediate environment of the connections

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次

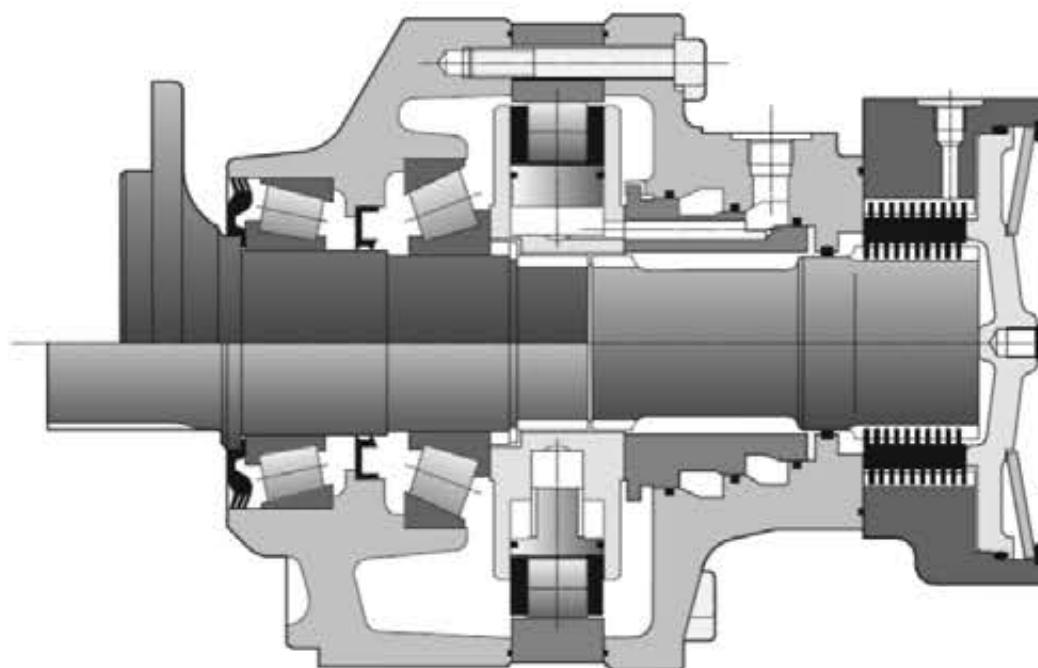
	Ø M(1)	Ø U	S	Ra V	Studs 螺栓	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	216 [8.50]	267 [10.51]	0.2 [0.008]	12.5µm [0.49µin]	10	8.8	210N.m [155 lb.ft]
	224 [8.82]	265 [10.43]			2x4		
SHAFT MOTOR 轴式马达	200 [7.87]	265 [10.43]			M16x2		2x4
					M16x2		

(1) +0.3 [+0.012]

(1) +0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

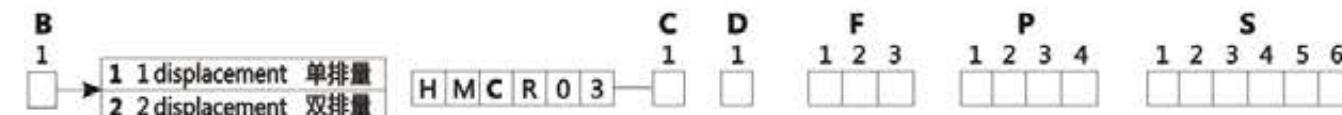
* : 指传动时扭矩及负载的最小值



马达惯量 = 0.01 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMCR03 液压马达技术参数

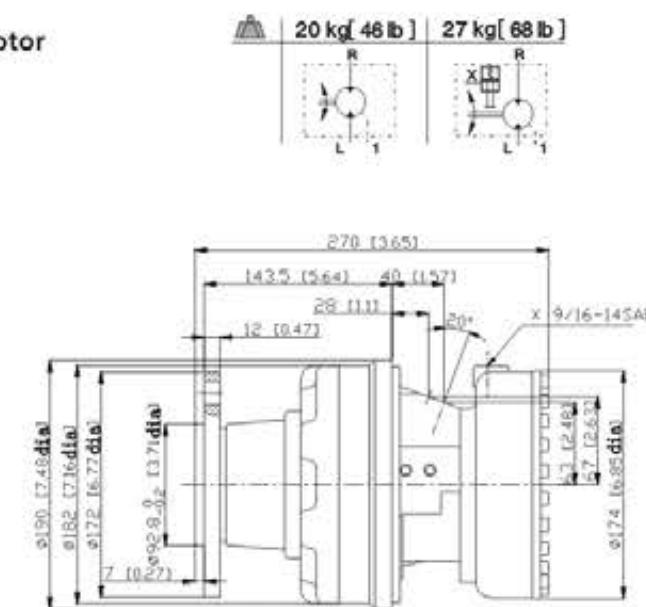
马达规格 Motor specifications	160	225	255	280	325	365	400
排量 Displacement (ml/r)	160	225	255	280	325	365	400
连续输出功率 Continuous wattage output (KW)	18	18	18	18	22	22	22
压差10MPa扭矩 Differential pressure 10MPa torque (N.m)	225	358	405	445	517	580	636
额定扭矩 Rated torque (N.m)	598	840	953	1046	1214	1363	1494
额定压力 Rated pressure (Mpa)	25	25	25	25	25	25	25
最高压力 Max Pressure (Mpa)	40	40	40	40	40	40	40
最高持续转速 Maximum continuous speed (r.p.m)	320	320	280	260	240	240	240
转速范围 Speed range (r.p.m)	0-400	0-400	0-360	0-330	0-310	0-280	0-260



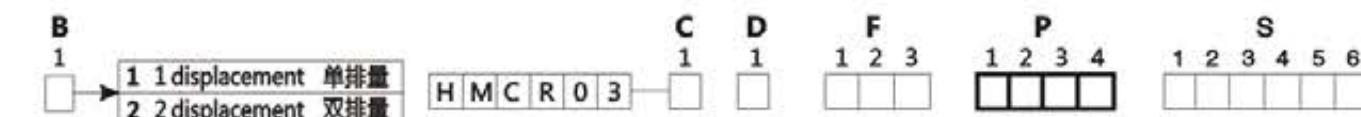
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

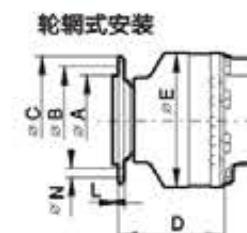
Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸



SUPPORT TYPES 前盖类型

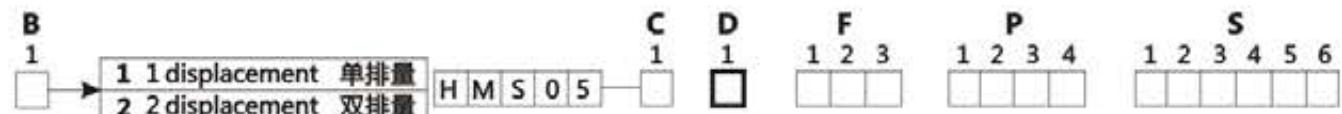


C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 1 2 3 4 P	ø92.8 [3.65dia.]	ø140 [5.51dia.]	ø172 [6.77dia.]	143.5 [5.56]	ø182 [7.07dia.]	ø18 [0.71dia.]	5×M14*1.5	12 [0.47]



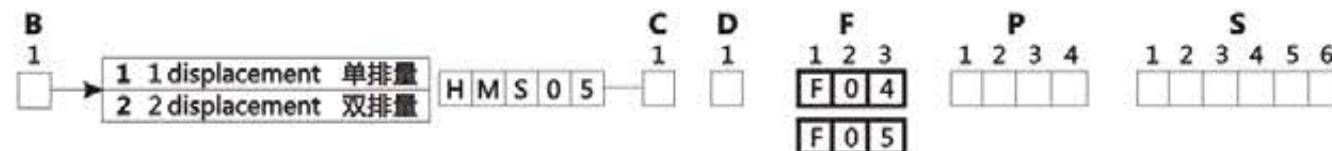


HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain	制动器控制油口 Control of Parking break
A SAEJ514	ISO11926-1	1 1/16"-12UNF	3/4"-16UNF	3/4"-16UNF	9/16"-18UNF
1 DIN3852	ISO9974-1	M27x2	M14x1.5	M16x1.5	M14x1.5
2 NFE48050	ISO6149-1	M18x1.5	M14x1.5	M14x1.5	M14x1.5
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]

BRAKES 制动器

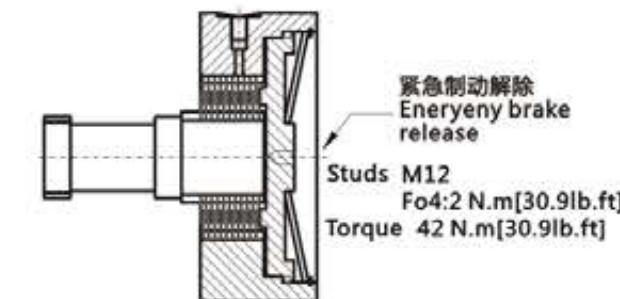


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。

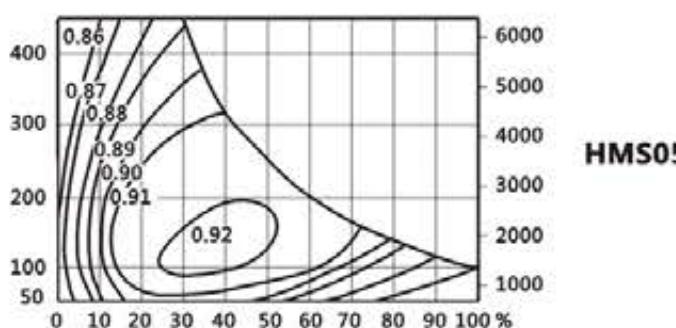
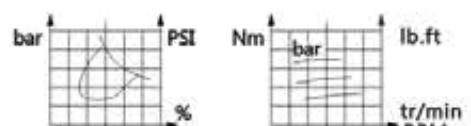


EFFICIENCY 效率

Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

C	F 0 4	F 0 5
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	1400Nm [1030 lb.ft]	2500Nm [1840 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	910 Nm [670 lb.ft]	1625Nm [1200 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	1050Nm [770 lb.ft]	1875Nm [1380 lb.ft]
Min. Brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]
Oil capacity 油量	100 cm³ [6.1 cu.in]	100 cm³ [6.1 cu.in]
Volume for brake release 制动开启量	16 cm³ [1.0 cu.in]	16 cm³ [1.0 cu.in]
Max. Energy dissipation 最大能耗数		38179 J

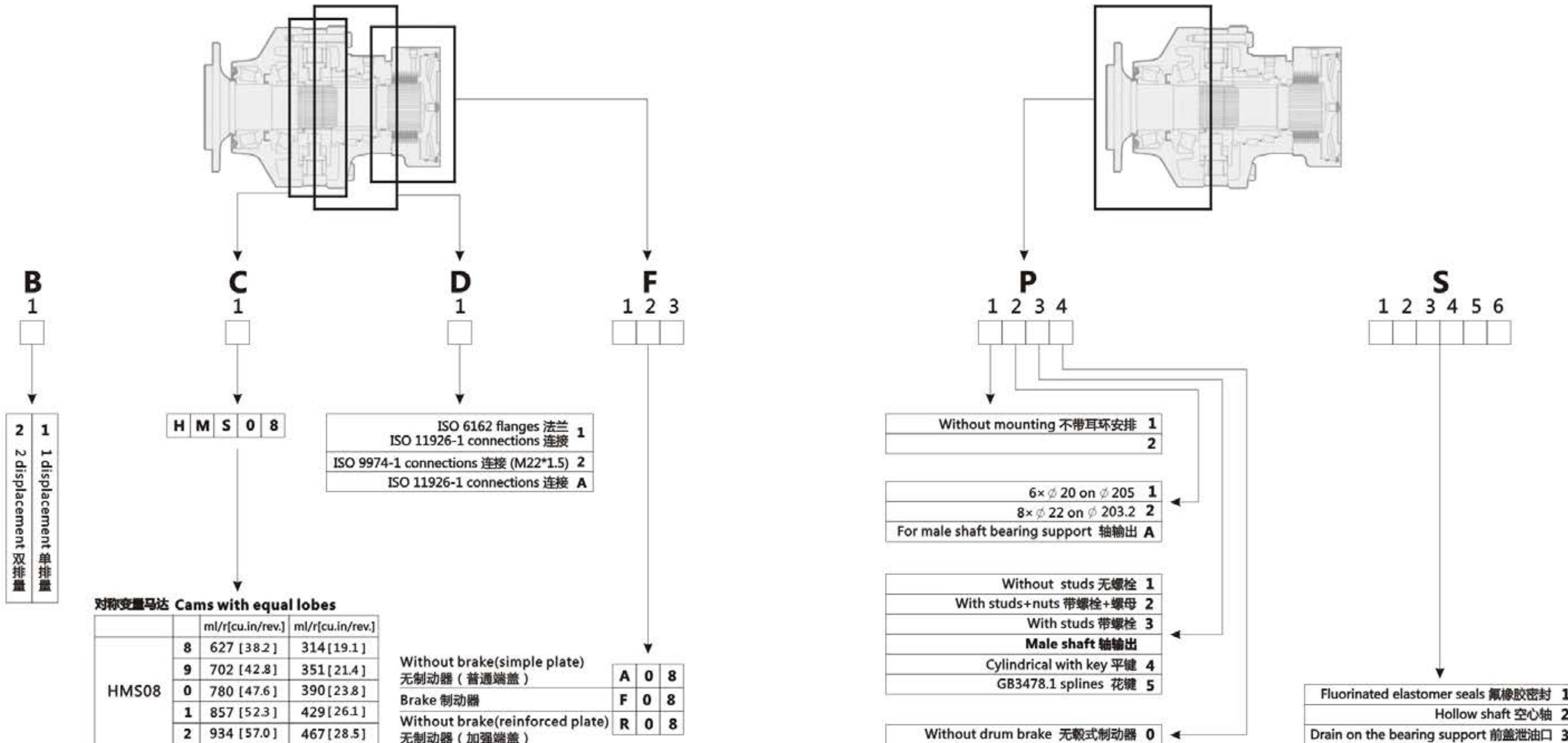
* After emergency brake has been used
* 指经过紧急制动后参数

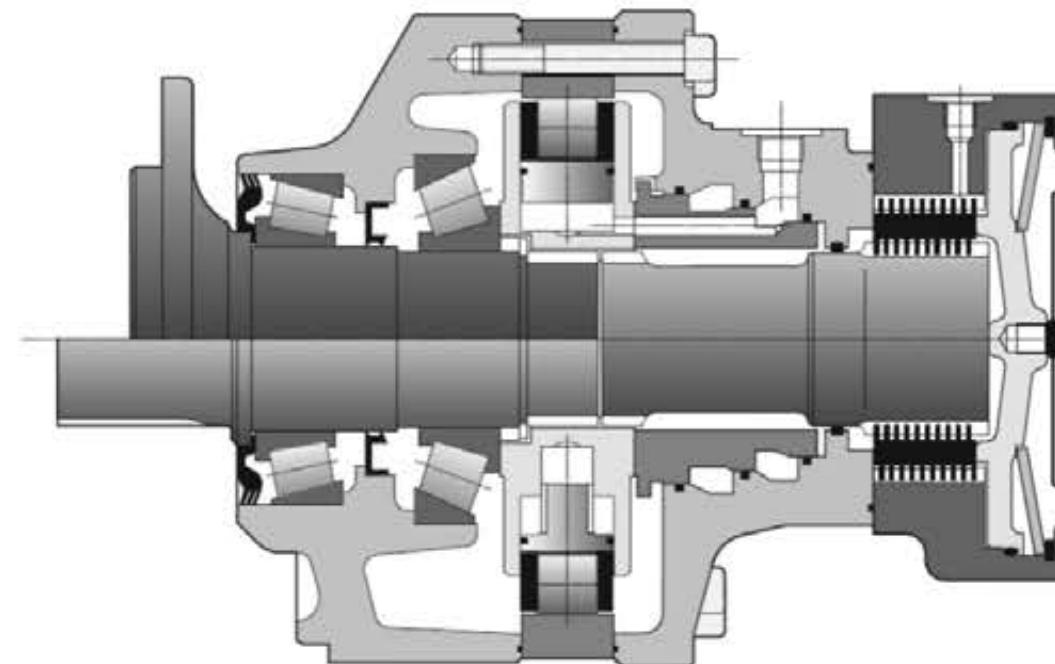
D Do not run in multidisc brakes
马达运转前必须先行开启制动器

A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

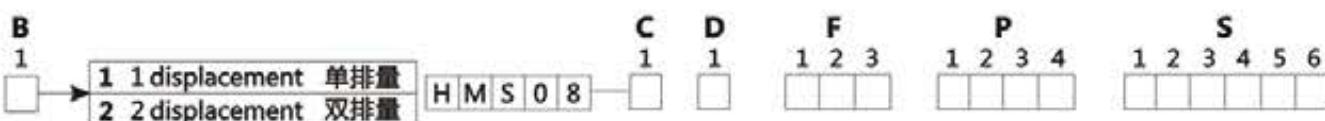




马达惯量 = 0.05 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS08 液压马达技术参数

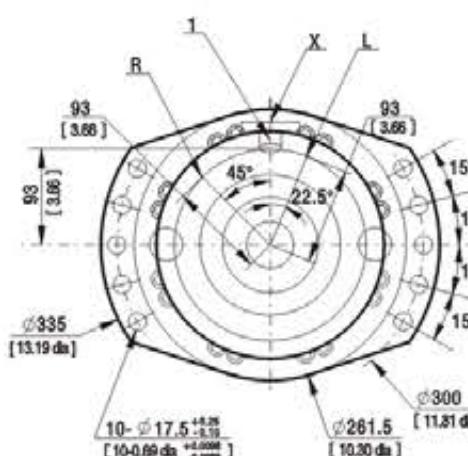
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	627	313	702	351	780	390	857	428	934	467
最大功率 Max Power (kw)	36	24	36	24	36	24	36	24	36	24
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	937	459	1049	514	1166	571	1281	628	1396	684
额定扭矩 Rated torque (N.m)	2343		2623		2914		3202		3490	
额定压力 Rated pressure (MPa)	25		25		25		25		25	
最高压力 Max Pressure (MPa)	40		40		40		35		35	
额定转速 Rated speed (r/min)	70		70		70		65		65	
转速范围 Speed range (r/min)	0-170		0-170		0-170		0-155		0-140	



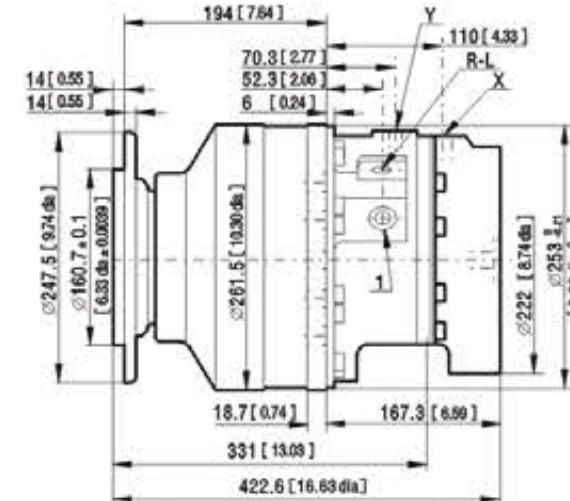
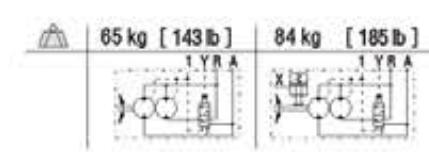
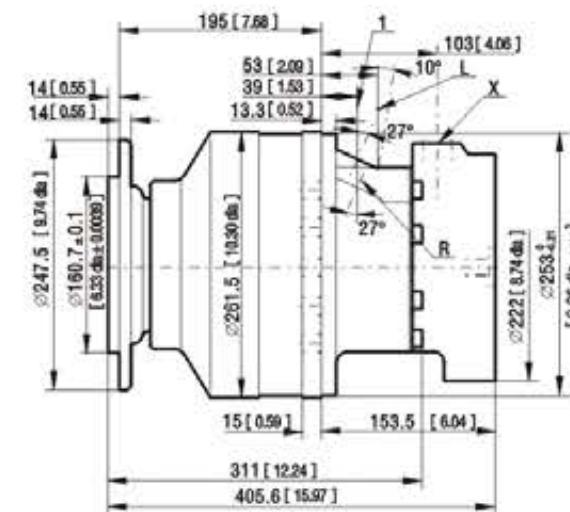
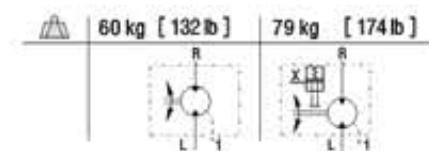
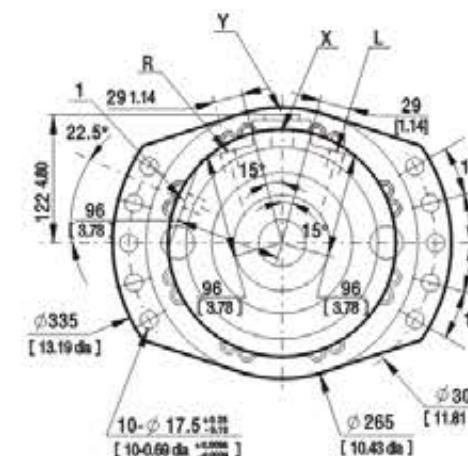
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸

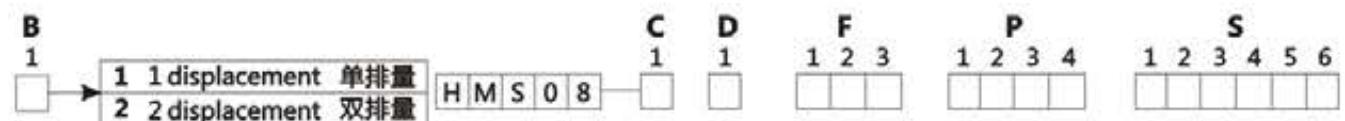


Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸





SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 P	φ160.7 [6.33dia.]	φ205 [8.07dia.]	φ245 [9.65dia.]	195 [7.68]	φ261.5 [8.98dia.]	6×φ20 [6×0.79dia.]	M18×1.5	13.5 [0.53]
1 2 1 0 P	φ150.9 [5.94dia.]	φ203.2 [8.00dia.]	φ238 [9.37dia.]	194.1 [7.64]	φ261.5 [10.3dia.]	8×φ22 [8×0.87dia.]	M20×1.5	13.5 [0.43]
1 2 3 4 P								



STUDS 螺栓

	Screws	P mm[in]	C min mm[in]	C max mm[in]	D mm[in]	Class 等级	Torque(1) 扭矩(1) Nm [ib.ft]	Torque(2) 扭矩(2) Nm [ib.ft]
Various Studs 各式螺栓	M14×1.5	45 [1.77]	5 [0.20]	15 [0.57]		12.9	200 [147.5]	250 [184.4]
	M18×1.5	55 [2.17]		18 [0.71]			420 [309.8]	550 [405.7]
	M18×1.5	55 [2.17]		23 [0.91]				
	M20×1.5	60 [2.36]		21 [0.83]				
	M22×1.5	55 [2.17]		15 [0.59]				
	M22×1.5	80 [3.15]		40 [1.57]				
Screws 螺纹	M12×1.75 1/2"-20 UNF				10.9	120 [88.5]	120 [88.5]	
					8.8	250 [184.4]	120 [88.5]	

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭矩

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭矩 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭矩(Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

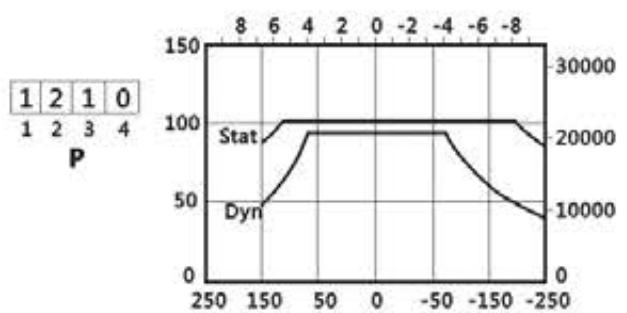
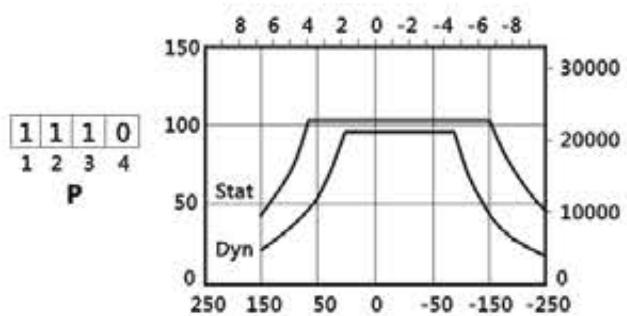
Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic: 0 r/min[0 RPM],code 0 displacement,
动态 : 0 r/min[0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭矩

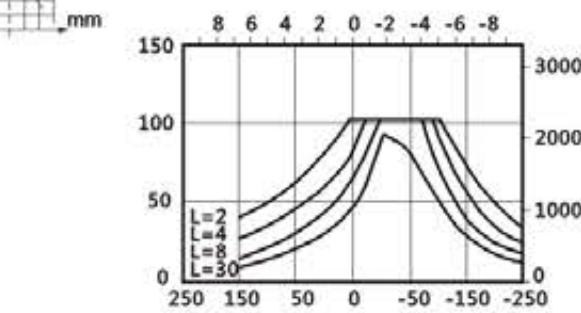
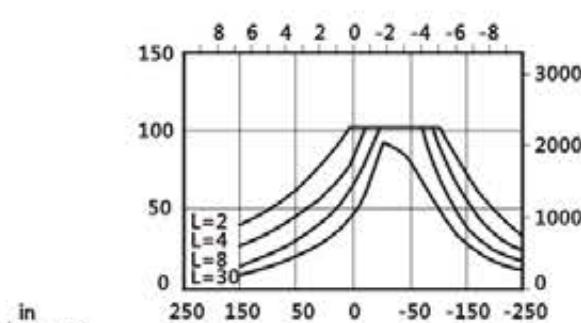


Service life of bearings 使用寿命

Test conditions 检测条件

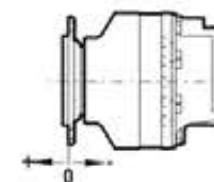
L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。

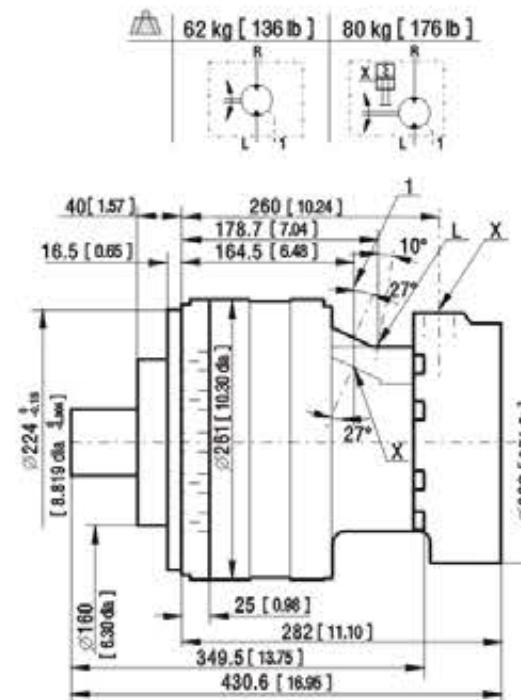
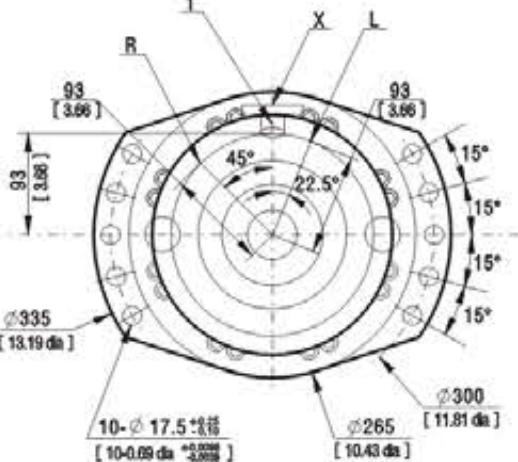


轴式马达 SHAFT MOTOR

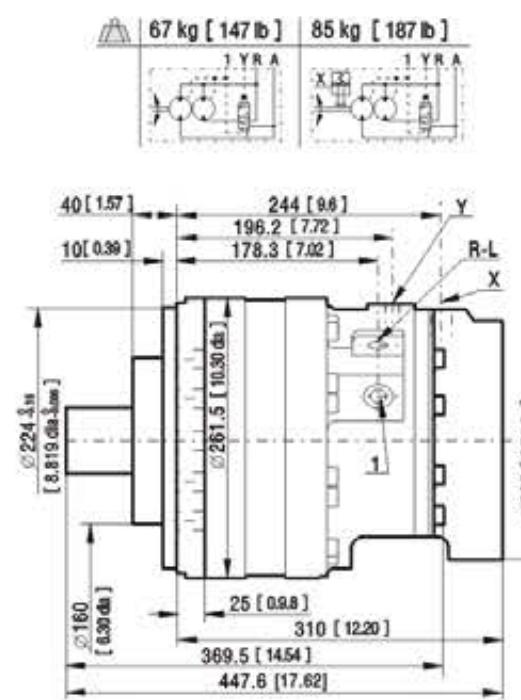
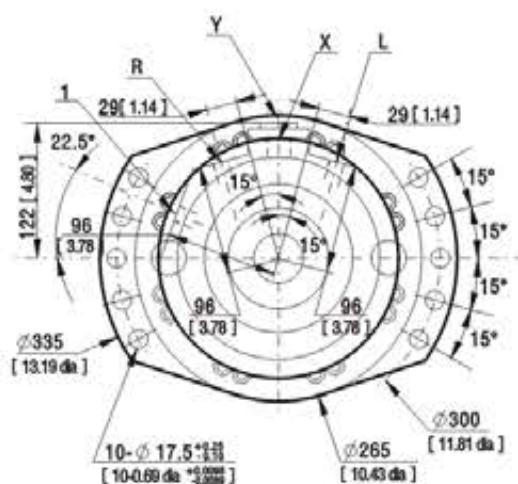
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制(括号内英制)

Dimensions for standard(2A50) 1-displacement motor (2A50) 标准单排量马达尺寸



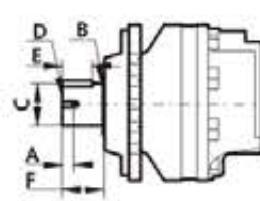
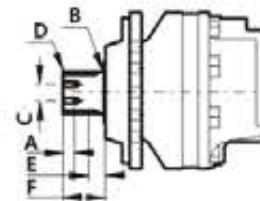
Dimensions for standard(2A50) 2-displacement motor (2A50) 标准双排量马达尺寸



SUPPORT TYPES 前盖类型

B	C	D	F	P	S
1	1	1	1 2 3	1 2 3 4	1 2 3 4 5 6
→ 1 1 displacement 单排量	H M S 0 8				
2 2 displacement 双排量					

C	A	B	C	D	E	F
2 A 5 0	GB3478.1 spline 花鍵	15 [0.59]	R2.5 [0.10]	35 [1.38]	2×M10	23 [0.91]
1 2 3 4	Module 模數 3					60 [2.76]
P	Z 22					



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0 bar [0 PSI]

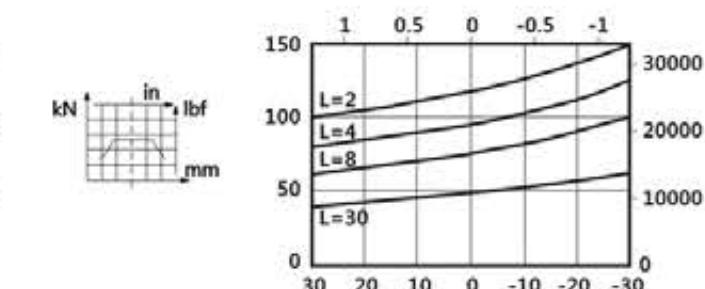
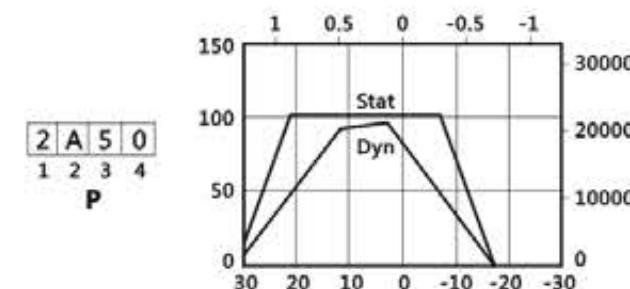
静态 : 0r/min [0RPM] 0bar [0PSI]

Dynamic : 0 r/min [0 RPM] , code 0 displacement.

动态: 0r/min [0 RPM]

without axial load at max.tor

0组排量，无轴向力最大扭矩



Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

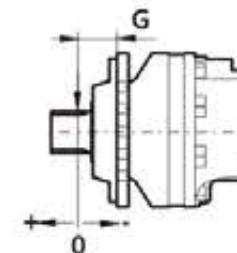
0组排量无轴向力，粘度为25cst，平均压力为150bar
工作寿命为B10 100万次



C
G
2 A 5 0 86.75 [3.42]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。

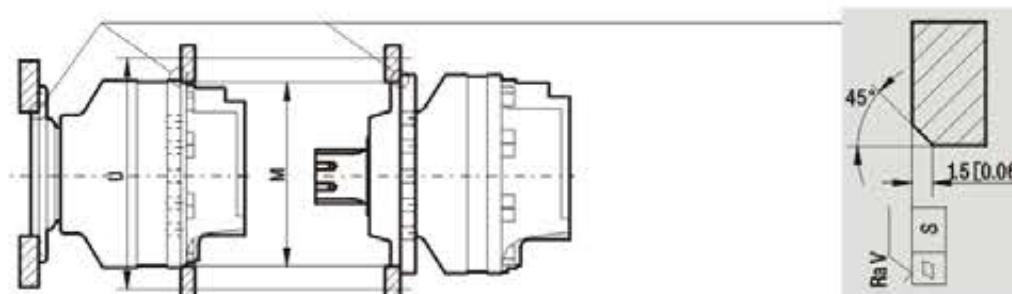


HYDRAULIC CONNECTIONS CONNECTIONS 连接

B 1	1 displacement 单排量	H M S 0 8	C 1	D 1	F 1 2 3	P 1 2 3 4	S 1 2 3 4 5 6
<input type="checkbox"/>	2 displacement 双排量	<input type="checkbox"/>					

Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ514	ISO11926-1	1 1/16"-12UNF	9/16"-18UNF	3/4"-16UNF	9/16"-18UNF
1 ISO6162 DIN3852	ISO6162 ISO9974-1	DN13PN400	M14×1.5	M18×1.5	M16×1.5
2 NF E48 050	ISO9974-1	M22×1.5	M14×1.5	M18×1.5	M16×1.5
Max Pressures	MS Bar [PSI]	400 [5800] 350 [5075]	30[440]	1[10]	30[440]

CHASSIS MOUNTING 支架安装



△ 安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	253 [9.96]	300 [11.81]	0.2	12.5µm [0.49µin]	2×5 M16×2	8.8	210N.m [155 lb.ft]
SHAFT MOTOR 轴式马达	224 [8.82]	300 [11.81]					

(1) +0.3[+0.012]
+0.2[+0.008]

* : Min.Values for torque and load to be transmitted

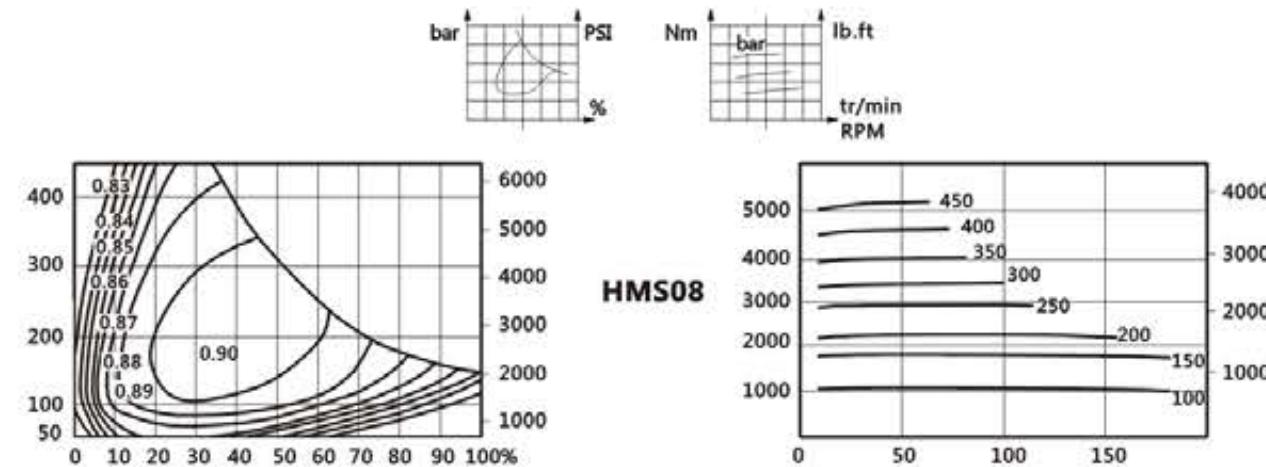
* : 指传动时扭矩及负载的最小值

EFFICIENCY 效率

Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

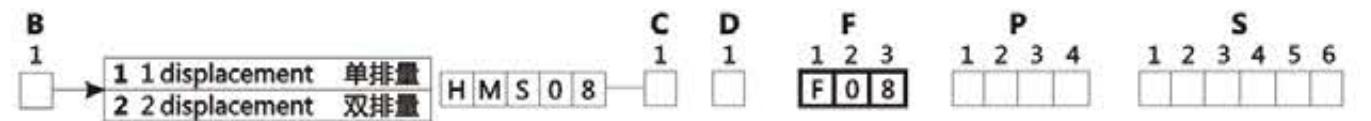
下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



△ The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.
启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。



BRAKES 制动器

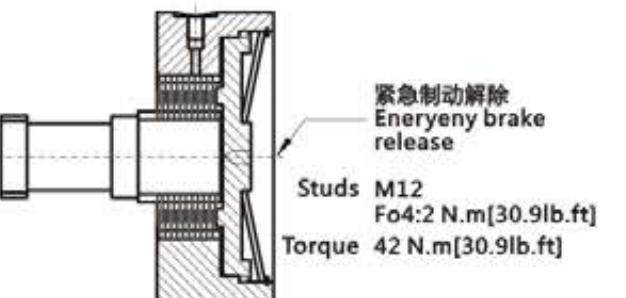


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 0 8
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	5620Nm [4150 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	3653 Nm [2690 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	4215Nm [3110 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]
Oil capacity 油量	100cm ³ [6.1 cu.in]
Volume for brake release 制动开启量	40cm ³ [2.4 cu.in]
Max.energy dissipation 最大能耗数	110336J

* After emergency brake has been used
* 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动(或者紧急制动)使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/h时所有车辆，请联络我公司工程师。



STUDS 螺栓

	Screws	P mm [in]	C _{min} mm [in]	C _{max} mm [in]	D mm [in]	Class 等级	Torque (1) Nm [ib.ft]	Torque (2) Nm [ib.ft]
Various Studs 各式螺栓	M14x1.5	45 [1.77]	5 [0.20]	18 [0.71]	165 [0.65]	12.9	200 [147.5]	250 [184.4]
	M14x1.5	50 [1.97]		23 [0.91]			300 [221.3]	380 [280.3]
	M14x1.5	62 [2.44]		33 [1.30]				
	M16x1.5	50 [1.97]		23 [0.91]				
Screws 螺纹	M12x1.75				21 [0.83]	10.9	120 [88.5]	
	1/2"-20 UNF					8.8		

(*) The tightening torques are given for the indicated loads.

(*) 指上述负载的预紧扭距

(1) Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1) 轮辋：建议轮辋式安装的预紧扭距 (Re steel disc>240N/mm² [>34800 PSI])

(2) Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2) 标准：建议在其它情况安装时预紧扭距(Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min[0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭距

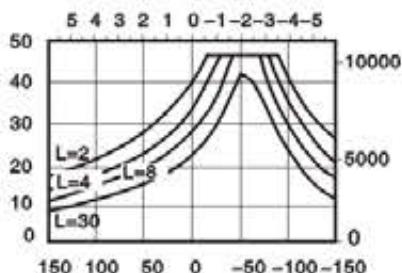
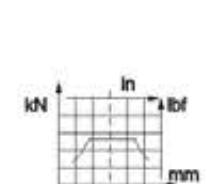
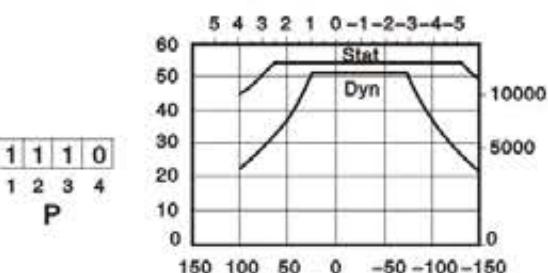
Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average

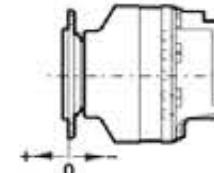
Pressure),with 25cst fluid, code 0 displacement,
without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，
工作寿命为B10 100万次



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

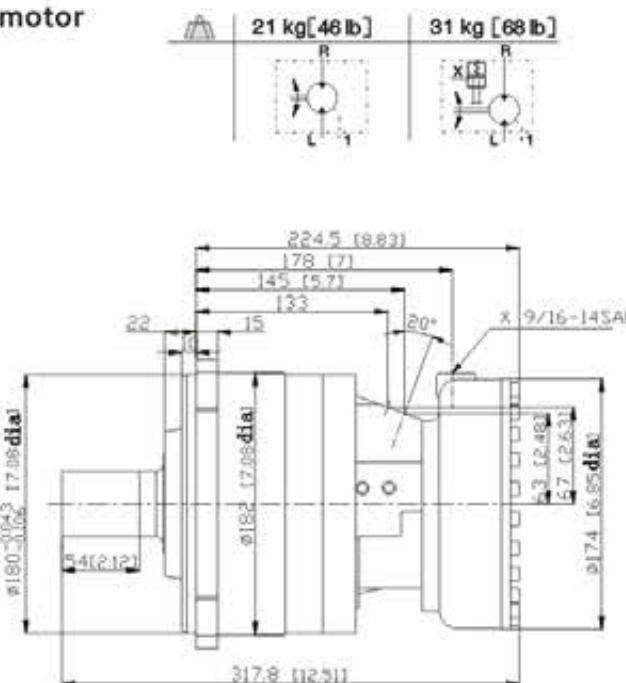
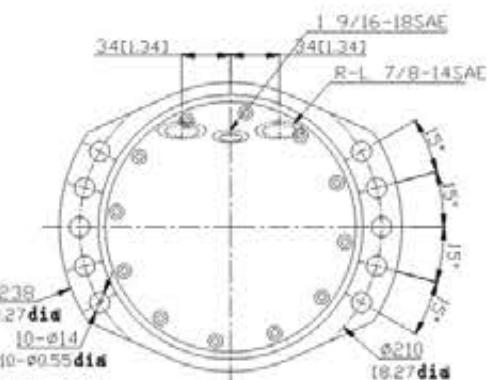
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



SHAFT MOTOR 轴式马达

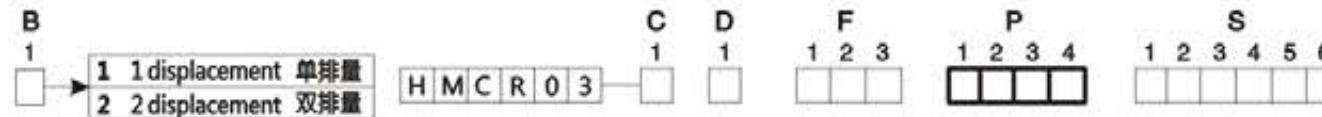
The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸

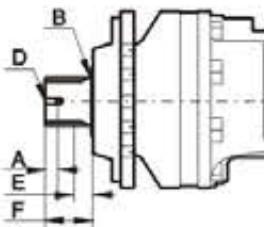




SUPPORT TYPES 前盖类型



C	A	B	D	E	F
2 A 5 0	GB 3478.1 spline 花键	25 [0.98]	R5 [0.2]	M12	25 [0.98] 70 [2.75]
1 2 3 4	Module 模数 2				
P	Z	24			



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

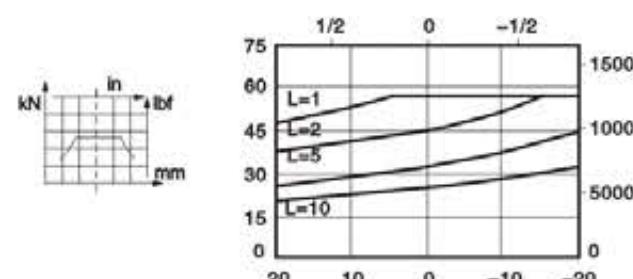
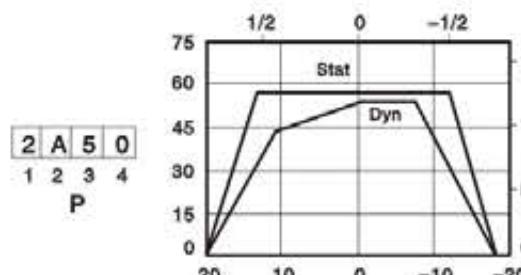
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
without axial load at max.torque

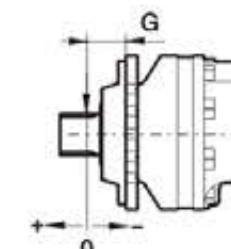
动态 : 0 r/min [0 RPM]
without axial load at max.torque
0组排量，无轴向力最大扭距



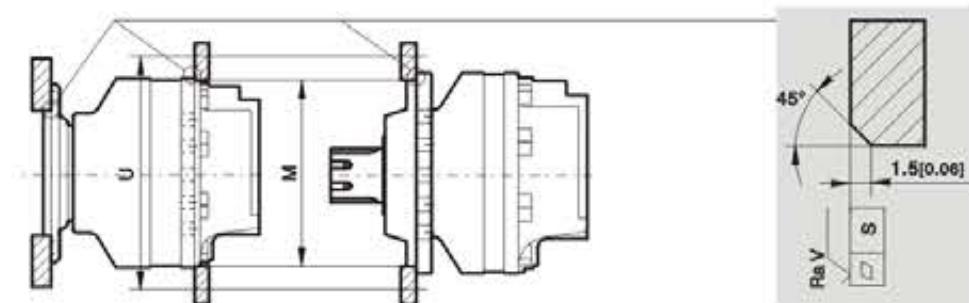
C	G
2 A 5 0	66.45 [2.62]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



CHASSIS MOUNTING 支架安装

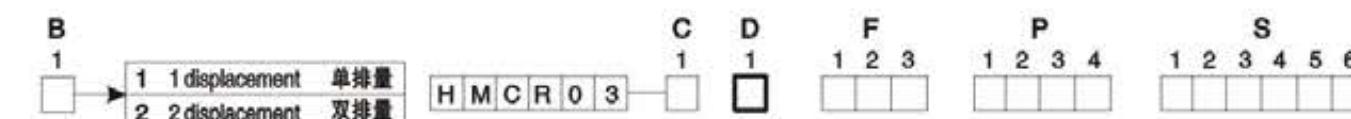


⚠ 安装时注意清洁 Take care over the immediate environment of the connections

Ø M(1)	Ø U	S	Ra V	Studs 螺栓	Class 等级	Torque 扭矩 *
180.25 [7.10]	240 [9.45]	0.2 [0.008]	12.5 μm [0.49 μin]	10 M12×2	10.9	120N.m [89 lb.ft]
(1) +0.3 [+0.012] +0.2 [+0.008]						

* : Min.Values for torque and load to be transmitted
*: 指传动时扭矩及负载的最小值

HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Powersupply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAE J514	ISO 11926-1	7/8 "-14UNF	9/16"-18UNF	9/16"-18UNF	9/16"-18UNF
1	ISO 228/1	G1/2	G1/4	G3/8	G3/8
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]

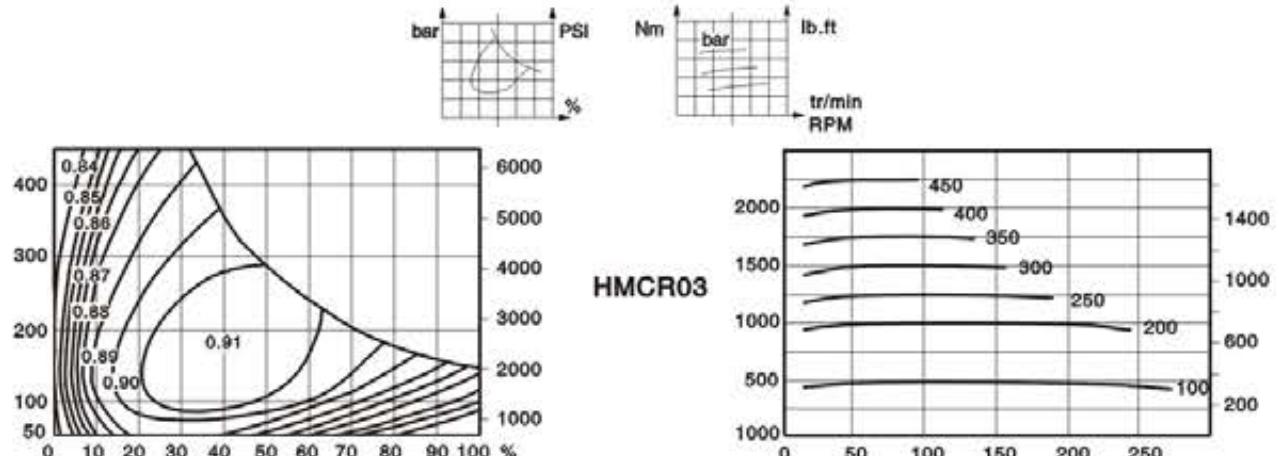


EFFICIENCY 效率

Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。

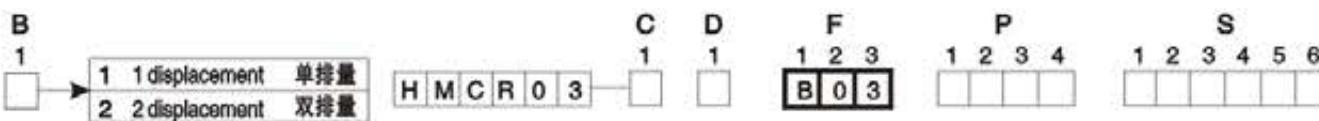


The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

- * After emergency brake has been used
* 指经过紧急制动后参数
- Do not run in multidisc brakes
马达运转前必须先行开启制动器
 - A functional check of the parking brake must be carried out each time it is used as an auxiliary brake (or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm Tower Hydraulic application engineer.
 - 每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

BRAKES 制动器

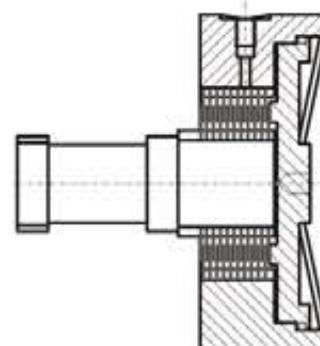


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	B 0 3
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭矩(新制动器)	2200Nm [1618 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭矩(最多使用10次紧急制动)	1430 Nm [1052 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭矩	1650Nm [1213 lb.ft]
Min. brake release pressure 最小自动开启压力	15 bar [217 PSI]
Oil capacity 油量	100 cm³ [6.1 cu.in]
Volume for brake release 制动开启量	23 cm³ [1.4 cu.in]
Max. energy dissipation 最大能耗数	

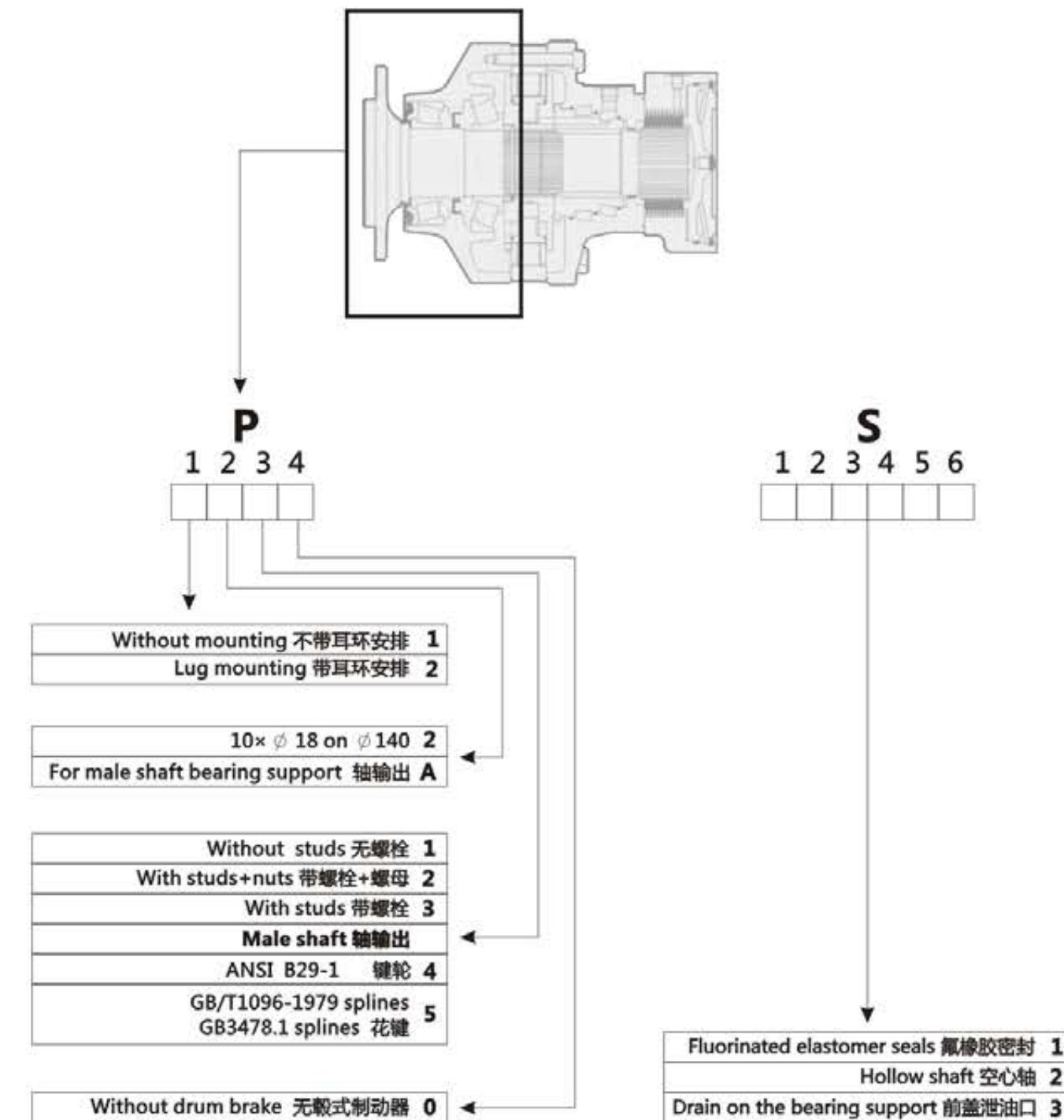
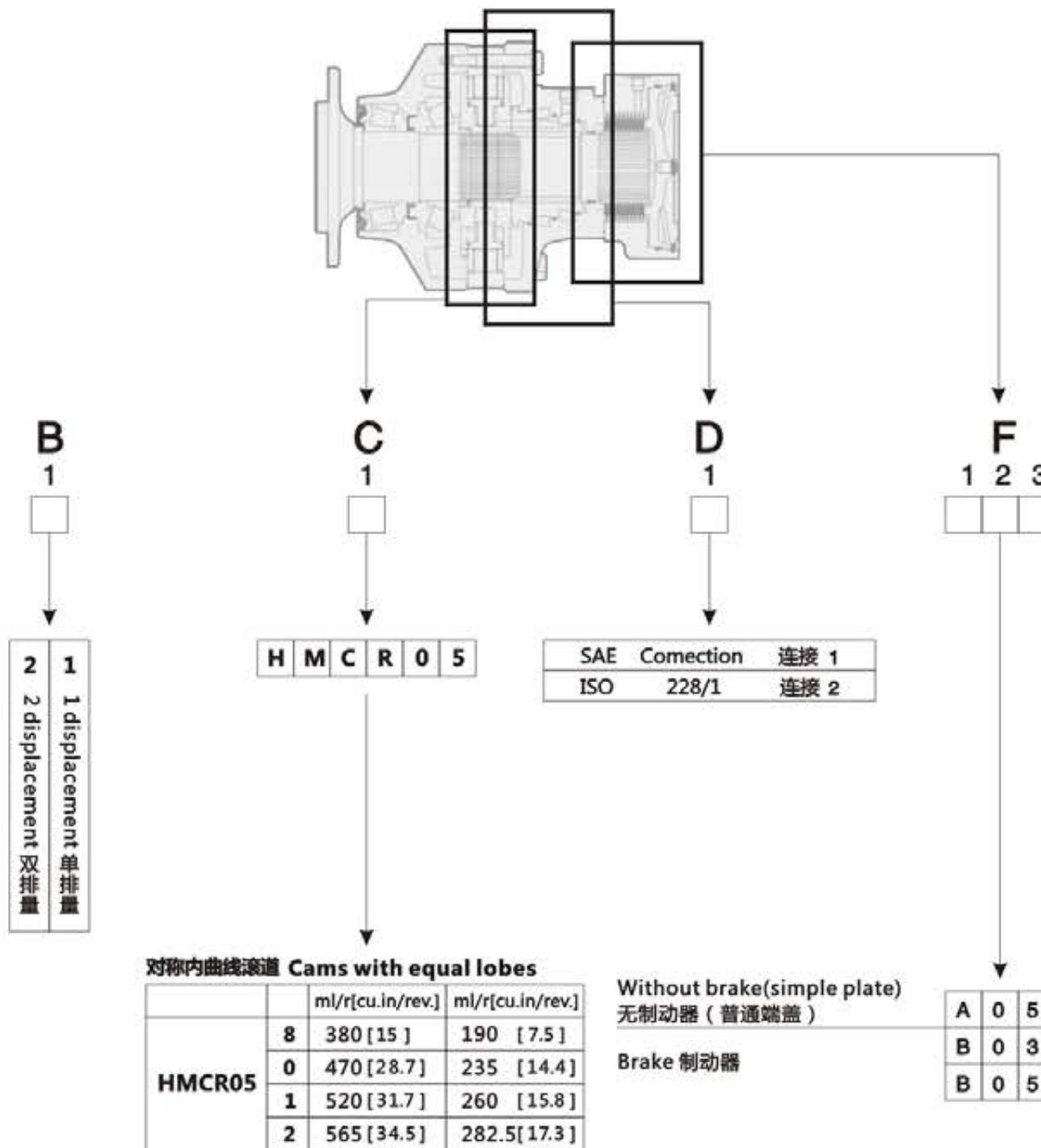
HMCR05

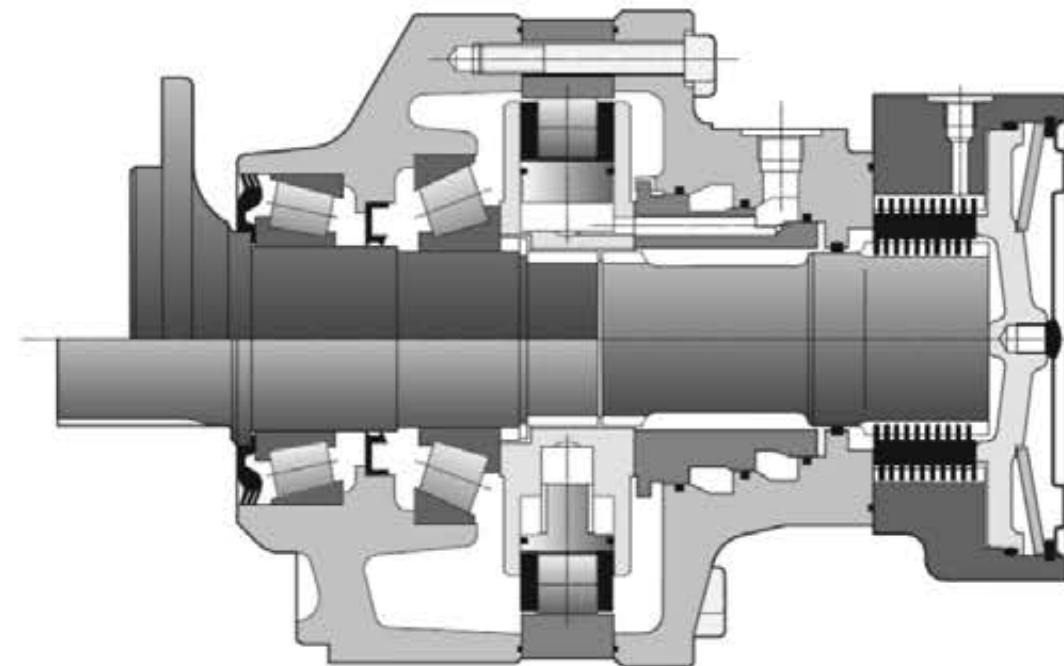
HYDRAULIC MOTORS

HMCR05

HYDRAULIC MOTORS

MOTOR NUMBER 马达编号

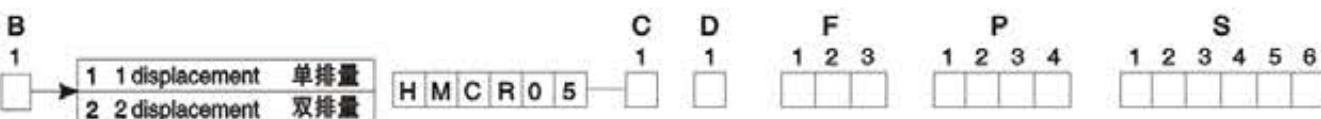




马达惯量 = 0.03 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMCR05 液压马达技术参数

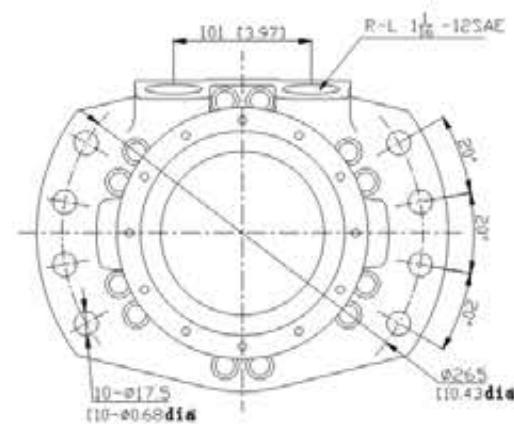
液压马达规格 (Hydraulic Motor Specifications)	380	470	520	565	680	750	820	
排量 (Displacement)	ml/r	380	470	520	565	680	750	820
连续输出功率 (Continuous wattage output)	KW	29	29	29	29	35	35	35
压差10MPa扭矩 (Differential pressure 10MPa torque)	Nm	604	748	827	899	1082	1194	1305
额定扭矩 (Rated torque)	Nm	1419	1756	1942	2111	2540	2802	3063
额定压力 (Pressure rating)	Mpa	25	25	25	25	25	25	25
最高压力 (The highest pressure)	Mpa	40	40	40	40	40	40	40
最高转速 (Maximum speed)	r.p.m	220	220	220	220	220	170	150



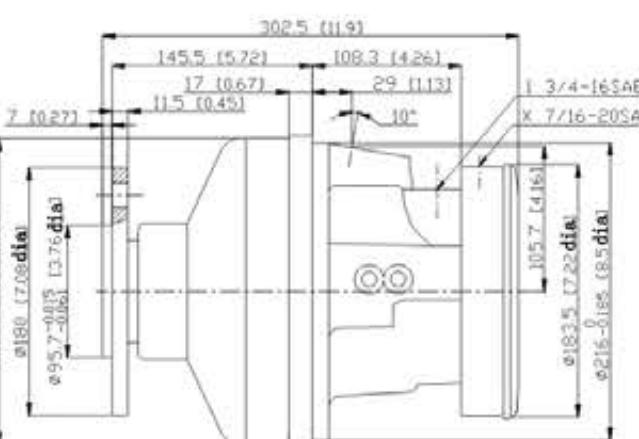
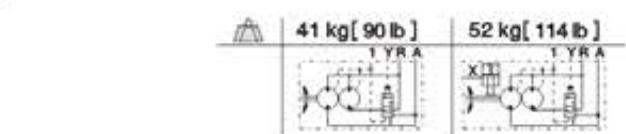
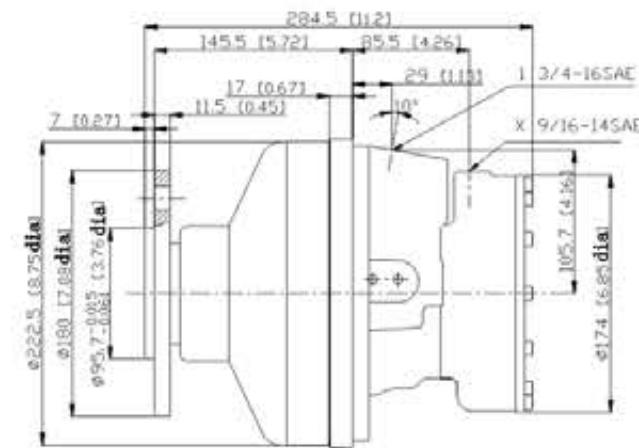
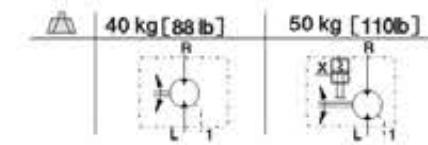
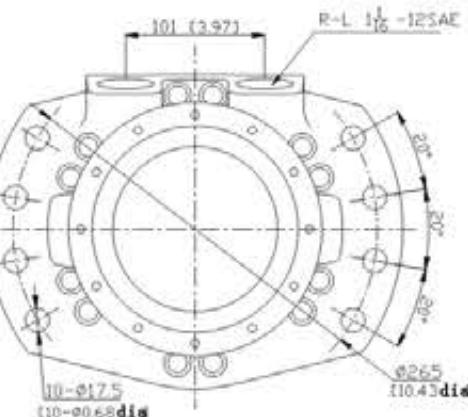
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(1210) 1-displacement motor
(1210) 标准单排量马达尺寸

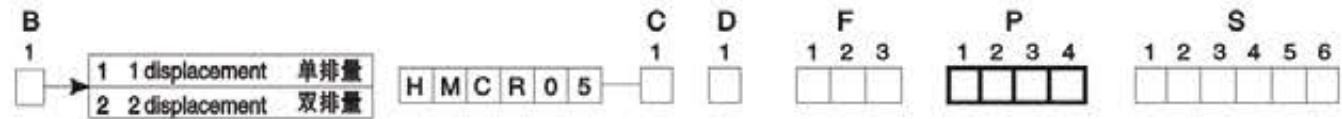


Dimensions for standard(1210) 2-displacement motor
(1210) 标准双排量马达尺寸





SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 2 1 0	φ 95.7	φ 140	φ 180	145.5	φ 182	φ 18	10 × M14×1.5	11.5
1 2 3 4	[3.76dia.]	[5.51dia.]	[7.08dia.]	[5.72]	[7.16 dia.]	[0.71dia.]		[0.45]
P								



STUDS 螺栓

	Screws	P mm [in]	Cmin mm [in]	Cmax mm [in]	D mm [in]	Class 等级	Torque (1) Nm [lb.ft]	Torque(2) Nm [lb.ft]
Various Studs 各式螺栓	M14×1.5	45 [1.77]	5 [0.20]	18 [0.71]		12.9	200 [147.5]	250 [184.4]
	M14×1.5	50 [1.97]		23 [0.91]				
	M14×1.5	62 [2.44]		33 [1.30]			420 [309.8]	550 [405.7]
	M18×1.5	65 [2.56]		28 [1.10]				
Screws 螺纹	M12×1.75	1/2"-20 UNF		23 [0.91]		10.9	120 [88.5]	120 [88.5]

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭距

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭距 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭距(Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM],code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭距

Service life of bearings 使用寿命

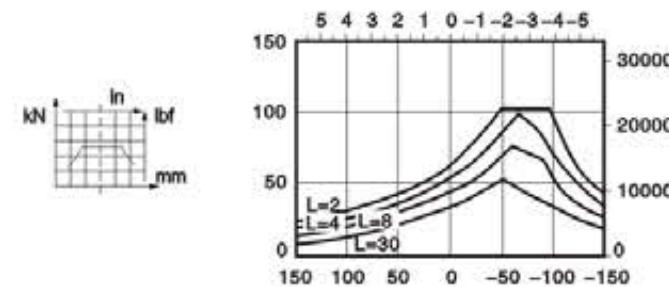
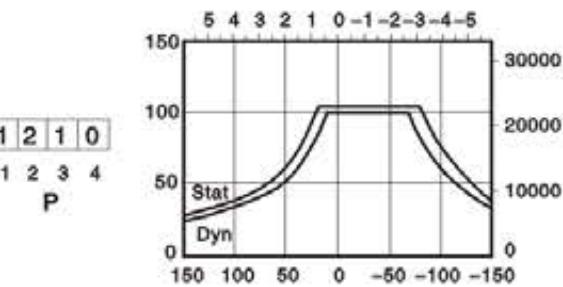
Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement,

without axial load

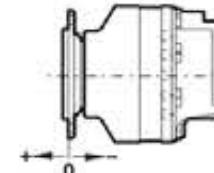
0组排量无轴向力，粘度为25cst，平均压力为150bar，

工作寿命为B10 100万次



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

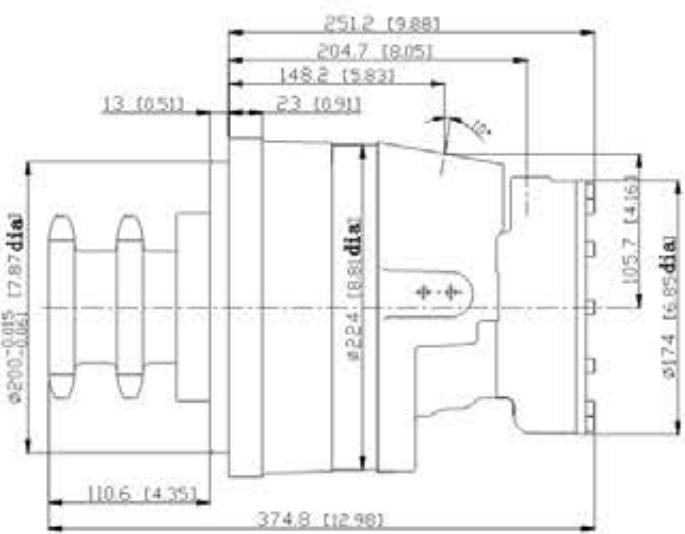
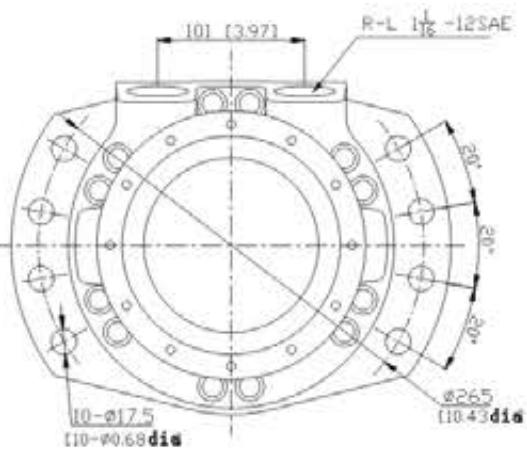
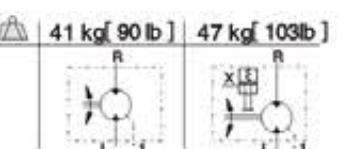
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



SHAFT MOTOR 轴式马达

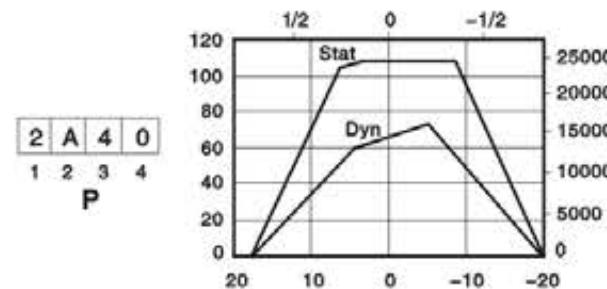
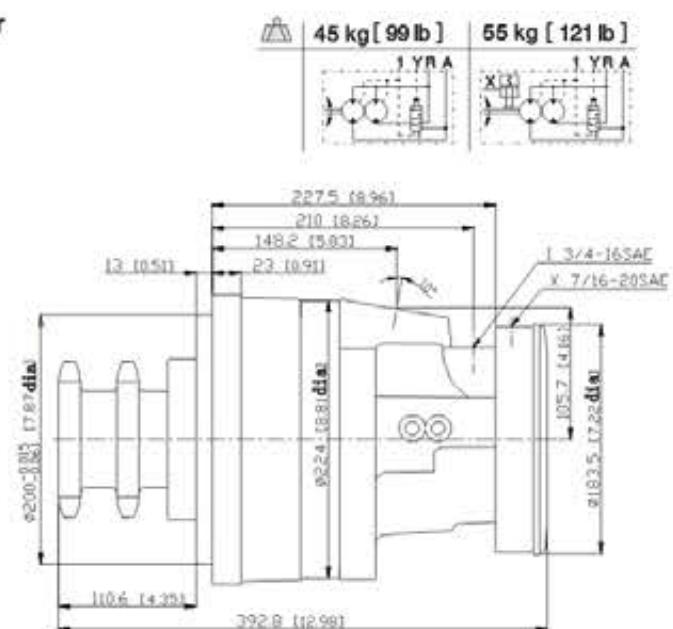
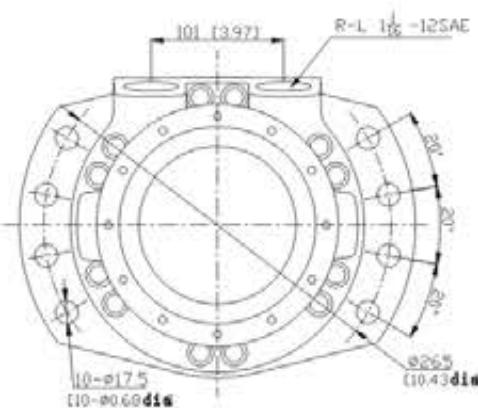
The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A40) 标准单排量马达尺寸





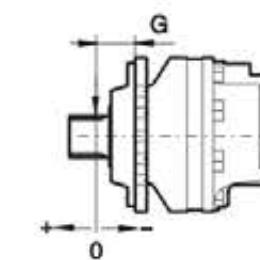
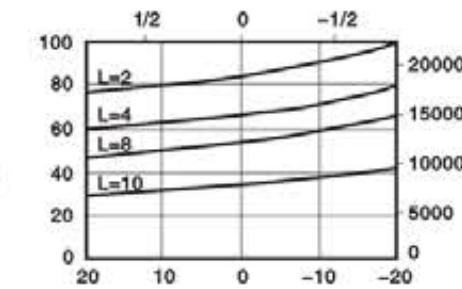
Dimensions for standard(2A50) 2-displacement motor
(2A40) 标准双排量马达尺寸



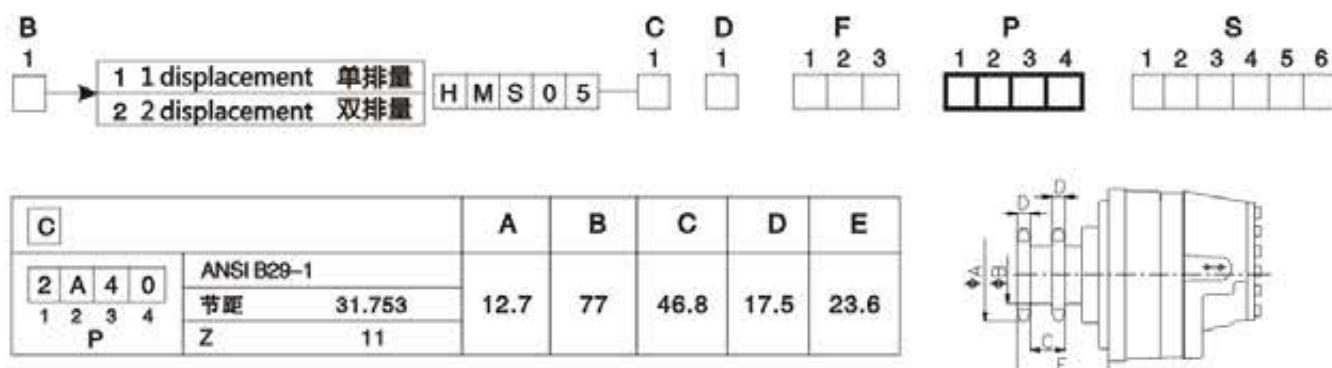
C G
2 A 4 0 81.75 [3.22]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

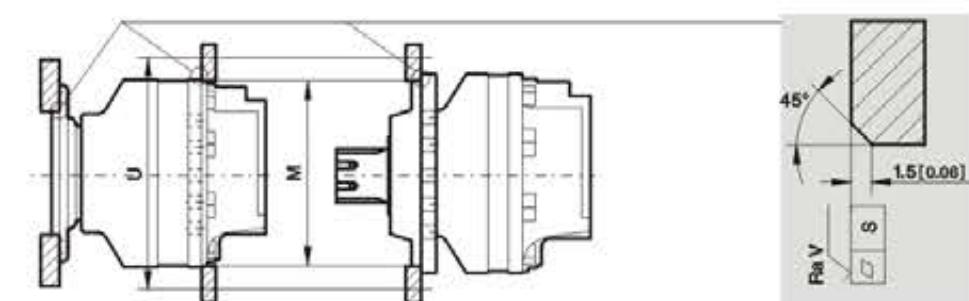
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



SUPPORT TYPES 前盖类型



CHASSIS MOUNTING 支架安装



安装时注意清洁 Take care over the immediate environment of the connections

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM]

without axial load at max.torque

0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次

	Ø M(1)	Ø U	S	Ra V	Studs 螺栓	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	216 [8.50]	267 [10.51]	0.2 [0.006]	12.5 μm [0.49 μin]	10	8.8	210N.m [155 lb.ft]
	224 [8.82]	265 [10.43]			M16x2 2x4 M16x2 2x4 M16x2		
SHAFT MOTOR 轴式马达	200 [7.87]	265 [10.43]			10 M16x2 2x4 M16x2		

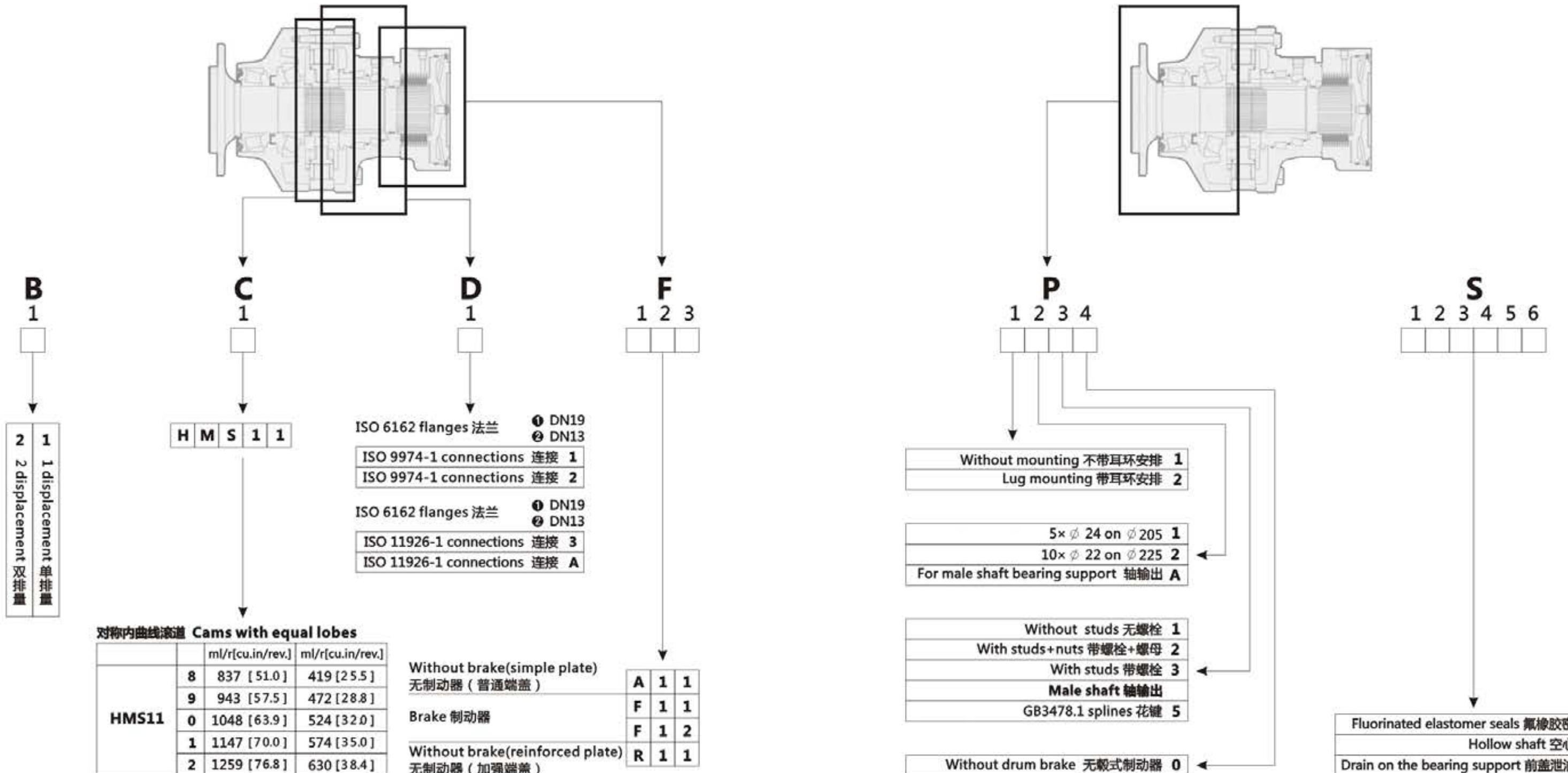
(1) +0.3 [+0.012]

(1) +0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

MOTOR NUMBER 马达编号



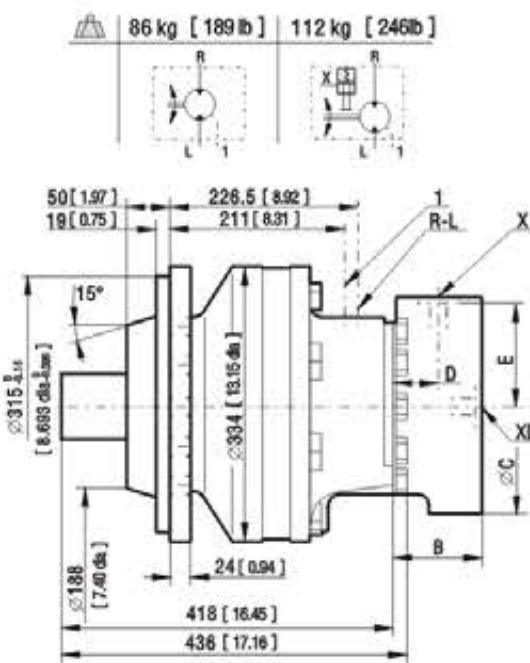
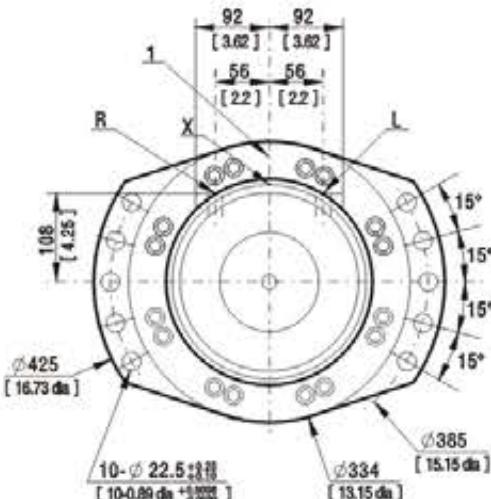


SHAFT MOTOR 轴式马达

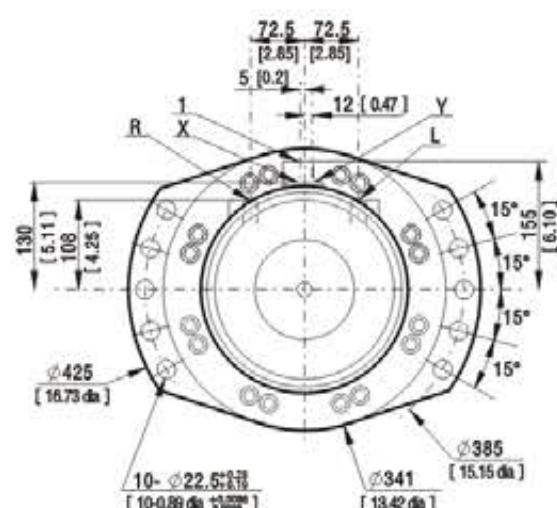
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸

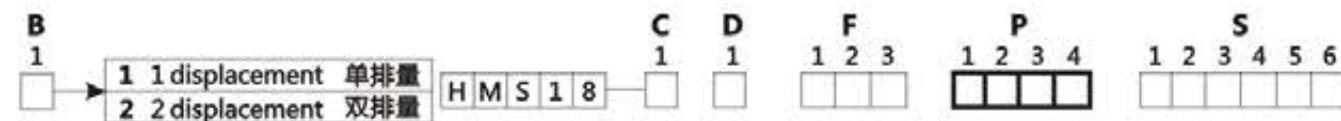


Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸

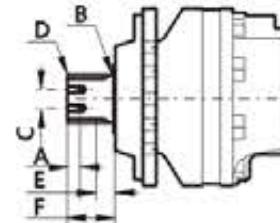


C	B	C	D	E
F11	108 [4.25]	Φ 247 [9.72dia.]	62.5 [2.46]	128 [5.04]
F19	140 [5.51]	Φ 250 [9.84dia.]	82 [3.22]	185 [7.28]
F42	157 [6.18]	Φ 375 [14.76dia.]	82 [3.22]	183.5 [7.22]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
2 A 5 0 1 2 3 4 P Z 28	GB 3478.1-83 spline 花键 Module 模数 3	23 [0.91]	R3 [0.12]	35 [1.38]	2xM14	23 [0.91] 90 [3.54]



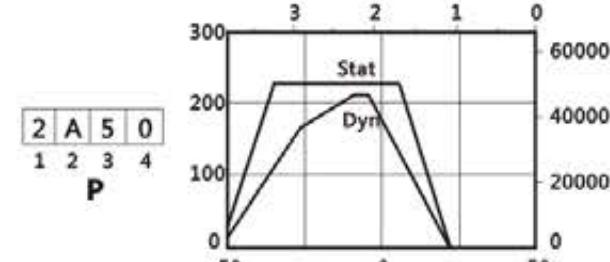
LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]
静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM]
without axial load at max.torque
0组排量，无轴向力最大扭矩



C	G
2 A 5 0	106.5 [4.19]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

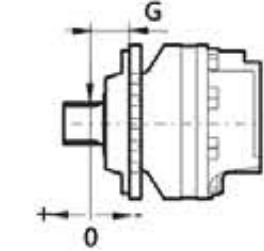
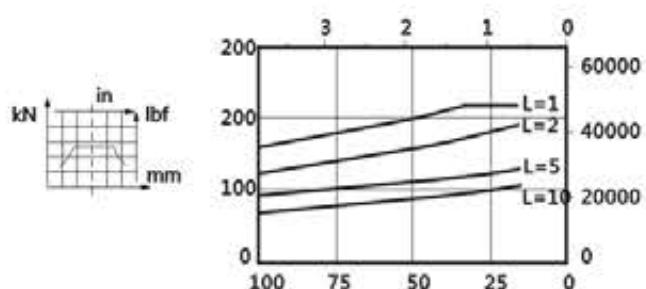
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。

Service life of bearings 使用寿命

Test conditions 检测条件

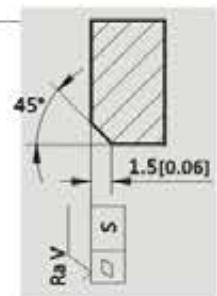
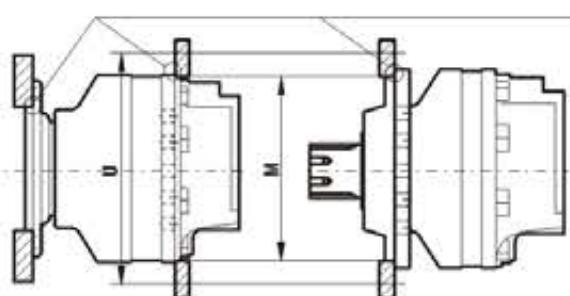
L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次





CHASSIS MOUNTING 支架安装



安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Studs 螺栓	Class 等级	Torque 扭距 *
WHEEL MOTOR 轮式马达	330 [12.99]	385 [15.16]	0.2	12.5µm [0.008]	2×9 M20×2.5	8.8	410N.m [302 lb.ft]
SHAFT MOTOR 轴式马达	380 [14.96]	440 [17.32]			2×8 M20×2.5		

(1) +0.3 [+0.012]
+0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

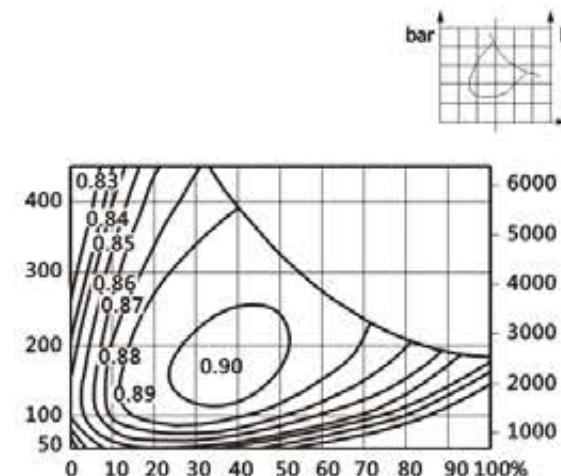
* : 指传动时扭距及负载的最小值

EFFICIENCY 效率

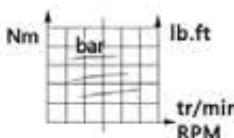
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

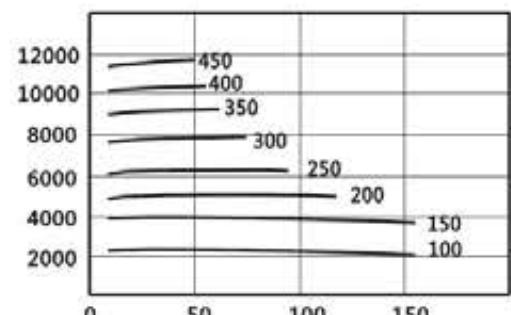
下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭距

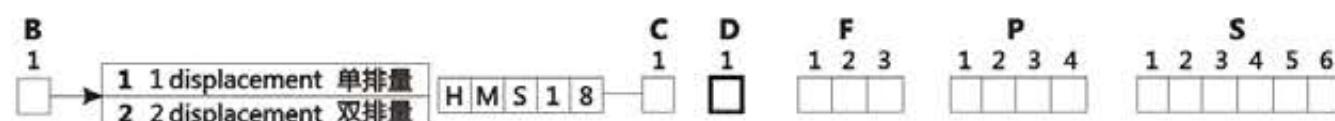


HMS18



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HYDRAULIC CONNECTIONS CONNECTIONS 连接



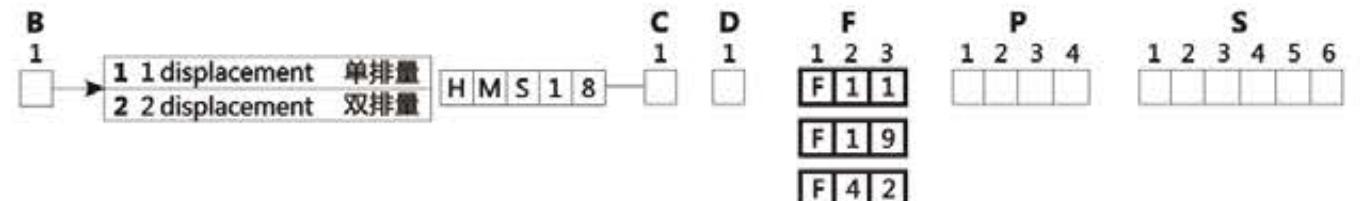
Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ514	ISO11926-1 S18	1 1/16"-12UNF	3/4"-16UNF	7/8"-14UNF 3/4"-16UNF	
1 ISO6162 DIN3852	ISO6162 S18 ISO9974-1 S35 2C	DN19 PN400 DN25 PN400	M16×1.5 M18×1.5	M22×1.5	M18×1.5
4 NFE48050	ISO9974-1 S18	M27×2	M16×1.5 M22×1.5	M22×1.5	M18×1.5
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]

The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。



BRAKES 制动器

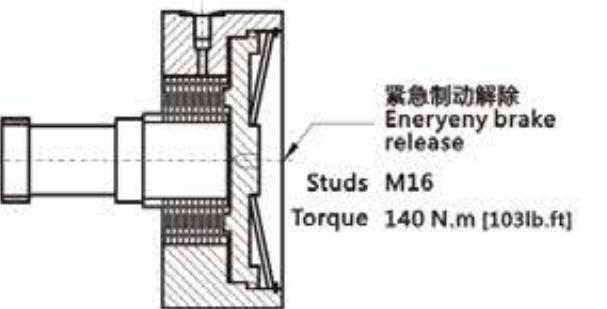


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 1 1	F 1 9	F 4 2
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭矩(新制动器)	7320Nm [5400 lb.ft]	18600Nm [13720 lb.ft]	25000Nm [18400 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭矩(最多使用10次紧急制动)	4760 Nm [3510 lb.ft]	12800 Nm [9440 lb.ft]	16250Nm [11990 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常制动扭矩	5490Nm [4050 lb.ft]	13940Nm [10280 lb.ft]	18750Nm [13830 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity 油量	170cm³ [10.4 cu.in]	180cm³ [11.0 cu.in]	400cm³ [24.4 cu.in]
Volume for brake release 制动开启量	40cm³ [2.4 cu.in]	70cm³ [4.3 cu.in]	135cm³ [8.2 cu.in]

* After emergency brake has been used
* 指经过紧急制动后参数

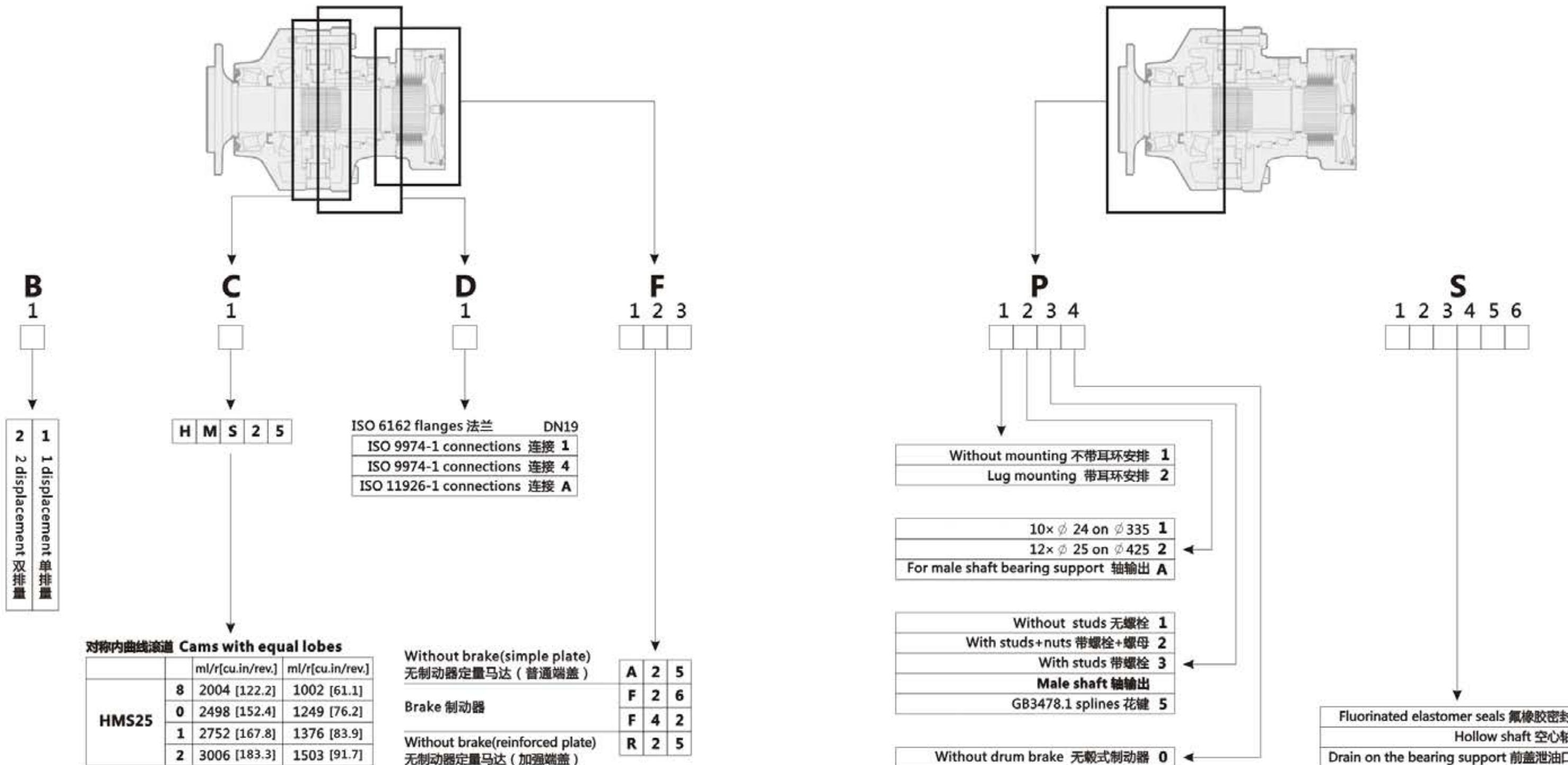
Do not run in multidisc brakes
马达运转前必须先行开启制动器

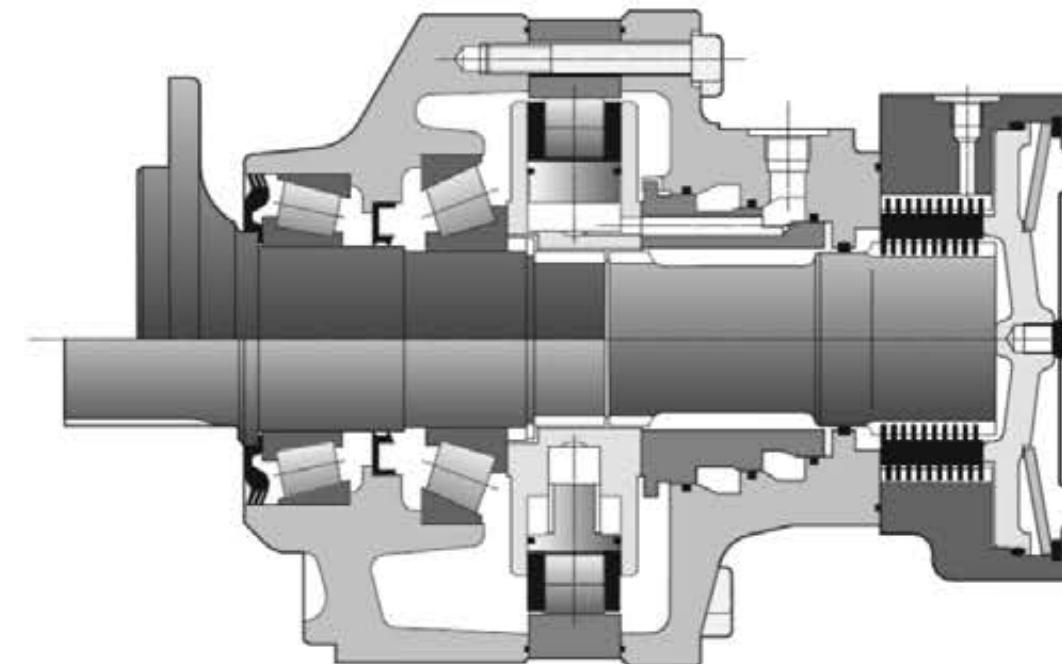
A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动(或者紧急制动)使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/h小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

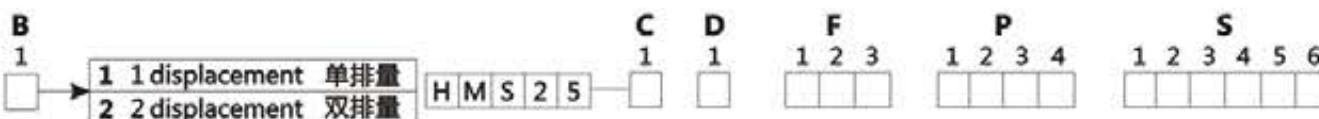




马达惯量 = 0.4 kg.m
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS25 液压马达技术参数

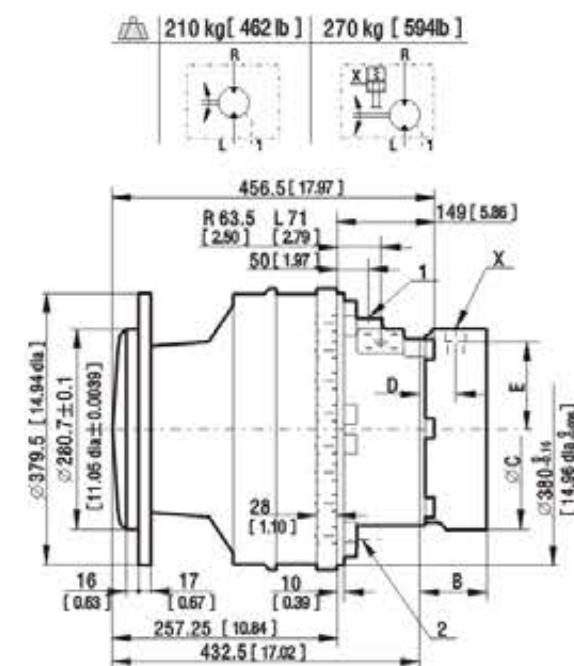
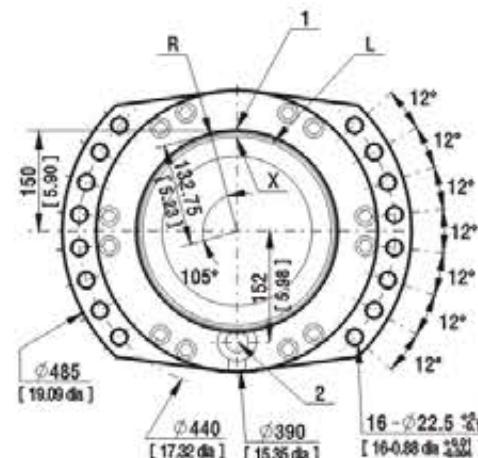
排量分组 Displacement group	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	2004	1002			2498	1249	2752	1376	3006	1503
最大功率 Max Power (kw)	80	53			80	53	80	53	80	53
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	1995	1468			3733	1829	1829	2015	4493	2201
额定扭矩 Rated torque (N.m)	7488				9334		10283		11232	
额定压力 Rated pressure (MPa)	25				25		25		25	
最高压力 Max Pressure (MPa)	40				40		35		35	
额定转速 Rated speed (r/min)	50				50		45		45	
转速范围 Speed range (r/min)	0-130				0-130		0-120		0-110	



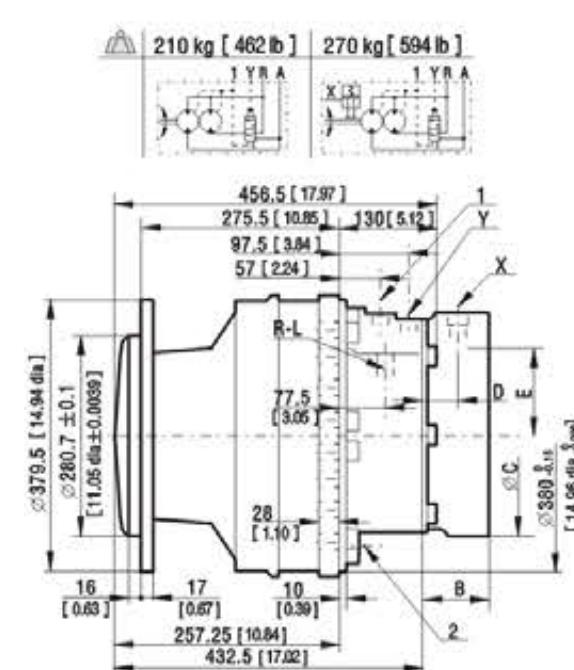
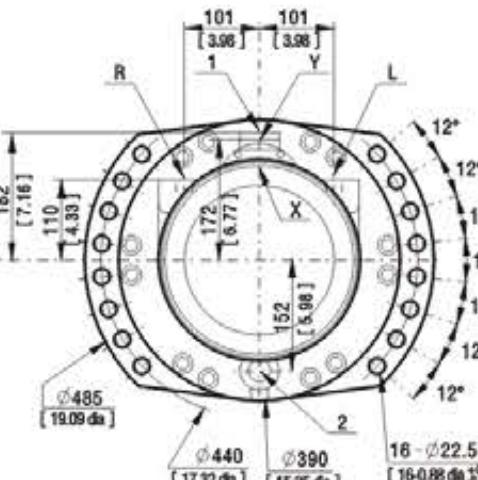
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制（括号内英制）

Dimensions for standard(1110) 1-displacement motor (1110) 标准单排量马达尺寸



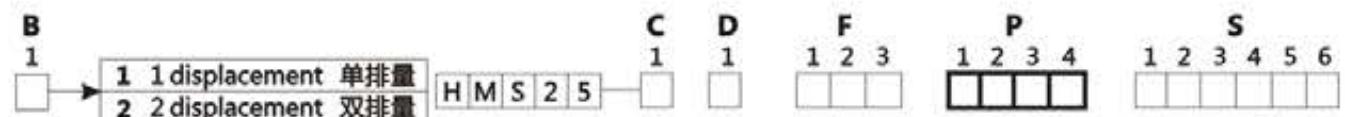
Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸



C	B	C	D	E
F26-F42	157 [6.18]	Ø375 [14.76 dia.]	82 [3.22]	183.5 [7.22]



SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 1 2 3 4 P	φ 280.7 [11.05 dia.]	φ 335 [13.19dia.]	φ 379 [14.92dia.]	275.5 [10.85]	φ 390 [15.35dia.]	φ 24 [0.94 dia.]	10×M22×1.5	17 [0.6]
1 2 1 0 1 2 3 4 P	φ 370 [14.57dia.]	φ 425 [16.73dia.]	φ 472 [18.58dia.]	333.45 [13.13]	φ 390 [15.35 dia.]	φ 26 [1.02 dia.]	12×M24×12	24 [0.94]



STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭矩(1) Nm [ib.ft]	Torque(2) 扭矩(2) Nm [ib.ft]
Various Studs 各式螺栓	M22×1.5	80 [3.15]	5 [0.20]	36 [1.42]	26 [1.02]		12.9	695 [512.6]	1050 [774.4]
	M24×2	95 [3.74]		38 [1.50]	30 [1.18]			910 [671.2]	1050 [848.2]
Screws 螺纹	M20						12.9	600 [442.5]	770 [567.9]

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭矩

(1)Wheel rim:suggested tightening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭矩 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested tightening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭矩 (Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

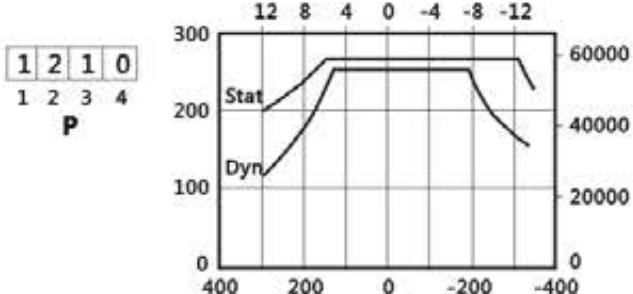
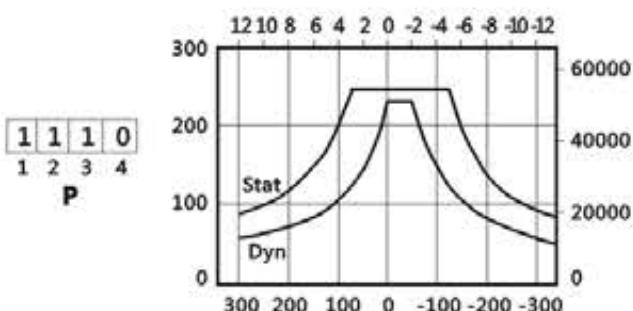
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

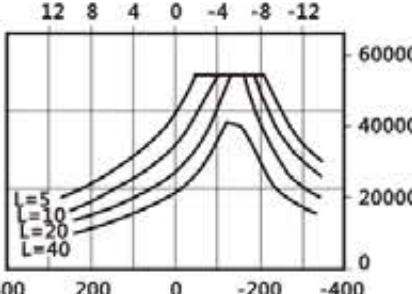
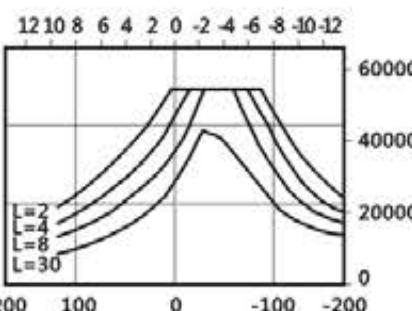
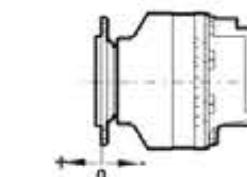
Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,

without axial load at max.torque
0组排量，无轴向力最大扭矩



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



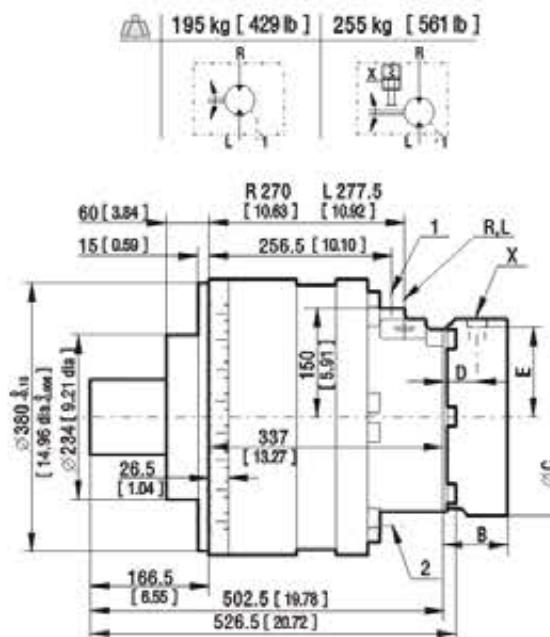
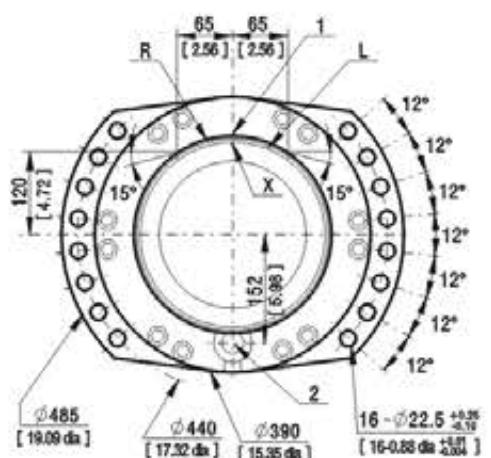


SHAFT MOTOR 轴式马达

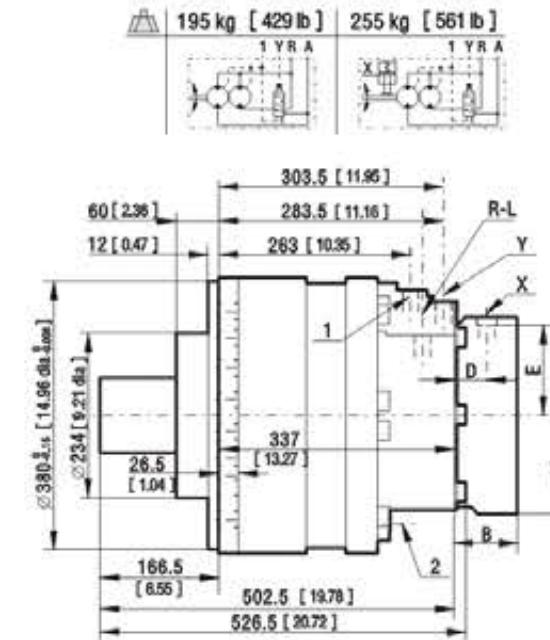
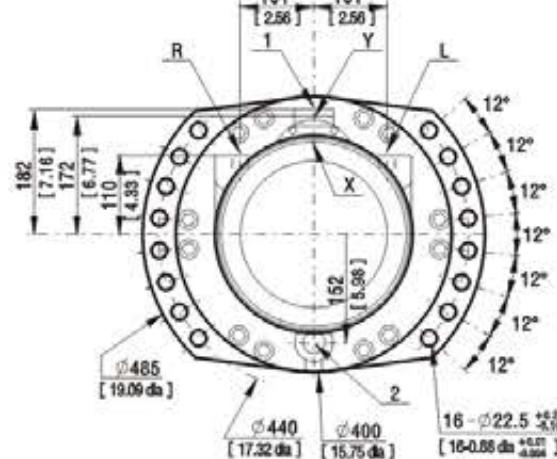
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸

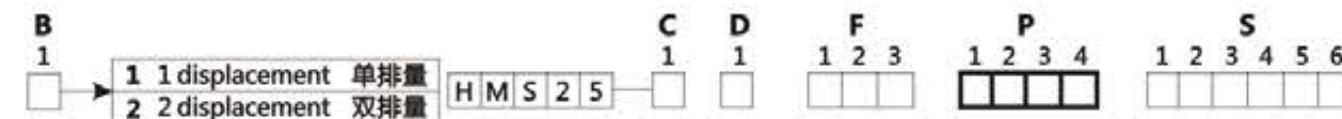


Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸

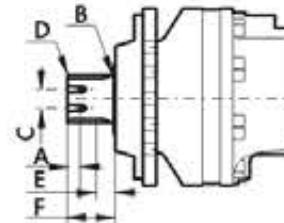


C	B	C	D	E
F26-F42	157 [6.18]	ø375 [14.76 dia.]	82 [3.22]	183.5 [7.22]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
2 A 5 0 1 2 3 4 P Z 32	GB 3478.1 spline 花键 Module 模数 3	23 R4 35 2xM14	[0.91] [R0.16] [1.38]	25 [0.98]	105 [4.13]	



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

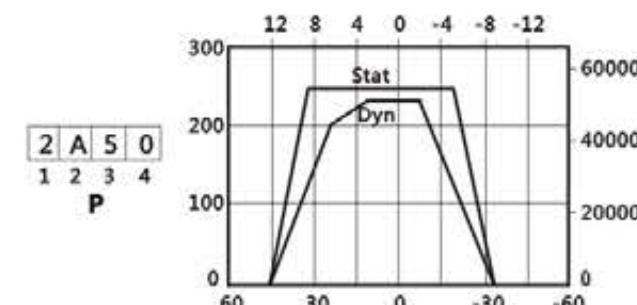
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,
without axial load at max.torque

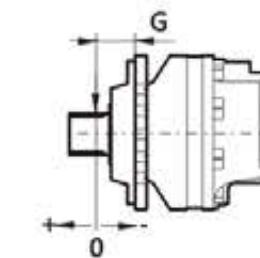
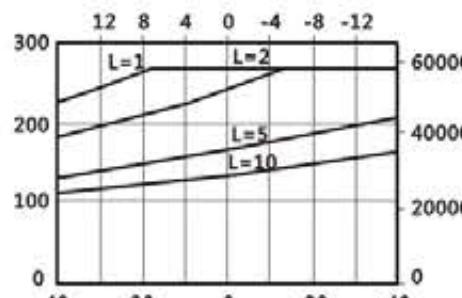
0组排量，无轴向力最大扭矩



C	G
2 A 5 0	125 [4.92]

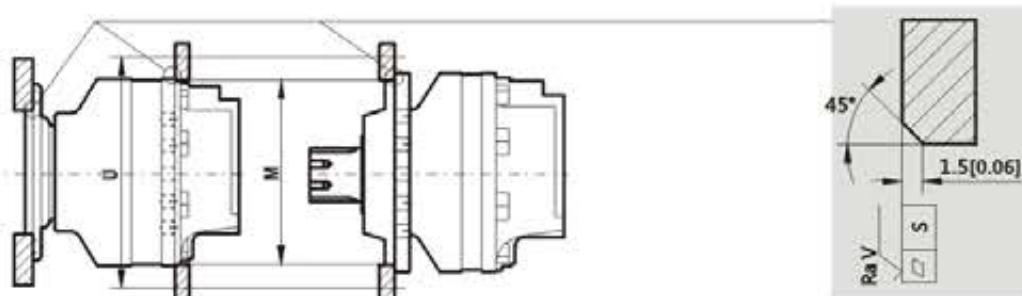
The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。





CHASSIS MOUNTING 支架安装



⚠ 安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	380 [14.96]	440 [17.32]	0.2 [0.008]	12.5µm [0.49µin]	2×8 Ø 22.5 M20×2.5	8.8	410N.m [302 lb.ft]
SHAFT MOTOR 轴式马达							

(1) +0.3 [+0.012]
+0.2 [+0.008]

* : Min. Values for torque and load to be transmitted

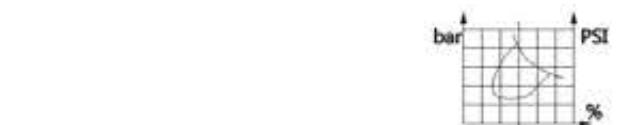
* : 指传动时扭距及负载的最小值

EFFICIENCY 效率

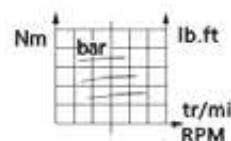
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

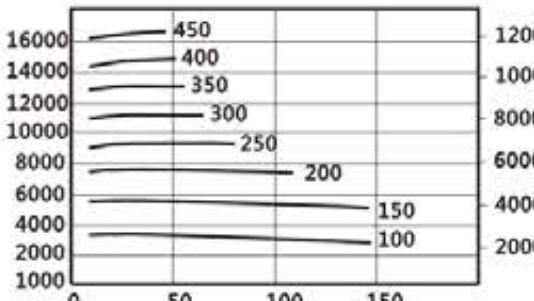
下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭距



HMS25

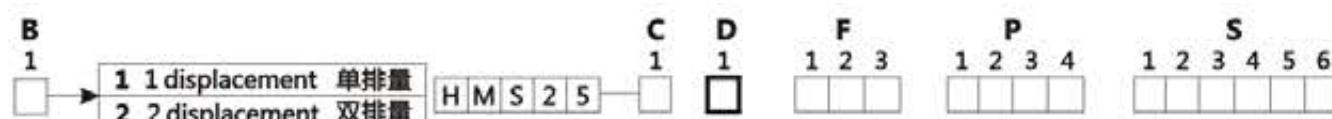


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⚠ The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

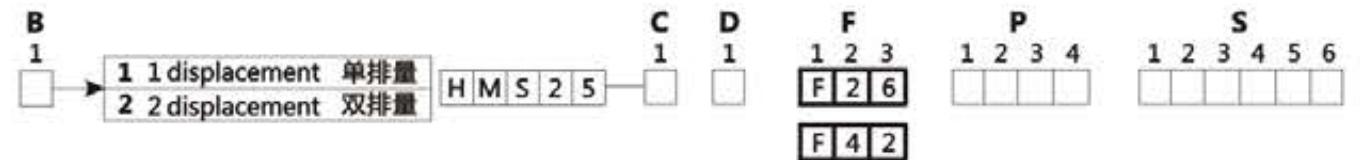
HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ511	ISO11926-2	1 1/16"-12UNF	3/4"-16UNF	7/8"-14UNF	3/4"-16UNF
1 ISO6162 DIN3852	ISO6162 ISO9974-1 ① ②	DN32 PN400 DN25 PN400	M18×1.5	M22×1.5	M18×1.5
Max Pressures	MS Bar [PSI]	400 [5800]	30 [440]	1 [10]	30 [440]



BRAKES 制动器

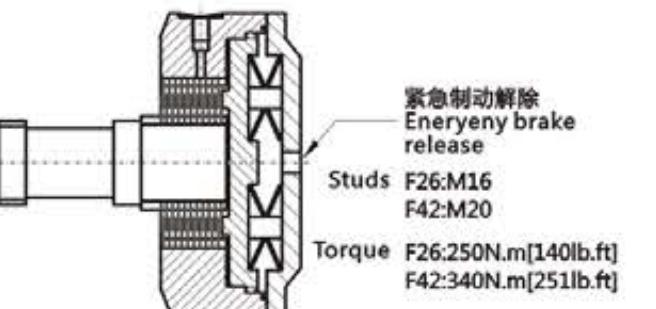


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 2 6	F 4 2
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	26730Nm [19720 lb.ft]	25000Nm [18400 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	17375Nm [12820 lb.ft]	16250Nm [11990 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	20048Nm [14790 lb.ft]	18750Nm [13830 lb.ft]
Min.brake release pressure 最小自动开启压力	10 bar [138 PSI]	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity 油量	200cm³ [12.2 cu.in]	400cm³ [24.4 cu.in]
Volume for brake release 制动开启量	120cm³ [7.3 cu.in]	135cm³ [8.2 cu.in]

* After emergency brake has been used

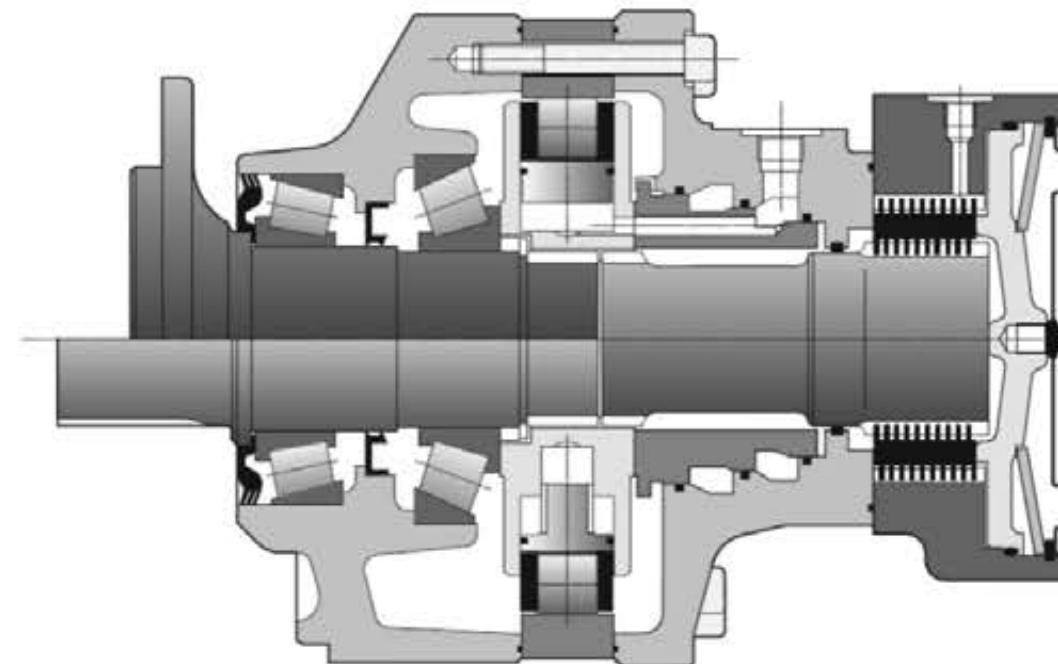
* 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.

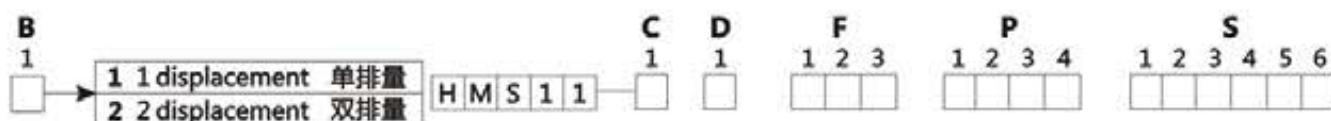
每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。



马达惯量 = 0.05 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS11 液压马达技术参数

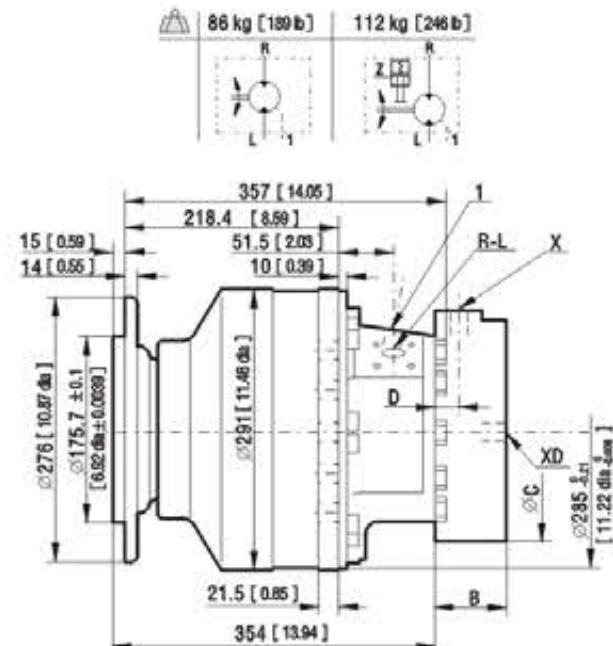
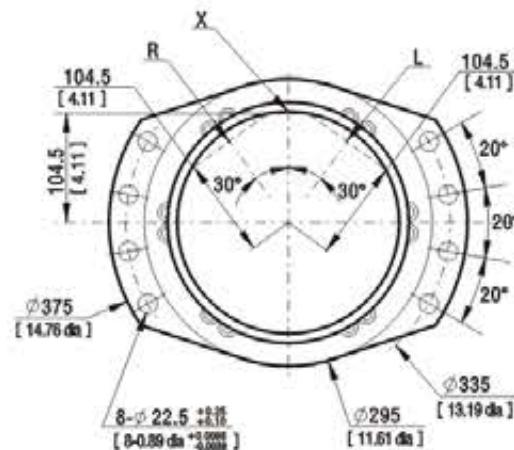
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	837	418	943	471	1048	524	1147	573	1259	629
最大功率 Max Power (kw)	44	29	44	29	44	29	44	29	44	29
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	1251	613	1409	391	1566	768	1714	840	1882	922
额定扭矩 Rated torque (N.m)	3127		3524		3916		4286		4704	
额定压力 Rated pressure (MPa)	25		25		25		25		25	
最高压力 Max Pressure (MPa)	40		40		40		35		35	
额定转速 Rated speed (r/min)	65		65		65		60		60	
转速范围 Speed range (r/min)	0-160		0-160		0-160		0-150		0-150	



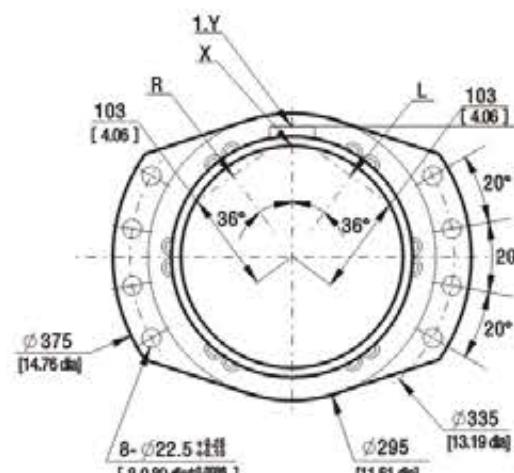
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

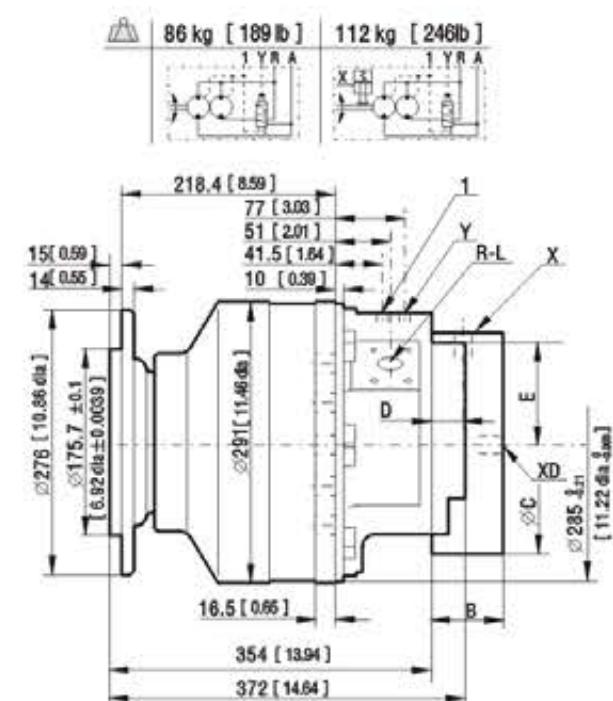
Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸



Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸

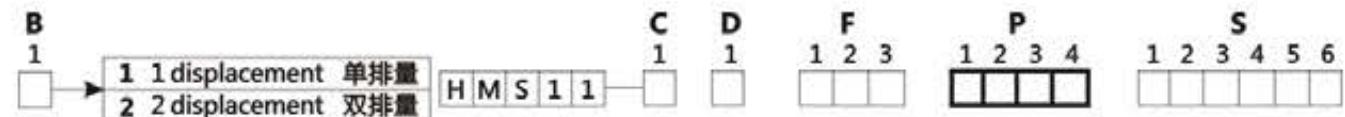


C	B	C	D
F11-F12	108 [4.25]	Φ 247 [9.72dia.]	62.5 [2.46]





SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 P	Ø175.7 [6.92dia.]	Ø225 [8.86dia.]	Ø276 [10.87dia.]	218.6 [8.61]	Ø291 [11.46dia.]	Ø24 [0.94 dia.]	5×M22×1.5	14 [0.55]
1 2 1 0 P	Ø175.7 [6.92dia.]	Ø225 [8.86dia.]	Ø276 [10.87dia.]	218.6 [8.61]	Ø291 [11.46 dia.]	Ø22 [0.87 dia.]	5×M20×1.5	14 [0.55]
1 2 3 4 P								



STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭矩(1) Nm [ib.ft]	Torque(2) 扭矩(2) Nm [ib.ft]
Various Studs 各式螺栓	M18×1.5	55 [2.17]	5 [0.20]	17 [0.67]	23 [0.91]		12.9	420 [309.8]	550 [405.7]
	M20×1.5	60 [2.36]		14 [0.55]	25 [0.98]			600 [442.5]	770 [567.9]
	M22×1.5	65 [2.56]		25 [0.94]	26 [1.02]			695 [512.6]	1050 [774.4]
Screws 螺纹	M12				120 [88.5]			120 [88.5]	

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭矩

(1)Wheel rim:suggested tightening torque for wheel rim mountings (Re steel disc>240N/mm² [$>34800\text{ PSI}$])

(1)轮辋：建议轮辋式安装的预紧扭矩 (Re steel disc>240N/mm² [$>34800\text{ PSI}$])

(2)Standard:suggested tightening torque in other cases (Re steel flange>360N/mm² [$>52215\text{ PSI}$])

(2)标准：建议在其它情况安装时预紧扭矩 (Re steel flange>360N/mm² [$>52215\text{ PSI}$])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

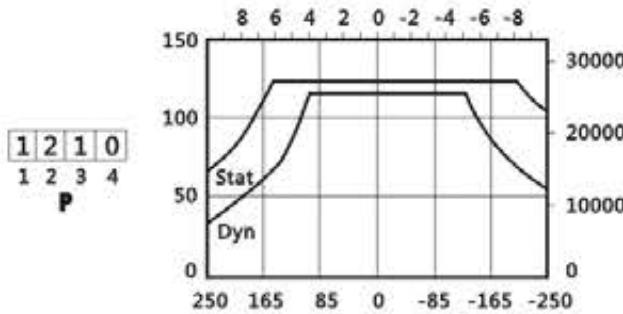
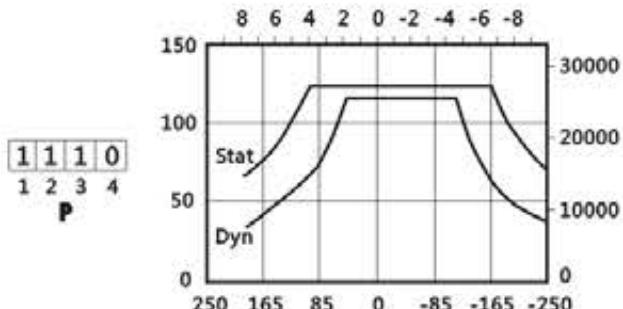
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

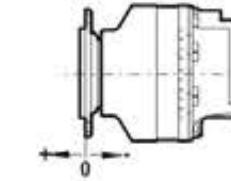
Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,

without axial load at max.torque
0组排量，无轴向力最大扭距



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



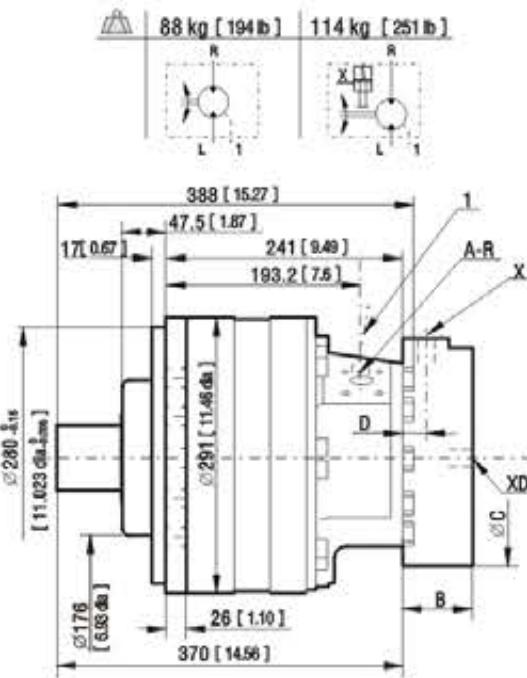
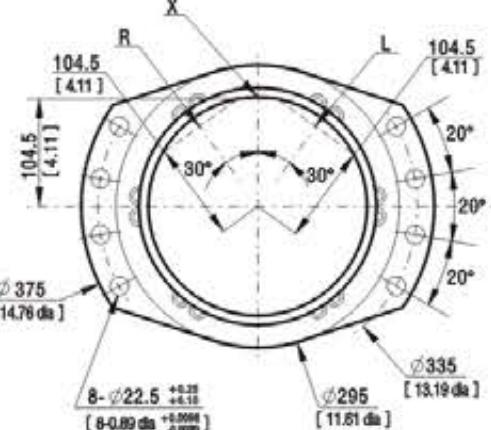


SHAFT MOTOR 轴式马达

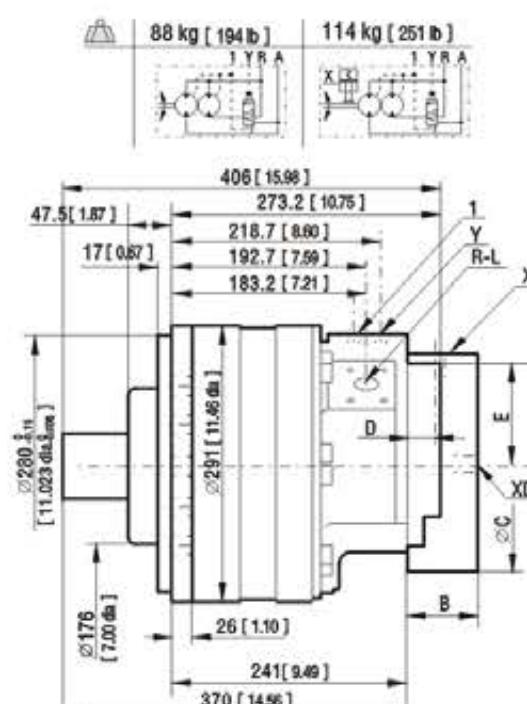
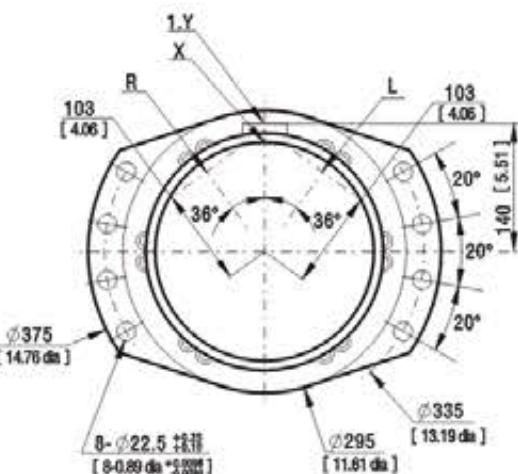
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸

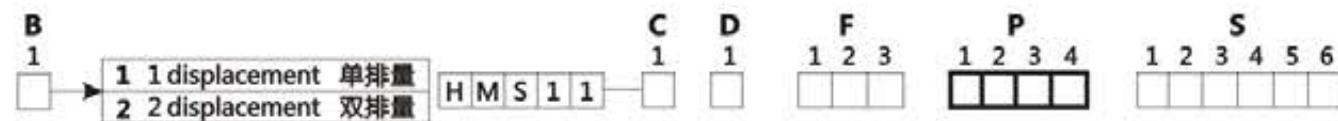


Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸

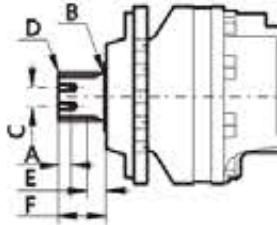


C	B	C	D
F11-F12	108 [4.25]	Φ247 [9.72dia.]	62.5 [2.46]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
2 A 5 0 1 2 3 4 P Z	GB 3478.1 spline 花键 Module 模数 3 25	15 [0.59]	R2.75 [0.11]	35 [1.38]	2xM10 23 [0.91]	80 [3.15]



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

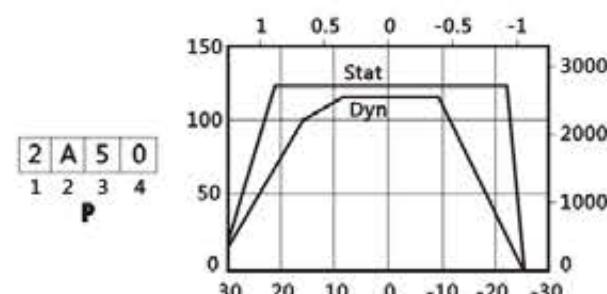
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,
without axial load at max.torque

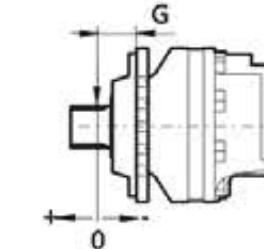
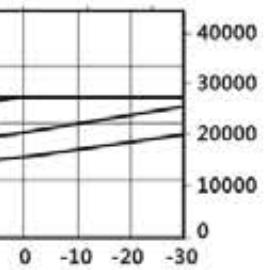
0组排量, 无轴向力最大扭矩



C G
2 A 5 0 101.25 [3.99]

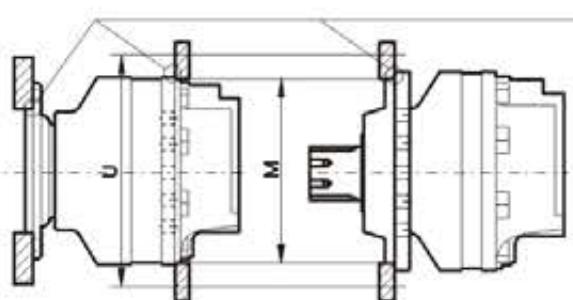
The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。





CHASSIS MOUNTING 支架安装



⚠ 安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	285 [11.22]	335 [13.19]	0.2	12.5µm [0.49µin]	2×4 4×M20	8.8	410N.m [302lb.ft]
SHAFT MOTOR 轴式马达	280 [11.02]	335 [13.19]	(1) +0.3 [+0.012] (1) +0.2 [+0.008]	[0.008]			

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

EFFICIENCY 效率

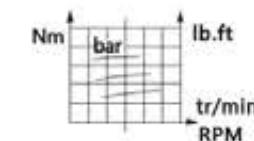
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

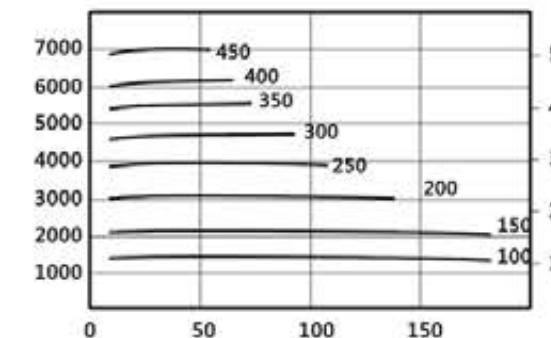
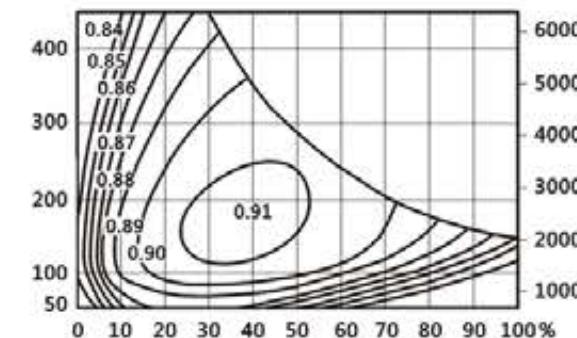
下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭矩



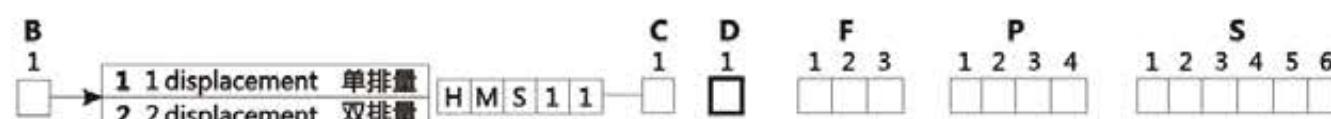
HMS11



⚠ The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。

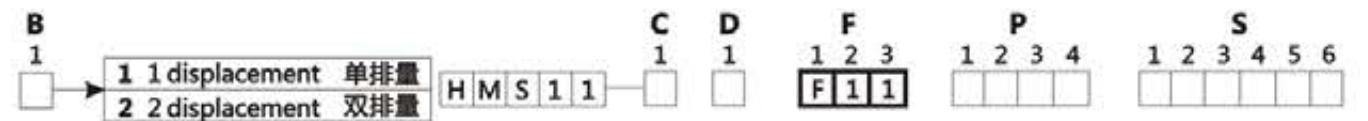
HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2 nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ514	ISO11926-1	1"1/16-12UNF	9/16"-18UNF	3/4"-16UNF	9/16"-18UNF
1 ISO6162 DIN3852	ISO6162 ISO9974-1 ① ②	DN19 PN400 DN13 PN400	M16×1.5	M18×1.5	M18×1.5
2 NF E48 050	ISO9974-1	M27×2	M16×1.5	M18×1.5	M18×1.5
3 ISO6162 SAEJ514	ISO6162 ISO11926-1 ① ②	DN19 PN400 DN13 PN400	9/16"-18UNF	3/4"-16UNF	9/16"-18UNF
Max Pressures	MS bar [PSI]	400 [5800] 350 [5075]	30 [440]	1 [10]	30 [440]



BRAKES 制动器

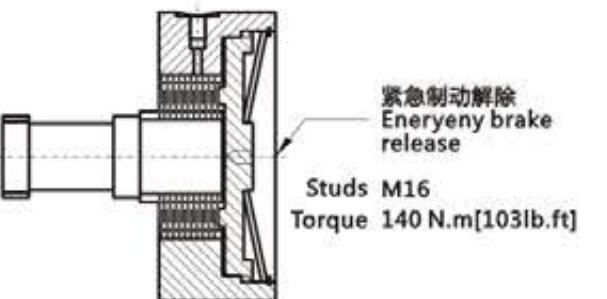


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 1 1	F 1 2
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	7320Nm [5400 lb.ft]	11840Nm [8730 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	4760 Nm [3510 lb.ft]	7695Nm [5680 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	5490Nm [1050 lb.ft]	8880Nm [6550 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity 油量	170cm ³ [10.4 cu.in]	170cm ³ [10.4 cu.in]
Volume for brake release 制动开启量	40cm ³ [2.4 cu.in]	40cm ³ [2.4 cu.in]
Max.energy dissipation 最大能耗数	123699 J	

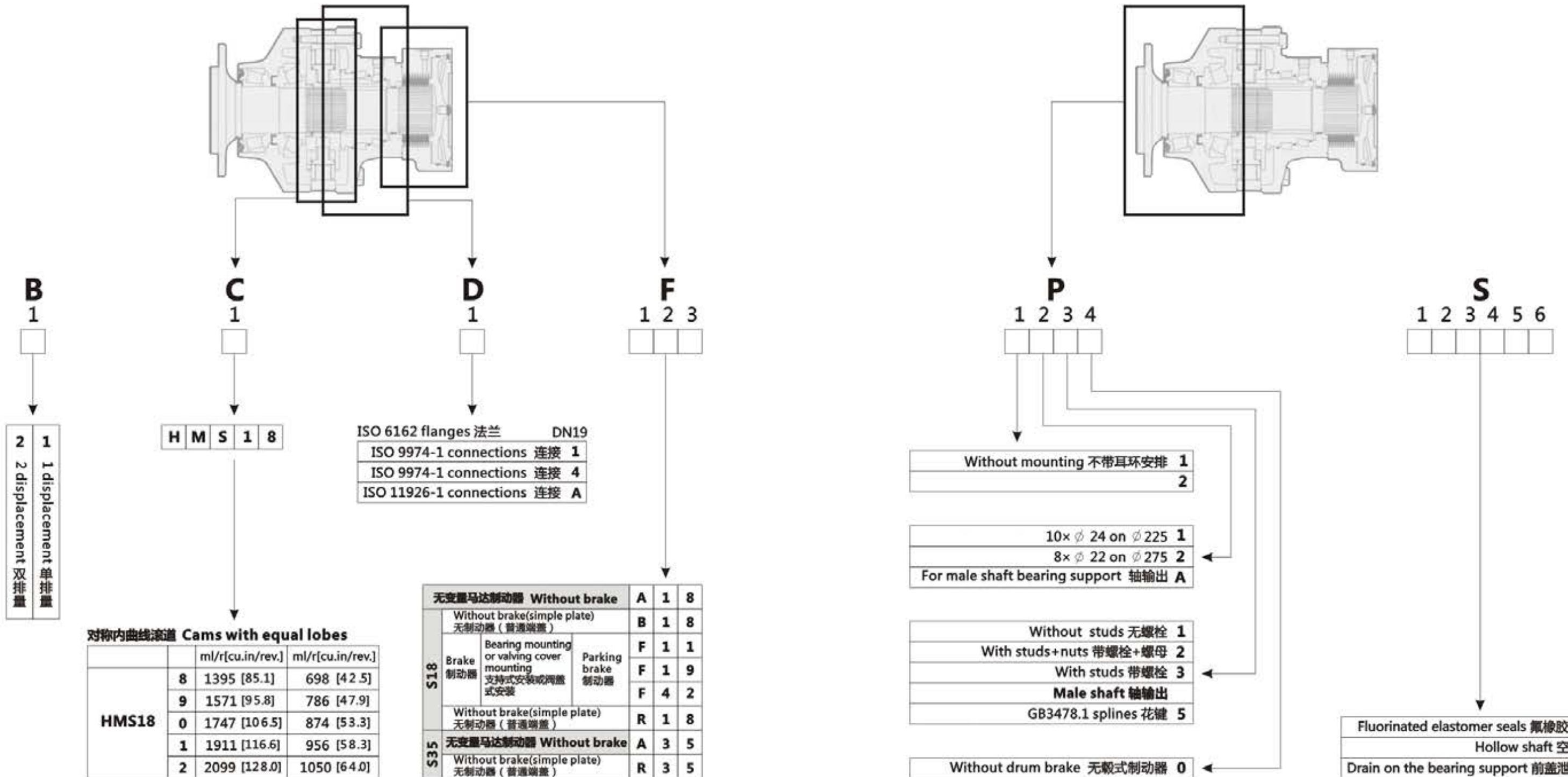
* After emergency brake has been used
* 指经过紧急制动后参数

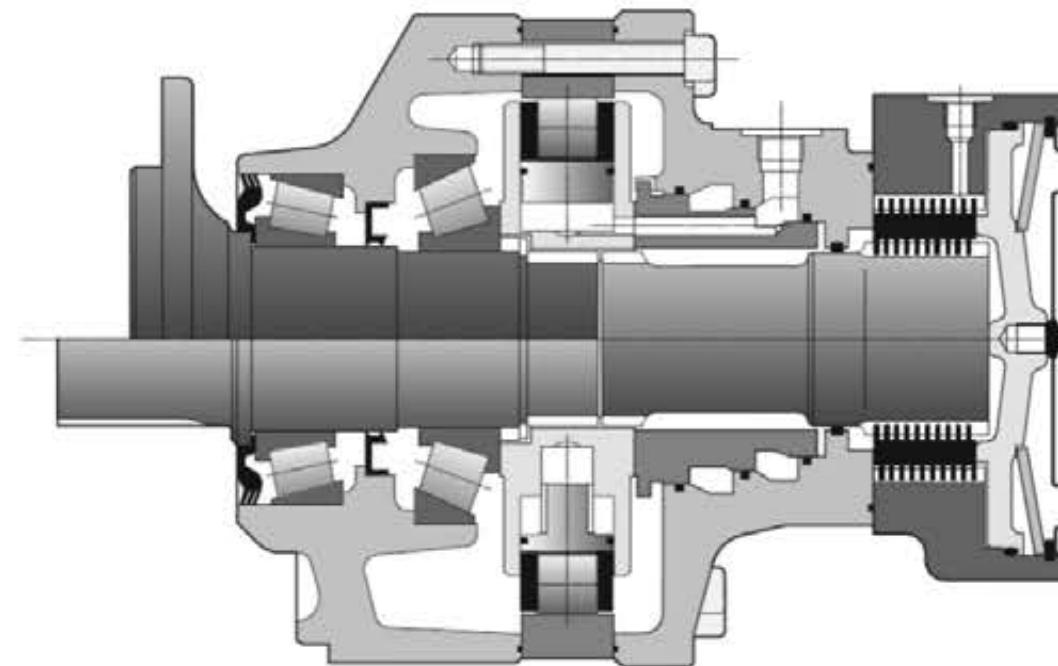
Do not run in multidisc brakes
马达运转前必须先行开启制动器

A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.
每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/h小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

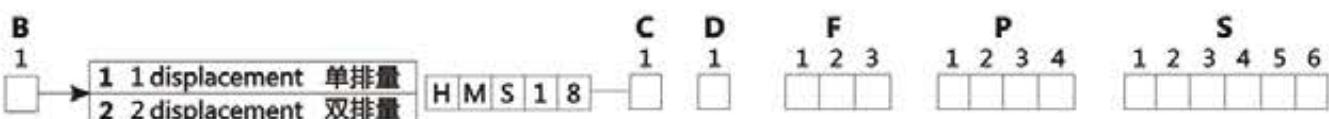




马达惯量 = 0.2 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS18 液压马达技术参数

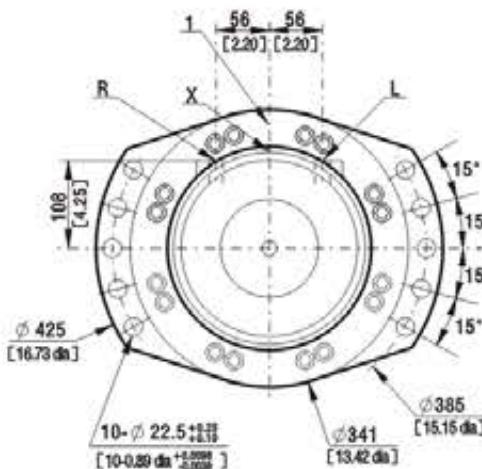
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	1395	697	1571	785	1747	873	1911	955	2099	1049
最大功率 Max Power (kw)	62	42	62	42	62	42	62	42	62	42
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	2085	1022	2348	1151	2611	1279	2856	1400	3137	1537
额定扭矩 Rated torque (N.m)	5212		5870		6528		7140		7843	
额定压力 Rated pressure (MPa)	25		25		25		25		25	
最高压力 Max Pressure (MPa)	40		40		40		35		35	
额定转速 Rated speed (r/min)	55		55		55		55		50	
转速范围 Speed range (r/min)	0-150		0-150		0-150		0-135		0-125	



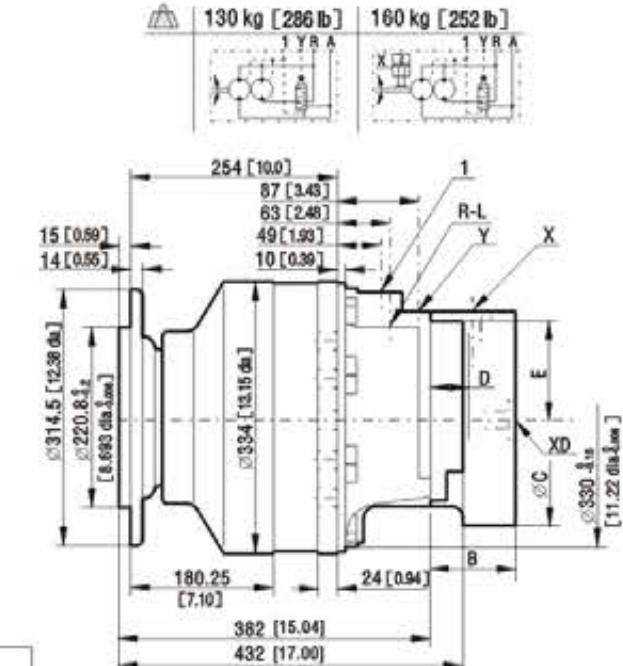
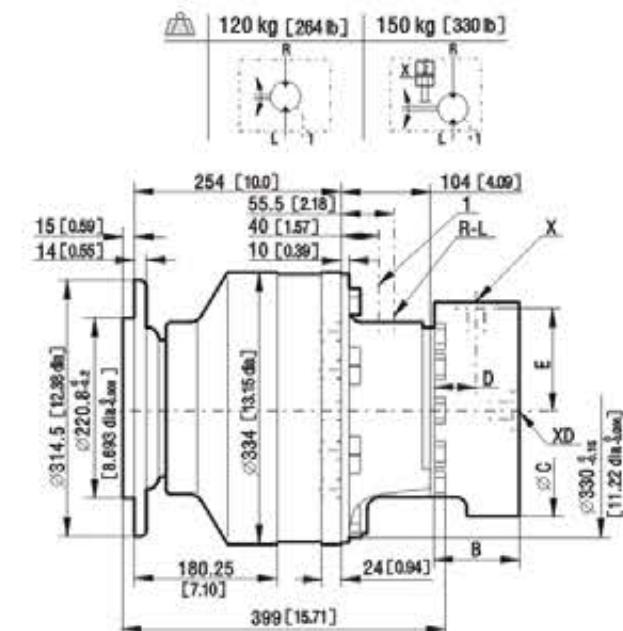
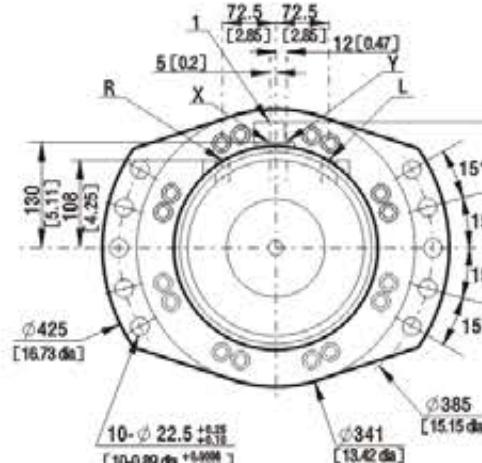
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(1110) 1-displacement motor (1110) 标准单排量马达尺寸



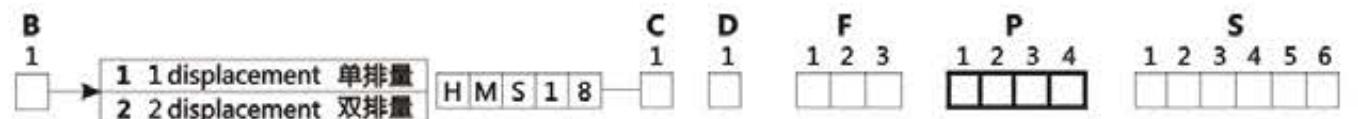
Dimensions for standard(1110) 2-displacement motor (1110) 标准双排量马达尺寸



C	B	C	D	E
F11	108 [4.25]	ø 247 [9.72dia.]	62.5 [2.46]	128 [5.04]
F19	140 [5.51]	ø 250 [9.84dia.]	82 [3.22]	185 [7.28]
F42	157 [6.18]	ø 375 [14.76dia.]	82 [3.22]	183.5 [7.22]



SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮胎安装 Wheel rim mounting	L mm
1 1 1 0 1 2 3 4 P	Ø175.7 [6.92dia.]	Ø225 [8.86dia.]	Ø265 [10.43dia.]	253.45 [9.98]	Ø334 [13.15dia.]	Ø24 [0.94 dia.]	10×M22×1.5	14 [0.55]
1 2 1 0 1 2 3 4 P	Ø220.7 [8.69dia.]	Ø275 [10.83dia.]	Ø314 [12.36dia.]	253.25 [9.97]	Ø291 [11.46 dia.]	Ø22 [0.87 dia.]	8×M20×1.5	14 [0.55]



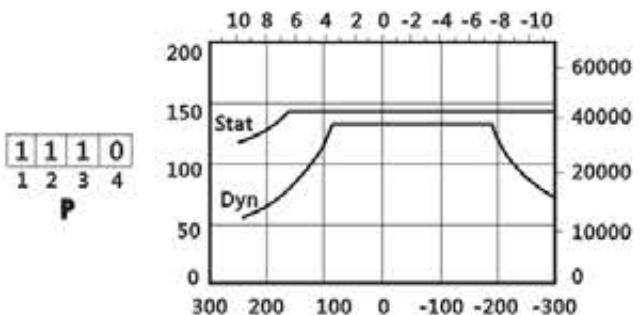
LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]
静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,
without axial load at max.torque
0组排量，无轴向力最大扭矩

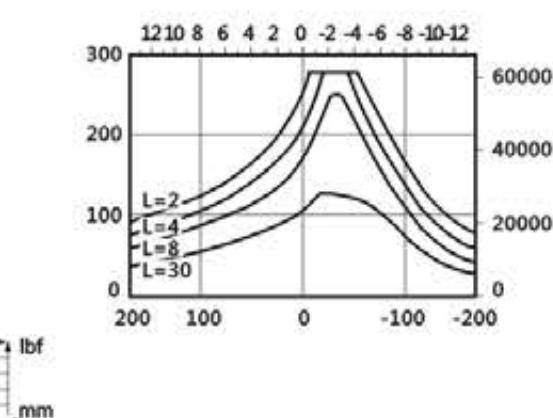


Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement,

without axial load
0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]	Class	Torque(1) Nm [ib.ft]	Torque(2) Nm [ib.ft]
Various Studs 各式螺栓	M16×2	50 [1.97]	5 [0.20]	17.75 [0.70]	21 [0.83]	12.9	300 [221.3]	380 [280.3]
	M20×1.5	60 [2.36]		20 [0.79]	25 [0.98]		600 [442.5]	770 [567.9]
	M20×1.5	70 [2.76]		27 [1.06]	25 [0.98]		695 [512.6]	1050 [774.4]
	M22×1.5	65 [2.56]		24 [0.94]	26 [1.02]			
	M22×1.5	80 [3.15]		29 [1.14]	26 [1.02]			
Screws 螺纹	M16×1.5					10.9	275 [202.8]	275 [202.8]
	M20×1.5						535 [394.6]	535 [394.6]

(*) The tightening torques are given for the indicated loads.

(*) 指上述负载的预紧扭矩

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

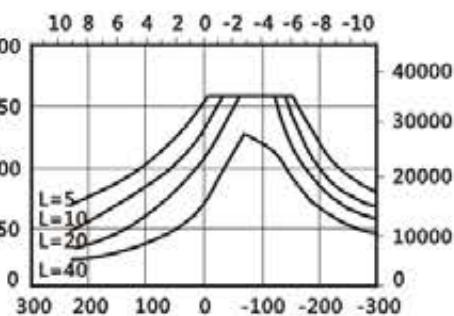
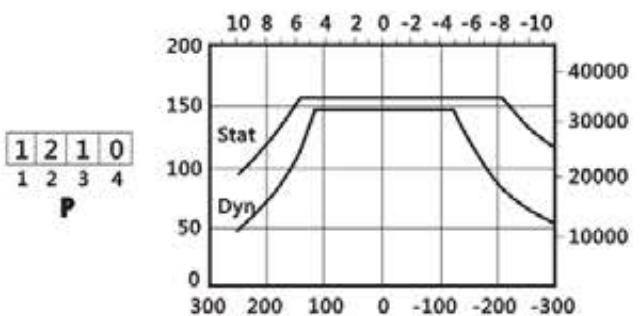
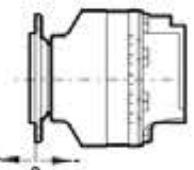
(1)轮毂：建议轮毂式安装的预紧扭距 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

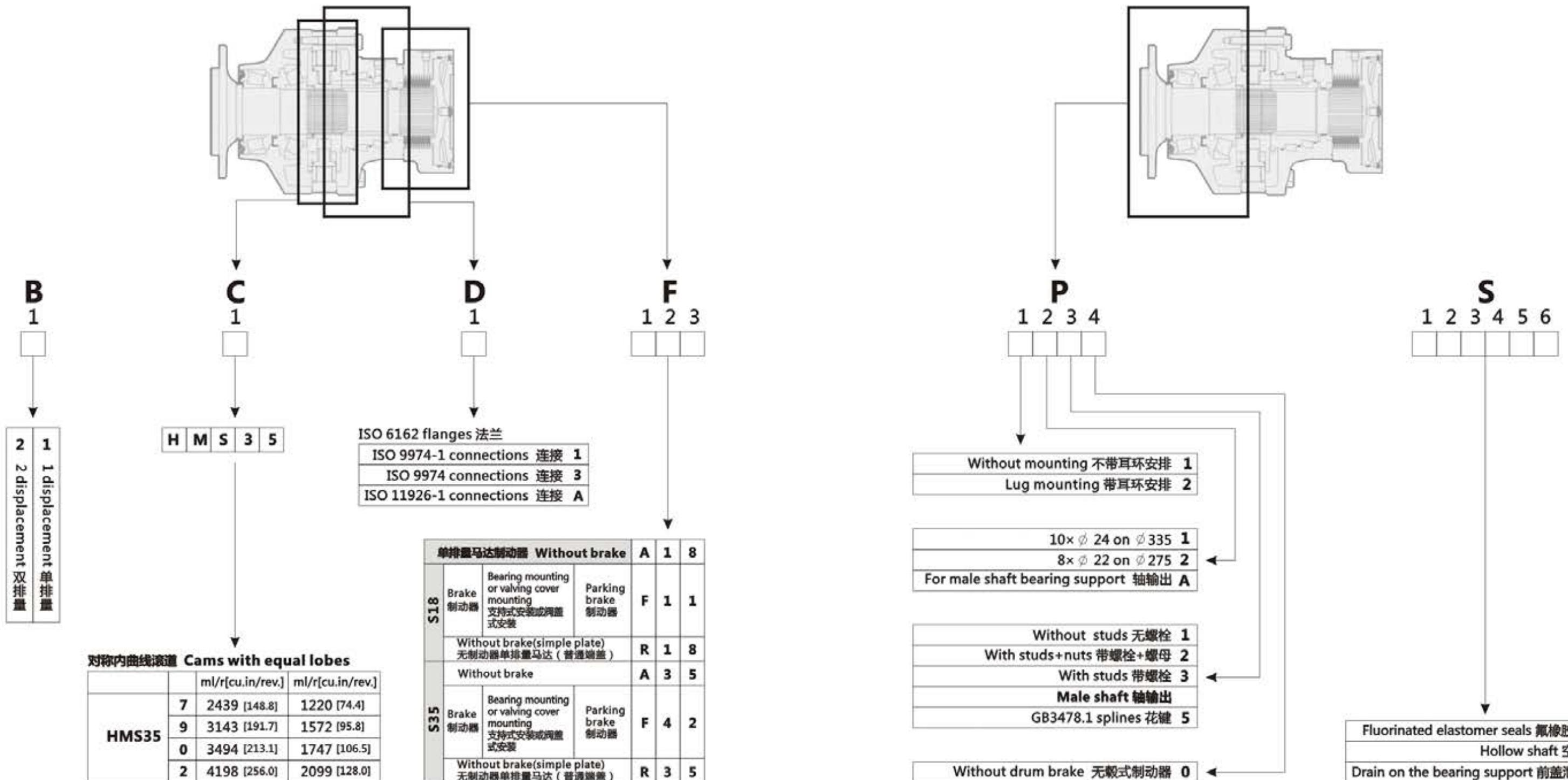
(2)标准：建议在其它情况安装时预紧扭距(Re steel flange>360N/mm² [>52215 PSI])

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



MOTOR NUMBER 马达编号





SHAFT MOTOR 轴式马达

The dimensional data is given in mm and in inches (inches are between brackets)

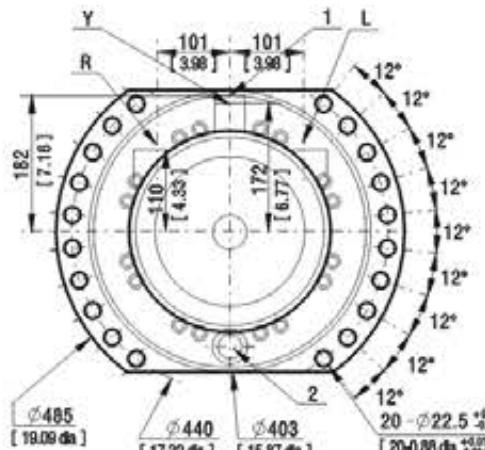
尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸



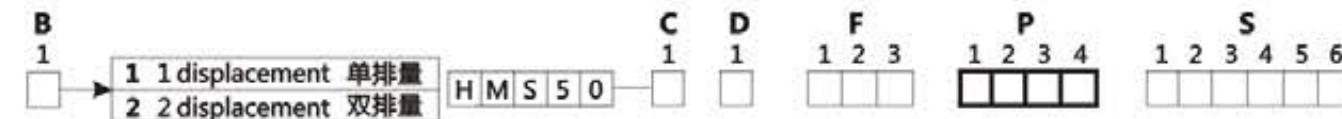
110
PAGE

Dimensions for standard(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸

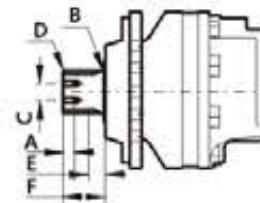


C	B	C	D	E
F42	157 [6.18]	Ø375 [14.76 dia.]	82 [3.22]	183.5 [7.22]
F50	200 [7.87]	Ø375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
2 A 5 0 1 2 3 4 P Z 24	GB3478.1 spline 花键 Module 模数 5	40 [1.57] R4 [R0.16]	60 [2.36] [2.36]	2xM16 [3.26] 32 [1.26]	136 [5.35]	



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,

动态 : 0 r/min [0 RPM] ,code 0 displacement,

without axial load at max.torque

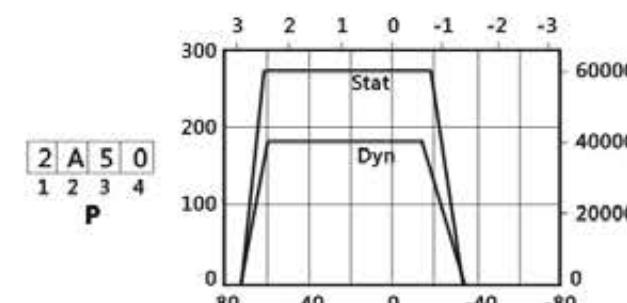
0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

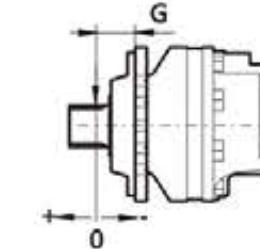
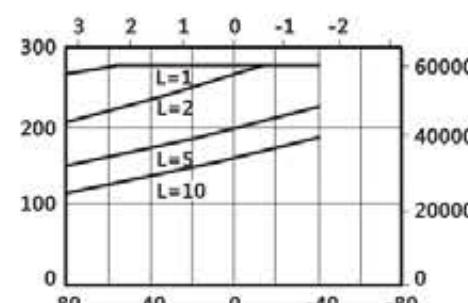
0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



C	G
2 A 5 0	144 [5.67]

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

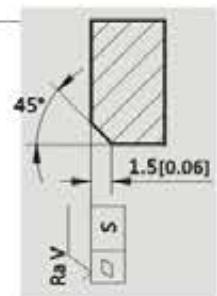
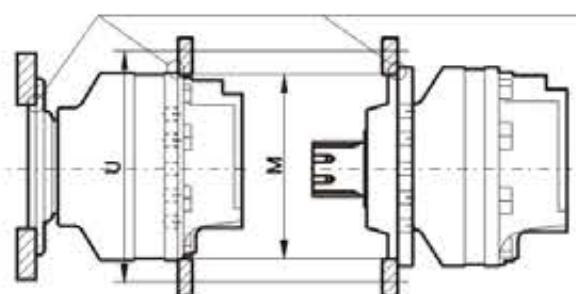
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。



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PAGE



CHASSIS MOUNTING 支架安装



⚠ 安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	380 [14.96]	440 [17.32]	0.2 [0.008]	12.5µm [0.49µin]	2×8 M20×2	8.8	410N.m [302 lb.ft]
SHAFT MOTOR 轴式马达	380 [14.96]	485 [19.09]	0.2 [0.008]	12.5µm [0.49µin]	12 M20×2	8.8	410N.m [302 lb.ft]

(1) +0.3 [+0.012]
+0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

EFFICIENCY 效率

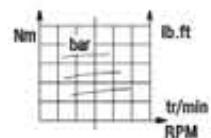
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。

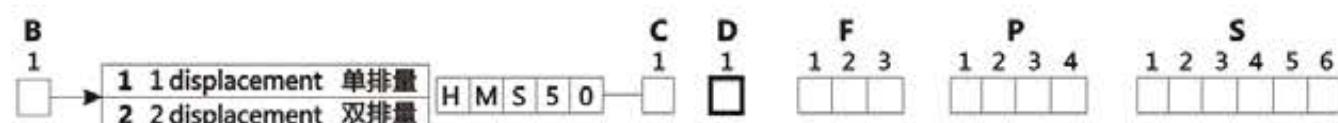


Actual output torque 实际输出扭矩



HMS50

HYDRAULIC CONNECTIONS CONNECTIONS 连接



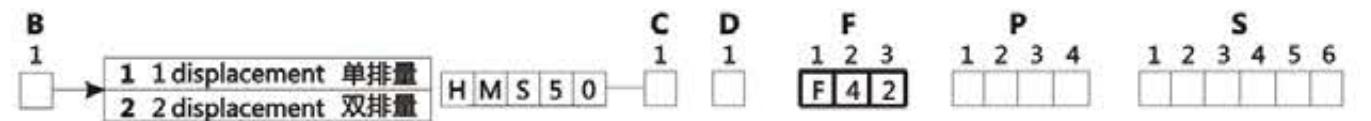
Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L A1	双排量马达控制油口 2 nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
1 ISO6162 DIN3852	ISO6162 ISO9974-1	DN25 PN400	M20×1.5 M18×1.5	M27×2 M22×1.5	M18×1.5
2 ISO6162 NFE45050	ISO6162 ISO9974-1	DN32 PN400	M18×1.5	M22×1.5	M18×1.5
Max Pressures MS bar [PSI]	400 [5800]	30 [440]	1 [10]	30 [440]	

⚠ The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。



BRAKES 制动器

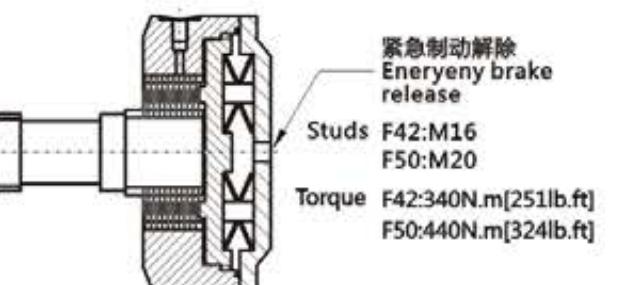


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 4 2	F 5 0
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	25000Nm [18400 lb.ft]	30000Nm [22130 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	16250Nm [11990 lb.ft]	19500Nm [14380 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	18750Nm [13830 lb.ft]	22500Nm [16600 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity 油量	400cm³ [24.4 cu.in]	450cm³ [27.5 cu.in]
Volume for brake release 制动开启量	135cm³ [8.2 cu.in]	135cm³ [8.2 cu.in]

*. After emergency brake has been used

*. 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

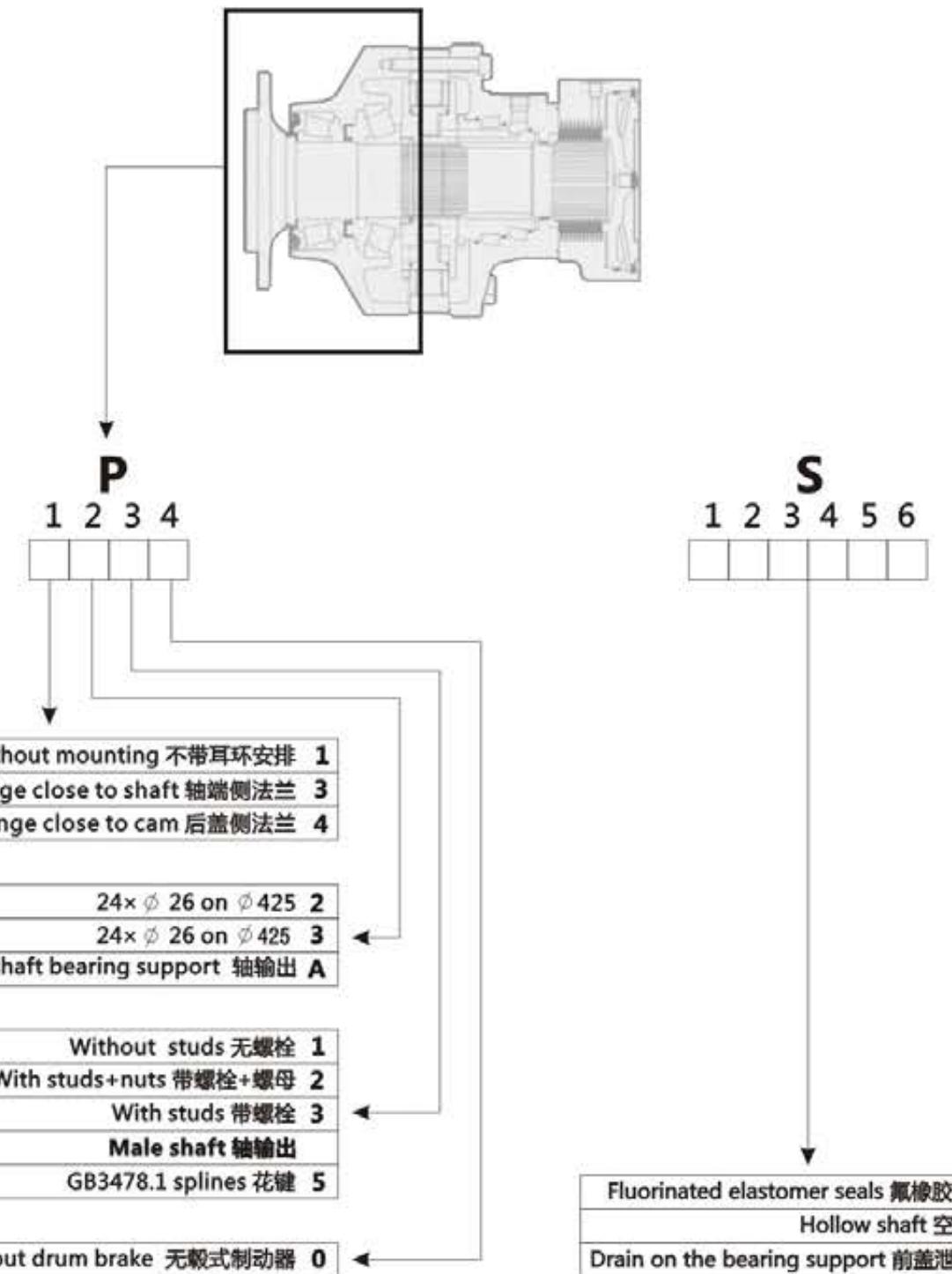
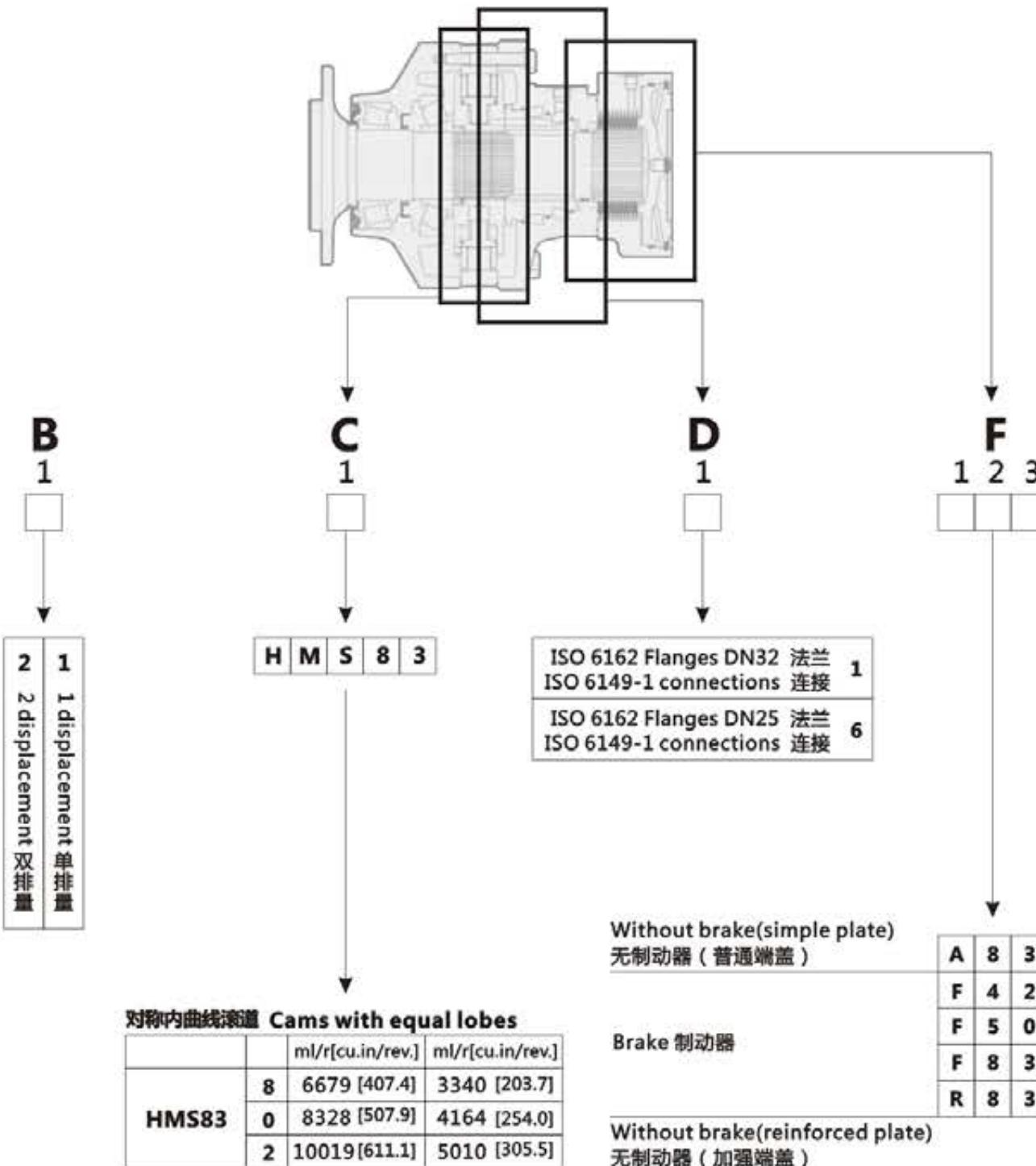
A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.

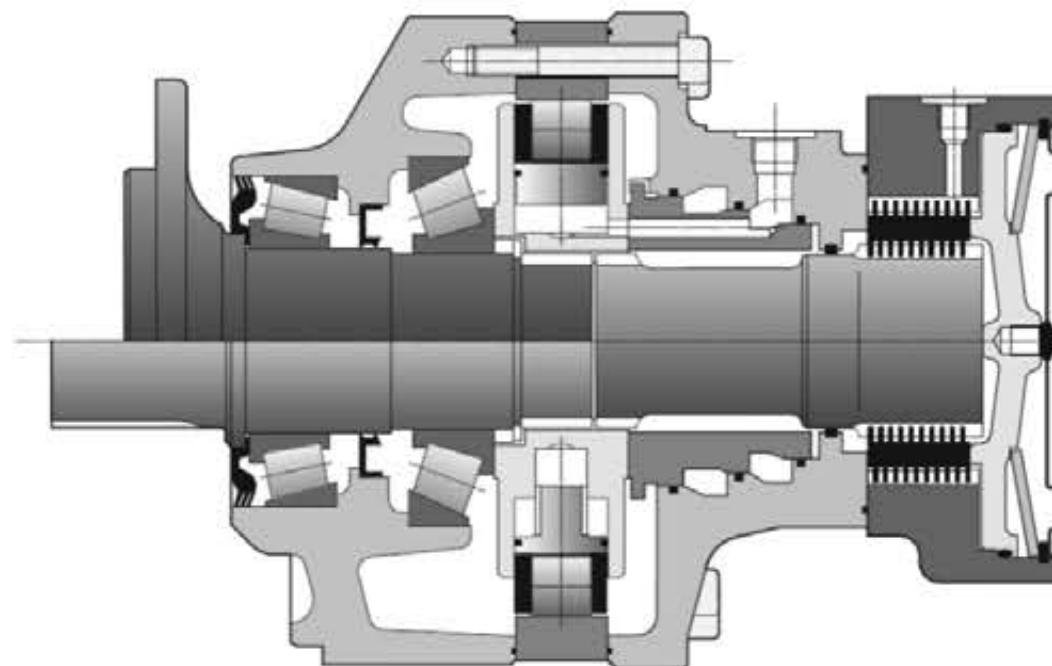
每当驻车制动器作为辅助制动(或者紧急制动)使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

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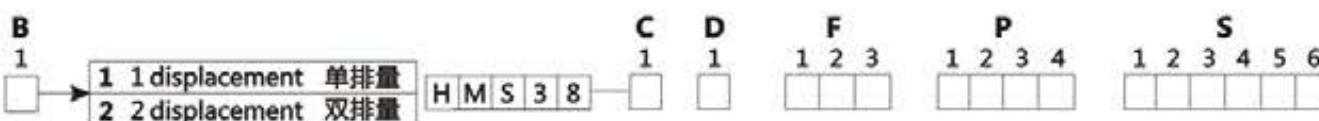
117 PAGE



马达惯量 = 1.5 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS83 液压马达技术参数

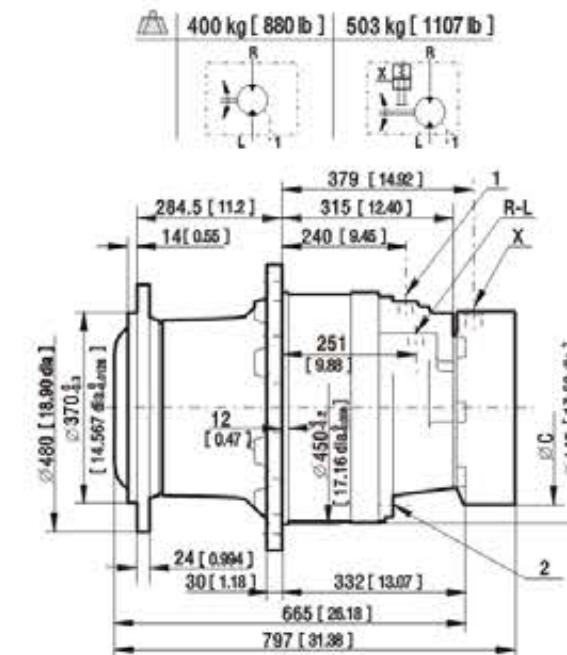
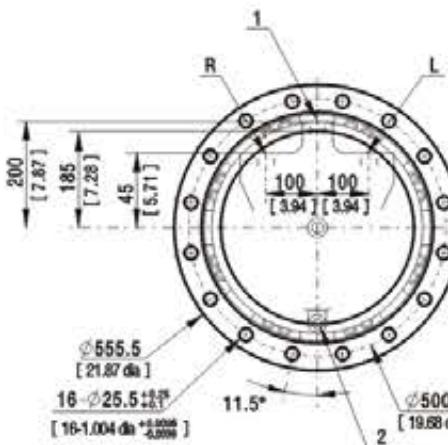
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	6679	3339			8328	4164			10019	5009
最大功率 Max Power (kw)	176	120			176	120			176	120
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	9982	4890			12439	6099			14974	7336
额定扭矩 Rated torque (N.m)	24956		31098		37436					
额定压力 Rated pressure (MPa)	25		25		25					
最高压力 Max Pressure (MPa)	40		40		35					
额定转速 Rated speed (r/min)	35		35		32					
转速范围 Speed range (r/min)	0-80		0-80		0-75					



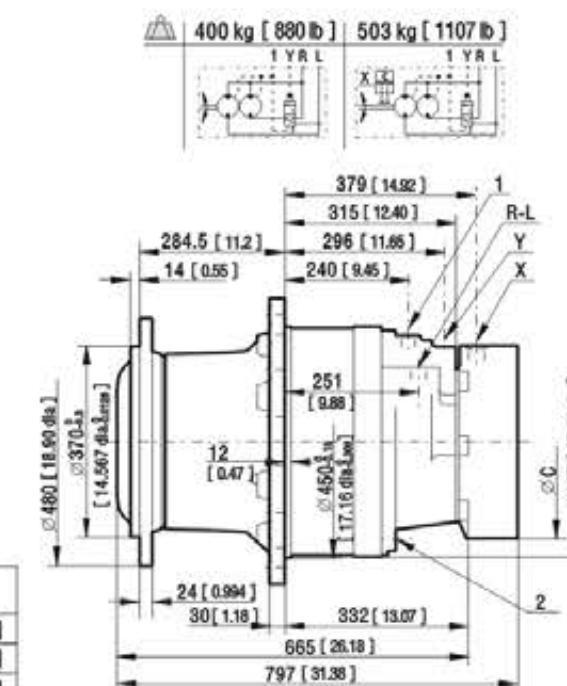
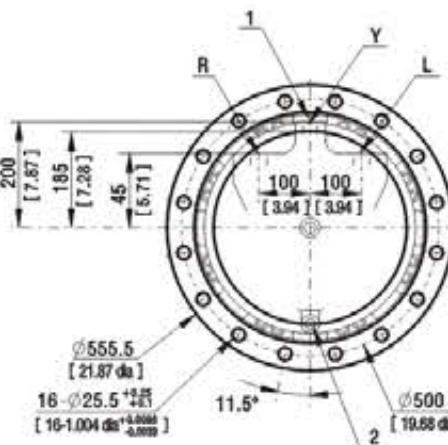
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(4210) 1-displacement motor (4210) 标准单排量马达尺寸



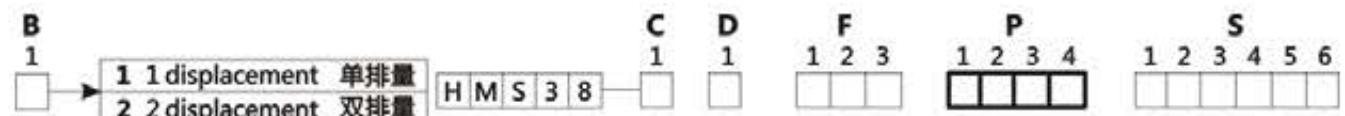
Dimensions for standard(4210) 2-displacement motor (4210) 标准双排量马达尺寸



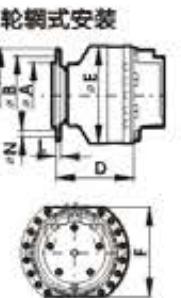
C	B	C	D	E
F42	157 [6.18]	φ375 [14.76 dia.]	62 [3.22]	183.5 [7.22]
F50	200 [7.87]	φ375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]
F83	200 [7.87]	φ375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]



SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
4 2 1 0 1 2 3 4 P	Ø370 [14.57dia.]	Ø425 [16.73dia.]	Ø470 [18.50dia.]	284 [11.18]	Ø445 [17.52dia.]	Ø26 [1.02 dia.]	24×M24×2	24 [0.94]



C	A mm	B mm	C mm	D mm	E mm	F mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 3 1 0 1 2 3 4 P	Ø370 [14.57dia.]	Ø425 [16.73dia.]	Ø470 [18.50dia.]	404 [15.91]	Ø445 [17.52dia.]	Ø465 [18.31dia.]	Ø26 [1.02 dia.]	24×M24×2	24 [0.94]

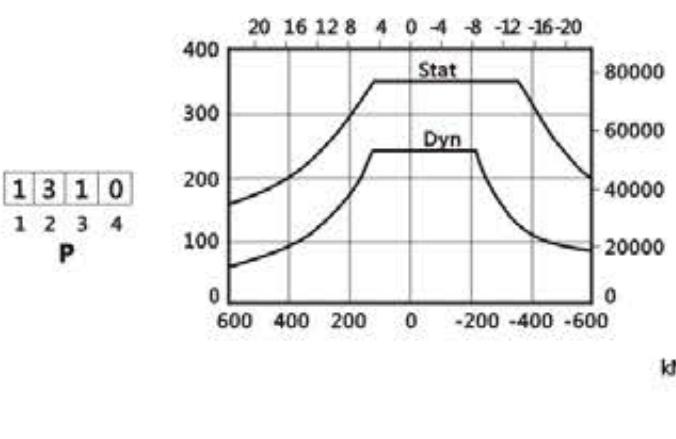
LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]
静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,
without axial load at max.torque
0组排量 , 无轴向力最大扭矩

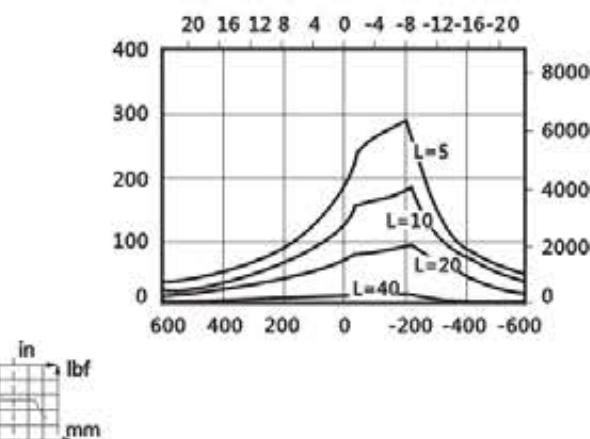


Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力 , 粘度为25cst , 平均压力为150bar , 工作寿命为B10 100万次



STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭距(1) Nm [ib.ft]	Torque(2) 扭距(2) Nm [ib.ft]	
Various Studs 各式螺栓	M24×2	95 [3.74]	5 [0.20]	39 [1.54]	30 [1.18]		4 2 1 0 1 2 3 4 P	12.9	910 [671.2]	1150 [848.2]
Screws 螺纹	M24×2						12.9	910 [671.2]	1150 [848.2]	

(*) The tightening torques are given for the indicated loads.

(*) 指上述负载的预紧扭距

(1) Wheel rim: suggested tightening torque for wheel rim mountings (Re steel disc > 240N/mm² [$> 34800\text{ PSI}$])

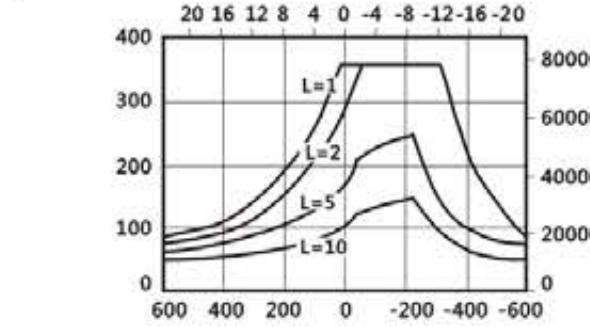
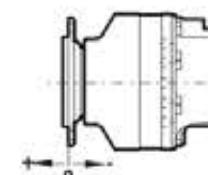
(1) 轮辋 : 建议轮辋式安装的预紧扭距 (Re steel disc > 240N/mm² [$> 34800\text{ PSI}$])

(2) Standard: suggested tightening torque in other cases (Re steel flange > 360N/mm² [$> 52215\text{ PSI}$])

(2) 标准 : 建议在其它情况安装时预紧扭距 (Re steel flange > 360N/mm² [$> 52215\text{ PSI}$])

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响 , 必须确认所受合力 (轴向负载/径向负载) 是否在零部件负载力范围内 , 并且这些零部件的实际使用寿命与要与规定上参数一致 , 进一步的精确计算 , 请联络我司工程师。



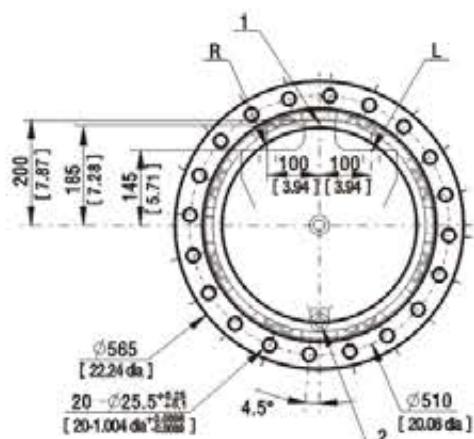


SHAFT MOTOR 轴式马达

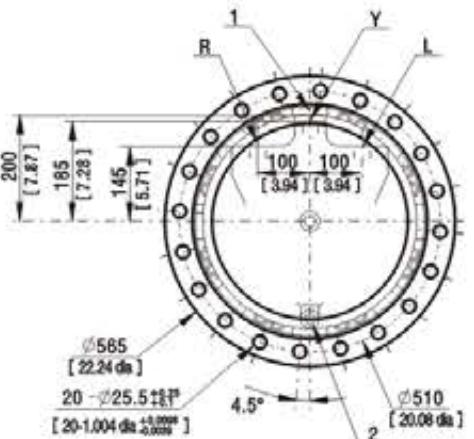
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

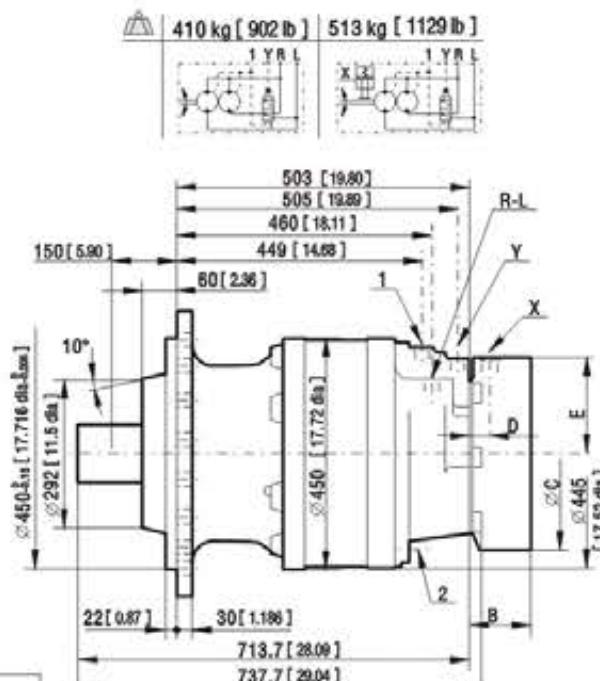
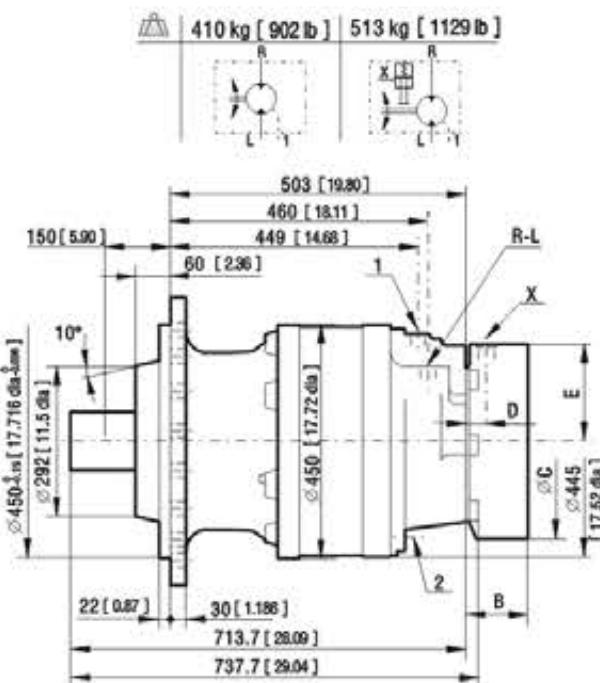
Dimensions for standard(3A50) 1-displacement motor
(3A50) 标准单排量马达尺寸



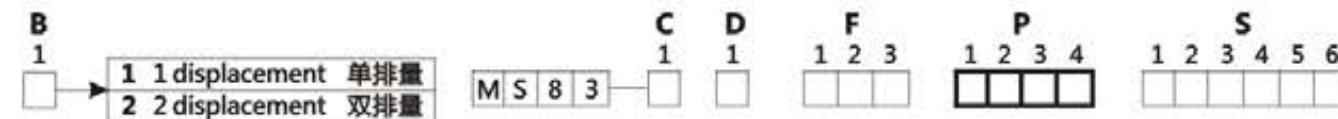
Dimensions for standard(3A50) 2-displacement motor
(3A50) 标准双排量马达尺寸



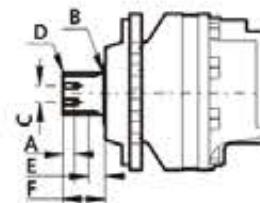
C	B	C	D	E
F42	157 [6.18]	Ø375 [14.76 dia.]	62 [3.22]	183.5 [7.22]
F50	200 [7.87]	Ø375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]
F83	200 [7.87]	Ø375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]



SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
3 A 5 0 1 2 3 4 P Z	GB3478.1 spline Module 模数 5 [1.57] 28	40 R4 [0.16]	60 [2.36]	2xM16 32 [1.26]	150 [5.91]	



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,

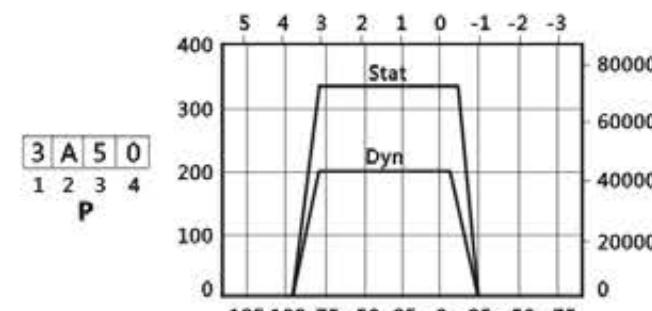
without axial load at max.torque
0组排量，无轴向力最大扭矩

0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

Test conditions 检测条件

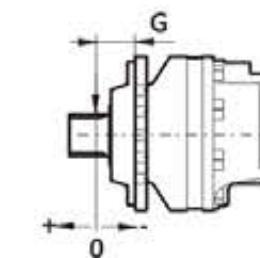
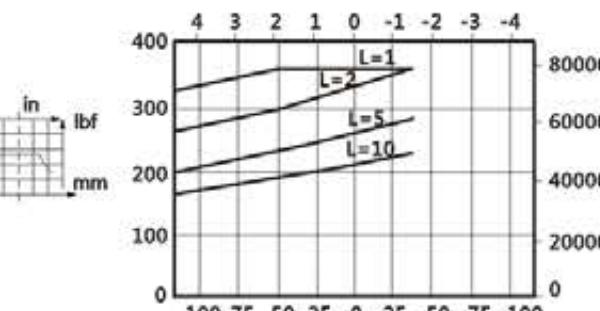
L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load
L : 百万次B10转速在150bar (平均压力)，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



C	G
3 A 5 0	144.7 [5.67]

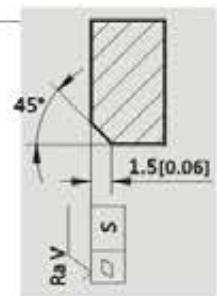
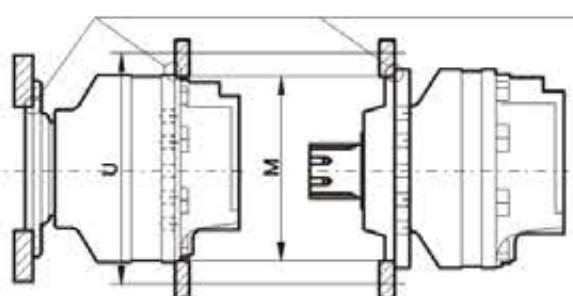
The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。





CHASSIS MOUNTING 支架安装



⚠ 安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	450 [17.72]	565 [22.24]	0.2 [0.008]	12.5µm [0.49µin]	16×M24	12.9	1200N.m [885.1lb.ft]
SHAFT MOTOR 轴式马达					20×M24		

(1) +0.3 [+0.012]
+0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

EFFICIENCY 效率

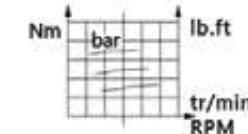
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

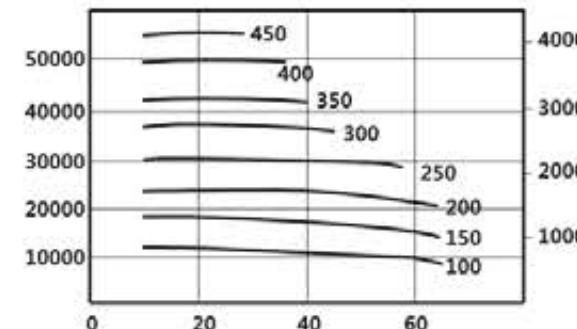
下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



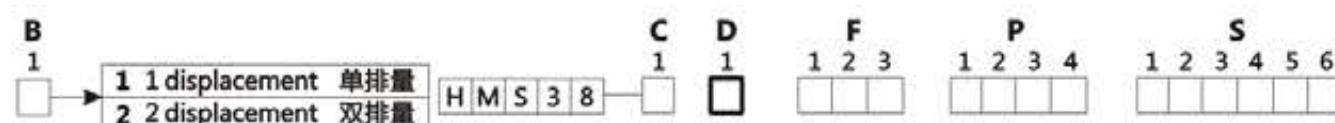
Actual output torque 实际输出扭矩



HMS83



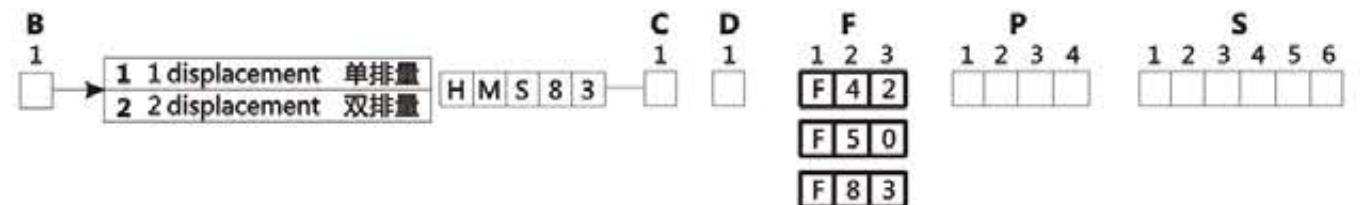
HYDRAULIC CONNECTIONS CONNECTIONS 连接



Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
1 ISO6162 DIN3852	ISO6162 ISO9974-1	DN25 PN400	M20×1.5 M18×1.5	M27×2 M22×1.5	M18×1.5
2 ISO6162 NFE45050	ISO6162 ISO9974-1	DN32 PN400	M18×1.5	M22×1.5	M18×1.5
Max Pressures MS bar [PSI]	400 [5800]	30 [440]	1 [10]	30 [440]	



BRAKES 制动器

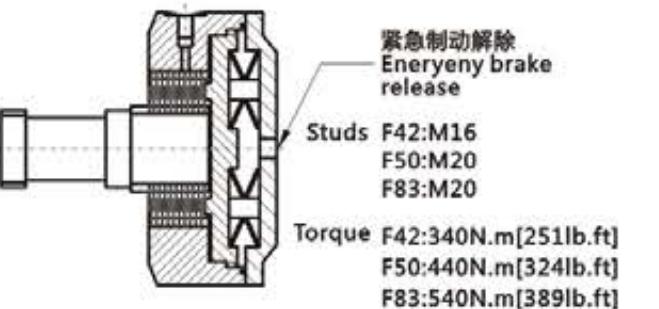


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 4 2	F 5 0	F 8 3
Parking brake torque at 0 bars on housing (New brake) 0 bars 静态驻车制动扭距(新制动器)	25000Nm [18400 lb.ft]	30000Nm [22130 lb.ft]	42000Nm [30980 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	16250Nm [11990 lb.ft]	19500Nm [14380 lb.ft]	27300Nm [20140 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	18750Nm [13830 lb.ft]	22500Nm [16600 lb.ft]	31500Nm [23230 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]	12 bar [174 PSI]	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]	30 bar [435 PSI]	30 bar [435 PSI]
Oil capacity 油量	400cm ³ [24.4 cu.in]	450cm ³ [27.5 cu.in]	450cm ³ [27.5 cu.in]
Volume for brake release 制动开启量	135cm ³ [8.2 cu.in]	135cm ³ [8.2 cu.in]	135cm ³ [8.2 cu.in]

* After emergency brake has been used
* 指经过紧急制动后参数

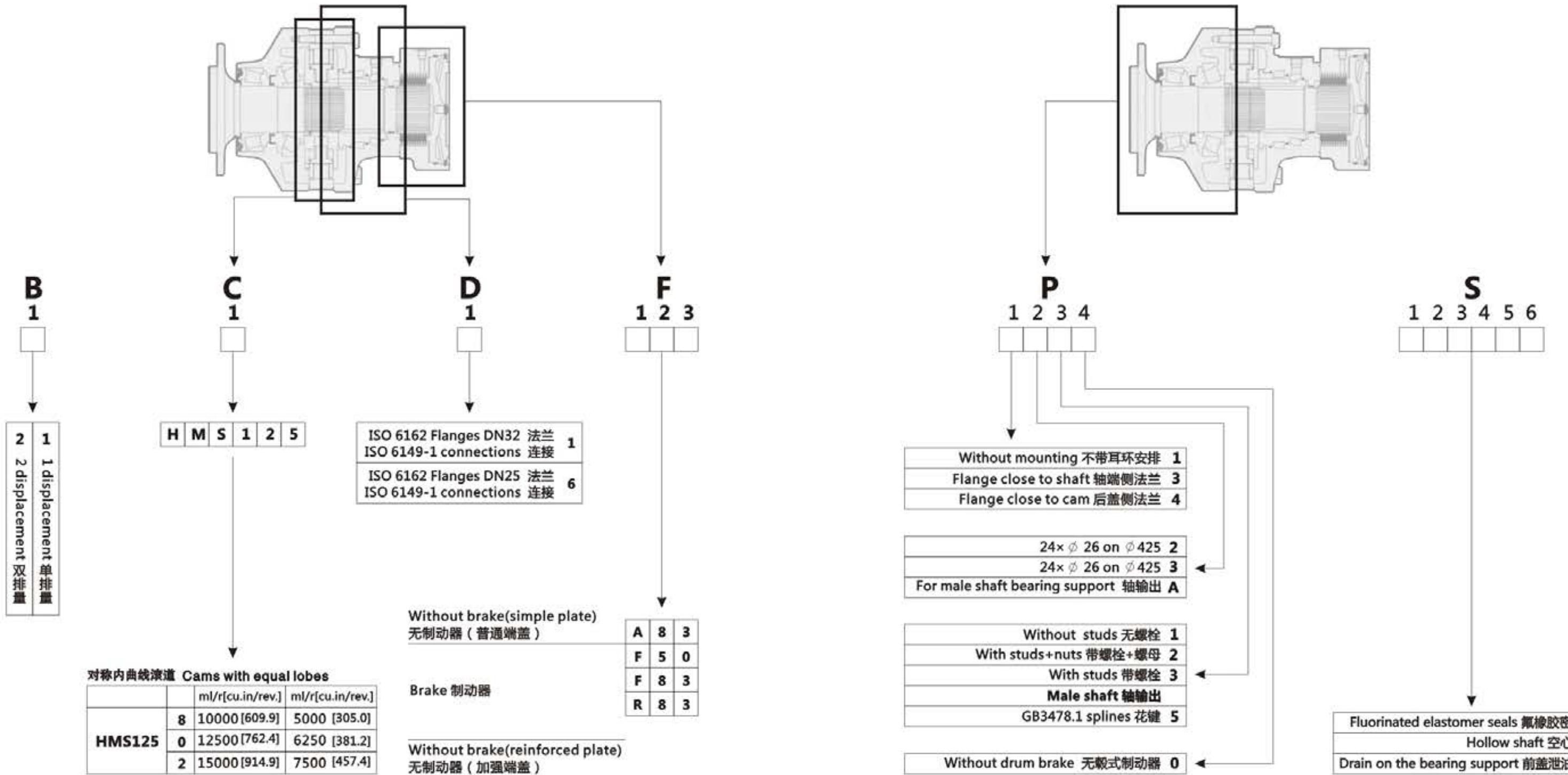
I Do not run in multidisc brakes
马达运转前必须先行开启制动器

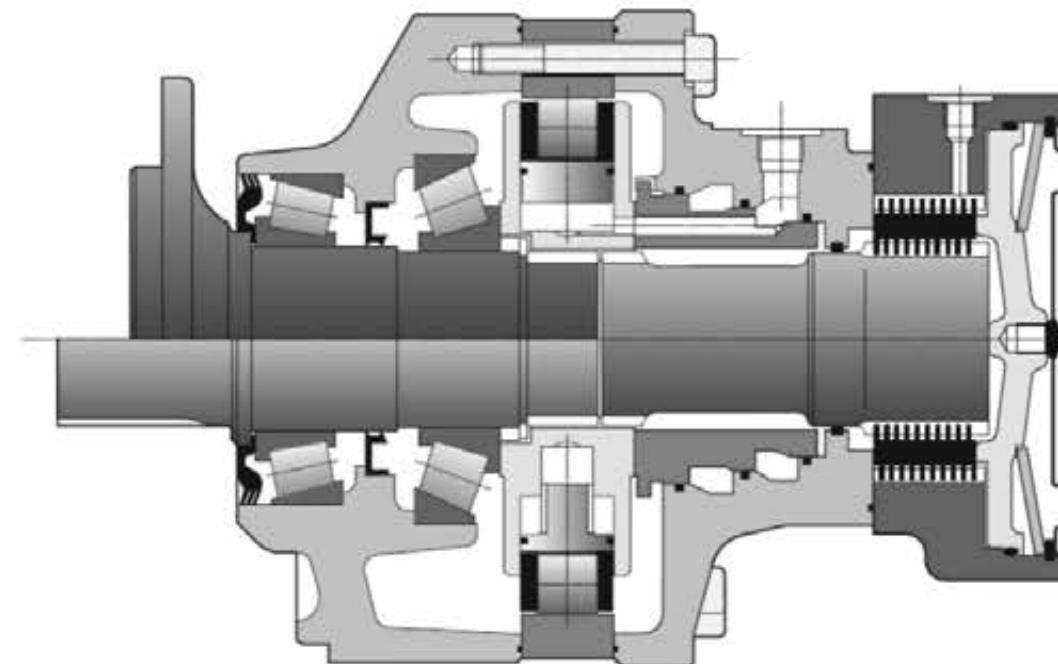
A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动(或者紧急制动)使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

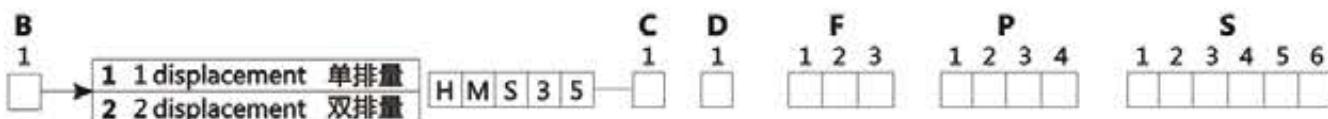




马达惯量 = 0.5 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS35 液压马达技术参数

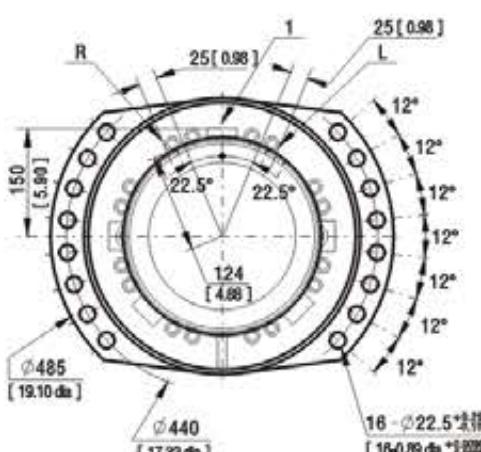
排量分组	7		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	2439	1220	3143	1572	3494	1747			4198	2099
最大功率 Max Power (kw)	97	65	97	65	97	65			97	65
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	3645	1786	4697	2302	5222	2558			6274	3074
额定扭矩 Rated torque (N.m)	9113		11743		13055		15685			
额定压力 Rated pressure (MPa)	25		25		25		25			
最高压力 Max Pressure (MPa)	40		40		40		35			
额定转速 Rated speed (r/min)	45		45		45		40			
转速范围 Speed range (r/min)	0-100		0-100		0-100		0-95			



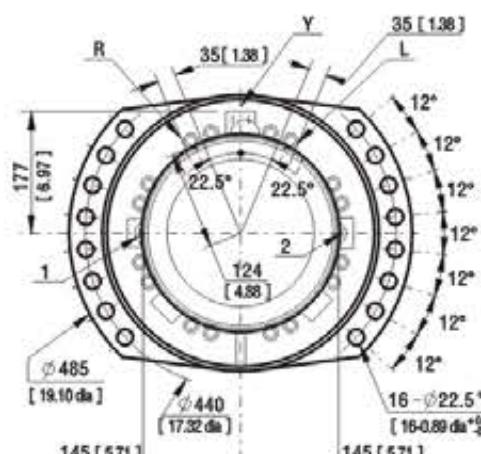
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

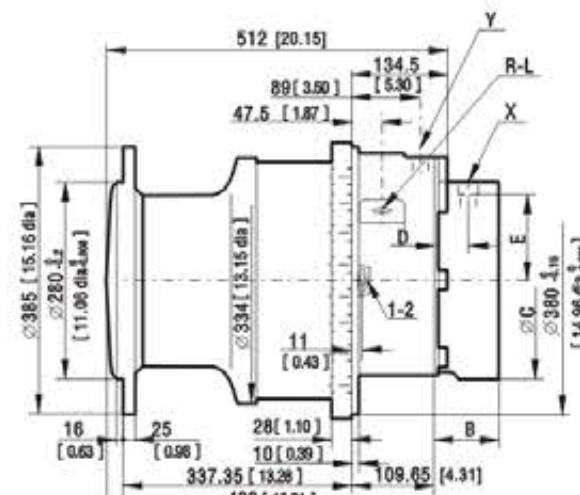
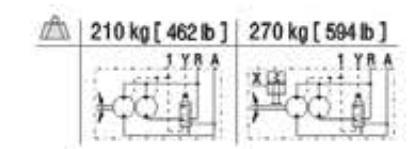
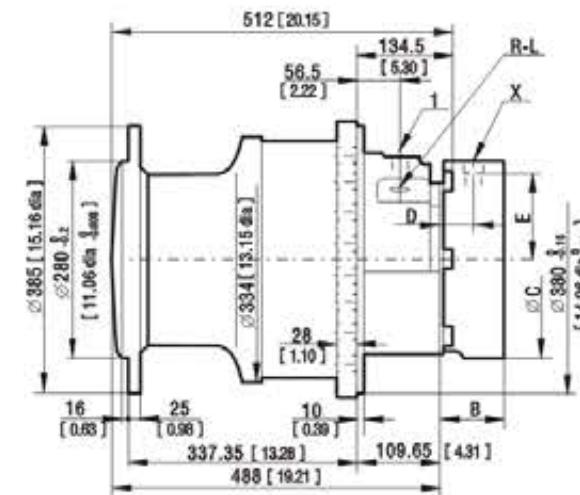
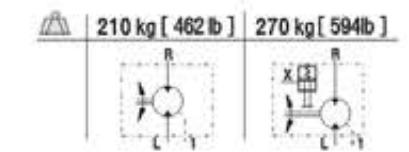
Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸

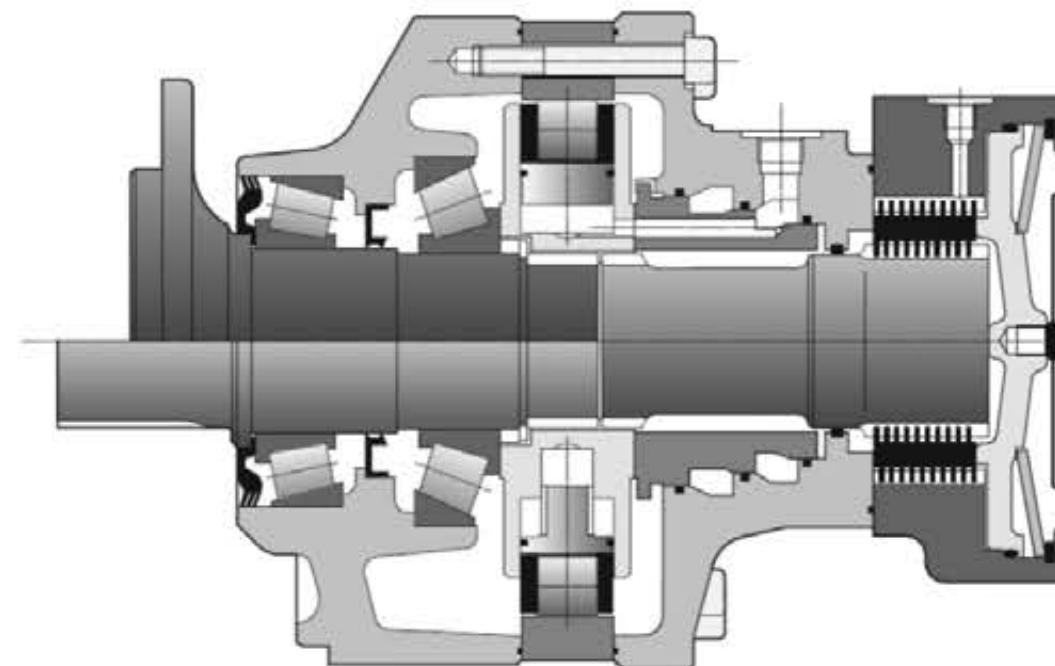


Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸



C	B	C	D	E
F42	157 [6.18]	Φ375 [14.76 dia.]	82 [3.22]	183.5 [7.22]

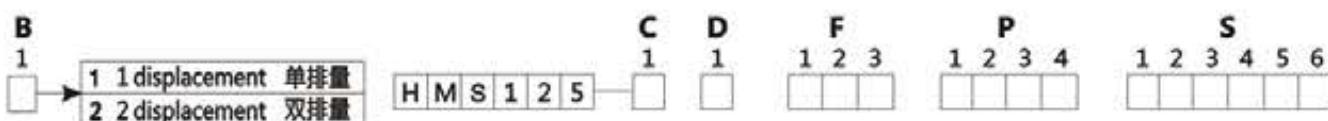




马达惯量 = 1.5 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS125 液压马达技术参数

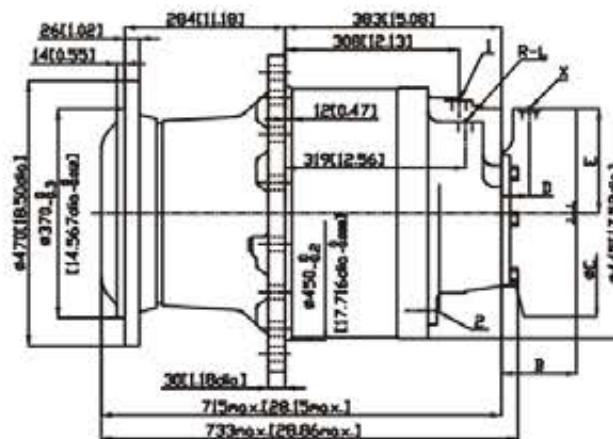
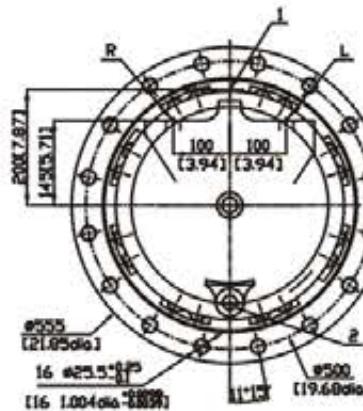
排量分组	8		9		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	10000	5000			12500	6250			15000	7500
最大功率 Max Power (kw)	240	160			240	160			240	160
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	15900	7794			19875	9743			23850	11691
额定扭矩 Rated torque (N.m)	37365		46706		56048					
额定压力 Rated pressure (MPa)	25		25		25					
最高压力 Max Pressure (MPa)	40		33		27					
额定转速 Rated speed (r/min)	30		30		28					
转速范围 Speed range (r/min)	0-50		0-40		0-30					



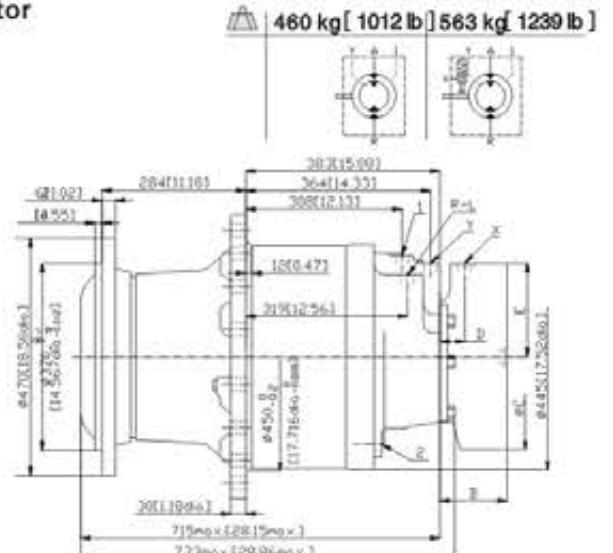
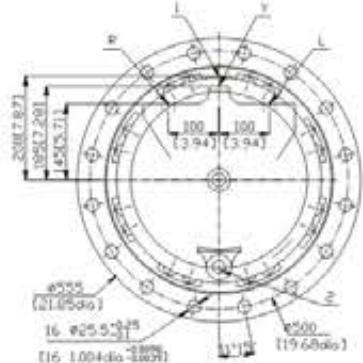
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

Dimensions for standard(4210) 1-displacement motor
(4310) 标准单排量马达尺寸



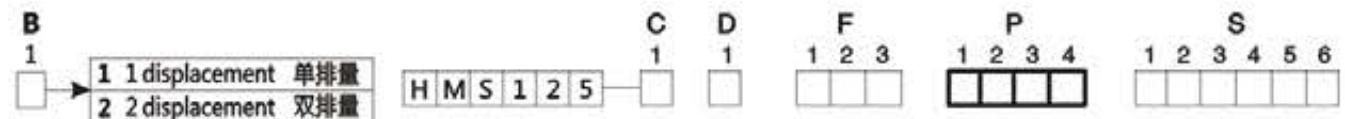
Dimensions for standard(4210) 2-displacement motor
(4310) 标准双排量马达尺寸



C	B	C	D	E
F50	152 [5.98]	Φ375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]
F83	152 [5.98]	Φ375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]



SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
4 3 1 0 1 2 3 4 P	Ø370 [14.57dia.]	Ø425 [16.73dia.]	Ø470 [18.50dia.]	284 [11.18]	Ø445 [17.52dia.]	Ø26 [1.02dia.]	24×M24×2	26 [0.98]



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
4 4 1 0 1 2 3 4 P	Ø370 [14.57dia.]	Ø425 [16.73dia.]	Ø470 [18.50dia.]	239 [9.41]	Ø445 [17.52dia.]	Ø26 [1.02dia.]	24×M24×2	25 [0.98]

STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭距(1) Nm [ib.ft]	Torque(2) 扭距(2) Nm [ib.ft]
Various Studs 各式螺栓	M24×2	95 [3.74]	5 [0.20]	39 [1.54]	30 [1.18]		12.9	910 [671.2]	1150 [848.2]
Screws 螺纹	M24×2						12.9	910 [671.2]	1150 [848.2]

(*) The tightening torques are given for the indicated loads.

(*) 指上述负载的预紧扭距

(1) Wheel rim: suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [<>34800 PSI])

(1) 轮辋：建议轮辋式安装的预紧扭距 (Re steel disc>240N/mm² [<>34800 PSI])

(2) Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [<>52215 PSI])

(2) 标准：建议在其它情况安装时预紧扭距 (Re steel flange>360N/mm² [<>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

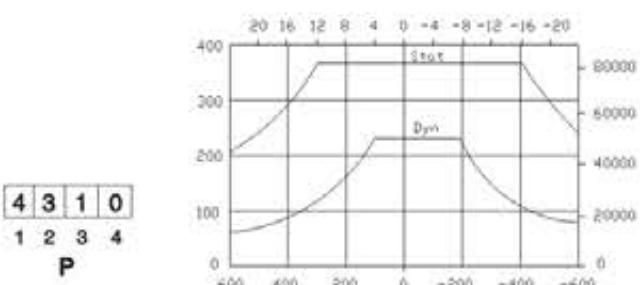
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI] 静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement, 动态 : 0 r/min [0 RPM], code 0 displacement,

without axial load at max.torque 0组排量，无轴向力最大扭矩

0组排量，无轴向力最大扭矩



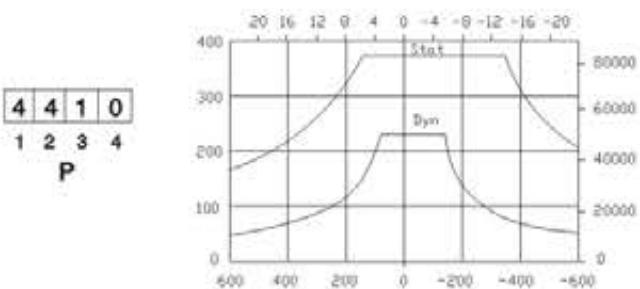
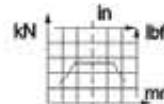
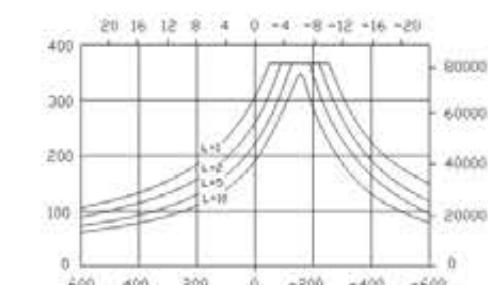
4 3 1 0
1 2 3 4
P

Service life of bearings 使用寿命

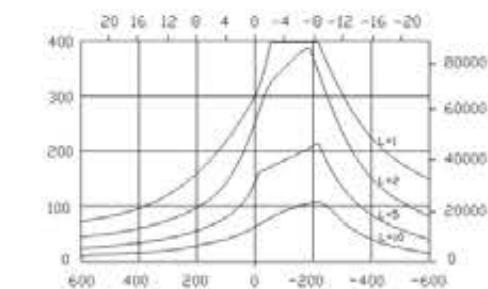
Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次

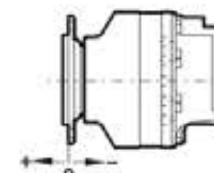


4 4 1 0
1 2 3 4
P



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命与要与规定上参数一致，进一步的精确计算，请联络我司工程师。



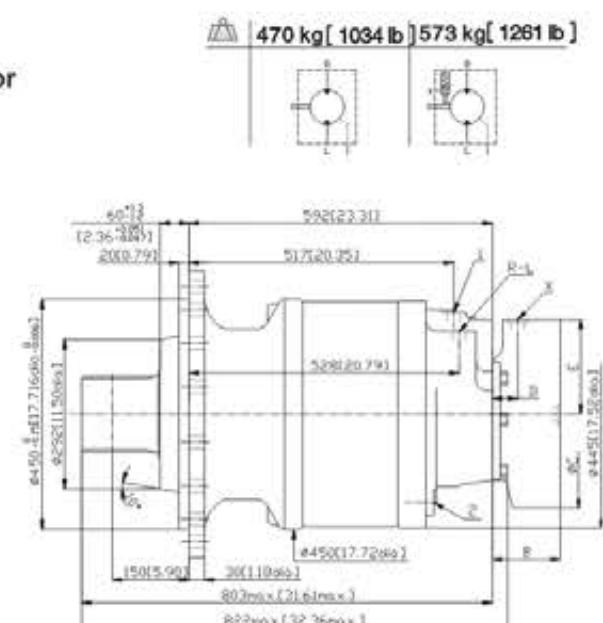
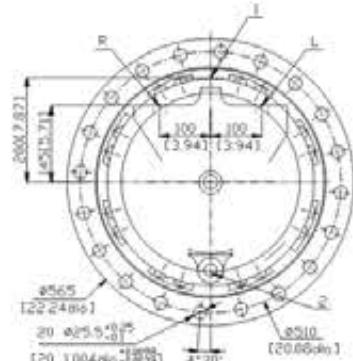


SHAFT MOTOR 轴式马达

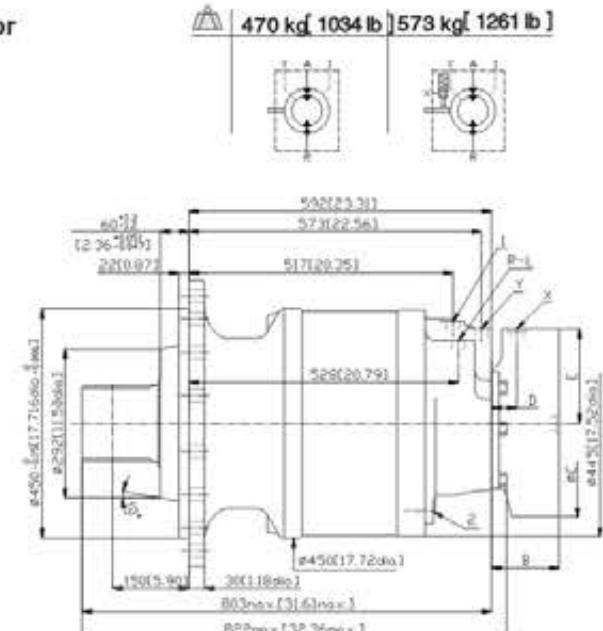
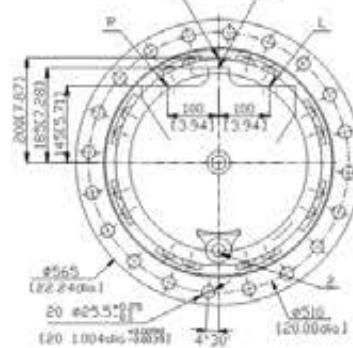
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

Dimensions for standard(3A50) 1-displacement motor
(3A50) 标准单排量马达尺寸

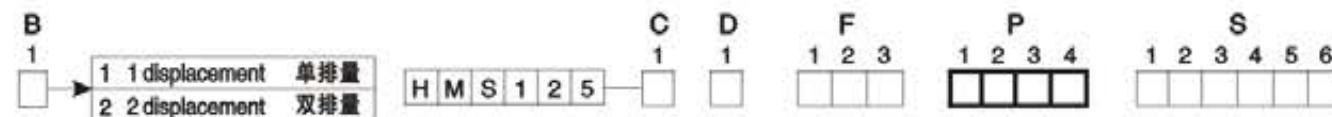


Dimensions for standard(3A50) 2-displacement motor
(3A50) 标准双排量马达尺寸

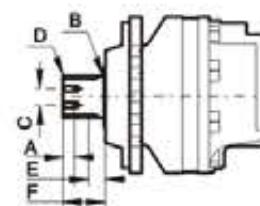


C	B	C	D	E
F50	152 [5.98]	Ø375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]
F83	152 [5.98]	Ø375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F								
<table border="1"> <tr> <td>3 A 5 0</td> <td>GB3478.1 spline</td> </tr> <tr> <td>1 2 3 4</td> <td>Module 模数 5</td> </tr> <tr> <td>P</td> <td>[1.57] [R0.16]</td> </tr> <tr> <td>Z</td> <td>28</td> </tr> </table>	3 A 5 0	GB3478.1 spline	1 2 3 4	Module 模数 5	P	[1.57] [R0.16]	Z	28	40	R4	60	2×M16	32	150
3 A 5 0	GB3478.1 spline													
1 2 3 4	Module 模数 5													
P	[1.57] [R0.16]													
Z	28													



LOAD CURVE 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], code 0 displacement,

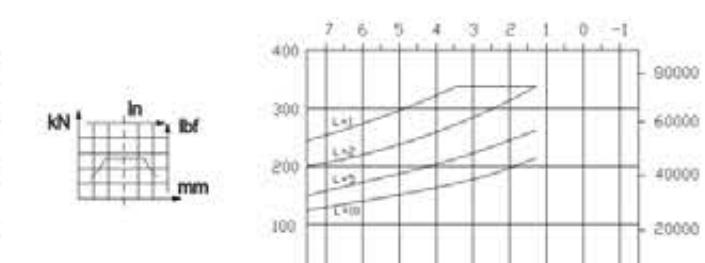
without axial load at max.torque
0组排量，无轴向力最大扭矩

0组排量，无轴向力最大扭矩

Service life of bearings 使用寿命

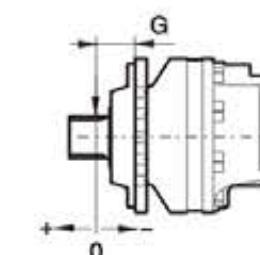
Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure), with 25cst fluid, code 0 displacement, without axial load
L : 百万次B10转速在150bar (平均压力)，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



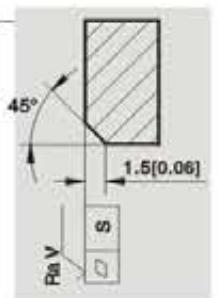
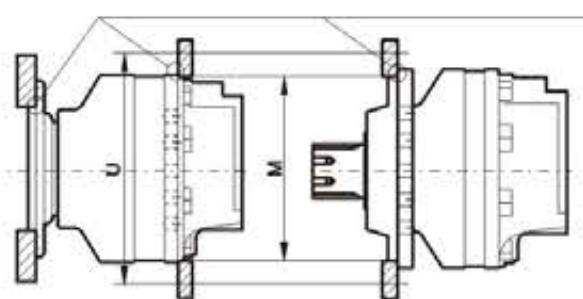
The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。





CHASSIS MOUNTING 支架安装



安装时注意清洁 Take care over the immediate environment of the connections

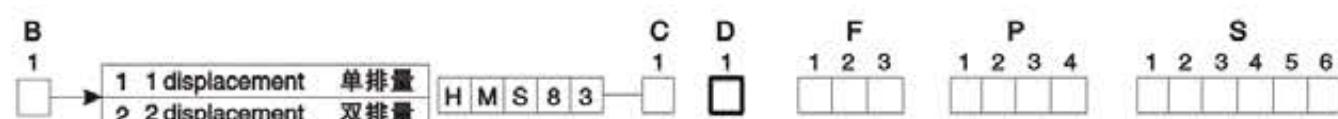
	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭距 *
WHEEL MOTOR 轮式马达	450 [17.72]	565 [22.24]	0.2 [0.008]	12.5 μ m [0.49 μ in]	16 x M24 20 x M24	12.9	1200 N.m [885.1 lb.ft]
SHAFT MOTOR 轴式马达							

(1) +0.3 [+0.012]
+0.2 [+0.008]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

HYDRAULIC CONNECTIONS CONNECTIONS 连接



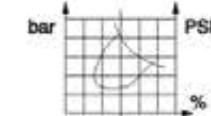
Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain	制动器控制油口 Control of Parking break
1 ISO6162 DIN3852	ISO6162 ISO9974-1	Dn32 PN400	M18x1.5	M27x2	M18x1.5
Max Pressures MS bar [PSI]	450 [6530]	30 [440]	1 [10]	30 [440]	

EFFICIENCY 效率

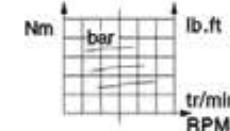
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭矩



HMS125

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PAGE

The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的85%计算，若需进行精确的计算，请与我公司研发部联络。



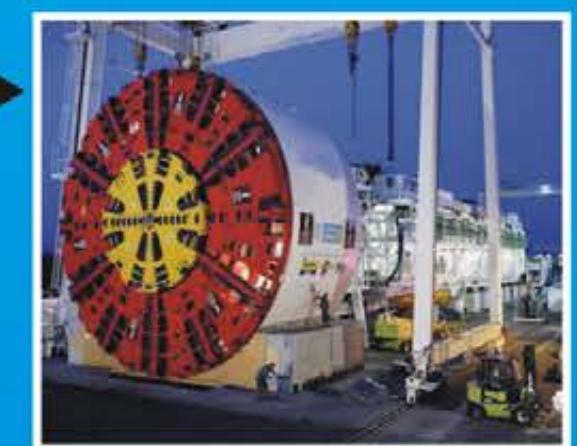
▶▶ 产品应用
Product applications



滑移装载机
skid loaders



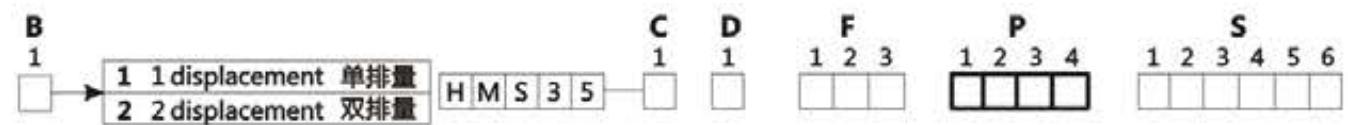
切削钻机
drilling rigs equipment



盾构机
shield machine



SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0	ø280.7	ø335	ø385	338	ø334	ø24	10xM20*1.5	24
1 2 3 4	[11.05 dia.]	[13.19dia.]	[15.16dia.]	[13.31]	[13.15dia.]	[0.94dia.]		
P								



STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭矩(1) Nm [ib.ft]	Torque(2) 扭矩(2) Nm [ib.ft]
Various Studs 各式螺栓	M16×1.5	50 [1.97]	5 [0.20]	16.5 [0.65]	P D C	12.9	300 [221.3]	380 [280.3]	
	M20×1.5	60 [2.36]					600 [442.5]	770 [567.9]	
	M20×1.5	70 [2.76]					695 [512.6]	1050 [774.4]	
	M22×1.5	64 [2.52]							
	M22×1.5	80 [3.15]							
Screws 螺纹	M16×1.5	23 [0.91]				10.9	250 [184.4]	315 [232.3]	

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭矩

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭矩 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭矩(Re steel flange>360N/mm² [>52215 PSI])

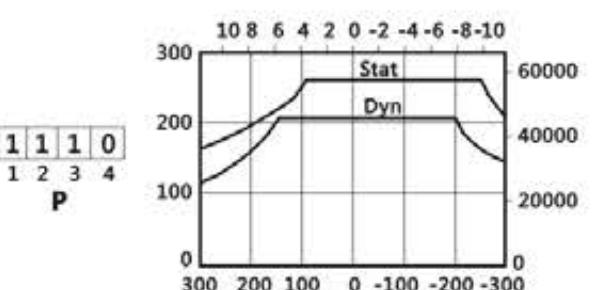
LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI]
静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min[0 RPM], code 0 displacement,
动态 : 0 r/min[0 RPM]
without axial load at max.torque
0组排量，无轴向力最大扭矩

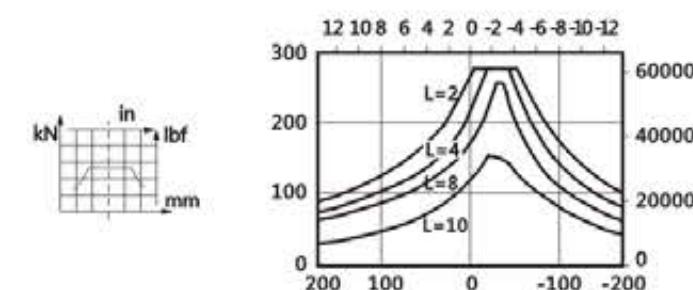


Service life of bearings 使用寿命

Test conditions 检测条件

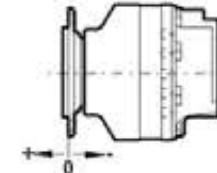
L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载力范围内，并且这些零部件的实际使用寿命与要与规定上参数一致，进一步的精确计算，请联络我司工程师。



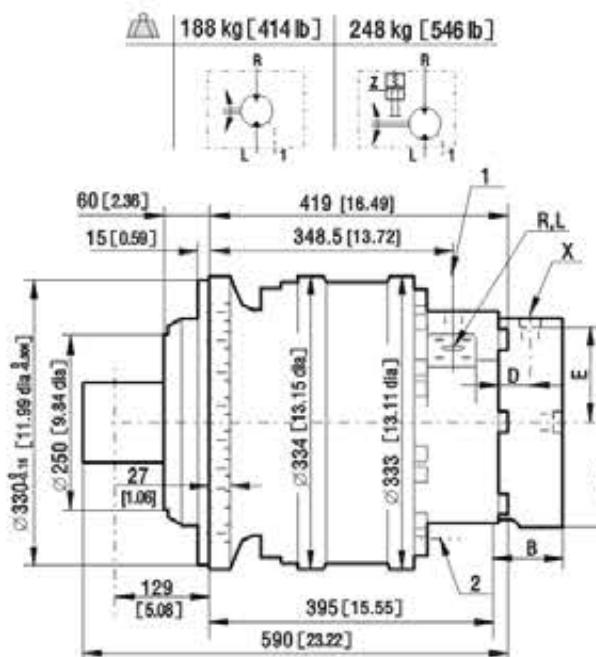
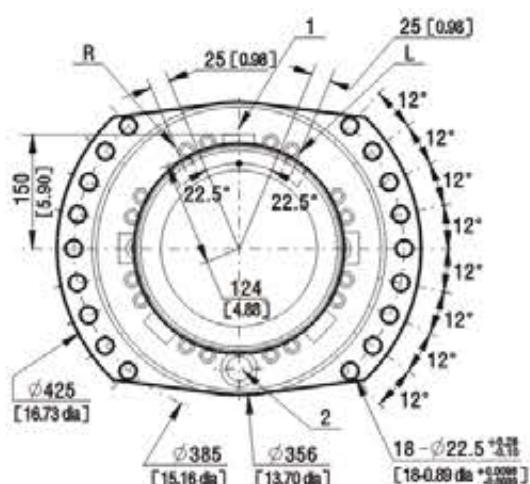


SHAFT MOTOR 轴式马达

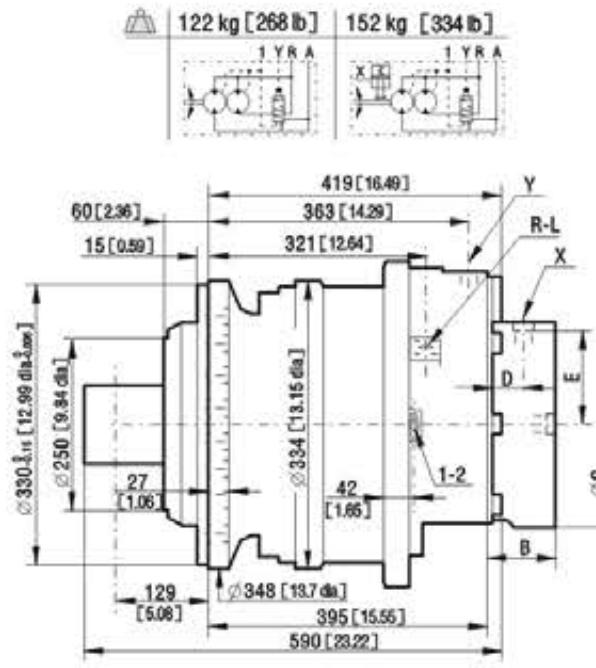
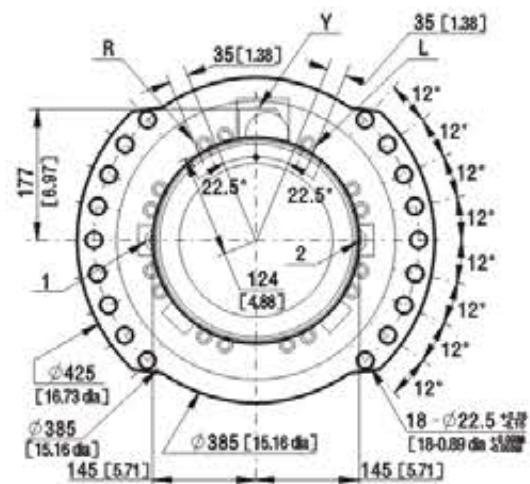
The dimensional data is given in mm and in inches (inches are between brackets)

尺寸米制 (括号内英制)

Dimensions for standard(2A50) 1-displacement motor
(2A50) 标准单排量马达尺寸

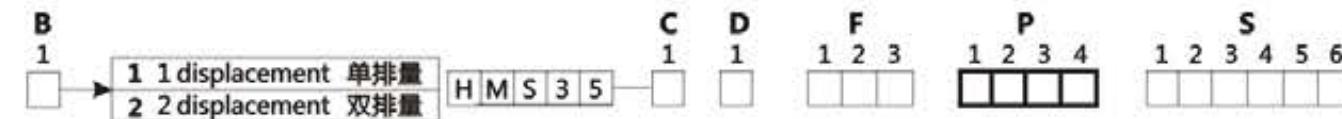


Dimensions for standar(2A50) 2-displacement motor
(2A50) 标准双排量马达尺寸

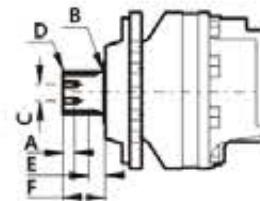


C	B	C	D	E
F42	157 [6.18]	ø375 [14.76 dia.]	82 [3.22]	183.5 [7.22]

SUPPORT TYPES 前盖类型



C	A	B	C	D	E	F
2 A 5 0	GB3478.1 spline 花键	40	R3	60	2xM16	110
1 2 3 4	Module 模数 5	[1.57]	[R0.12]	[2.36]	[1.10]	[4.33]
P	Z 22					



LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

Test conditions 检测条件

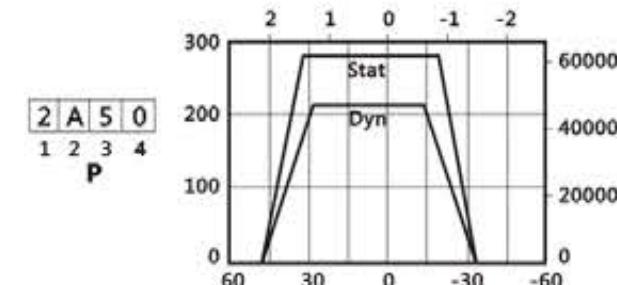
Static : 0 r/min [0 RPM] 0bar [0 PSI]

静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement,
动态 : 0 r/min [0 RPM], 级数 0 移动,

without axial load at max.torque
无轴向力最大扭矩

0组排量, 无轴向力最大扭矩



C		G
2 A 5 0	129 [5.08]	

The service life of the components is influenced by the pressure. You must check that the combination of forces applied (Axial load/Radial load) is compatible with the permissible loads for the components, and that the resulting service lives of these components complies with the application's specifications. For an accurate calculation, consult our Helm Tower Hydraulics application engineer.

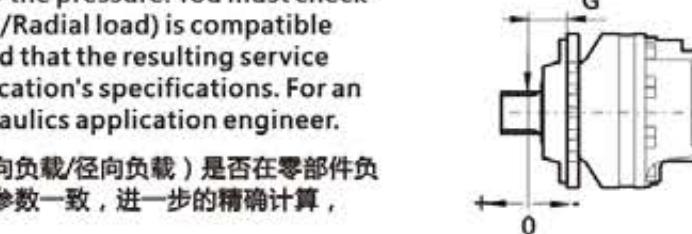
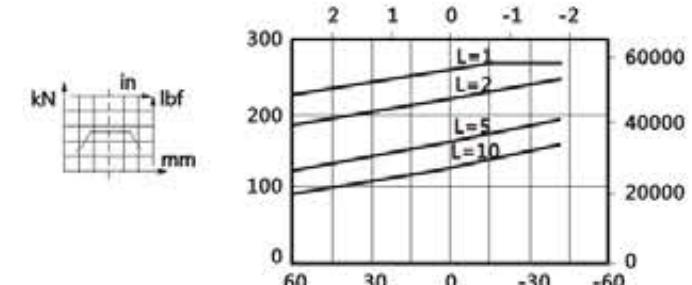
零部件的使用寿命受压力影响，必须确认所受合力（轴向负载/径向负载）是否在零部件负载范围内，并且这些零部件的实际使用寿命要与规定参数一致，进一步的精确计算，请联络我公司研发部。

Service life of bearings 使用寿命

Test conditions 检测条件

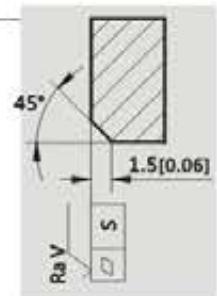
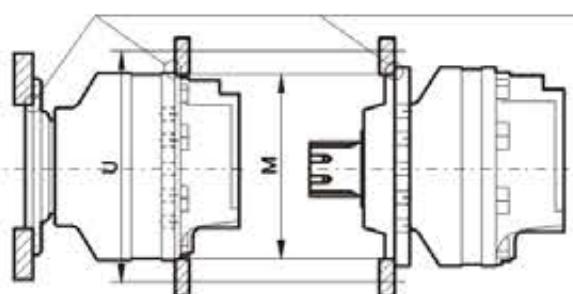
L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次





CHASSIS MOUNTING 支架安装



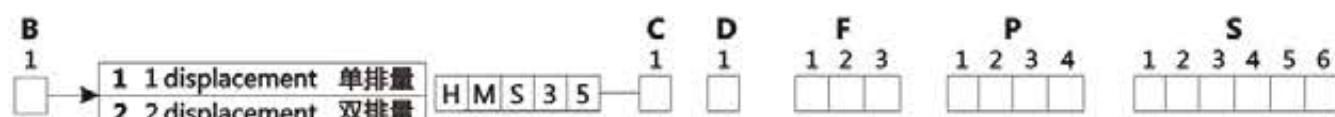
安装时注意清洁 Take care over the immediate environment of the connections

	Ø M(1)	Ø U	S	Ra V	Screws 螺纹	Class 等级	Torque 扭矩 *
WHEEL MOTOR 轮式马达	380 [14.96]	485 [15.16]	0.2 [0.008]	12.5µm [0.49µin]	2×8 M20×2	8.8	410N.m [302 lb.ft]
SHAFT MOTOR 轴式马达	330 [12.99] (1) +0.3 [+0.012] +0.2 [+0.008]	485 [15.16]	0.2 [0.008]	12.5µm [0.49µin]	2×8 M20×2	8.8	410N.m [302 lb.ft]

* : Min.Values for torque and load to be transmitted

* : 指传动时扭矩及负载的最小值

HYDRAULIC CONNECTIONS CONNECTIONS 连接



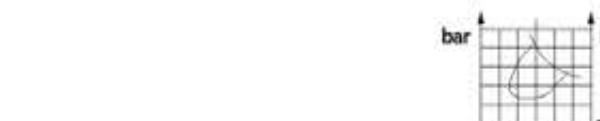
Old Standards 旧标准	Standards 新标准	进出油口 Power supply R-L	双排量马达控制油口 2nd Displacement Control Y	壳体泄油口 Case drain 1,2	制动器控制油口 Control of Parking break X
A SAEJ514	ISO11926-1	1 1/16"-12UNF	3/4"-16UNF	7/8"-14UNF	9/16"-18UNF 3/4"-16UNF
1 ISO6162 DIN3852	ISO6162 S18 ISO9974-1 S35 2C	DN19 PN400 DN25 PN400	M16×1.5 M18×1.5	M22×1.5	M16×1.5
2 NFE48050	ISO9974-1	M27×2	M16×1.5 M22×1.5	M22×1.5	M16×1.5
Max Pressures	MS Bar [PSI]	400 [5800] 350 [5070]	30 [440]	1 [10]	30 [440]

EFFICIENCY 效率

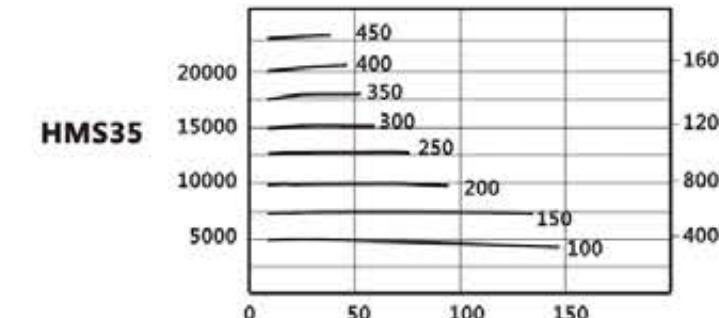
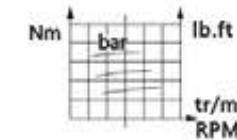
Overall efficiency 效率曲线

Average values given for guidance for code 0 displacement after 100 hours of operation with HV46 hydraulic fluid at 50°C [122°F]

下图为：0组排量在50°C [122°F] 下，液压油为 HV46抗磨液压油经过100个小时跑合后的平均值。



Actual output torque 实际输出扭矩

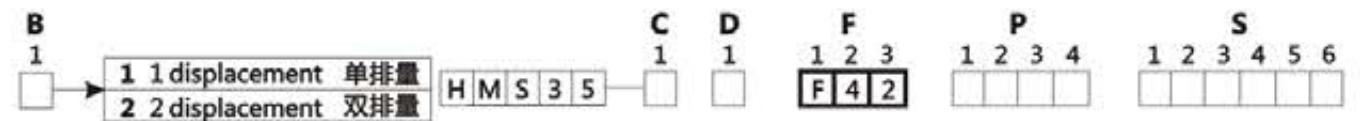


The starting torque is taken to be approximately 75% of the first value for available pressure. For a precise calculation, consult our Helm Tower Hydraulic application engineer.

启动扭矩按给定压力下初始扭矩的75%计算，若需进行精确的计算，请与我公司研发部联络。



BRAKES 制动器

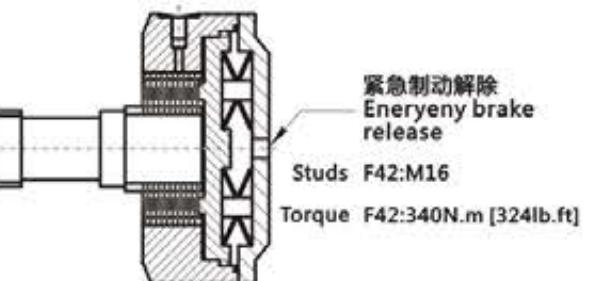


REAR BRAKE 后制式制动器

Brake Principle 制动器工作原理

This is a multidisc brake which is activated by a lack of pressure. The spring exerts a force on the piston, which presses on the fixed mobile discs, and immobilizes the shaft. The braking torque decreases in linear proportion to the brake release pressure.

常闭式油压开启多片式制动器，弹簧作用于活塞，使动摩擦片与静摩擦片产生阻力而制动。



C	F 4 2
Parking brake torque at 0 bar on housing (New brake) 0 bar 静态驻车制动扭距(新制动器)	25000Nm [18400 lb.ft]
Dynamic emergency braking torque at 0 bar on housing (Max.10 uses of emergency brakes) 动态紧急制动扭距(最多使用10次紧急制动)	16250Nm [11990 lb.ft]
Residual parking braking at 0 bar on housing * 0 bar 下常规制动扭距	18750Nm [13830 lb.ft]
Min.brake release pressure 最小自动开启压力	12 bar [174 PSI]
Max.brake release pressure 最大自动开启压力	30 bar [435 PSI]
Oil capacity 油量	400cm ³ [24.4 cu.in]
Volume for brake release 制动开启量	135cm ³ [8.2 cu.in]

* After emergency brake has been used
* 指经过紧急制动后参数

Do not run in multidisc brakes
马达运转前必须先行开启制动器

A functional check of the parking brake must be carried out each time it is used as an auxiliary brake
(or emergency brake). For all vehicles capable of speeds over 25 km/hour, please contact our Helm

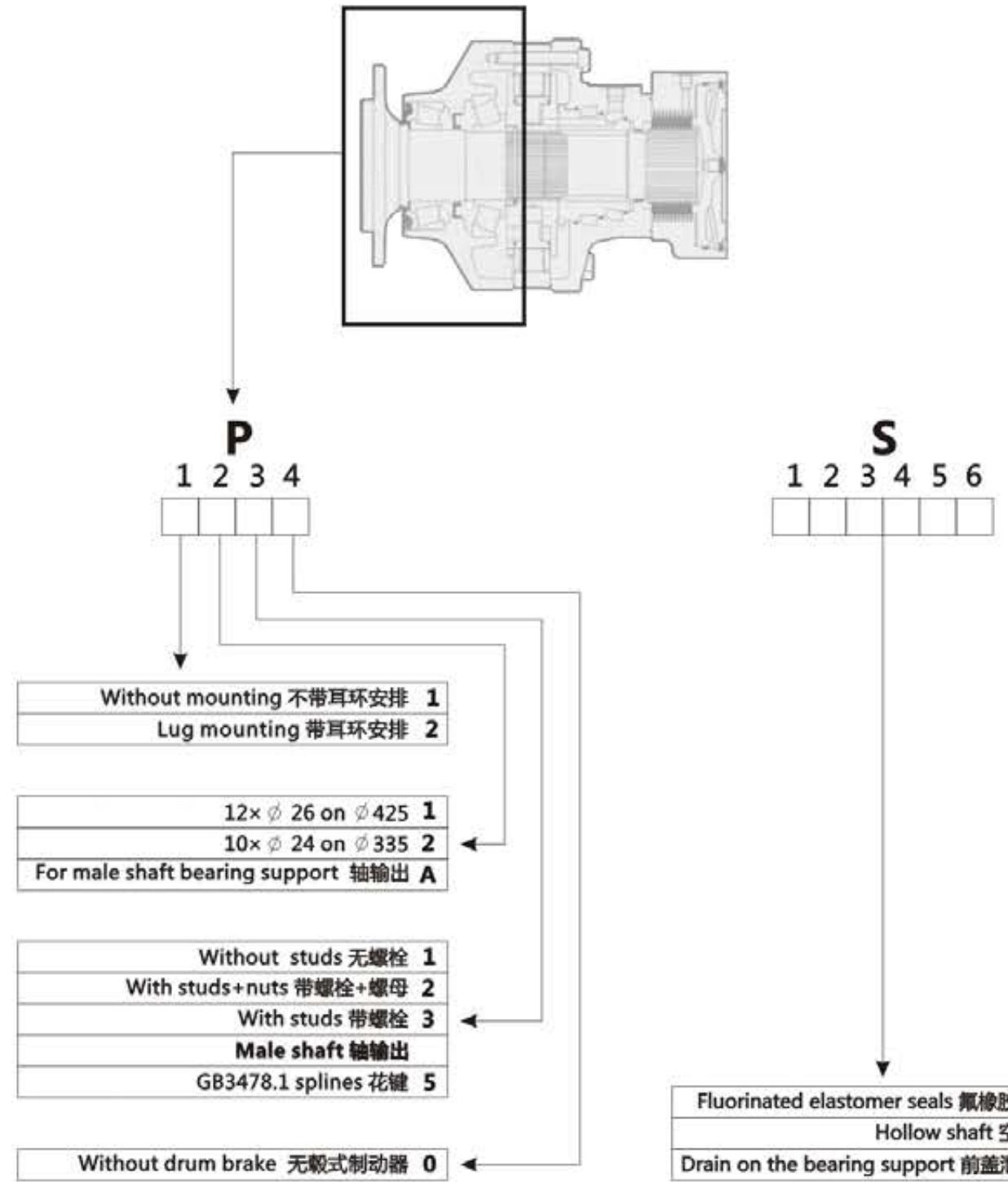
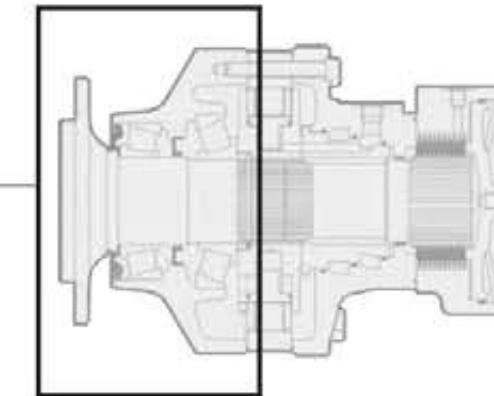
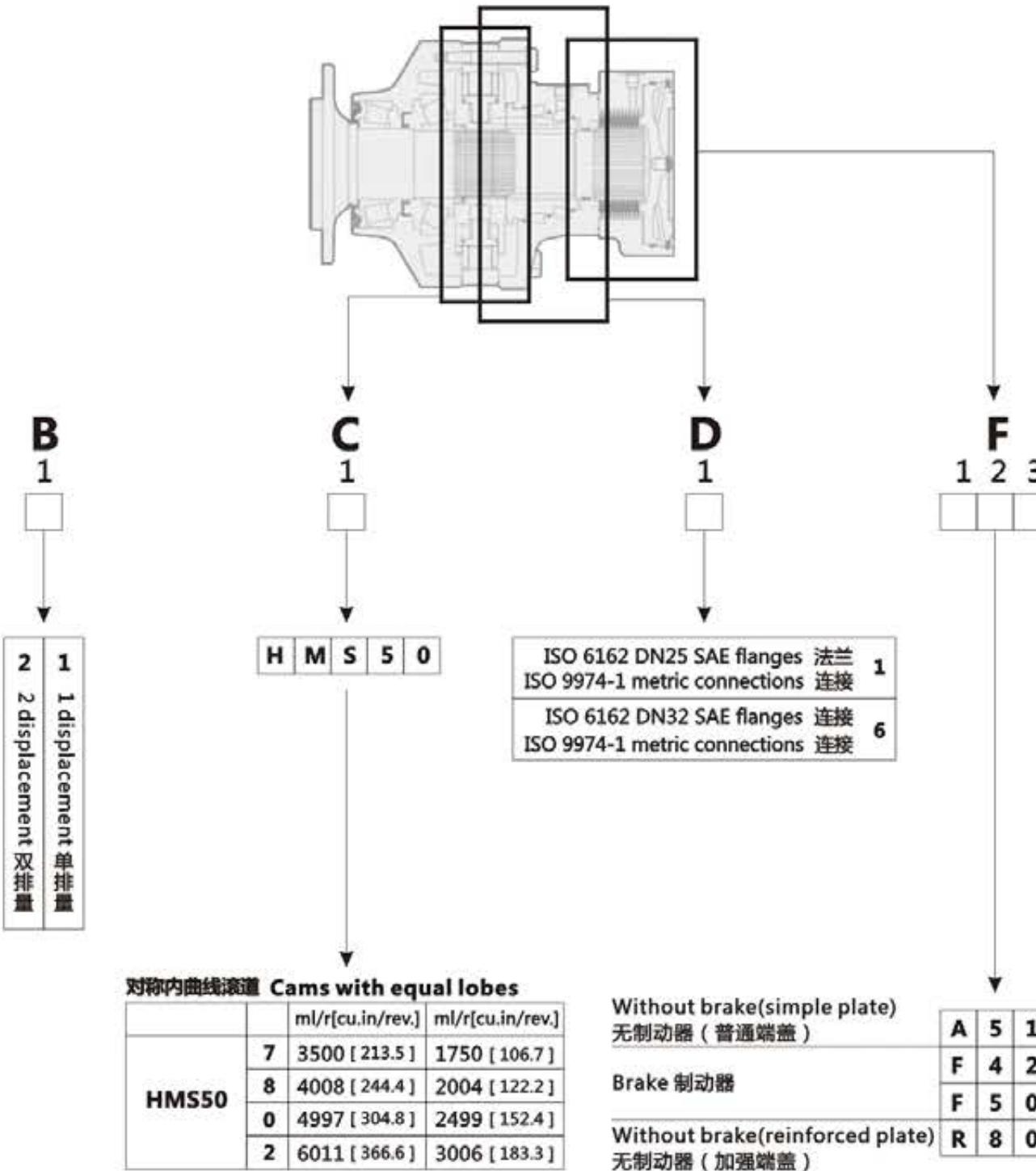
Tower Hydraulic application engineer.

每当驻车制动器作为辅助制动（或者紧急制动）使用时，都要对驻车制动器进行功能的检查，对于速度超出25km/小时车速时所有车辆，请联络我公司工程师。

MOTOR NUMBER 马达编号

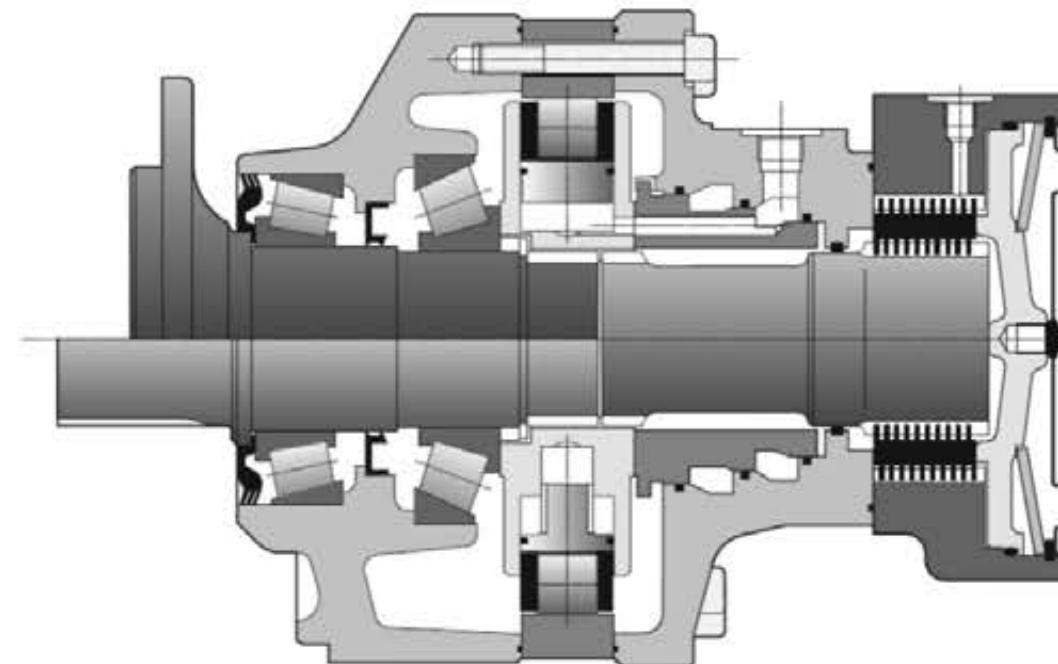
104

PAGE



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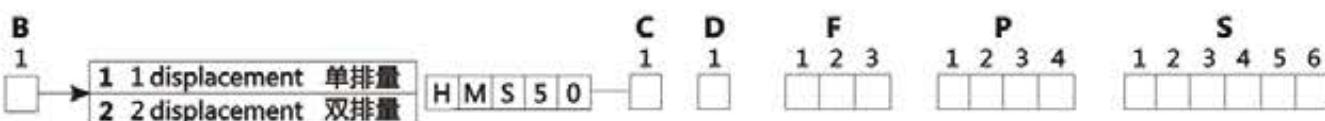
PAGE



马达惯量 = 1 kg.m²
噪音辐射 = 60 dB(A)

MOTOR PERFORMANCE HMS50 液压马达技术参数

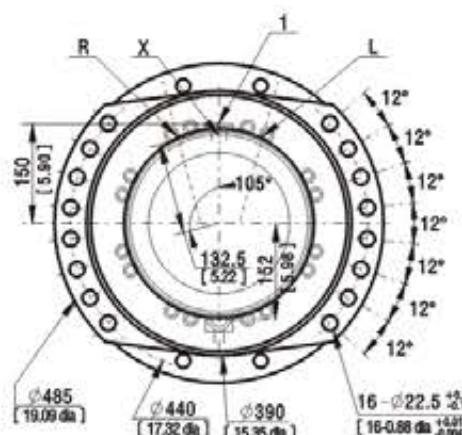
排量分组	7		8		0		1		2	
	全排量 Full displ	半排量 Half displ								
排量 Displacement (ml/r)	3500	1750	4008	2004	4996	1747			6012	3006
最大功率 Max Power (kw)	123	82	123	82	123	65			123	82
压差10MPa扭矩 Theoric torque at 10MPa (N.m)	5231	2562	5990	2935	7467	2558			8985	4402
额定扭矩 Rated torque (N.m)	13077		14975		18667		22463			
额定压力 Rated pressure (MPa)	25		25		25		25			
最高压力 Max Pressure (MPa)	40		40		40		35			
额定转速 Rated speed (r/min)	40		40		40		35			
转速范围 Speed range (r/min)	0-100		0-100		0-100		0-90			



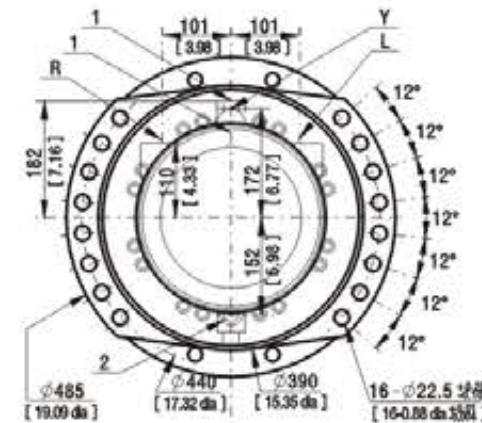
WHEEL MOTOR 轮式马达

The dimensional data is given in mm and in inches (inches are between brackets)
尺寸米制 (括号内英制)

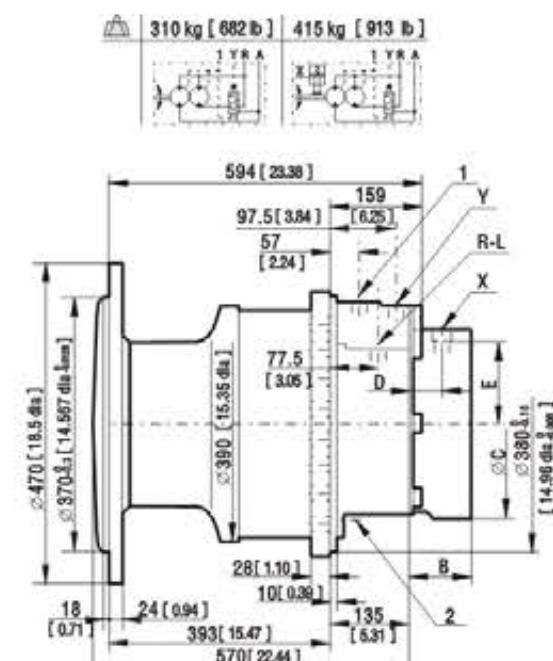
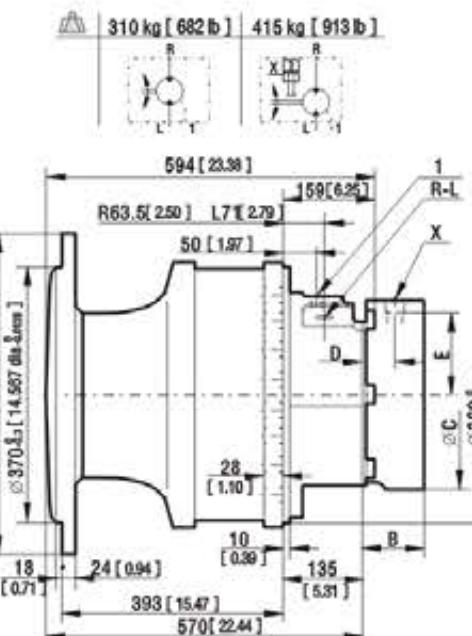
Dimensions for standard(1110) 1-displacement motor
(1110) 标准单排量马达尺寸



Dimensions for standard(1110) 2-displacement motor
(1110) 标准双排量马达尺寸

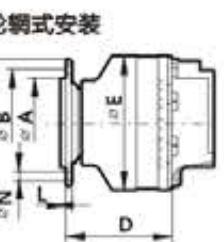
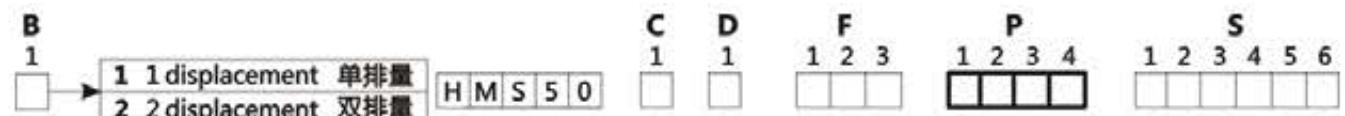


C	B	C	D	E
F42	157 [6.18]	Φ375 [14.76 dia.]	82 [3.22]	183.5 [7.22]
F50	200 [7.87]	Φ375 [14.76 dia.]	63.5 [2.50]	183.5 [7.22]





SUPPORT TYPES 前盖类型



C	A mm	B mm	C mm	D mm	E mm	N mm	轮辋安装 Wheel rim mounting	L mm
1 1 1 0 1 2 3 4 P	Ø370 [14.57dia]	Ø425 [16.73]	Ø472 [18.58dia.]	393 [15.47]	Ø390 [15.35dia.]	Ø26 [1.02dia]	12×M24×2	24 [0.94]
1 1 1 0 1 2 3 4 P	Ø370 [14.57dia]	Ø425 [16.73]	Ø472 [18.58dia.]	393 [15.47]	Ø390 [15.35dia.]	Ø26 [1.02dia]	12×M24×2	24 [0.94]

STUDS 螺栓

	Screws	P mm [in]	C min mm [in]	C max mm [in]	D mm [in]		Class 等级	Torque(1) 扭矩(1) Nm [ib.ft]	Torque(2) 扭矩(2) Nm [ib.ft]
Various Studs 各式螺栓	M22×1.5	80 [3.15]	5 [0.20]	36 [1.42]	26 [1.02]		12.9	695 [512.6]	1050 [774.4]
	M24×2	95 [3.74]		38 [1.50]	30 [1.18]			910 [671.2]	1150 [848.2]
Screws 螺纹	M20						12.9	600 [442.5]	770 [567.9]

(*)The tightening torques are given for the indicated loads.

(*)指上述负载的预紧扭矩

(1)Wheel rim:suggested thghtening torque for wheel rim mountings (Re steel disc>240N/mm² [>34800 PSI])

(1)轮辋：建议轮辋式安装的预紧扭矩 (Re steel disc>240N/mm² [>34800 PSI])

(2)Standard:suggested thghtening torque in other cases (Re steel flange>360N/mm² [>52215 PSI])

(2)标准：建议在其它情况安装时预紧扭矩 (Re steel flange>360N/mm² [>52215 PSI])

LOAD CURVES 负载曲线

Permissible radial loads 允许径向负载

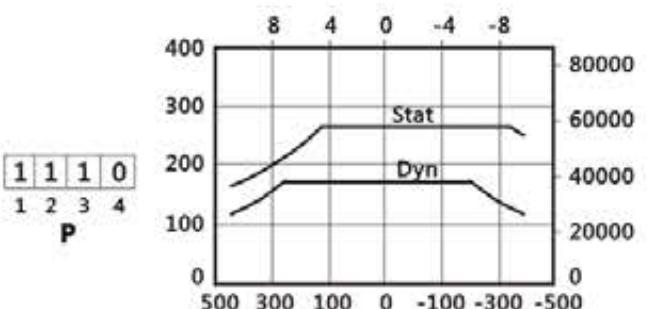
Test conditions 检测条件

Static : 0 r/min [0 RPM] 0bar [0 PSI] 静态 : 0 r/min [0 RPM] 0bar [0 PSI]

Dynamic : 0 r/min [0 RPM], code 0 displacement, 动态 : 0 r/min [0 RPM], code 0 displacement,

without axial load at max.torque 0组排量，无轴向力最大扭矩

0组排量，无轴向力最大扭矩

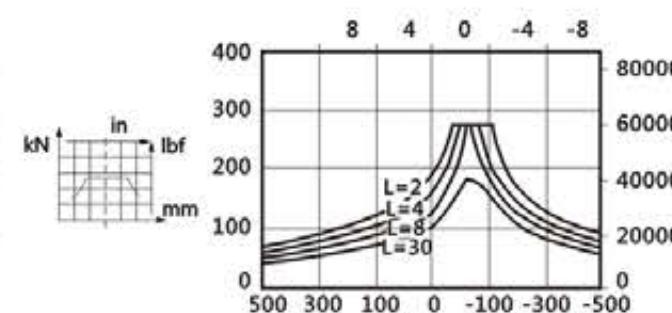


Service life of bearings 使用寿命

Test conditions 检测条件

L : Millions B10 revolutions at 150bar (average Pressure),with 25cst fluid, code 0 displacement, without axial load

0组排量无轴向力，粘度为25cst，平均压力为150bar，工作寿命为B10 100万次



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