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# GROB

ANTRIEBSTECHNIK

电 动 推 杆

Linear Actuator



页码  
Page

IP43电动推杆介绍

*Introduction linear actuator IP43*

4



型号一览表 / IP43电动推杆订购编号

*Type overview / Order code linear actuator IP43*

5

7-GL60D-0500-05...

IP43电动推杆

*Linear Actuator IP43*

6



控制器

*Control Box*

7



手持操作器

*Hand Operator*

8



IP43电动推杆部件清单

*Checklist linear actuator IP43*

9



“IP65电动推杆”介绍

*Introduction „linear actuator up to IP65 possible“*

10



“EMH”型号一览表

*Type overview „EMH“*

11

7-SAIP65-0100-6,5..

型号一览表 / “SAIP65”订购编号

*Type overview / Order code „SAIP65“*

12

IP65电动推杆

*Linear actuator up to IP65 possible*

13



“SAIP65”标准丝杆头

*Standard spindle ends „SAIP65“*

14



“SAIP65”部件清单

*Checklist „SAIP65“*

15



重型电动推杆介绍

*Introduction electromechanical linear actuator*

16 - 17



“EMH”型号一览表

*Type overview „EMH“*

18



“EMH”订购编号






*Order code „EMH“*

19

F20-M100-TR24x5..

# 产品目录

## Product Overview

	页码 Page	
M100基本型号 <i>M100 basic model</i>	20	
“EMH”标准丝杆头 <i>Standard ends „EMH“</i>	21 - 23	
KAD螺母型耳适配器 <i>Nut trunnion adaptor KAD</i>	24	
旋转轴承 <i>Swivel bearing</i>	25	
M205 减速电机直线形布置 <i>M205 geared motor linear arrangement</i>	26	
M501 直角垂直带型 <i>M501 right angled belt</i>	27	
M505 锥齿轮箱型 <i>M505 bevel gear box</i>	28	
M601 螺杆轴承型 <i>M601 worm bearing</i>	29	
M605 直接传动型 <i>M605 direct drive</i>	30	
计算 <i>Calculation</i>	31 - 33	$E=m \cdot c^2$
一般技术数据 <i>General technical data</i>	34	$E=m \cdot c^2$
滚珠丝杆 (KGT) <i>Ballscrew spindles (KGT)</i>	35	
重型电动推杆部件清单 <i>Checkliste electromechanical linear actuator</i>	36	
快速服务 <i>Express service</i>	37	
设计数据表 <i>Design sheet</i>	38	7-GL60D-0500-05... 7-SAIP65-0100-6,5..

所有型号都采用插头式连接和1米电缆的标准配置。限位开关是内置的。更详细的资料请联系我们。传动系是由减速电机和/或皮带电机传动。减速箱通过控制箱操作，直接切断电源。手动控制用于操作传动控制。

GROB电动推杆应用于：

- 医疗行业，用于调节康复领域床、椅以及其它辅助设施；
- 建筑物内用于调节窗户，翻门/窗，滑条 或其它设施以及空调系统；
- 用于工模具制造以及自动化工业中的调节和固定。

**注意：** 负载需要导向。超过550mm行程仅可用拉伸负载。

All models are provided as standard with jack plugs and 1 meter of cable. The limit switches are integrated (for internal use). For further information please ask our **GROB team**. The drive train is configured a geared motor drive and/ or belted motor drive. The gearboxes are operated through the **control box**, directly off the electrical supply. The **control box** provides voltage transformation. The manual controls are used to operate the control drives.

**GROB linear actuators are applied:**

- In medical technology, for adjustment of beds, chairs and other auxiliary devices in the rehabilitation sector.
- For the manipulation of windows, flaps, sliders or other applications in building and air conditioning technology.
- In the industry and jig manufacturing, as well as in the automation technology for pivoting, adjusting and fixing they are used

**Attention:** Load needs guidance. Upper 550 mm stroke only tensile loading acceptable



**IP43电动推杆**  
*Linear actuator IP43*

型号 Size	订购编号 Order code	最大提升力 max. lifting power [N]	速度 Speed [mm/sec]	行程 Stroke [mm]
GL60D	7-GL60D-0050-05-0	6000	5	50
	7-GL60D-0100-05-0	6000	5	100
	7-GL60D-0150-05-0	6000	5	150
	7-GL60D-0200-05-0	6000	5	200
	7-GL60D-0250-05-0	5400	5	250
	7-GL60D-0300-05-0	3900	5	300
	7-GL60D-0350-05-0	2900	5	350
	7-GL60D-0400-05-0	2300	5	400
	7-GL60D-0450-05-0	1900	5	450
	7-GL60D-0500-05-0	1500	5	500
	7-GL60D-0600-05-0	1100	5	600
	7-GL60D-0700-05-0	790	5	700
	7-GL60D-0800-05-0	610	5	800
	7-GL60D-0900-05-0	490	5	900
	7-GL60D-1000-05-0	400	5	1000
	7-GL60D-0050-20-0	2000	20	50
	7-GL60D-0100-20-0	2000	20	100
	7-GL60D-0150-20-0	2000	20	150
	7-GL60D-0200-20-0	2000	20	200
	7-GL60D-0250-20-0	1800	20	250
	7-GL60D-0300-20-0	1200	20	300
	7-GL60D-0350-20-0	966	20	350
	7-GL60D-0400-20-0	766	20	400
	7-GL60D-0450-20-0	630	20	450
	7-GL60D-0500-20-0	506	20	500
	7-GL60D-0600-20-0	366	20	600
	7-GL60D-0700-20-0	263	20	700
	7-GL60D-0800-20-0	202	20	800
	7-GL60D-0900-20-0	163	20	900
	7-GL60D-1000-20-0	133	20	1000

### 订购编号

### Order code



1. 产品样本  
7

2. 规格  
GL60D

3. 行程  
用 mm 表示

4. 速度  
用mm/sec 表示

5. 版本  
0 = 标准

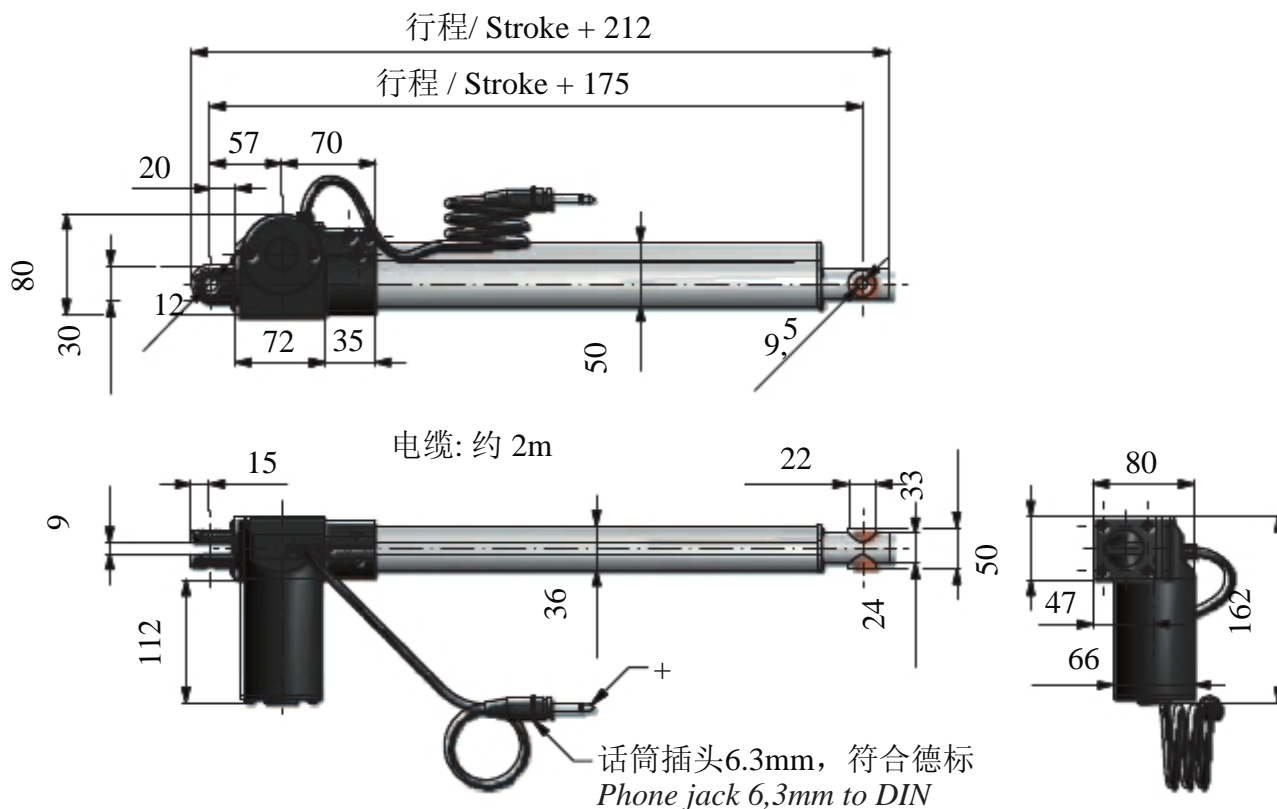
1. Article category  
7

2. Size  
GL60D

3. Stroke  
in mm angegeben

4. Speed  
in mm/sec angegeben

5. Version  
0 = Standard

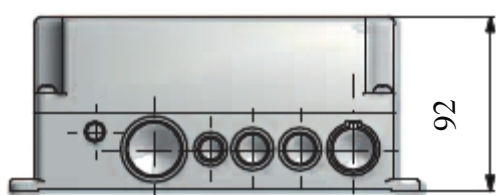


电缆长度: 约 2m  
Cable length: ca. 2m

输入电压	24 V/DC	
最大负载	6000 N	
速度	5 mm/sec.	(6000N)
行程	20 mm/sec.	(2000N)
可伸缩长度	50 ... 1000 mm	
静载	行程+ 175 mm	
工作制	8000 N	
限位开关	10%	
	控制箱	

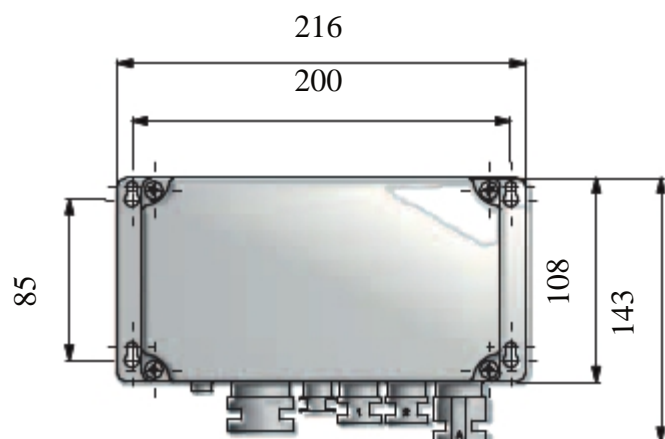
<b>Input power</b>	24 V/DC	
<b>Load Capacity</b>	6000 N	
<b>Speed</b>	5 mm/sec.	(6000N)
<b>Stroke</b>	20 mm/sec.	(2000N)
<b>Retracted Lengh</b>	50 ... 1000 mm	
<b>Static Load</b>	行程+ 175 mm	
<b>Duty Cycle</b>	8000 N	
<b>Limit switch</b>	10%	
	Control Box	

规格 Size	订购编号 Order code	输入电压 Input voltage	速度 Speed
GLB86	7-GLB86-24-010	[V] 1x230	1 Abgang
	7-GLB86-24-011	1x110	1 Abgang
	7-GLB86-24-020	1x230	2 Abgänge
	7-GLB86-24-021	1x110	2 Abgänge
	7-GLB86-24-040	1x230	4 Abgänge
	7-GLB86-24-021	1x110	4 Abgänge



输入电压	110 V oder 230 V/AC
输出电压	24 V/DC (86VA)
工作制	10 - 50%

带插头和电缆可连接1-4台电动推杆进行远程控制。



Input power	110 V or 230 V/AC
Output Power	24 V/DC (86VA)
Duty cycle	10 - 50%

Can connect 1-4 linear actuators remote control with plug and cable.

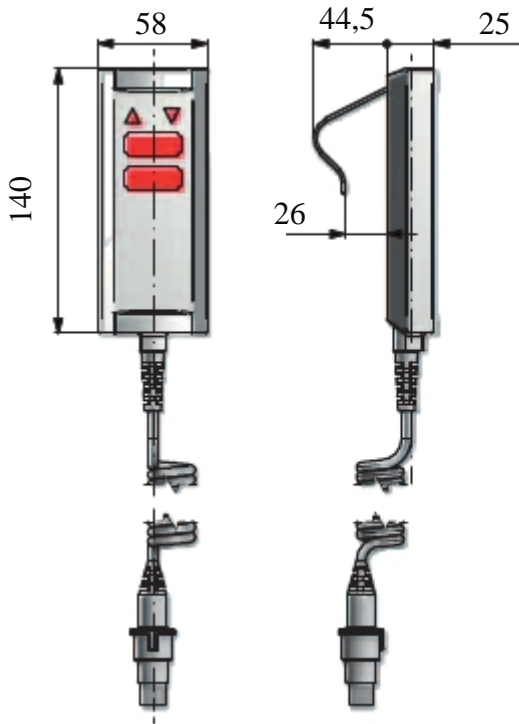


控制箱有灰色和黑色二种



Our control box is available in grey or black

尺寸 Size	订购编号 Order code	速度 Speed
GLH35	7-GLH35-01	1 Abgang / 1 Output
	7-GLH35-02	2 Abgänge / 2 Outputs
	7-GLH35-04	4 Abgänge / 4 Outputs



有黑、白二种颜色（标准为黑色），带插头和电缆  
可连接1-4台电动推杆进行远程控制。

*Available in black and white (Black standard)  
Can be connected to 1-4 linear actuators remote  
control available with plug and cable.*



# IP43电动推杆部件清单

## Checklist linear actuator IP43

负载: / Load: \_\_\_\_\_ kN

工作制 (ED): / Duty cycle: 10 %

负载类型: / Type of load:

拉力: / Tensile:  动态 / dynamic  静态 / static

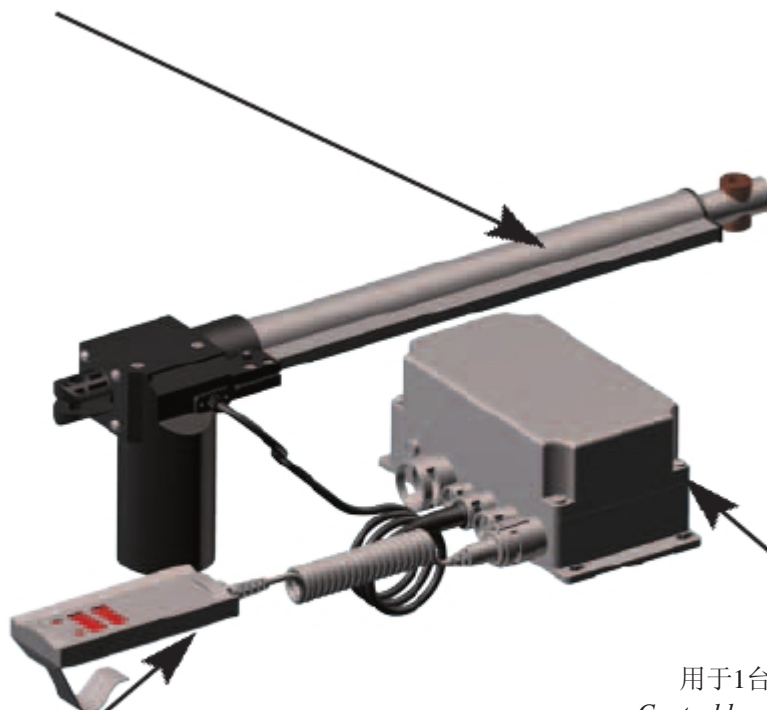
压力: / Compressive:  动态 / dynamic  静态 / static

行程长度: / Stroke length: \_\_\_\_\_ mm

提升速度: / Lifting speed:  5 mm/sec  20 mm/sec

其它/特殊: / Other / special: \_\_\_\_\_

- 1x** IP43电动推杆  
*1x Linear actuator IP43*
- 2x** IP43电动推杆  
*2x Linear actuator IP43*
- 3x** IP43电动推杆  
*3x Linear actuator IP43*
- 4x** IP43电动推杆  
*4x Linear actuator IP43*



- 用于1台电动推杆的手操器  
*Hand operator for 1 linear actuator*
- 用于2, 3和4台电动推杆的手操器  
*Hand operator for 2, 3 and 4 linear actuators*

- 用于1台电动推杆的控制器  
*Control box for 1 linear actuator*
- 用于2台电动推杆的控制器  
*Control box for 2 linear actuators*
- 用于2, 3和4台电动推杆的控制器  
*Control box for 2, 3 and 4 linear actuators*

**GROB IP65 电动推杆**用于户外，适用于多种不同场合。由于设计成IP65的防护等级，我们的齿轮箱是防尘的，可防止各个不同方向喷过来的水。

**GROB IP65 电动推杆**可用于：

- 倾斜和旋转太阳能电池板向着太阳
- 用于转动房顶上的太阳能电池板-
- 调整卫星天线
- 也可用于可移动系统

可用于其它类似的用途，特别是户外。

标准行程                      100 mm ... 800 mm

从100到800mm，50mm一档，所有行程都有。

*The **GROB IP65 linear actuators** are usable individually in outdoor areas and are suitable for many situations due to their many possible variations. Thanks to design in **protection class IP65**, our gearboxes are dustproof and protected against water jets from all directions.*

***GROB IP65 linear actuators** are used*

- *for tilting and turning solar cells towards the sun*
- *for swivelling solar cells on the roofs of houses*
- *for aligning parabolic antennas*
- *for mobile systems also*

*and are usable for similar applications, particularly outdoors.*

*Standard stroke                      100 mm ... 800mm*

*All stroke lengths available from 100 to 800 mm in 50 mm steps.*



**IP65电动推杆**  
*Linear actuator IP65*

尺寸 Size	丝杆 Spindle	速比 Ratio		速度 Speed	动载荷 dynamic load
				[mm/sec]	[N]
7-SAIP65	TR 16x4	4:1	So	50	1500
		5:1	So	40	1700
		6,5:1	So	30,77	2000
		10:1	So	20	2800
		15:1	Ss	13	3900
		20:1	Ss	10	4500
		30:1	Sd	6,67	6000
		40:1	Sd	5	6000
		50:1	Sd	4	6000
7-SAIP65	KGT 1602	4:1	So	25	1500
		5:1	So	20	1700
		6,5:1	So	15,38	2000
		10:1	So	10	2500
		15:1	So	6,67	2500
		20:1	So	5	2500
		30:1	So	3,33	2500
		40:1	So	2,5	2500
		50:1	So	2	2500

So = 无自锁  
Ss = 静载自锁  
Sd = 动载自锁

So = no self-locking  
Ss = static self-locking  
Sd = dynamic self-locking

## 电机

## Motor

直流电机	
<b>GR63x55</b>	
输入电压	24 V/DC
电流	$A_{Nenn} = 4,9 \text{ A}$
引擎转速	3350 1/min
功率	94,7 kW
防护等级	IP65
三相电机	
<b>M056</b>	
输入电压	230 / 400 V
频率	50 Hz
引擎转速	3000 1/min
功率	0,09 kW
防护等级	IP65
版本	B14
三相电机	
<b>M063</b>	
输入电压	230 / 400 V
频率	50 Hz
引擎转速	3000 1/min
功率	0,18 kW
防护等级	IP65
版本	B14

DC-Motor	
<b>GR63x55</b>	
Input voltage	24 V/DC
Current	$A_{Nenn} = 4,9 \text{ A}$
Engine speed	3350 1/min
Power	94,7 kW
Protection class	IP65
3 phase motor	
<b>M056</b>	
Input voltage	230 / 400 V
Frequency	50 Hz
Engine speed	3000 1/min
Power	0,09 kW
Protection class	IP65
Version	B14
3 phase motor	
<b>M063</b>	
Input voltage	230 / 400 V
Frequency	50 Hz
Engine speed	3000 1/min
Power	0,18 kW
Protection class	IP65
Version	B14

行程 <i>Stroke</i>	总负载 <i>Gross load</i>
[mm]	[N]
100	8000
200	8000
300	8000
400	6780
500	4450
600	3150
700	2350
800	1800

### 订购编号 *Order code*

7	SAIP65	0100	6,5	1,44	0	0
1.	2.	3.	4.	5.	6.	7.

#### 1. 产品样本

7

#### 2. 型号

SAIP65

#### 3. 行程

in mm angegeben

#### 4. 速比

4 = 4:1

5 = 5:1

6,5 = 6,5:1

10 = 10:1

15 = 15:1

20 = 20:1

30 = 30:1

40 = 40:1

50 = 50:1

#### 5. 速度t

用 mm/sec 表示

#### 6. 限位开关

0 = ohne

1 = mit

#### 7. 版本

0 = Standard

#### 1. Article category

7

#### 2. Size

SAIP65

#### 3. Stroke

Please state in mm

#### 4. Ratio

4 = 4:1

5 = 5:1

6,5 = 6,5:1

10 = 10:1

15 = 15:1

20 = 20:1

30 = 30:1

40 = 40:1

50 = 50:1

#### 5. Speed

Please state in mm/sec

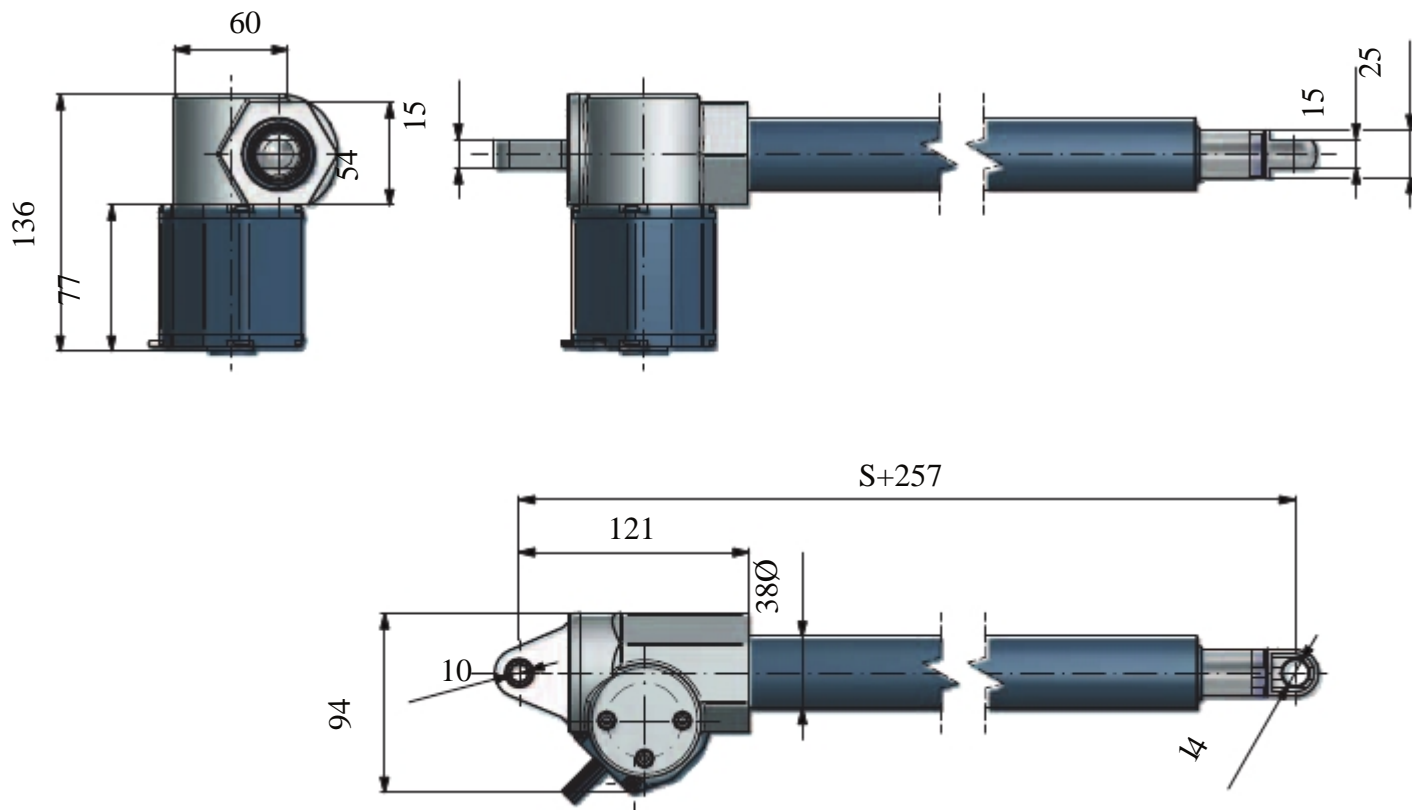
#### 6. Limit switch

0 = without

1 = with

#### 7. Version

0 = Standard



推杆孔径 mm		25
推杆导向孔径 mm		36
电机功率 W		60...150

其它型号如有需要也可提供

电机电压 V		DC12...DC24 AC230...240
电机转速 rpm		3000
最大动载 N		6000
最大拉力 N		8000
最大压力 N (按行程有所不同)		8000

限位开关  
磁性传感器

Anbaubeispiele auf vorletzte Seite!

Diameter aperture plunger mm		25
Diameter perture dip stick guide mm		36
Motor capacity W		60...150

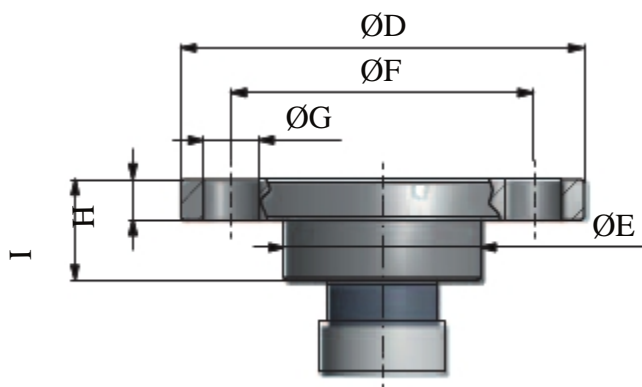
Other typs on request

Motor voltage V		DC12...DC24 AC230...240
Motor rotation speed rpm		3000
Dynamic strain N		6000
Tensile load N		8000
Compression load N (addicted from the stroke)		8000

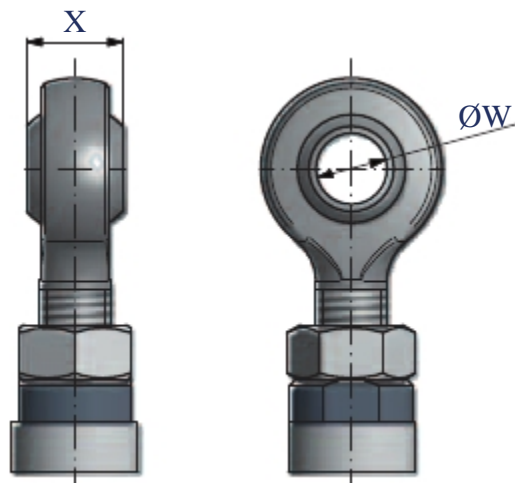
Limit switches  
Magnetic sensors

Cultivation examples on the last but one side!

**FP端头**  
*End FP*

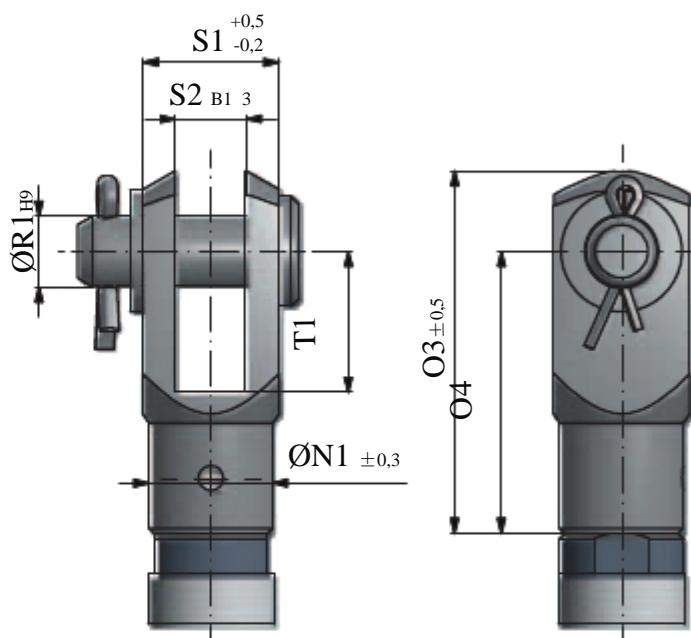


**KGK端头**  
*End KGK*



索引	7-SAIP65
<b>Kopf FP</b>	<b>End FP</b>
ØD	80
ØE	39
ØF	60
4xØG	11
H	8
I	20
螺纹 thread	M14
紧定螺丝 setscrew	M6
<b>KGK端头</b>	<b>End KGK</b>
ØW	14
X	19
螺纹 thread	M14
<b>GS端头</b>	<b>End GS</b>
ØN1 ±0,3	24,5
N2 h11	27
O3 ±0,5	72
O4	56
ØR1 H9	14
S1 <sup>+0,5</sup> / <sub>-0,2</sub>	27
S2 B13	14
T1	28

**GS端头**  
*End GS*



负载: / Load: \_\_\_\_\_ kN

工作制 (ED): / Duty cycle: 10 %

负载类型: / Type of load:

拉力: / Tensile:

动态; / dynamic

静态/ static

压力: / Compressive:

动态 / dynamic

静态/ static

行程: / Stroke length: \_\_\_\_\_ mm

提升速度: / Lifting speed:

5 mm/sec

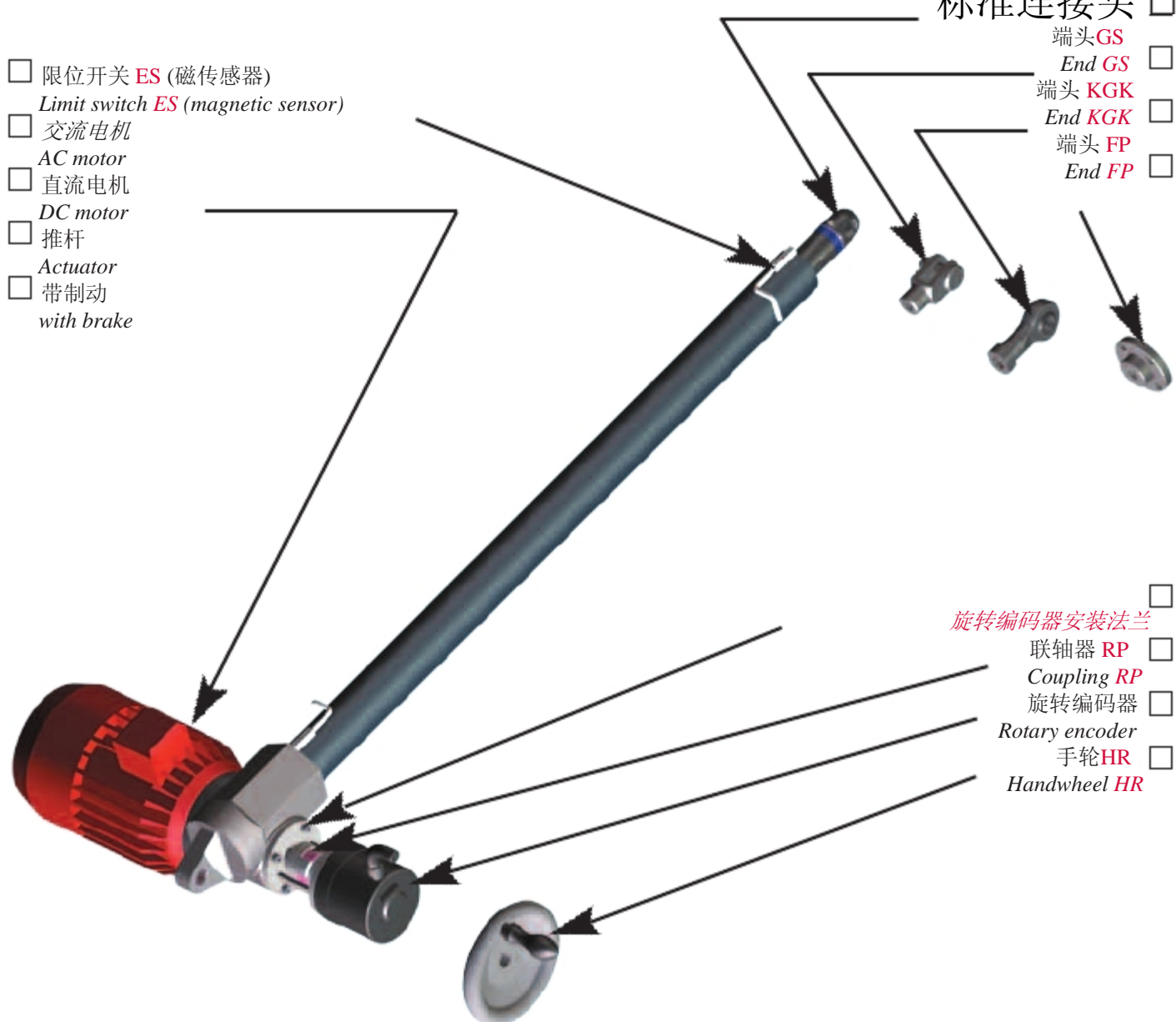
20 mm/sec

其它/特殊: / Other / special: \_\_\_\_\_

- 限位开关 ES (磁传感器)  
Limit switch ES (magnetic sensor)
- 交流电机  
AC motor
- 直流电机  
DC motor
- 推杆  
Actuator
- 带制动  
with brake

## 标准连接头

- 端头 GS   
End GS
- 端头 KGK   
End KGK
- 端头 FP   
End FP



- 旋转编码器安装法兰   
联轴器 RP   
Coupling RP
- 旋转编码器   
Rotary encoder
- 手轮 HR   
Handwheel HR

Grob的重型电动推杆通过电机带动连接滚珠丝杆或梯形丝杆使滚筒轴，从而控制速度和位置。标准行程范围100-1500mm。如需要还可提供不同的行程。最大动载为70000N。

这种机电调整方法具有液压和气动无法比拟的优势。可广泛安装在各种工业设备机器上有运动需要的地方，而无需使用手动，气动或液压方式。

#### 优势

- 容易安装。可水平，垂直或倾斜安装
- 与其它调节装置互配性好
- 以恒定的速度运动
- 停止时不耗能
- 工作时低噪音
- 双向恒定推力
- 对温度变化不敏感

低维护和寿命周期成本

- 有很大的速度范围可选

#### 丝杆型号

滚珠丝杆通过滚珠轴承的转动达到很低的摩擦损失，从而达到高效率。滚珠丝杆不自锁，从而可以用于高占空比的工作制。

*Grob's electromechanical linear actuators are a combination of ball-screw or ball-screw or trapezoidal screws driven via electrical motors which move a cylinder spindle, thus controlling both speed and position. Standard strokes range from 100 to 1.500 mm. Different lengths are available upon request. The maximum dynamic load capacity is 70.000N.*

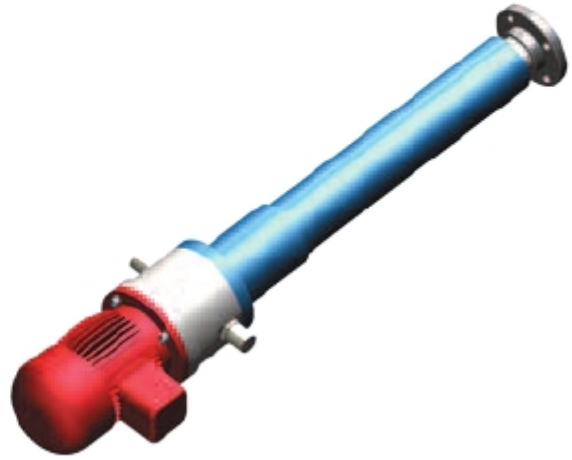
*The electromechanical adjustment unit outmatches hydraulic and pneumatic solution and they can be installed on practically any kind of industrial machine where movement is required without using manual, pneumatic or hydraulic methods.*

#### Advantages

- *Easy to install. They can be fixed horizontally, vertically or inclined.*
- *Interchangeable with other adjustment units.*
- *They move at a constant speed.*
- *No power consumption at stoppage.*
- *Low noise emission during working time.*
- *Constant thrust in both directions.*
- *Insensitive to temperature change.*
- *Low maintenance and life cycle costs.*
- *Wide range of speed available.*

#### Screw type

*The ball-screw has a high efficiency due to the low frictional losses imparted by the rotation of ball bearings. They are not self locking and can be used for high duty cycles.*



如负载和工作制都很低，也就意味着推杆工作时会有很长一段时间停止不动，可采用梯形丝杆带自锁功能在。

### 操作

D可手动操作或电机带动。配直流或交流电机的推杆可有。

### 变速

电机通常配备一个变速箱，这是必须的，当电机关掉时可使推杆处于一个锁定位置。如推杆可以反向驱动，可采用制动电机。制动电机的选用需考虑负载或尺寸。变速箱的可选速比范围很大，可安装制动电机。更详细的信息可向我们咨询。

### 丝杆效率

由于钢珠沿着螺纹方向滚动，所以滚珠丝杆的磨擦系数非常低。由于这个原因，机械效率几乎可以达到100%。

*If the load is low and the duty cycle is low, which means the actuator works periodically with long stops, a trapezoidal screw can be used with self locking feature.*

### Operation

*The operation can be manual or with electric motors. Both continuous current (DC) motors and alternating current (AC) motors are available.*

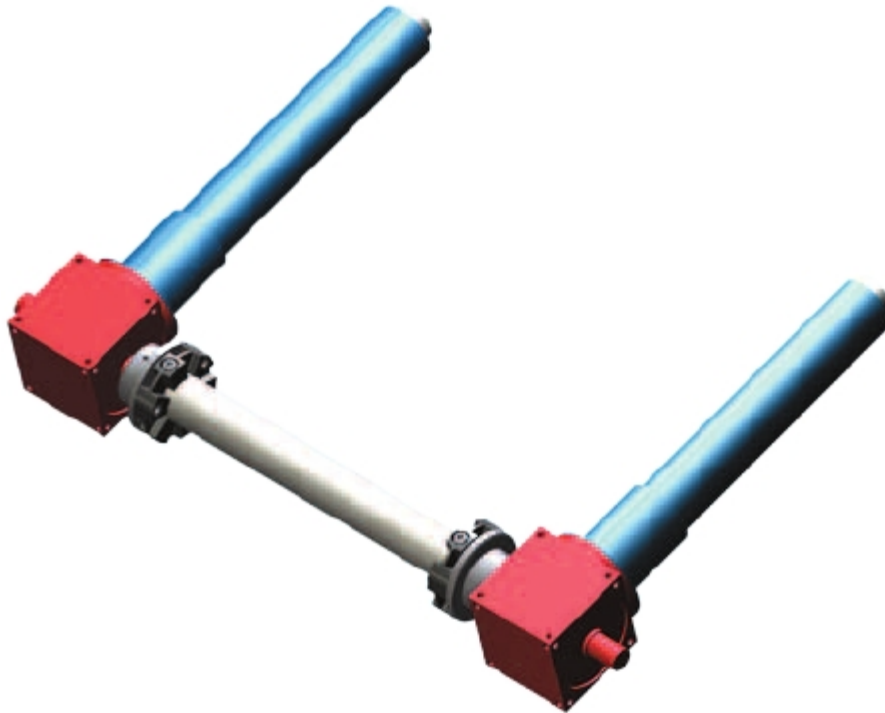
### Gears

*The motors are generally fitted with a gear box which is necessary to maintain the actuator in a locked position when the motor is switched off. If the actuator can back-drive, a braked motor can be utilised. Depend on the load or the dimensioning a brake motor can be utilised. A wide range of gearbox ratios are available, and they can be fitted to braked motors. For further details please ask our **GROB team**.*

### The screw's efficiency

*The ball screw's friction coefficient is very low due to the rolling of the ball bearing along the screw. Due to this, a mechanical efficiency of approximately 100 % can be achieved.*

规格		基本型 <b>M100</b> Basic model <b>M100</b>							Size
		F16	F20	F30	F40	F45	F50		
采用梯形丝杆时的最大提升力	kN	3	7,5	15	20	30	40	kN	Max lifting force with Tr spindle
采用梯形丝杆时的最大拉力	kN	3	7,5	15	20	30	40	kN	Max tensile force with Tr spindle
梯形丝杆		16x4	24x5	36x6	45x7	50x8	60x9		Spindle TR
怠速t	Nm	0,38	0,52	1,6	1,9	2,1	2,1	Nm	Idling torque N
不含丝杆推杆重量	kg	2	3,1	8	17,1	28,3	75	kg	Weight of electromechanical linear actuator exclusive spindle
每 100 mm行程重量	kg	0,75	1,7	2,6	4,9	5,2	7,2	kg	Weight per 100 mm stroke



<b>F20</b>	<b>M100</b>	<b>TR24x5</b>	<b>0100</b>	<b>FP</b>	<b>M605</b>
1.	2.	3.	4.	5.	6.

1. 规格

**F16, F20, F30, F40, F50**

2. 版本

**M100** = Grundmodell

3. 丝杆

**KGT2005** = 滚珠丝杆

**TR16x4** = 梯形丝杆, (如非标, 请说明)

4. 行程

用mm表示

(注:如使用波纹管 (FB) 和螺纹保护套 (SF) 加尺寸T)

5. 丝杆头

**OE** = 无连接

**FP** = 安装法兰

**GK** = 凸形连接叉

**KGK** = 杆端轴承

**GS** = 凹形连接叉

6. 附件

**KAD** = 螺母耳轴适配器

**M205** = 减速电机

**M501** = 减速皮带传动

**M505** = 锥齿轮箱

**M601** = 蜗杆轴承

**M605** = 直接驱动

**SL** = 旋转轴承

1. Size

**F16, F20, F30, F40, F50**

2. Version

**M100** = Basic model

3. Spindle

**KGT2005** = Ball screw

**TR16x4** = Trapezoidal, if different from standard, please state

4. Stroke

Please state in mm

(Note: The use of bellows (FB) and spiral protective sleeve (SF) extends dimension T)

5. Spindelenden

**OE** = no rod end

**FP** = Mounting flange

**GK** = Male clevis

**KGK** = Rod end bearing

**GS** = Female clevis

6. Accessories

**KAD** = Nut trunnion adaptor

**M205** = Geared motor

**M501** = Geared belt drive

**M505** = Bevel gear box

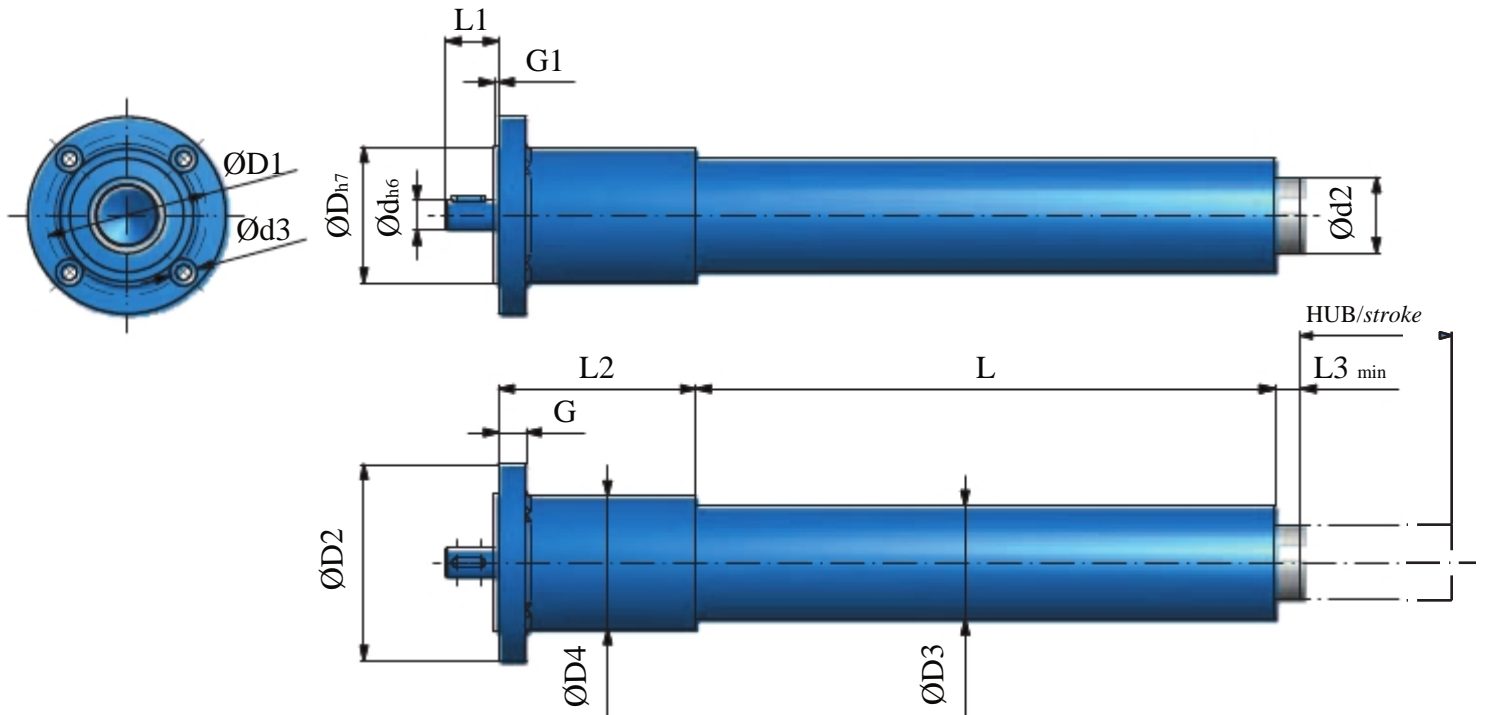
**M601** = Worm bearing

**M605** = Direct drive

**SL** = Swivel bearing

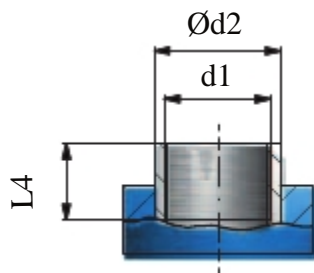
基本型推杆设计成可以很容易与几种驱动方式相配，如，手动，电动，机械，等。线性速度取决于电机的转速以及螺距。推力取决于螺距和电机功率。也可通过锥齿轮箱平行布置同时操作多台推杆。

The basic model actuator has been designed to easily attach several types of drive i.e. manual, electrical, mechanical, etc. The linear speed depends the RPM of the motor and the pitch of the screw. The thrust depends on the screw pitch and motor power. It is also possible to operate with several linear actuators which are aligned with bevel gear in parallel arrangement.

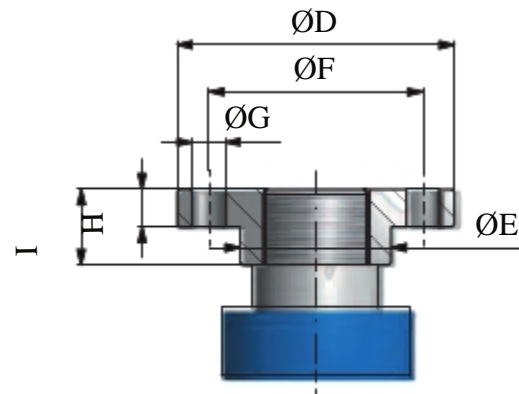


型号	F16-M100	F20-M100	F30-M100	F40-M100	F45-M100	F50-M100
梯形丝杆 Tr Spindle	16x4	24x5	36x6	44x7	50x8	60x9
标准行程 Standard strokes	100,200,300	100,200,300	200, 400, 600	250,500, 750	250,500, 750	300, 600, 1000
d h6	11	14	19	24	35	35
d2	32	35	50	70	80	90
d3	7(4x)	9(4x)	11(4x)	11(6x)	13(6x)	13(6x)
D h8	48	72	90	110	145	200
D1	56	84	106	130	170	225
D2	75	110	130	150	195	250
D3	40	55	75	90	112	150
D4	45	66	88	110	140	196
G	12	15	18	20	25	30
G1	2	2	3	4	5	5
L	79+行程/stroke	108+行程/stroke	124+行程/ stroke	155+行程/stroke	208+行程/stroke	185+行程/ stroke
L1	15	30	35	40	55	60
L2	61	100	130	150	195	300
L3	41	36	37	68	60	95

端头OE  
End OE



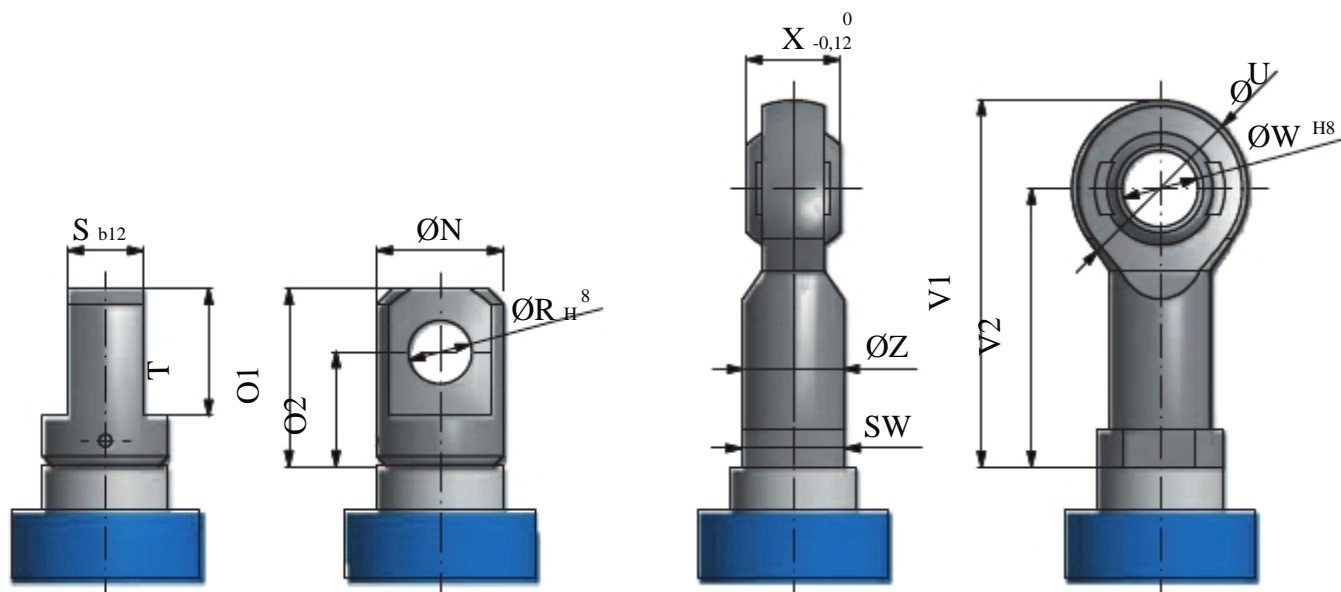
端头FP  
End FP



索引	F16	F20	F30	F40	F45	F50
端头OE	End OE					
d1	M26x1,5	M27x2	M42x2	M60x2	M70x2	M80x2
Ød2	32	35	50	70	80	90
L4	20	25	30	35	35	40
端头FP	End FP					
ØD	80	90	110	150	170	200
ØE	38,7	46	60	85	90	105
ØF	60	67	85	117	130	155
4xØG	11	11	13	17	21	25
H	8	10	15	20	25	30
I	21	23	30	50	50	60
螺纹 thread	M6	M8	M8	M10	M10	M10
紧定螺丝 setscrew	M14	M20	M30	M36	M48x2	M56x2

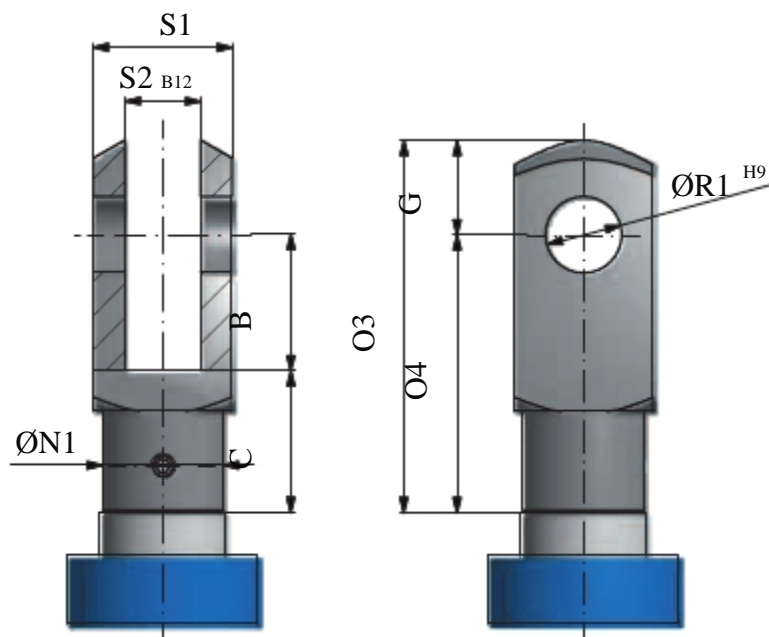
## GK端头 End GK

## KGK端头 End KGK

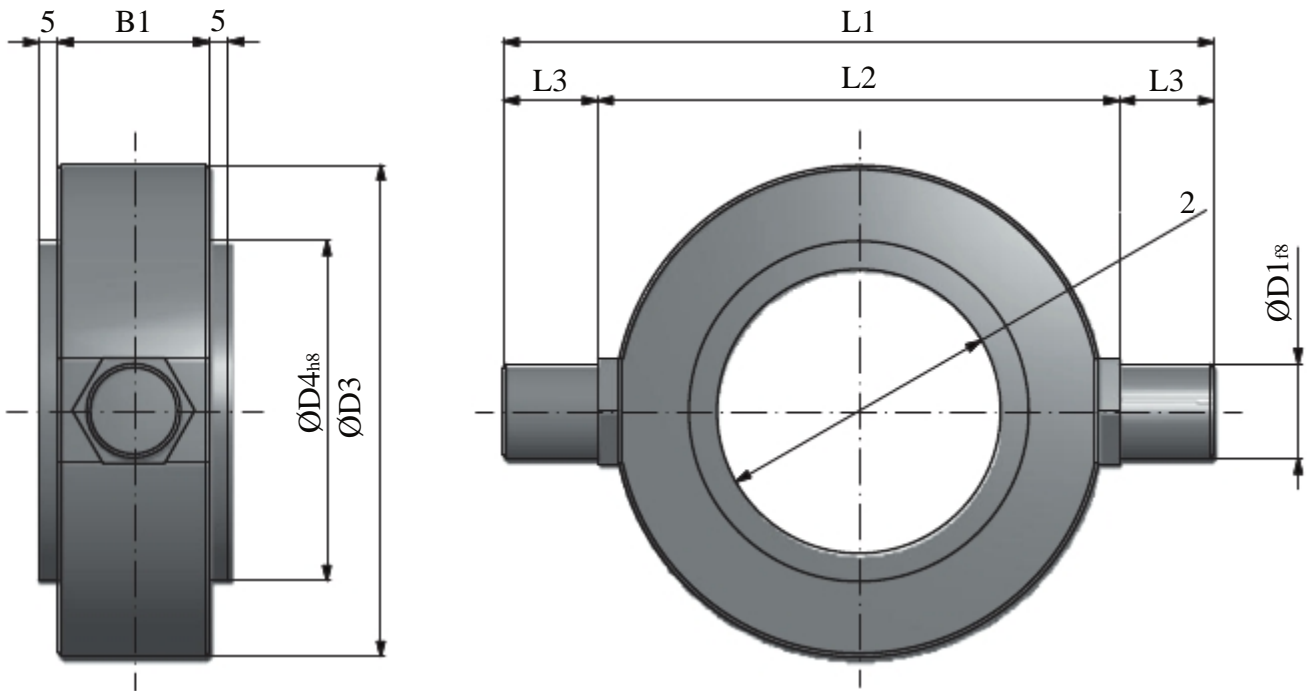


索引	F16	F20	F30	F40	F45	F50
<b>端头GK</b>	<i>End GK</i>					
ØN	-	-	-	80	90	100
O1	-	-	-	120	135	150
O2	-	-	-	80	90	100
ØR <sub>H8</sub>	-	-	-	45	50	60
S <sub>b12</sub>	-	-	-	60	65	70
T	-	-	-	90	95	110
螺纹 thread	-	-	-	M42x3	M45x3	M56x2
<b>螺纹KGK</b>	<i>End KGK</i>					
ØU	40	53	73	102	112	135
V1	81	103,5	146,5	196	216	242,5
V2	61	77	110	145	160	175
ØW <sub>H8</sub>	15	20	30	45	50	60
X <sub>-0,12</sub> <sup>0</sup>	12	16	22	32	35	44
ØZ	21	27,5	40	58	62	70
螺纹 thread	M14	M20x1,5	M30x2	M39x3	M45x3	M52x3

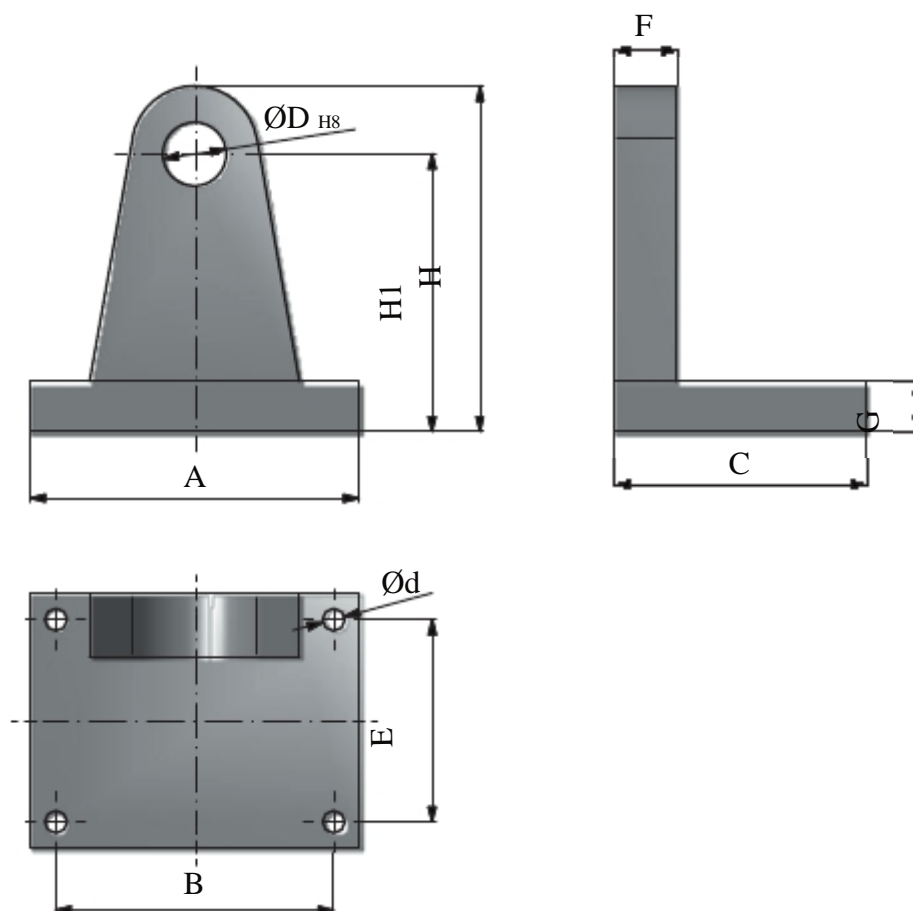
GS端头  
End GS



索引	F16	F20	F30	F40	F45
端头GS	<i>End GS</i>				
B	32	40	54	84	96
C	32	40	56	84	96
G	19	25	38	64	73
ØN1	30	34	48	70	82
O3	83	105	148	232	265
O4	64	80	110	168	192
ØR1 H9	16	20	30	40	50
□S1	32	40	55	85	96
S2 B12	16	20	30	40	50
螺纹 thread	-	M20	M30	-	M48x2



索引	F16	F20	F30	F40	F45	F50
B1	30	35	40	50	55	60
ØD1 <sub>f8</sub>	15	20	25	35	40	45
ØD2	40	55	75	90	112	150
ØD3	75	110	130	150	190	250
ØD4 <sub>h8</sub>	48	72	90	110	145	200
L2	82	116	138	160	200	260
L3	18	20	25	35	35	45



索引	F16	F20	F30	F40	F45	F50
A	80	100	130	200	220	240
B	60	80	110	170	190	210
C	65	80	100	150	170	180
ØD H8	15	20	25	35	40	45
Ød	7	9	9	11	13	13
E	45	60	80	120	130	150
F	18	20	25	35	40	45
G	12	15	20	30	30	35
H	80	107	137	188	200	222
H1	65	85	110	150	160	175

M205推杆设计成可在中低速下移动大载荷。

M205 actuator has been designed to move large loads at low and medium speeds.

### 部件

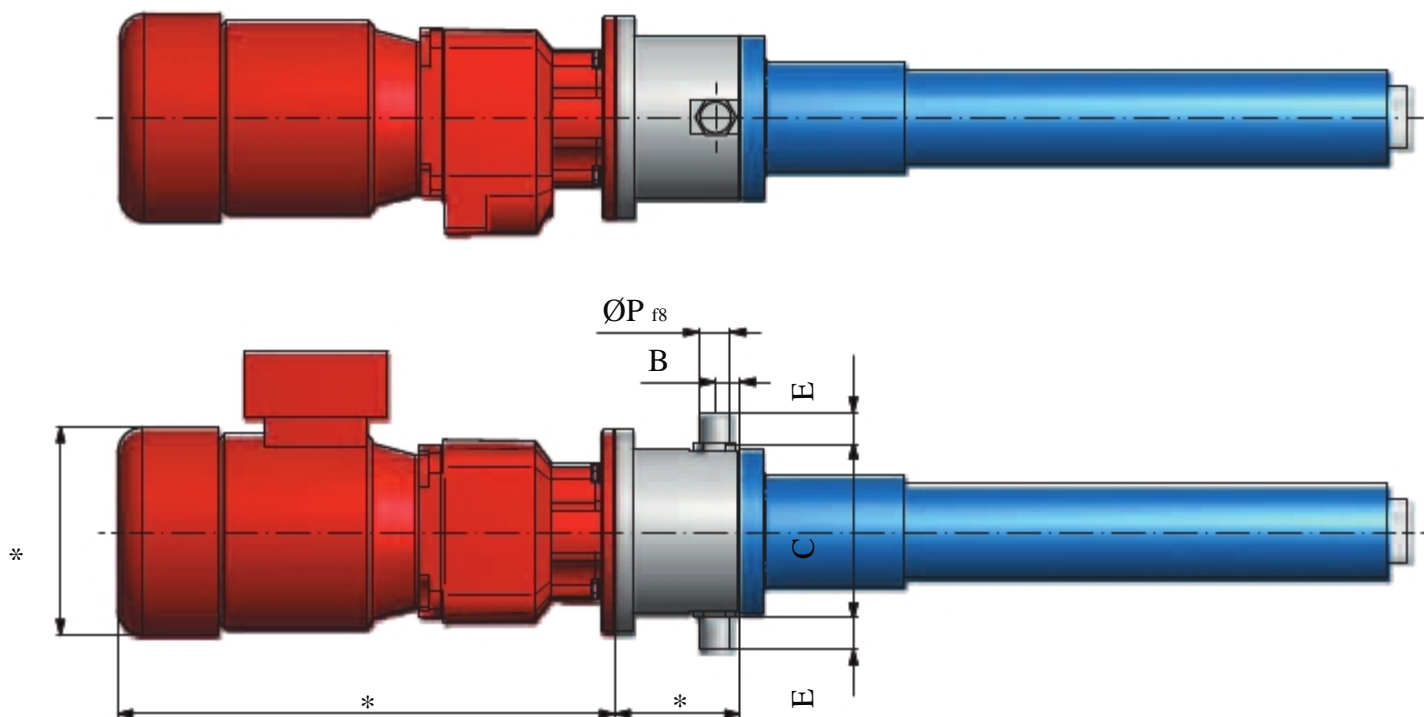
- 推杆: M100基本型
- 固定: 倾斜电机皮带
- 驱动: 减速电机 (制动可选)

### Components

- **Actuator:** M100 Basic model
- **Fixation:** Tilting motor bell
- **Drive:** Geared motor (brake in optional)

\* 取决于电机

\* depending on the motor



索引	转速	速比											
	Engine speed [1/min]	Ratio											
M205	3000	2,5:1	3:1	4:1	5:1	6:1	10:1	20:1	50:1	100:1	250:1	500:1	1000:1
	1500	2,5:1	3:1	4:1	5:1	6:1	10:1	20:1	50:1	100:1	250:1	500:1	1000:1
	1000	2,5:1	3:1	4:1	5:1	6:1	10:1	20:1	50:1	100:1	250:1	500:1	1000:1
	750	2,5:1	3:1	4:1	5:1	6:1	10:1	20:1	50:1	100:1	250:1	500:1	1000:1

索引	F20-M205	F30-M205	F40-M205	F45-M205	F50-M205
B	15	20	30	35	40
C	116	138	160	200	260
E	20	25	35	35	45
P f8	20	25	35	40	45

### 电机与推杆平行布置

#### Parallel motors

M501推杆设计 成可以提升中等负荷以及有很大的可选速度范围。推杆可由减速电机驱动或减速皮带传动。

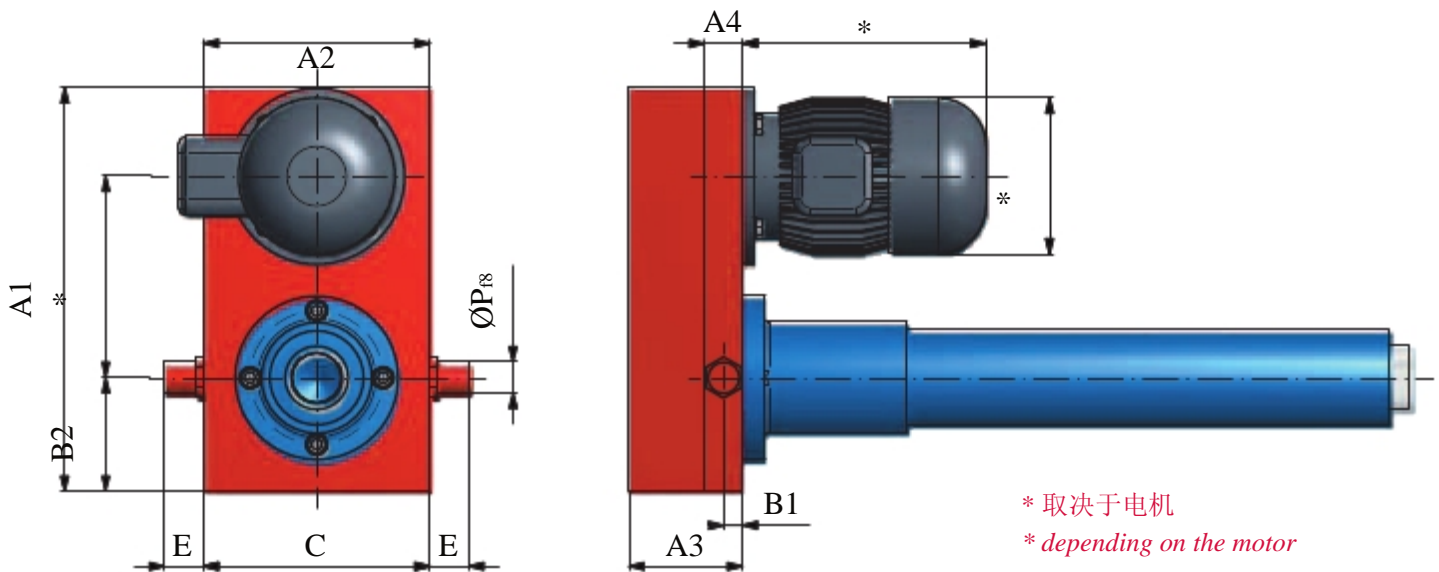
M501 actuator has been designed to lift medium loads and a wide range of speeds. It is a drive gear motor and gear belt drive transmission.

#### 部件

- 推杆: **M100 基本型**
- 固定: 用带螺杆的钢板支撑板支撑
- 驱动: 电机或减速电机和带齿皮带驱动  
(制动可选)
- 速比: 1:1 或 2:1

#### Components

- **Actuator:** **M100 Basic model**
- **Fixation:** Plate with tipper studs supports
- **Drive:** Motor or geared motor and toothed belt driven (brake in optional)
- **Ratio:** 1:1 or 2:1



\* 取决于电机  
\* depending on the motor

索引	F16-M501	F20-M501	F30-M501	F40-M501	F45-M501	F50-M501
A1	245	300	320	490	540	600
A2	130	150	180	250	-	300
A3	70	85	90	135	160	182
A4	20	25	30	40	45	50
B1	10	12,5	15	20	22,5	25
B2	50	65	90	135	135	135
C	138	160	192	270	290	320
E	18	20	25	35	35	45
ØP <sub>18</sub>	12	20	25	35	40	45

M505推杆设计成可在直角安装电机的驱动下，与多台推杆平行安装的模式。

The M505 actuator has been designed to easily attach several actuators in parallel order powered by a rectangular mounted motor.

## 部件

- 推杆: M100 基本型 1 (特殊)
- 固定: 锥齿轮箱

## Components

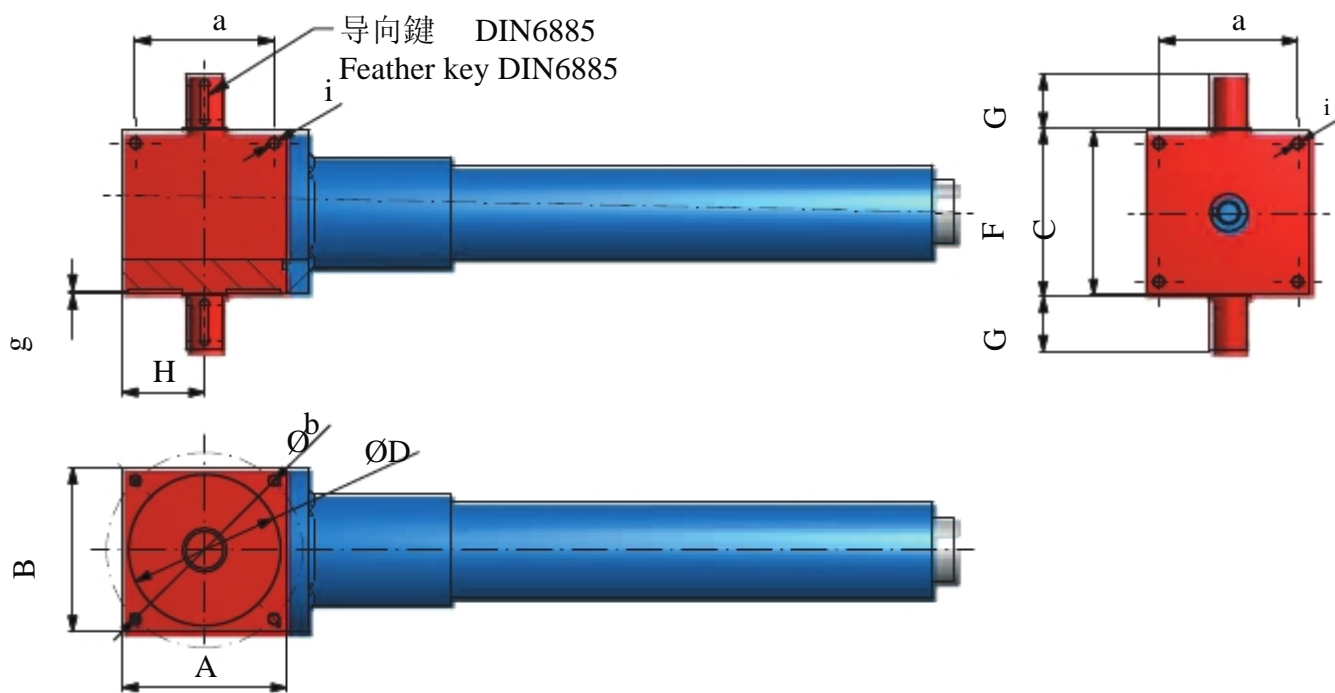
- Actuator: M100 Basic model (special)
- Fixation: Bevel gearbox

F40-M505 & F50-M505 详细资料请联系我们

F40-M505 & F50-M505 on request

注意: 标准速比是1:1—其它速比请联系我们。

ATTENTION!! The ratio 1:1 is standard - more ratios on request.



索引	F16-M505	F20-M505	F30-M505
Ød rs	14	16	19
A	65	89	120
B	70	90	120
C	84	110	154
ØD	58	62	75
F	86	112,5	158
G	25	34	40
H	32,5	45	60
a	45	70	100
Øb	75	75	100
g	2	3	5
i	M6x10	M8x14	M10x18

### 直角齿轮传动

#### Right angled gear drive

M601 推杆设计成可以用中低速提升重负。载

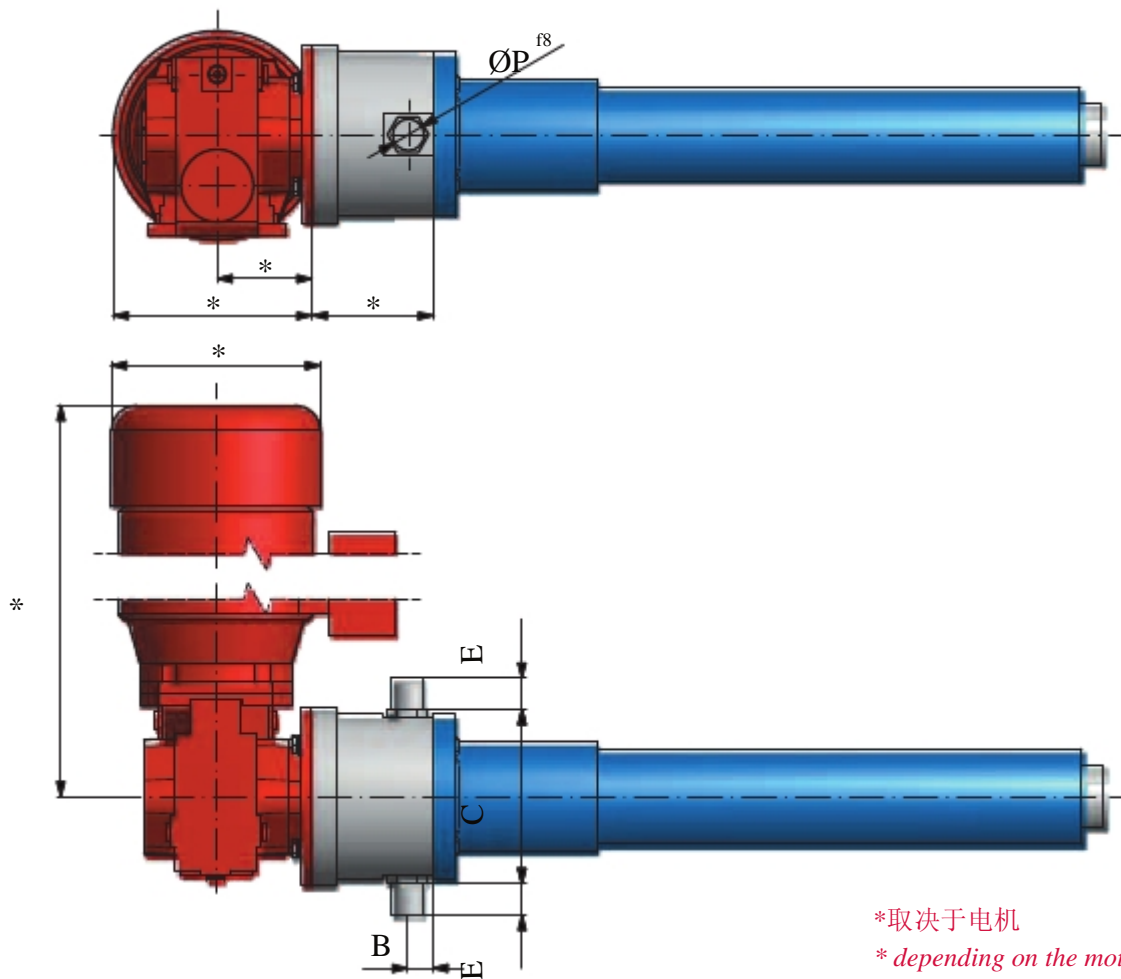
M601 actuator has been designed for heavy loads and small and medium speeds.

#### 部件

- 推杆: M100 基本型
- 固定: 倾斜电机皮带
- 驱动: 带蜗轮蜗杆的减速电机 (带制动可选)

#### Components

- **Actuator:** M100 Basic model
- **Fixation:** Tilting motor bell
- **Drive:** Gear motor with worm wheel and shaft (brake in optional)



\*取决于电机  
\* depending on the motor

索引	F20-M601	F30-M601	F40-M601	F45-M601	F50-M601
B	15	20	30	35	40
C	116	138	160	200	260
E	20	25	35	35	45
ØP f8	20	25	35	40	45

M601 推杆设计成用于高速运动和中低负载.

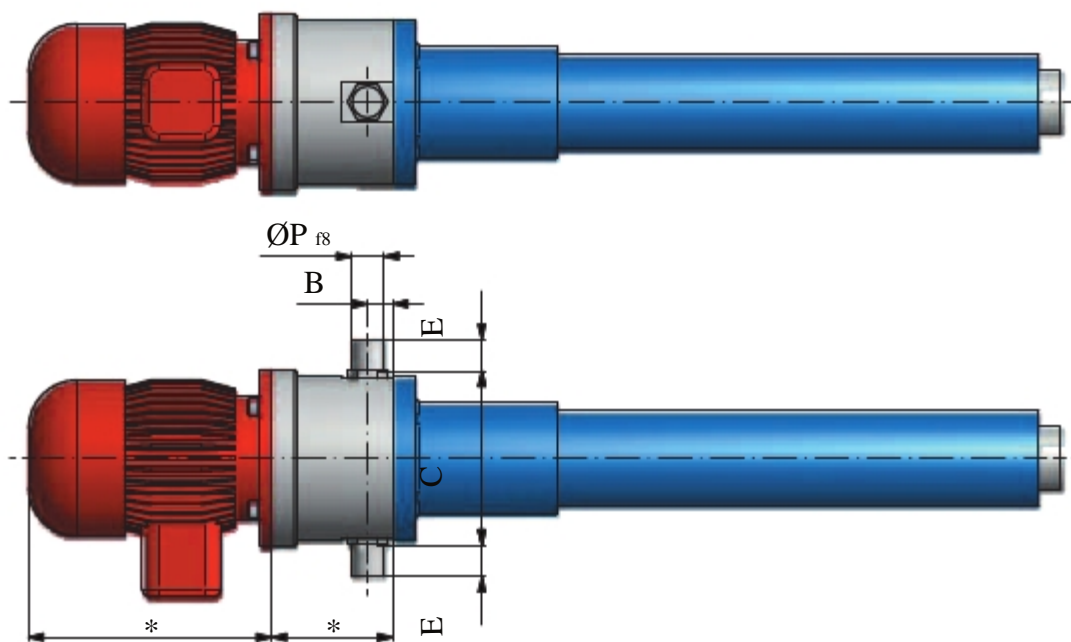
M605 actuator has been designed for high travel speeds and low-medium loads.

## 部件

- 推杆: **M100** Grundmodell
- 固定: Motorglocke mit Schwenkzapfen
- 驱动: Antrieb axial angeordnet (Bremse optional)
- 速比: 1:1

## Components

- **Actuator:** **M100** Basic model
- **Fixation:** Tilting motor bell
- **Drive:** Engine in line (brake in optional)
- **Ratio:** 1:1



\* 取决于电机  
\* depending on the motor

索引	F16-M605	F20-M605	F30-M605	F40-M605	F45-M605	F50-M605
B	12	15	20	30	35	40
C	82	116	138	160	200	260
E	18	20	25	35	35	45
P	12	20	25	35	40	45

节圆直径

Pitch diameter

$$d_2 = d - 0,5 \cdot P_h$$

节圆直径  
Pitch diameter

$d_2$  = 节圆直径  
 $d$  = 节距公称直径  
 $P_h$  = 主轴间距

= Pitch diameter = [mm]  
= Nominal diameter of pitch = [mm]  
= Spindle pitch = [mm]

提升速度

Lifting speed

$$v = n_1 \cdot \frac{P_h}{i}$$

提升速度  
Lifting speed

$v$  = Hubgeschwindigkeit  
 $n_1$  = Antriebsdrehzahl  
 $P_h$  = Spindelsteigung  
 $i$  = Übersetzung

= Lifting speed = [m/min]  
= Input speed = [min-1]  
= Spindle pitch = [mm]  
= Ratio

加速度

Acceleration

$$a = \frac{v}{(60 \cdot t)}$$

加速度  
Acceleration

$a$  = 加速度  
 $v$  = 提升速度  
 $t$  = 时间

= Acceleration = [m/s<sup>2</sup>]  
= Lifting speed = [m/min]  
= Time = [s]

工作制

Duty cycle

$$ED = \left[ \frac{\text{Weg} \cdot A_s}{(60 \cdot v)} \right] \cdot 100\%$$

工作制  
Duty cycle

$ED$  = 工作制  
 $\text{Weg}$  = 行程长度  
 $A_s$  = 负载周期数量  
(上下运动)  
 $v$  = 提升速度

= Duty cycle = [%/h]  
= Length of stroke = [mm]  
= Number of load cycles  
(up- and down movement)  
= Lifting speed = [m/min]

行程/转速

Stroke/ revolution

$$HU = \frac{P_h}{i}$$

Hub/ Umdrehung  
Stroke/ revolution

$HU$  = 行程/转速  
 $P_h$  = 丝杆螺距  
 $i$  = 比率

= Stroke/ revolution = [mm]  
= Spindle pitch = [mm]  
= Ratio

## 使用寿命

## Service life

$$L_h = \left( \frac{C}{F_{dyn}} \right)^3 \cdot \frac{10^6}{(n_2 \cdot 60)}$$

**L<sub>h</sub>** = 使用寿命  
**C** = 动载荷  
见 35 页 „滚珠轴承 (KGT)“  
**F<sub>dyn</sub>** = 动态轴向力 (= 提升力)  
**n<sub>2</sub>** = 输出速度

**Lebensdauer**  
**Service life**  
 = Service life = [h]  
 = Dynamic load capacity = [kN]  
see page 35 „Ball screw spindles (KGT)“  
 = Dynamic axial force (= lifting force) = [kN]  
 = Output speed = [min<sup>-2</sup>]

## 输出速度

## Output speed

$$n_2 = \frac{n_1}{i}$$

**n<sub>2</sub>** = 输出速度  
**n<sub>1</sub>** = 输入速度  
**i** = 比率

**Abtriebsdrehzahl**  
**Output speed**  
 = Output speed = [min<sup>-2</sup>]  
 = Input speed = [min<sup>-1</sup>]  
 = Ratio

## 电动推杆转矩

## Torque per linear actuator

$$M_1 = \frac{F_{dyn}}{2 \cdot \pi \cdot \eta_H} \cdot \left( \frac{P_h}{i} \right) + M_L$$

**M<sub>1</sub>** = 电动推杆转矩  
**F<sub>dyn</sub>** = 动态轴向力 (= 提升力)  
**P<sub>h</sub>** = 丝杆螺距  
**i** = 比率  
**M<sub>L</sub>** = 空转力矩

**Drehmoment für einen Zylinder**  
**Torque per linear actuator**  
 = Torque per linear actuator = [Nm]  
 = Dynamic axial force (= lifting force) = [kN]  
 = Spindle pitch = [mm]  
 = Ratio  
 = Idling torque = [Nm]

## 输入转矩

## Input torque

$$T_1 = P \cdot \frac{9550}{n_1}$$

**T<sub>1</sub>** = 输入转矩  
**P** = 功率  
**n<sub>1</sub>** = 输入转矩

**Antriebsdrehmoment**  
**Input torque**  
 = Input torque = [Nm]  
 = Power = [kW]  
 = Input speed = [min<sup>-1</sup>]

## 输出转矩 (=丝杆转矩)

## Output torque (= spindle torque)

$$T_2 = F_{\text{dyn}} \cdot 1000 \cdot \frac{d_2}{2} \cdot \tan(\varphi \pm \varrho)$$

$T_2$	= 输出转矩 (=丝杆转矩)
$F_{\text{dyn}}$	= 动态轴向力 (= 提升力)
$d_2$	= 中径
$\varphi$	= 螺纹升角
$\varrho$	= 牙型角-动摩擦角 $\sim 6^\circ$

输出转矩 (= 丝杆转矩)  
Output torque (= spindle torque)

= Output torque	= [Nm]
(= spindle torque)	
= Dynamic axial force (= lifting force)	= [kN]
= Pitch diameter	= [mm]
= Lead angle	= [° ]
= Thread angle, dynamic friction angle	= [° ]
$\sim 6^\circ$	

## 启动转矩

## Starting torque

$$T_A \sim T_1 \cdot 1,3$$

$T_A$	= 启动转矩
$T_1$	= 输入转矩

启动转矩  
Starting torque

= Starting torque	= [Nm]
= Input torque	= [Nm]

## 功率

## Power

$$P = F_{\text{dyn}} \cdot \frac{v}{(60 \cdot \eta_{\text{HE}})}$$

$P$	= 功率
$F_{\text{dyn}}$	= 动态轴向力 (= 提升力)
$v$	= 提升速度
$\eta_{\text{HE}}$	= 电动推杆效率

功率  
Power

= Power	= [kW]
= Dynamic axial force (= lifting force)	= [kN]
= Lifting speed	= [m/min]
= Linear actuator efficiency	

## 螺纹升角

## Lead angle

$$\varphi = \tan^{-1} \left[ \frac{P_h}{(d_2 \cdot \pi)} \right]$$

$\varphi$	= 行程/转速 停止时自锁: $2,4^\circ < \varphi < 4,5^\circ$  (运行时自锁): $\varphi < 2,4^\circ$  无自锁: $\varphi > 4,5^\circ$
-----------	--

螺纹升角  
Lead angle

= Stroke/ revolution	= [° ]
Self-locking at standstill: $2,4^\circ < \varphi < 4,5^\circ$  (Self-locking during operation): $\varphi < 2,4^\circ$  No self-locking: $\varphi > 4,5^\circ$	

$P_h$	= 丝杆螺距
$d_2$	= 中径

= Spindle pitch	= [mm]
= Pitch diameter	= [mm]

## 使用寿命

推杆的使用寿命取决于丝杆的寿命。如果丝杆表面一直有润滑油膜保护，在丝杆的生命周期内推杆可以正常运行。推杆使用寿命用Lc表示。

## 推杆的润滑

机械电动推杆要求用于滚珠轴承的润滑油是 **KLÜBER**

**ISOFLEX TOPAS NLGI Typ 2 (DIN 51818)**。在正常工作条件下，推杆应在 **800 至2.000** 工作小时之间进行润滑。（工作条件如载荷，工作制以及丝杆转速也必须考虑在内。

当在高转速使用推杆时选择类型1，重载荷时选择类型3。

不建议持续润滑因为往复运动会使过多的油脂积聚在丝杆套内导致有效行程减少。同时会导致温度升高。

## 最大允许载荷

最大允许载荷由制造厂规定。推杆在使用中不要超过规定的最大允许载荷，否则的话会影响使用寿命。最严重的情况会使丝杆弯曲变形。

## 负载和工作周期的关系

最大允许负载取决于工作周期。当工作周期增加时负载应降低。如超过建议负载推杆可能损坏，这属于在我方质量保证范围内。

## Life cycle

*The life of an actuator is dependant on the life of the screw if the spindle is always coated with a lubrication film. It is the number of complete cycles in time that an actuator can perform. It is represented by **Lc**.*

## Lubrication of the actuators

*The electromechanical linear actuators **require as lubrication grease and is delivered with KLUBER ISOFLEX TOPAS NLGI grease type 2, (DIN 51818)** which is used for ball bearings. Under normal working conditions, the actuators should be greased between **800 and 2.000** operating hours (working conditions such as load, number of cycles and the screws revolutions must be taken into account).*

*When using the unit at high speed choose **type 1**, and for heavy loads **type 3**.*

*Continuous lubrication is not advised because the alternating motion deposits too much grease on the screw filling the spindle tube and reducing the available stroke together. There will also be an increase in temperature.*

## Maximum load allowable

*The maximum load permissible is defined by the manufacturer. It should not be exceeded as the life of the units will be adversely effected. The worst case is for example a buckling of the spindle.*

## Relationship between load and duty cycle

*The maximum permissible load depends on the duty cycle. The load should be reduced when the duty cycles increases. If the advised duty is exceeded the actuator can be damaged and the warranty is forfeited.*

M100基本型推杆的尺寸信息见第20页！

For dimensional information of the M100 Basic modell, please see pages 20!

$L_H$  (使用寿命 / *Service life*) = h  
 $C_{dyn}$  (额定动载 / *Dynamic load rating*) = kN  
 $n_2$  (输出速度 / *Output speed*) = min

$$h_{sp} \approx 0,9$$

公式:  
Formula:

$$L_H = \frac{\left(\frac{C_{dyn}}{F}\right)^3 \cdot 10^6}{n_2 \cdot 60}$$

索引	丝杆KGT Spindle KGT	最大提升力	最大拉力	空转力矩
		Max lifting force	Max tensile force	Idling torque
		[kN]	[kN]	[Nm]
F16	1605	5	5	0,25
F20	2005	10	10	0,42
	2020	7,5	7,5	0,48
F30	3205	20	20	1,3
	3210	25	25	1,3
	3220	20	20	1,3
	3240	10	10	1,3
F40	4010	30	30	1,6
	4020	30	30	1,7
	4040	15	15	1,7
F45	5010	50	50	1,7
F50	6310	65	65	1,5



KGS 螺母  
KGS nut

负载: / Load: \_\_\_\_\_ kN

工作周期(ED): / Duty cycle: \_\_\_\_\_ %

负载类型: / Type of load:

拉力: / Tensile:

推力: / Compressive:

侧向力: / Lateral forces:

动载 / dynamic

动载 / dynamic

无 / no

静载 / static

S静载 / static

有 / yes

行程: / Stroke length: \_\_\_\_\_ mm

提升速度: / Lifting speed: \_\_\_\_\_ m/min

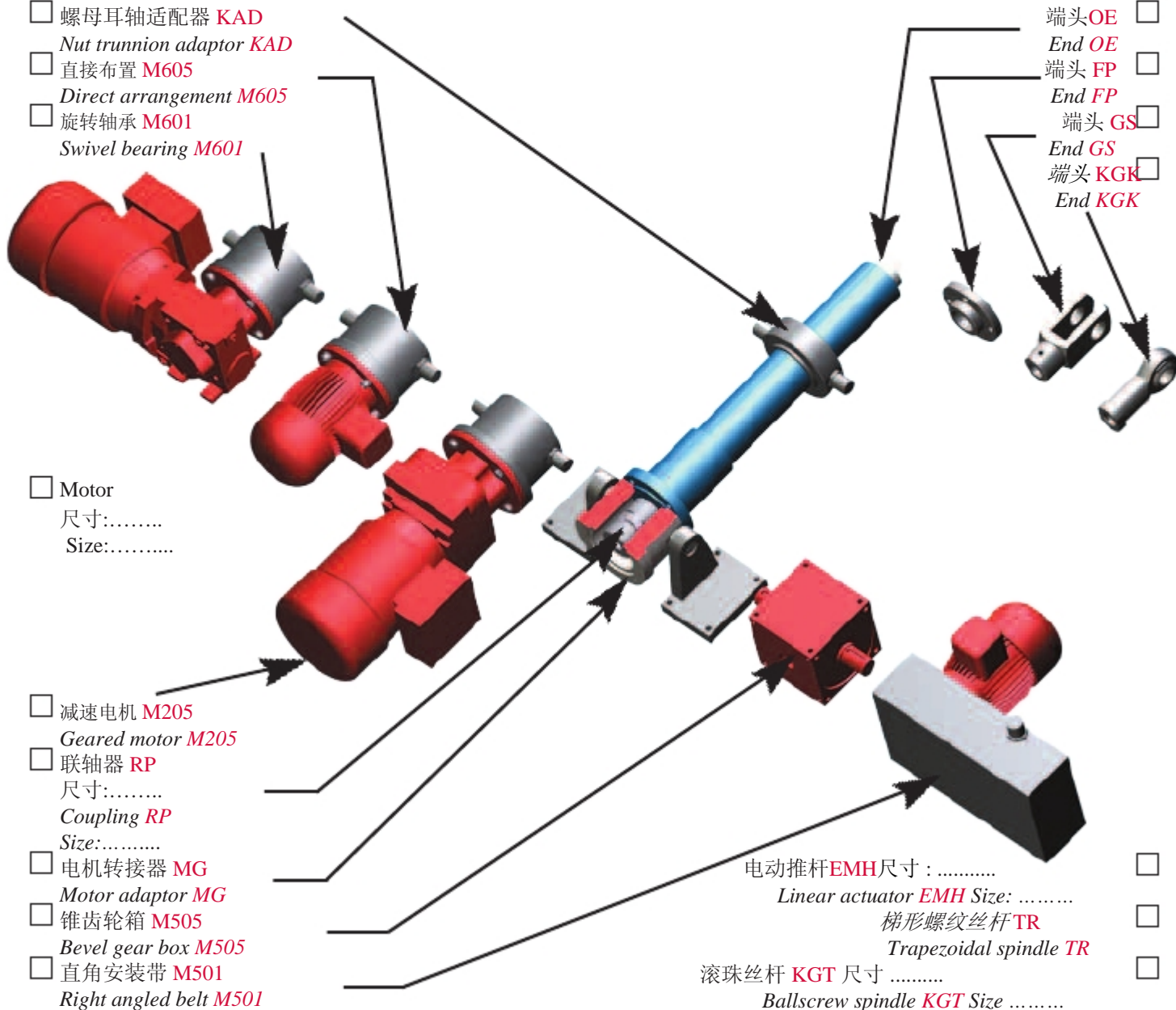
其它/特殊: / Other / special: \_\_\_\_\_

- 螺母耳轴适配器 KAD  
Nut trunnion adaptor KAD
- 直接布置 M605  
Direct arrangement M605
- 旋转轴承 M601  
Swivel bearing M601

- Motor  
尺寸:.....  
Size:.....

- 减速电机 M205  
Geared motor M205
- 联轴器 RP  
尺寸:.....  
Coupling RP  
Size:.....
- 电机转接器 MG  
Motor adaptor MG
- 锥齿轮箱 M505  
Bevel gear box M505
- 直角安装带 M501  
Right angled belt M501

- 端头 OE  
End OE
- 端头 FP  
End FP
- 端头 GS  
End GS
- 端头 KGK  
End KGK



- 电动推杆EMH尺寸: .....
- Linear actuator EMH Size: .....
- 梯形螺纹丝杆TR
- Trapezoidal spindle TR
- 滚珠丝杆 KGT 尺寸 .....
- Ballscrew spindle KGT Size .....



## 我们的吉祥物 Our mascot

本公司保留部分产能用于急单制作。

*Our company reserves production capacity for urgent requirements.*

我们有能力在短时间内交付很多产品。

*We are able to deliver many products at short notice.*

**这项服务不是免费的。**

***This service however is not free of charge.***

当采用我方快速服务时，建议自己安排运输。也可采用我方正常运输方式，我方再向贵司收费。费用如下：

*We recommend that you arrange your own transport when using our express service. Alternatively we can use our normal shipping methods and recharge the costs. The following surcharges apply: -*

### 高级快速服务

### Premium Express Service

增加50%的附加费可在2个工作日内发货

*Despatch availability within 2 working days at a 50% surcharge*

### 快速服务

### Express Service

增加25%的附加费可在5个工作日内发货

*Despatch availability within 5 working days at a 25% surcharge*

### 高级快速服务 50% 附加费

这项费用计算如下：—

下单日期最多加上二个工作日\*。

我方不能在规定时间内交付，

则只收25%的附加费。

### Premium Express 50% Surcharge

*This is calculated as follows: -*

*Day of order plus max 2 working days\*.*

*Should we fail to meet our target set out below, we will only apply a 25% surcharge.*

### 25%快速服务附加费

这项费用计算如下：—

下单日期最多加上五个工作日\*。

订单必须在10:00前下达，超过这个时间则被视为下一个

工作日下单。

### Express 25% Surcharge

*This is calculated as follows: -*

*Day of order plus max 5 working days\*.*

*The order must be received by 10:00 hours. Orders placed after this time will be classed as received on the following working day.*

### 举例:高级快速服务

周五11:00收到订单等同于下周一10:00前收到订单。通知周三下午16:00前取货/发货就达到了承诺的目标，收取50%的附加费。通知周四发货就意味着附加费下降到25%。如果我们不能在下一通知发货不收取任何附加费。

上述目标只适用于正常生产流程，不适用于假期和/或圣诞/新年期间。上述情况下，目标交货期相应顺延。请咨询我们。

交货期应从技术问题澄清和/或收到无问题的材料开始计算。

同样也适用于订单修改。目标交货期将会重新设定在规定时间内通知交货被认为是符合交货期的。

### Example: Premium Express Service

Receipt of order Friday 11:00 hours equates to receipt of order Monday before 10:00 hours Notification that order is available for collection/despatch Wednesday 16:00 hours The target has been met, therefore the 50% surcharge will be applied. Notification of despatch availability on Thursday means the surcharge is downgraded to 25%. No surcharge will be applied should we fail to meet the subsequent target of notification by Monday of the following week.

The stated targets are subject to normal production flows and do not apply during holiday and/or Christmas/ New Year periods. The targets are extended accordingly without invalidating the surcharge. Please ask.

The lead time starts upon any clarification of technical details and/or receipt of any free-issue material.

The same applies in cases of order amendments. The target will be reset and deemed as met upon notification of despatch availability within the specified time.

\*订单指定在某个工作日结束时取货/发货也是可行的。

\* The order is available for collection/despatch at the end of the particular working day

公司: / Company: \_\_\_\_\_  
 地址: / Address: \_\_\_\_\_  
 电话: / Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-Mail: \_\_\_\_\_

### 传动 / Drive

- 电动推杆IP43 *Linear actuator IP43*       电动推杆IP65 *Linear actuator IP65*       机械电动推杆 *Electromechanical linear actuator*

### 系统 / System

- 负载: / Load: \_\_\_\_\_ kN       单次 / Single       传动次数 / No of drives \_\_\_\_\_  
 电动推杆 IP65 *Linear actuator IP65*       梯形丝杆 *Trapezoidal spindle*       滚珠丝杆 *Ballscrew spindle*       多头螺纹丝杆 *High-helix lead screws*  
 机械电动推杆 *Electromechanical linear actuator*      梯形丝杆 *Trapezoidal spindle*       滚珠丝杆 *Ballscrew spindle*

### 传动技术数据 / Technical data drive

- 拉力 / Tensile       压力 / Compressive  
 动载 / dynamic       静载 / static
- 速比: / Ratio: \_\_\_\_\_  
 行程: / Stroke length: \_\_\_\_\_ mm      提升速度: / Lifting speed: \_\_\_\_\_ m/min
- 机械电动推杆 *Electromechanical linear actuator*      侧向力: Lateral forces:  无 *no*       有 *yes*  
 负载导向: Load guided:  无 *no*       有 *yes*

### 传动: / Drive:

- 电动推杆IP43 *Linear actuator IP43*       控制箱 *Control Box*       直流24 V/DC *direct 24 V/DC*  
 电动推杆IP65 *Linear actuator IP65*       手动 *by hand*       电机驱动 *motorized*  
 机械电动推杆 *Electromechanical linear actuator*       M205       M501       M505       M601       M605  
*M205      M501      M505      M601      M605*

### 用于 IP65 电动推杆或机械电动推杆的三相电机 3-phase motor for linear actuator IP65 or electromechanical linear actuator:

- 速度: / Speed: \_\_\_\_\_ U/min      功率: / Power: \_\_\_\_\_ kW  
 电压: / Voltage:  230V/1~       230/400V/3~  
 12V=       24V=  
 特殊电压: / Special voltage: \_\_\_\_\_  
 \_\_\_\_\_ % / 60 min

### 运行条件: / Operating conditions:

- 安装方向: / Installation position:  水平 / horizontal       垂直 / vertical  
 倾斜 / inclined       不定 / changeable  
 安装位置: / Installation location:  室内 / inside       室外 / outside  
 温度: / Temperature:  从 / from +/- \_\_\_\_\_ °C 到 / to +/- \_\_\_\_\_ °C  
 环境: / Environment:  S粉尘 / dusty       切削物 / swarf  
 潮湿 (nass) / moist (wet)

- 是否需要考虑特殊的安全法规?  否       是  
 Do special safety regulations need to be considered? *no      yes*

备注: / Remarks: \_\_\_\_\_





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