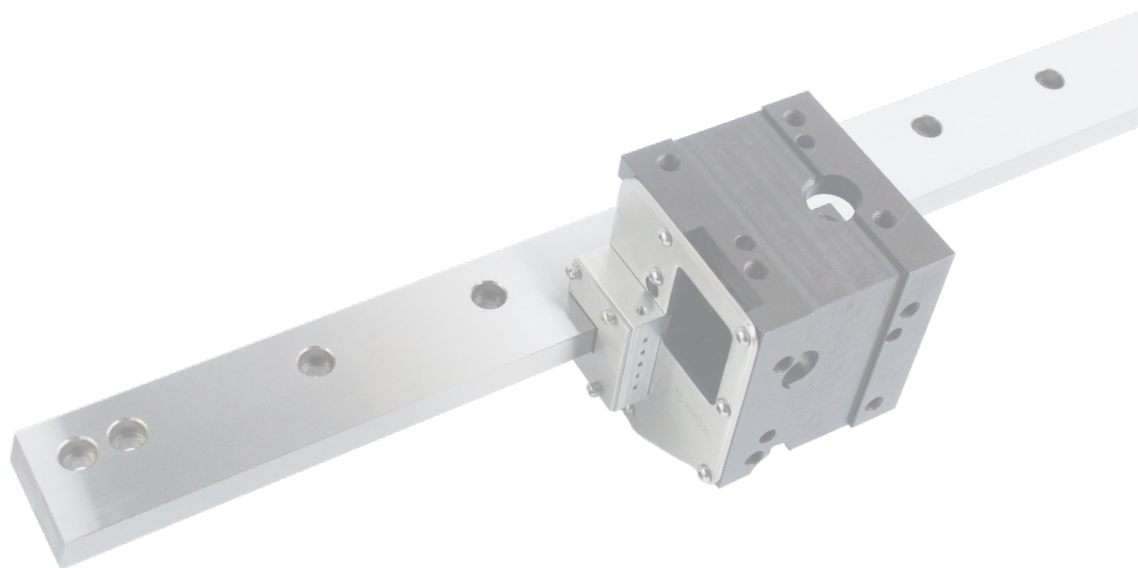




產品型錄



ROLLER GUIDE RAIL RACK



Certificat

Certificate

N° 2017/73977.1

AFNOR Certification certifies that the management system implemented by:
AFNOR Certification certifie que le système de management mis en place par :

KAI HE MACHINERY CO., LTD.

for the following activities:
pour les activités suivantes :

MANUFACTURE OF MECHANICAL PARTS (RACK).

has been assessed and found to meet the requirements of:
a été évalué et jugé conforme aux exigences requises par :

ISO 9001 : 2015

and is developed on the following locations:
et est déployé sur les sites suivants :

NO.117, ZHONGXIAO RD., DALI DIST., TAICHUNG CITY 412, TAIWAN (R.O.C.)

This certificate is valid from (year/month/day)
Ce certificat est valable à compter du (année/mois/jour)

2017-01-24

until
Jusqu'au

2020-01-24



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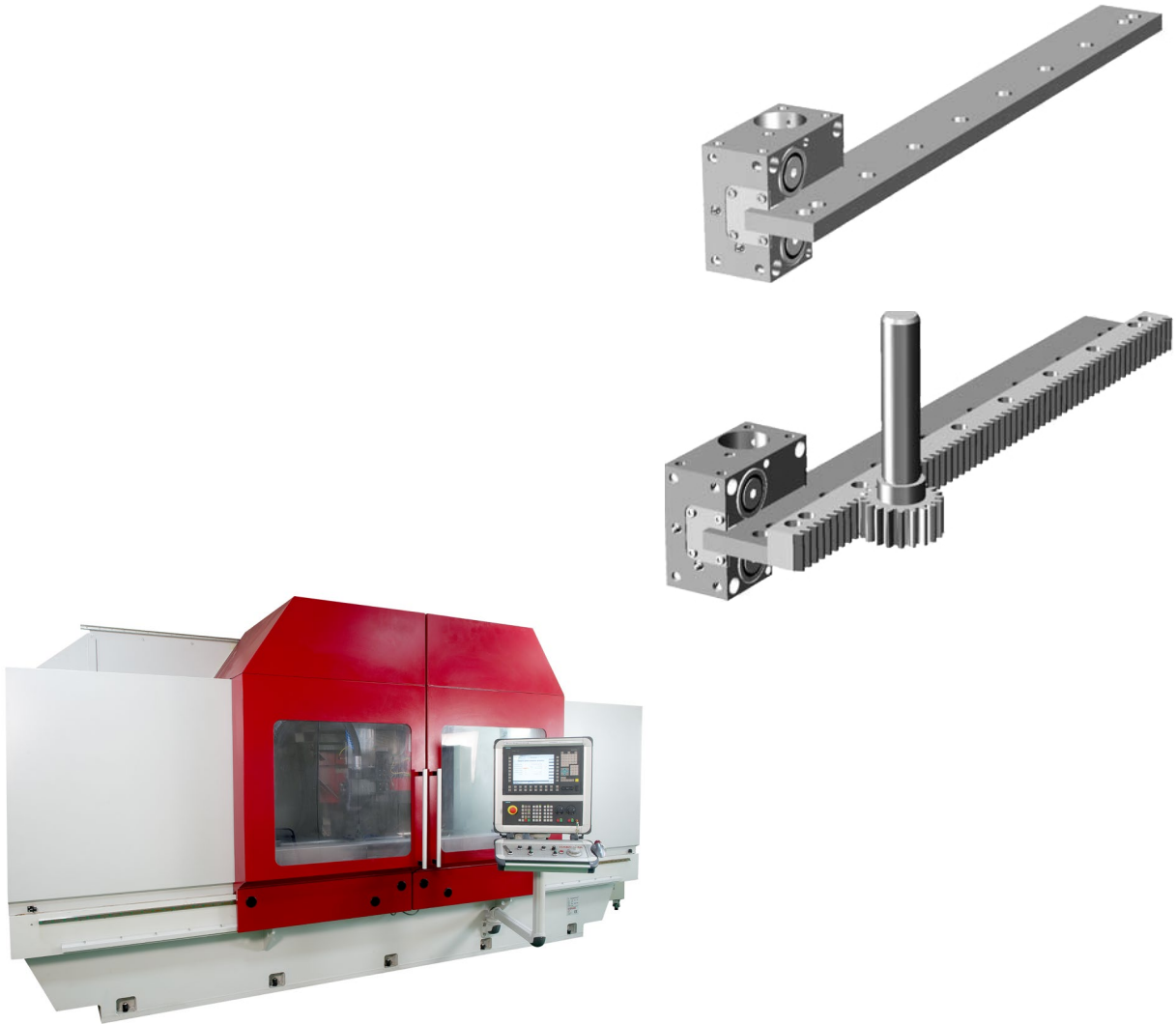
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公司簡介：

凱賀精密機械公司為齒條齒輪製造公司，具有領先的製造技術、加工設備及豐富的實務經驗，提供顧客滿意的產品和服務是我們的經營理念，誠摯歡迎工商界人士洽談蒞臨。我們相信祇有秉承誠信與專業，才能給客戶最完整的服務品質最大的生產效率并且引領企業走向低成本、高品格之路。

目前我們公司擁有 MCV 齒條滾齒機、立式綜合加工機、德國製齒條磨齒機等齒條加工專用機床 ... 等通用機床，擁有三次元檢測儀、... 等檢測儀器，具備完善的生產及檢驗體系。

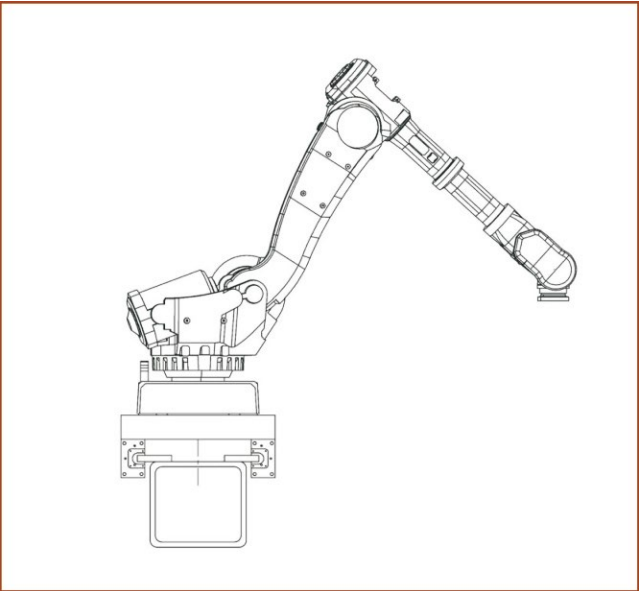




凱賀機械一直以以傳承，創新，創造作為企業發展理念，我們始終堅信品質為企業生存的根本，且一直保持著對更高品質的追求，為客戶提供放心高質的產品。一個產品的生命，其價值的體現便是滿足每一位使用它的客戶。在此，我們真誠的感謝您在凱賀機械成長的過程中給予我們的信任與陪伴，為了您的選擇，我們會盡最大的努力給您提供滿意的產品。在未來的日子里凱賀機械將繼續開拓創新，為您提供完善的解決方案。凱賀機械將一直秉承這些理念陪伴您走下去。

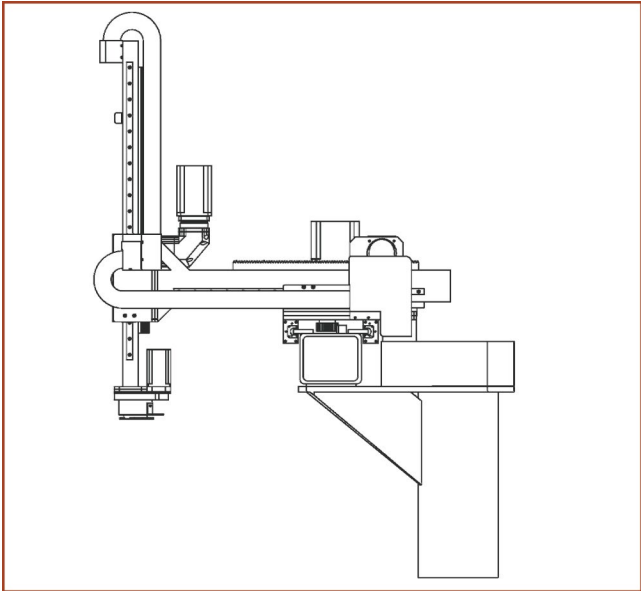
APPLICATIONS

應用案例



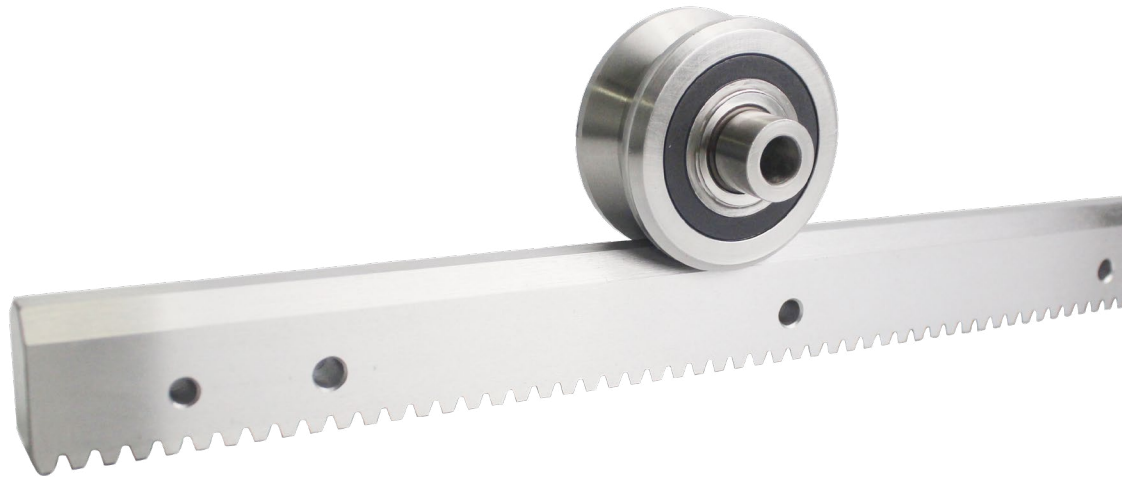
The seventh axis of the robot
機器人第七軸

Truss robot mobile platform
桁架機器人



GUIDEWAY SYSTEM

FOR MEDIUM DUTY APPLICATIONS



V型導軌 & 滾輪

V 型導軌齒條傳動系統 (應用於中等載荷的導軌系統)

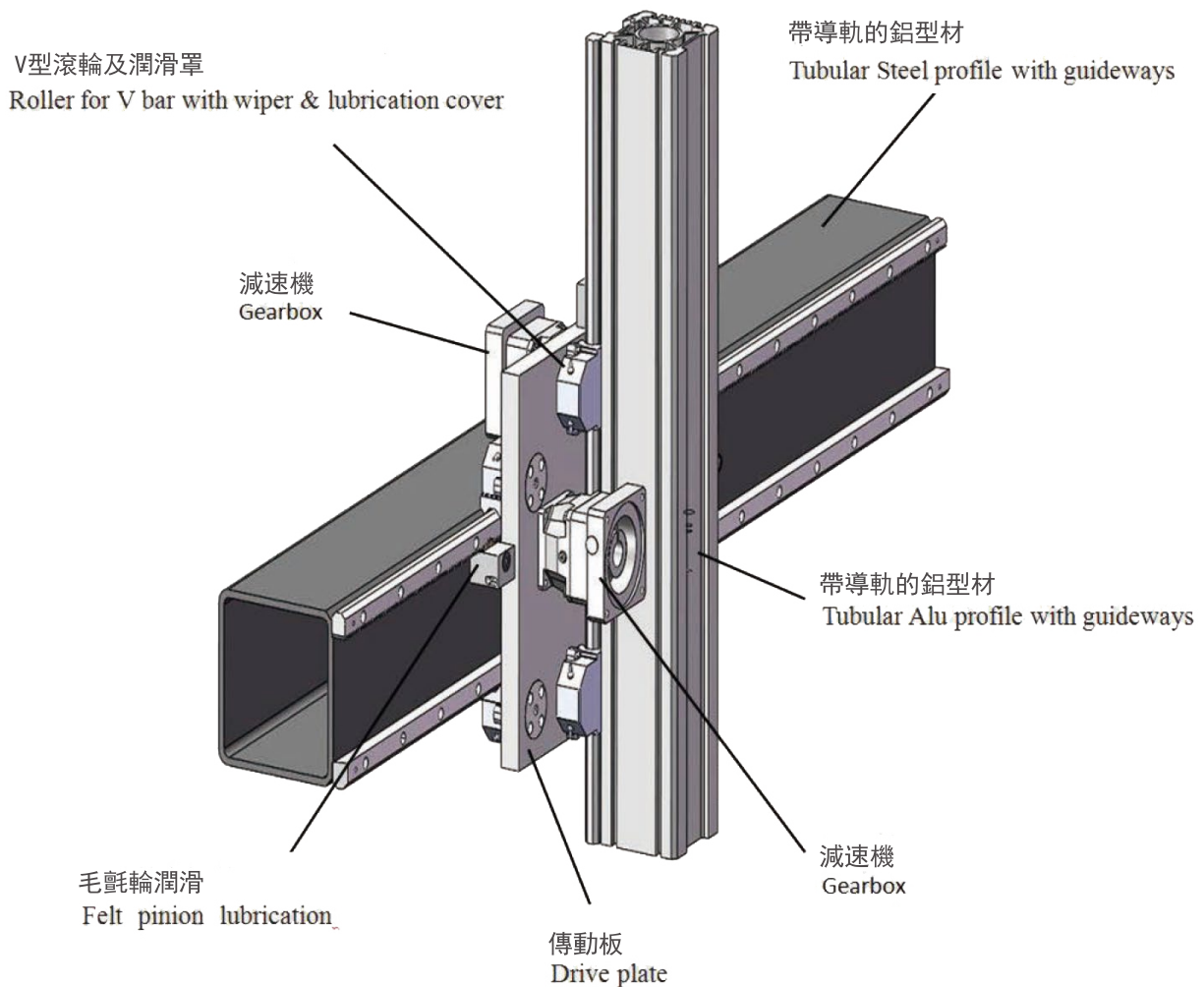
V 型導軌齒條傳動系統包括 V 型導軌、V 型導軌齒條、滾輪等部件，適用於中等載荷的導軌系統。滾輪與導軌之間為線型接觸，摩擦力小，傳動速度高，噪音低，精度高。

本目錄包含 15、20、25、35 四種型號，為了避免圓周率帶來的影響，齒條均為 CP 齒條。所有導軌均為高頻淬火，硬度為 HRC50-55。

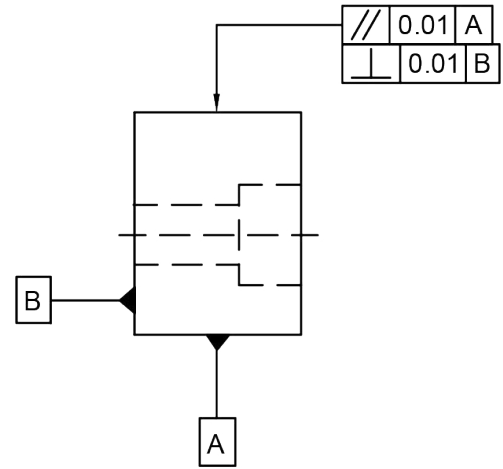
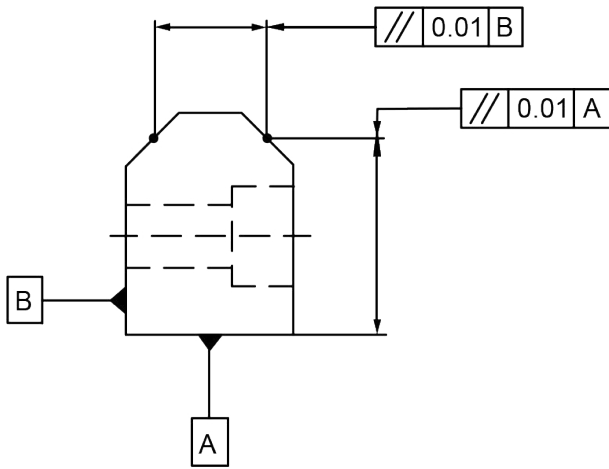
Guideway V bar rack drive system (medium duty)

The guideway V bar rack drive system includes guideway V bar, guideway V bar rack, roller etc. The contact between the roller and guideway is linear, ensuring high speed, low noise and precise positioning.

Now our standard code include 15, 20, 25, 35 sizes. To avoid cumulative pitch tolerance due to π , we use CP racks. The guideways are induction hardened to HRC50-55.



V 型导轨齿条传动系统精度



線型導軌

導軌系統的精度取決於導軌、滾輪和驅動元件的基本精度。碳素鋼導軌的表面硬度硬化至 50-55HRC。

Linear guideway

The accuracy of the guideway system is built up from the basic quality of the guide, roller and drive elements. The guiding surfaces of carbon steel guideways are hardened to 50-55HRC.

滾輪

滾輪按照 PN 等級公差製造，內部是帶有 PSR 永久密封圈的雙列角接觸球軸承，壓力角為 25°。我們可以提供偏心和非偏心的。普通間隙或預緊軸承間隙的兩種類型滾輪。

Rollers

The rollers are dual-row angular contact ball bearings with a 25 degree pressure angle with RSR seals and sealed for life. The rollers are manufactured to the PN tolerance class. The rollers can be supplied with normal or pre-loaded bearing clearances with concentric or eccentric centers.

型號 Code	Ga(μm) ①	Ga(μm) ②
15	+6/+23	-3/+5
20	+6/+23	-3/+5
25	+8/+27	-3/+5
35	+11/+33	-3/+5

①普通軸承間隙

②預載軸承間隙

驅動元件

我們可以提供多種規格齒條，以滿足不同應用的需求。在高精度和大扭矩的應用中，齒條需要磨削和硬化處理。

Drive elements

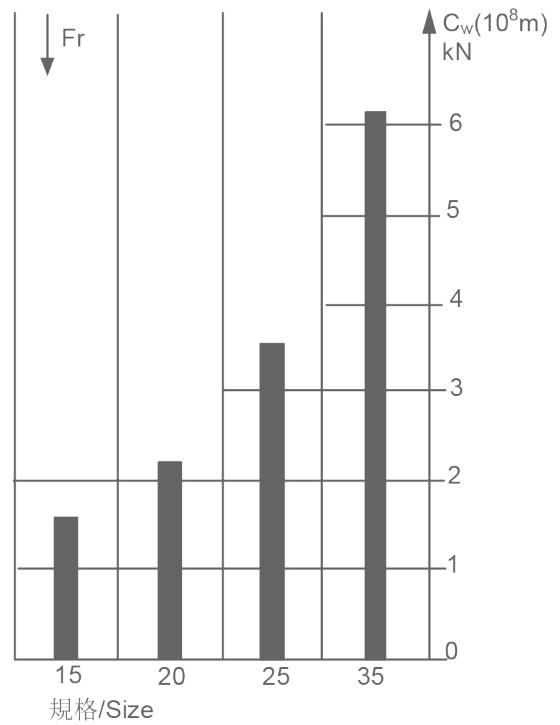
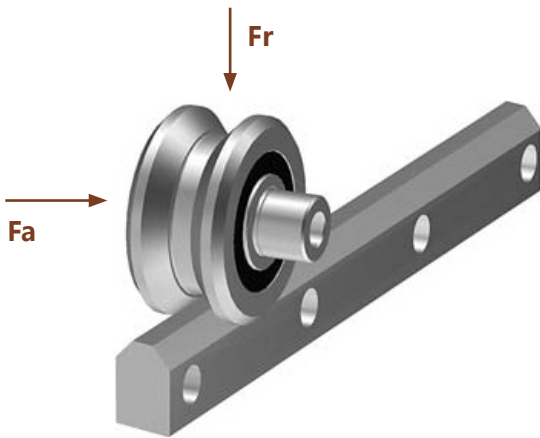
Racks are supplied in various sizes to meet the required application. For high precision and high torque applications, the racks are hardened and ground.

精度等級 Precision grade	fp(mm)	Fp(mm)	p(mm)	
DIN7h25	0.008	0.05	0/-0.02	精切削
DIN6h23	0.006	0.03	0/-0.01	硬化和磨削處理

規格選擇

您可以根據以下數據，為您所需的導軌系統做大致的選型。數據表中的 C_w 值，是基於額定使用壽命 10^8m (100000km) 時，滾輪所能承受的軸向載荷和徑向載荷。

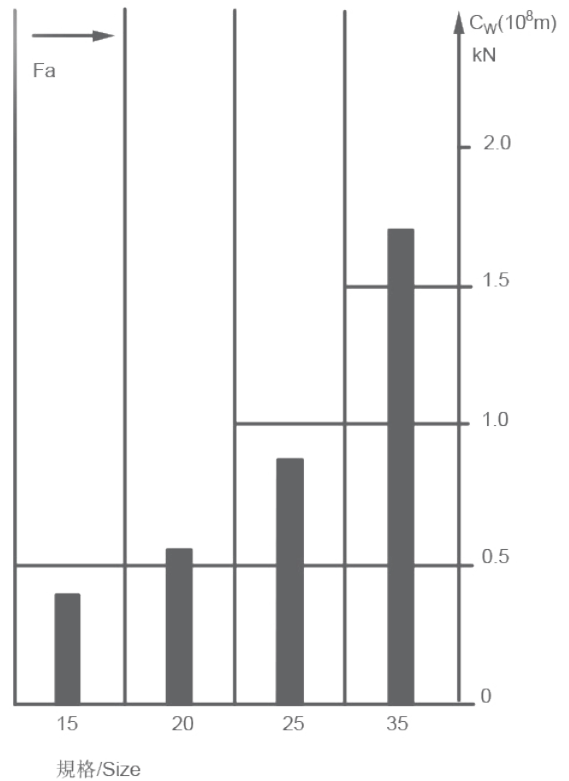
在多向受力和衝擊的情況下，需參考第 05 頁中的計算數據，或與我們諮詢。



Size selection

The data allows for a rough selection of the size of the required guideway system. The C_w value are listed in this table for a nominal service life of 10^8 m(100 000km), and refer to a roller with pure radial or axial loading.

IN cases of combined loading and shock, the calculation data on page 5 must be consulted, or a calculation verification can be requested from the manufacturer.



驅動力選擇

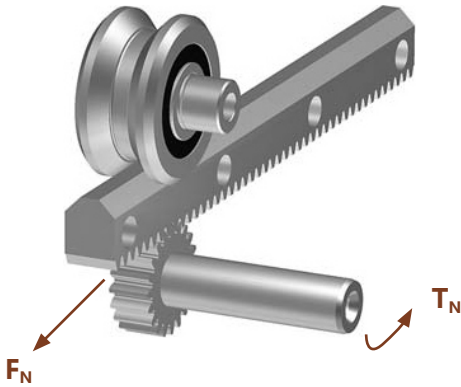
在選擇齒條以後，必須檢查齒輪齒數是否和所需驅動力及扭矩相匹配。

我們提供精鑲和研磨兩種齒條。

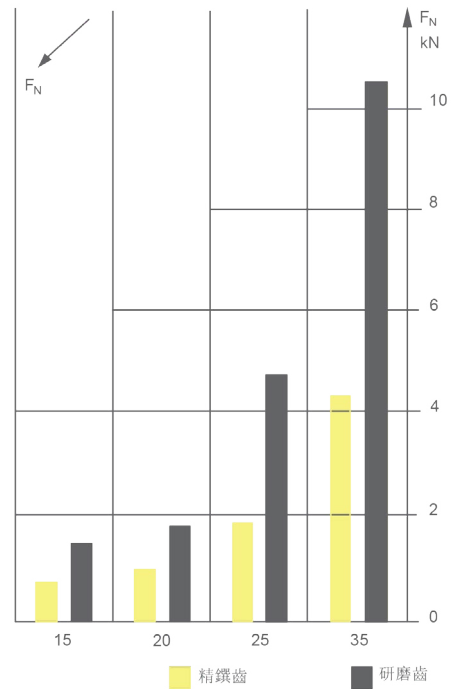
表中數據適用於無衝擊載荷，齒輪齒條潤滑良好以及正確安裝工況值。

此處齒根應力安全係數取 $S_F \geq 1.4$ ，赫茲應力安全係數取 $S_H \geq 1.0$ 。安全係數 $S_B \approx 1.0 \dots 4.0$ ，由用戶根據經驗選擇。

牽引力 F_N 與齒輪齒數 Z 有關。



V 型導軌傳動系統驅動力 and 力矩



Size selection

After selecting the rack, the gear teeth of the guideway system must be checked for compatibility with the required drive forces and torques.

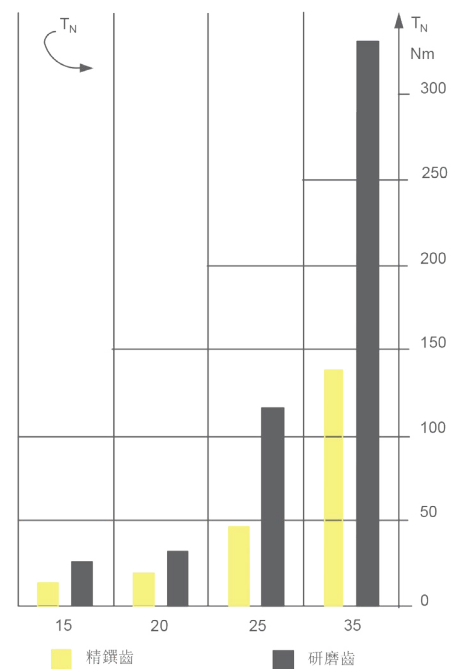
The rack can be supplied precision cut or hardened and ground.

The values given are values for shock-free operation, good lubrication and stiff arrangement of the pinion.

A safety factor for tooth root stress $S_F \geq 1.4$ and a safety factor for Hertzian stress $S_H \geq 1.0$ is taken in account.

Depending on your experience and application a safety factor $S_B \approx 1.0 \dots 4.0$ has to be considered.

The tracking force F_N is related to the number of teeth Z of the pinion.



選型確認

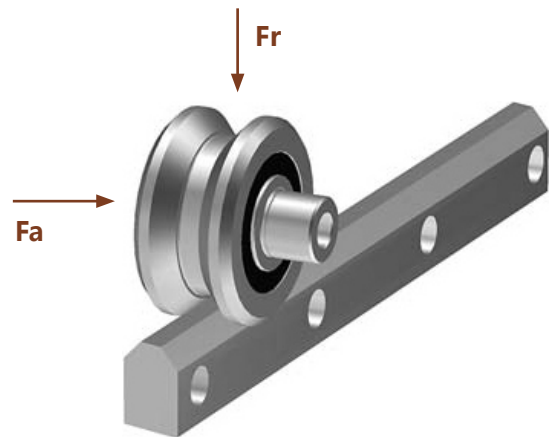
高負載情況下必須進行驗證。使用壽命計算值是標稱名義值，90% 以上的滾輪都可以達到該數值。使用壽命 Lh(h) 小時數可以根據滾輪使用的平均速度來計算。

Size verification

The calculation must be done for the roller under the highest load. The life time values calculated are nominal. 90% of all rollers reach these values.

- Fa : 單個滾輪外部軸向力 (KN) External axial force per roller(KN)
- Fr: 單個滾輪外部徑向力 (KN) External radial force per roller(KN)
- P: 當量動載荷 (KN) Equivalent dynamic load(KN)
- C_w : 有效動載荷定制 (KN) Effective basic dynamic load rating(KN)
- Lh : 額定使用壽命 (m) Nominal life time(m)
- Kr: 規格係數 (-) Size factor
- f: 使用係數 (-) Load factor
 - 平穩 : 1.0...1.2 Uniform shocks: 1.0...1.2
 - 中等衝擊 : 1.2...1.5 Moderate shocks: 1.2...1.5
 - 高強度 : 1.5...2.5 Heavy shocks: 1.5...2.5
- Fs: 靜載荷係數 Static loading factor
- C_{ow}: 最大容許靜態徑向力 (KN) Max. admissible static radial force(KN)

$P = Fr + 3 \cdot Fa$	(KN)
$P_w = f \cdot P$	(KN)
$L = Kr \cdot \frac{C_w^3}{P_w} \cdot 10^5$	(m)
$f_s = 0.7 \cdot \frac{C_{ow}}{f \cdot (Fr + 3 \cdot Fa)}$	$f_s \geq 1$



VR	Kr	FR	Kr	VR	C _w (KN)	FR	C _w (KN)	VR/FR	C _{ow} (KN)
15	1.555	15	1.447	15	13.4	15	13.1	15	6.8
20	1.882	20	2.262	20	18	20	18	20	9.5
25	2.199	25	2.670	25	27	25	27	25	15
35	3.075	35	3.142	35	42	35	43	35	32

安裝

背隙設置和滾輪預緊操作是通過滾輪的偏心法蘭來實現的。

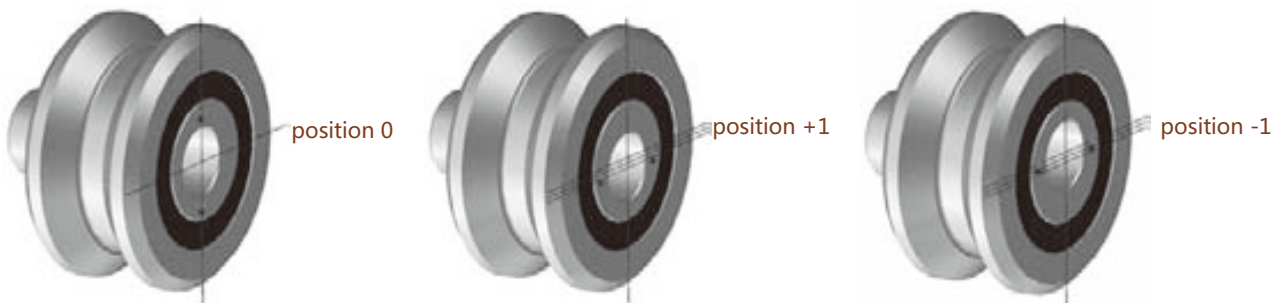
VR..A 系列是同心結構的。在偏心滾輪系列中，在偏心軸上提供 2 個孔，它們可用來調整背隙。

如果滾輪位於它的零位位置，齒輪嚙合背隙應該為標準值，此時側隙為 0.05mm。

過度預緊會降低系統使用壽命，預緊不足會導致滾輪不轉，或者因為齒輪嚙合不良而造成磨損。

通過端面扳手旋轉滾輪的偏心軸來實現滾輪的預載。

正確的預載大約是滾輪在無負載的情況下，適度用力，可以用手轉動滾輪。

**Assembly**

The backlash setting and the pre-tensioning of the rollers takes place via the eccentric hub of the rollers of the series.

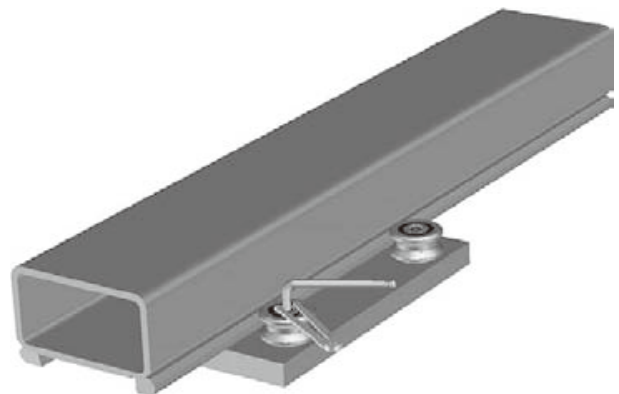
If a roller is located in its zero position, the gear teeth backlash will be the standard value of 0.05mm flank clearance.

The service life of the system will be reduced by excessive tensioning.

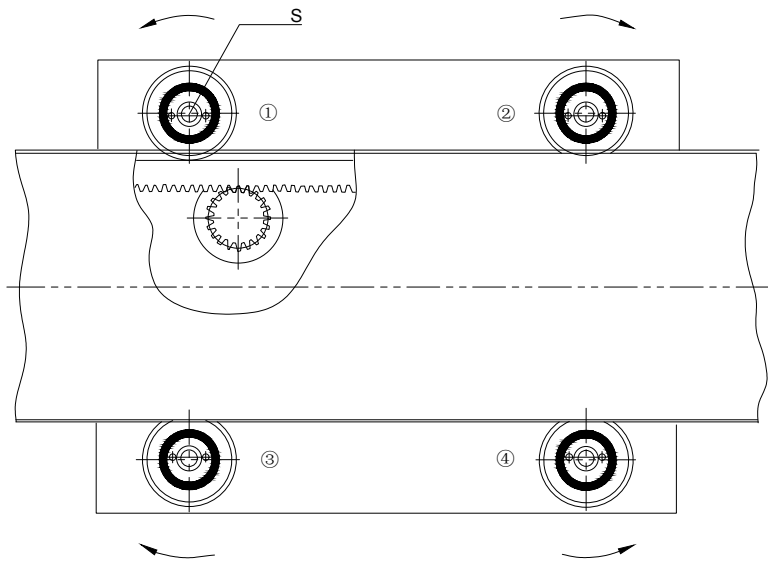
With too little tension the rollers will not run, or will wear due to the poor meshing.

By using a face spanner the eccentric of the roller can be turned and preloaded.

A correct preload means that the non-load-carrying roller can still be rotated manually using moderate force.



滾輪預載調整



滾輪預載調整

1. 鬆開位置 1 處偏心滾輪的緊固螺栓 S，將載板推到橫樑上。
2. 按箭頭所示方向均勻轉動滾輪 1 和 2，直到側隙達到最小值。用偏心調整其背隙到 0.05mm。如果滾輪位於它的零位位置，齒輪嚙合背隙應該為標準值，此時側隙為 0.05mm。
3. 按箭頭方向均勻旋轉偏心輪 3 和 4，適度預緊滾輪。
4. 擰緊固定螺栓 S，緊固力矩見上表。
5. 檢查齒輪齒條之間的背隙，齒輪不能過緊。否則，請鬆開滾輪，重複第 2 點。
6. 檢測預緊：滾輪在無負載狀態下，適度用力，可以用手轉動。如果不能，請鬆開滾輪 3 和 4，重複第 3 點。

V 型導軌傳動系統滾輪預載調整 Adjustment of preload of rollers

型號 Code	螺栓型号 Bolt size	緊固力矩 MA
15	M8×35	24Nm
20	M10*50	48Nm
25	M12*60	83Nm
35	M16*80	200Nm

Adjustment of preload of rollers

1. Loosen the fixing screws S, with the eccentric hub in Position I, push the drive carriage onto the beam.
2. Turn the eccentric hubs of rollers 1 and 2 evenly in the direction of the arrow until the tooth flank clearances are at a minimum. With the eccentric set at the minimum distance in the vertical direction, the backlash measured is 0.05mm. The service life of the system will be reduced by excessive tensioning.
3. Turn eccentric of roller 3 and 4 evenly in the direction of arrow and the rollers will become slightly pre-tensioned. By using a face spanner the eccentric of the roller can be turned and preloaded.
4. Tighten fixing screw S: see above table for tightening torques.
5. Check the backlash of the pinion to the rack. The pinion must not bind. Otherwise, loosen the roller and repeat point 2.
6. Check the pre-tensioning: Rollers that are not under load must be able to turn using moderate force. If not free, loosen rollers 3 and 4 and repeat point 3.

偏心安裝法蘭 KEP 和同心滾輪 VR..B 同時使用可以實現與偏心滾輪 VR..A 同樣功能。

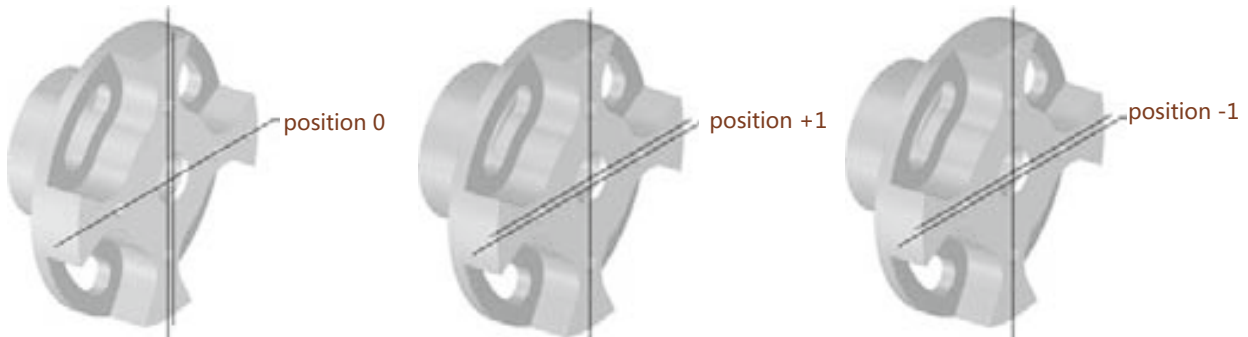
在某些應用中，我們不能到滾輪的正面通過滾輪的偏心軸來調整滾輪導軌之間的背隙，這時可以採用這個組合。

通過旋轉安裝法蘭 KEP, 偏心結構可以使滾輪向導軌方向徑向移動，從而達到調整的目的。

調整偏心安裝法蘭時，可以使用與 VR 調整同樣的工具。

偏心安裝法蘭 KEP 和同心安裝法蘭 KSP 具有同樣的尺寸。為了使用 1mm 的偏心調整量全程可用，在法蘭的安裝板上必須加工 12 個螺孔，而不像同心法蘭那樣加工 4 個即可。

每旋轉 30 度，4 個安裝螺栓就能移動到下一個固定位置。



Eccentric mounting flanges KEP together with centric rollers VR..B fulfil the same function as eccentric rollers VR..A.If a roller is located in its zero position,the gear teeth backlash will be the standard value of 0.05mm flank clearance.

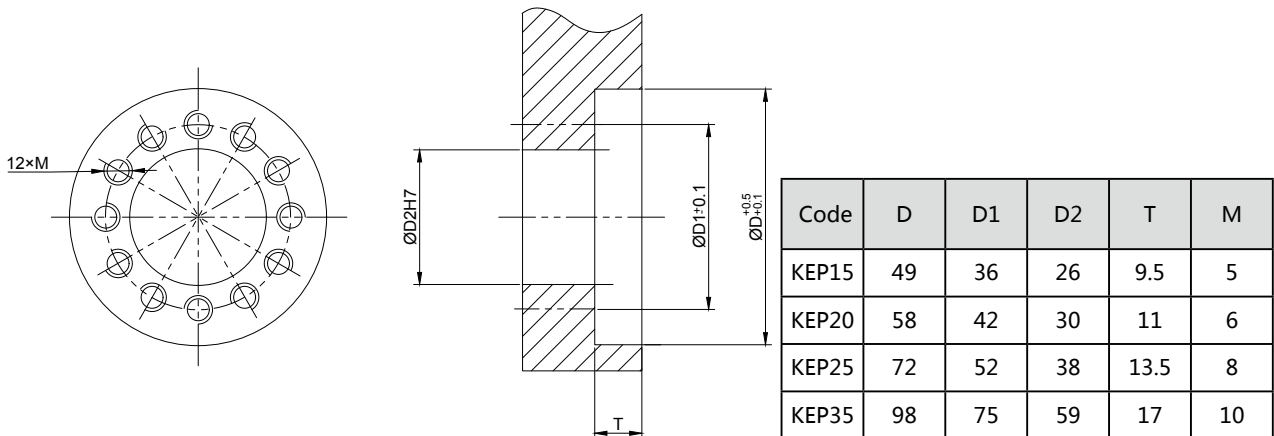
The backlash is adjusted by turning the mounting flange KEP.The eccentric positioned roler therefore moves radially towards the rail and the roller becomes adjusted.

The backlash is adjusted by turning the mounting flange KEP.The eccentric positioned roler therefore moves radially towards the rail and the roller becomes adjusted.

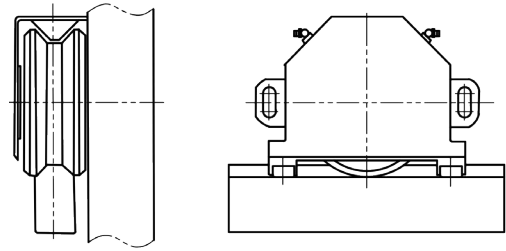
To do the adjustment of the eccentric mounting flanges KEP the same tools as for the adjustment of the eccentric rollers VR..A can be used.

Eccentric mounting flanges KEP have the same dimensions as centric mounting flanges KSP.In order to be able to use the full range of +1mm of the eccentric there have to be drilled 12 threads in the carriage instead of 4 on the centric mounting flanges.

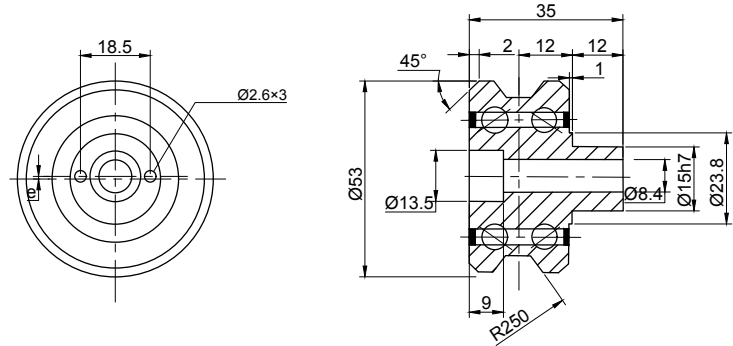
After a rotation of 30° the 4 screws have to be moved to the next pattern.



15 型 V 軌、法蘭、潤滑罩
Size 15 roller for guideway V bars, Mounting flange, Wiper & lubrication unit

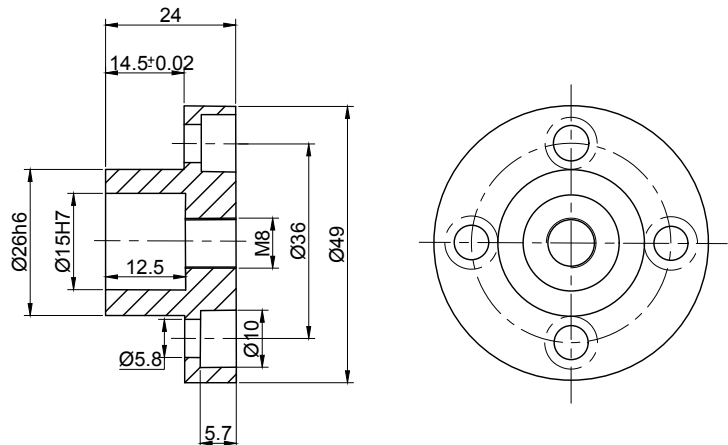


V 型滾輪 Roller for guideway V bars



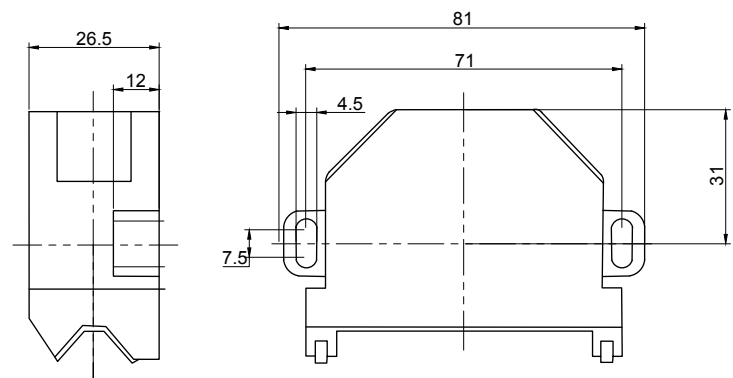
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{ow} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	N_{max} (min^{-1})	螺栓型號 Bolt size
VR15A	1mm	-3/+5	6100	6500	1400	9000	M8*35 8.8 級
VR15B	0	-3/+5	6100	6500	1400	9000	M8*35 8.8 級

法蘭 Mounting flange



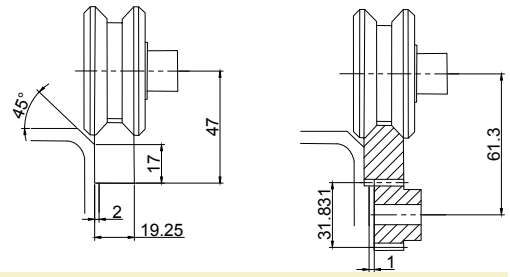
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP15	0.15	M5*16 8.8 級

潤滑罩 Wiper & lubrication unit

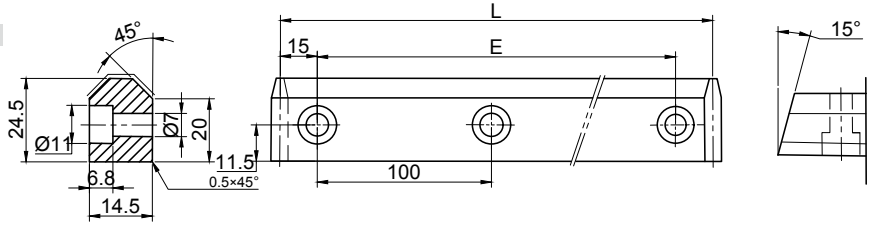


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSA15	0.1	M4*18 8.8 級

15 型 V 型導軌、齒條、齒輪
Size 15 roller for guideway V bars, guideway
V bar rack, pinion

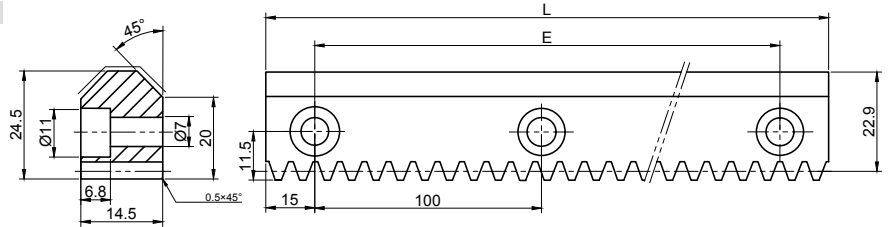


V 型導軌 **Guideway V bar**



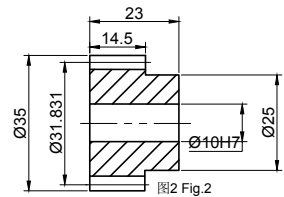
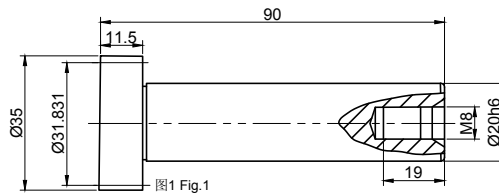
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
SV1506	630	600	S45C	M8*16 8.8級
SV1510	1030	1000	S45C	M8*16 8.8級

V 型導軌齒條 **Guideway V bar rack**



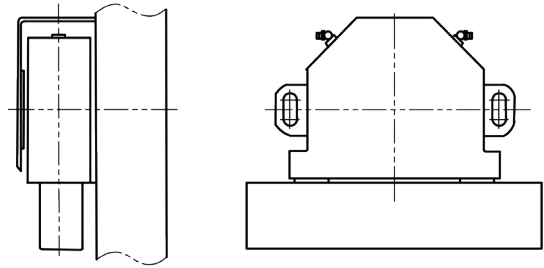
型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
SVGH150606	630	600	1.5915	5.0	DIN6	S45C
SVGH151006	1030	1000	1.5915	5.0	DIN6	S45C
SVFH150609	630	600	1.5915	5.0	DIN9	S45C
SVFH151009	1030	1000	1.5915	5.0	DIN9	S45C

齒輪 **Drive pinion**

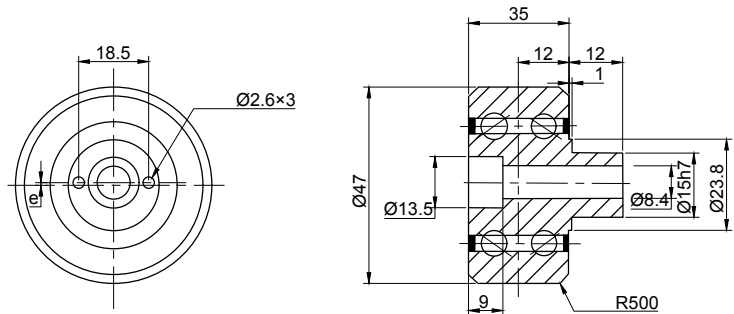


型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP15	20	1.5915	5.0	1	DIN6	3KN
SGSP15	20	1.5915	5.0	2	DIN6	4KN

15 型平滾輪、法蘭、潤滑罩
Size 15 roller for plain roller, Mounting flange, Wiper&lubrication unit

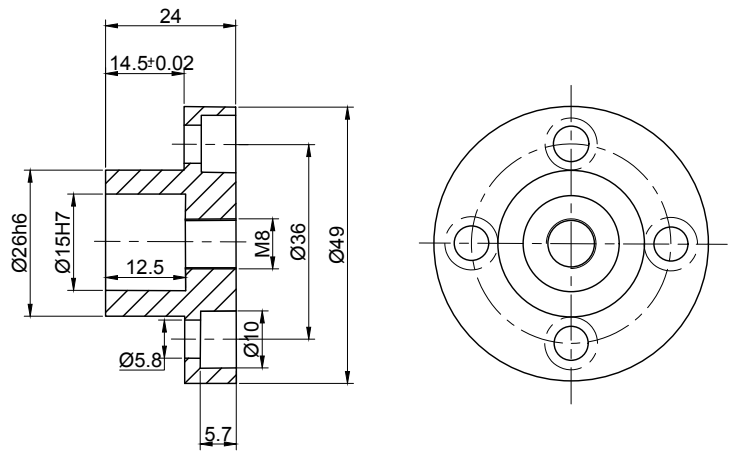


平滾輪 Plain roller



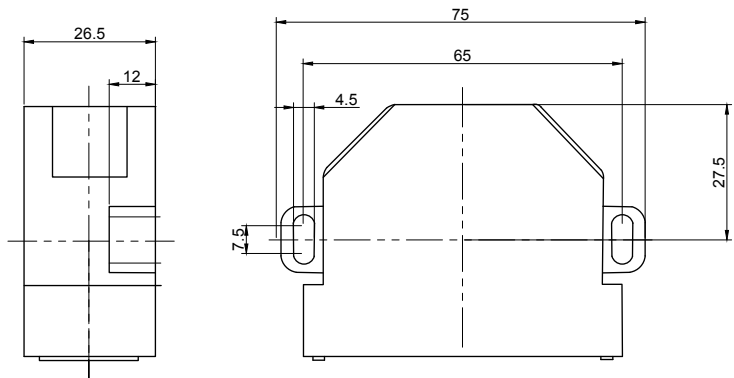
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	N_{max} (min^{-1})	螺栓型號 Bolt size
FR15A	1mm	-3/+5	6100	6500	1400	9000	M8*35 8.8 級
FR15B	0	-3/+5	6800	7200	1560	9000	M8*35 8.8 級

法蘭 Mounting flange



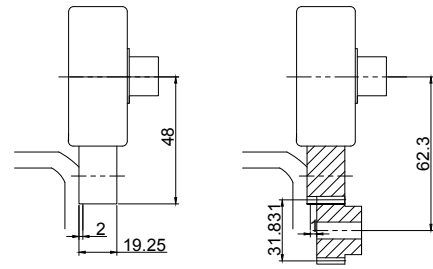
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP15	0.15	M5*16 8.8 級

潤滑罩 Wiper&lubrication unit

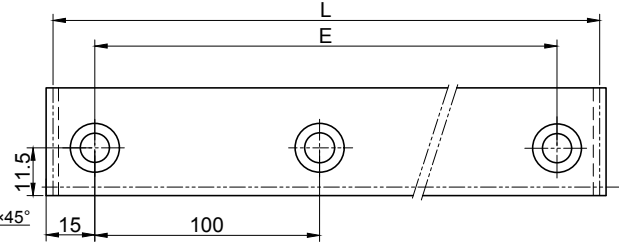
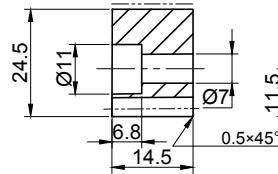


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSB15	0.1	M4*18 8.8 級

15 型平導軌、齒條、齒輪
Size 15 guideway flat rail, guideway flat rail rack, pinion

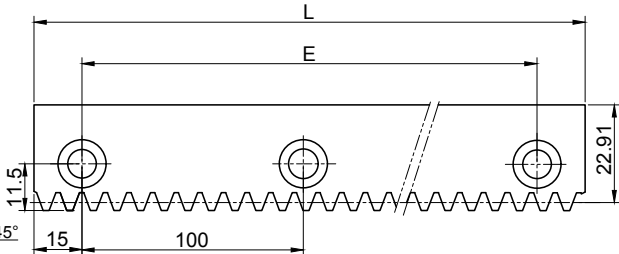
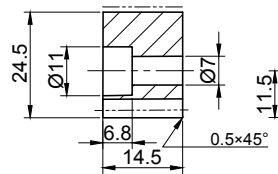
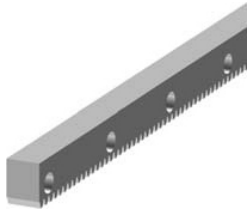


平導軌 **Guideway flat rail**



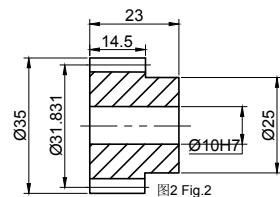
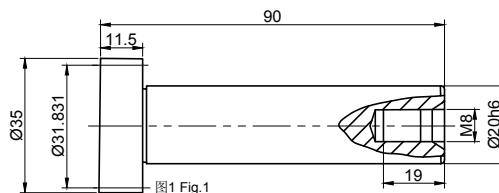
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
ST1506	630	600	S45C	M6*16 8.8 級
ST1510	1030	1000	S45C	M6*16 8.8 級

平導軌齒條 **Guideway flat rail rack**



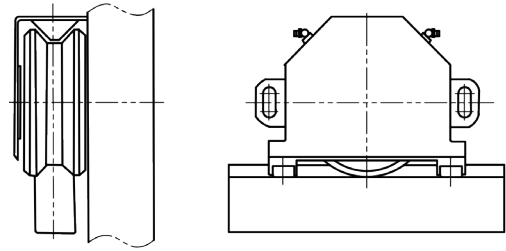
型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
STGH150606	630	600	1.5915	5.0	DIN6	S45C
STGH151006	1030	1000	1.5915	5.0	DIN6	S45C
STFH150609	630	600	1.5915	5.0	DIN9	S45C
STFH151009	1030	1000	1.5915	5.0	DIN9	S45C

齒輪 **Drive pinion**

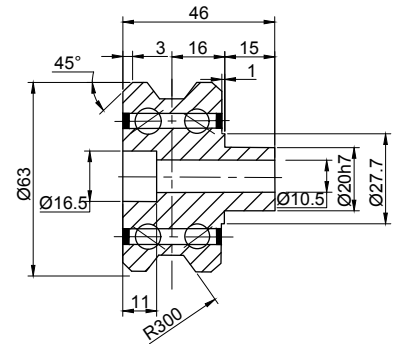
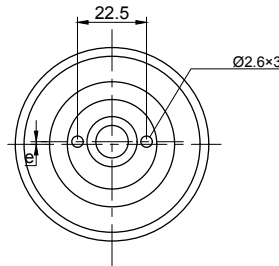


型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP15	20	1.5915	5.0	1	DIN6	3KN
SGSP15	20	1.5915	5.0	2	DIN6	4KN

20 型 V 軌、法蘭、潤滑罩
Size 20 roller for guideway V bars, Mounting flange, Wiper & lubrication unit

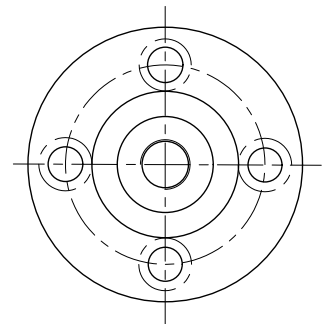
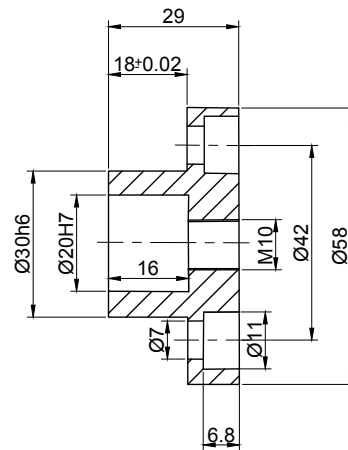


V 型滾輪 Roller for guideway V bars



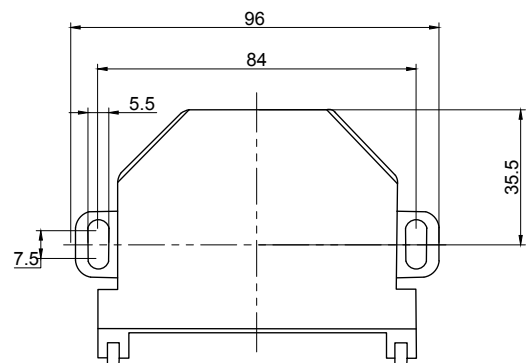
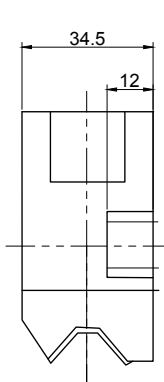
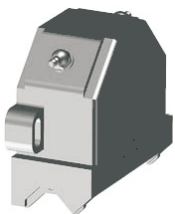
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	Nmax (min ⁻¹)	螺栓型號 Bolt size
VR20A	1mm	-3/+5	8600	9000	2000	7000	M10*50 8.8 級
VR20B	0	-3/+5	8600	9000	2000	7000	M10*50 8.8 級

法蘭 Mounting flange



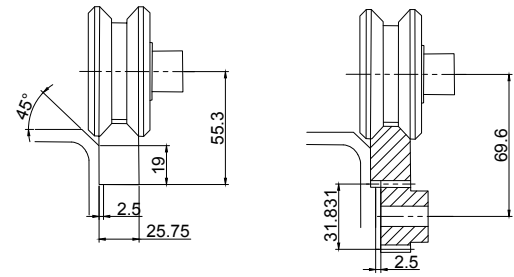
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP20	0.25	M6*16 8.8 級

潤滑罩 Wiper & lubrication unit

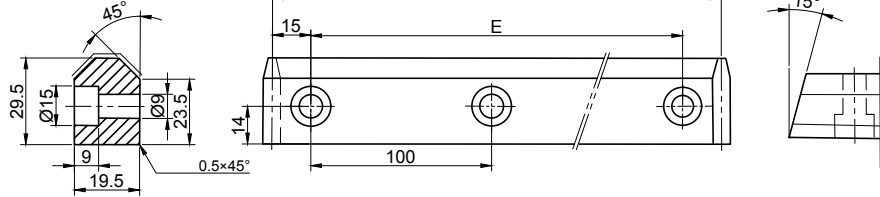


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSA20	0.1	M5*20 8.8 級

20 型 V 型導軌、齒條、齒輪
Size 20 roller for guideway V bars, guideway
V bar rack, pinion

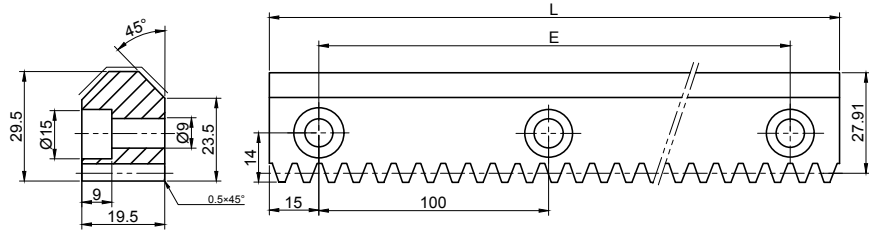


V 型導軌 **Guideway V bar**



型號 Code	L	E	材料 Material	螺栓型號 Bolt size
SV2006	630	600	S45C	M8*20 8.8 級
SV2010	1030	1000	S45C	M8*20 8.8 級

V 型導軌齒條 **Guideway V bar rack**



型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
SVGH200606	630	600	1.5915	5.0	DIN6	S45C
SVGH201006	1030	1000	1.5915	5.0	DIN6	S45C
SVFH200609	630	600	1.5915	5.0	DIN9	S45C
SVFH201009	1030	1000	1.5915	5.0	DIN9	S45C

齒輪 **Drive pinion**

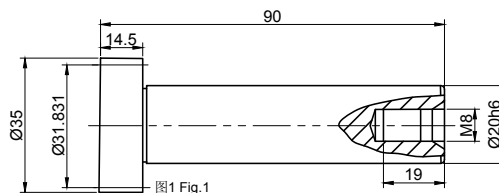


图1 Fig.1

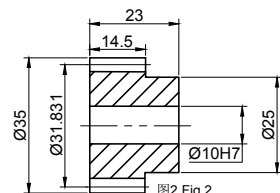
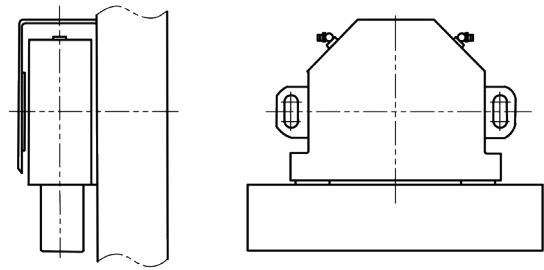


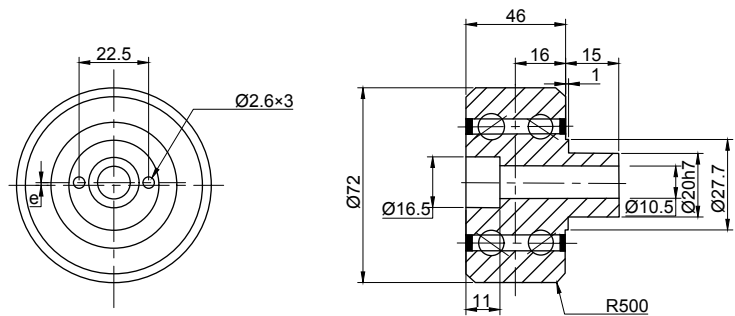
图2 Fig.2

型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP20	20	1.5915	5.0	1	DIN6	4KN
SGSP20	20	1.5915	5.0	2	DIN6	4KN

20 型平滾輪、法蘭、潤滑罩
Size 20 roller for plain roller, Mounting flange, Wiper&lubrication unit

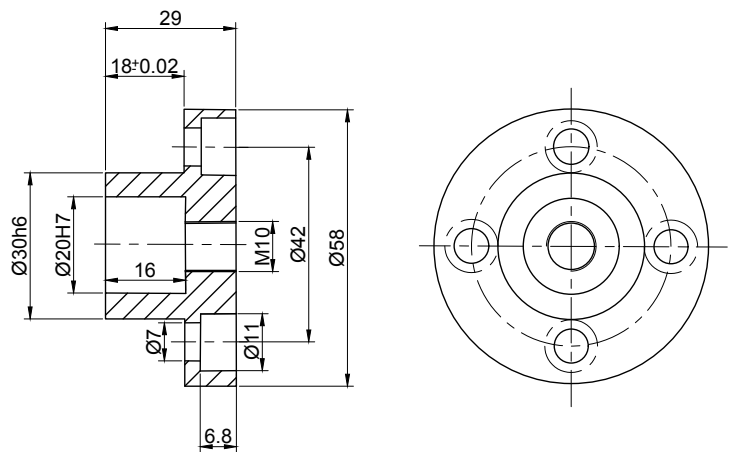


平滾輪 Plain roller



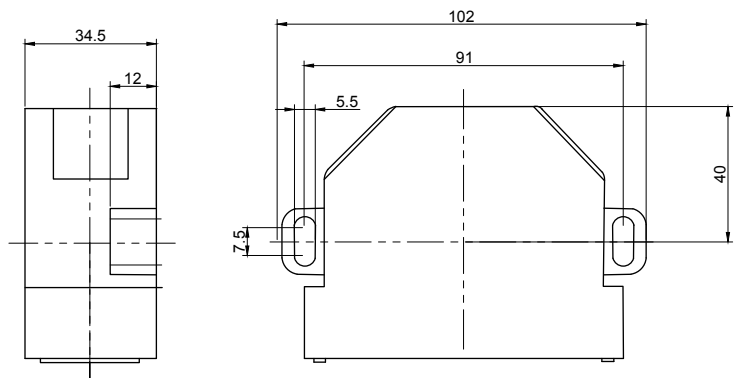
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	Nmax (min^{-1})	螺栓型號 Bolt size
FR20A	1mm	-3/+5	8600	9000	2000	7000	M10*50 8.8 級
FR20B	0	-3/+5	9500	10200	2200	7000	M10*50 8.8 級

法蘭 Mounting flange



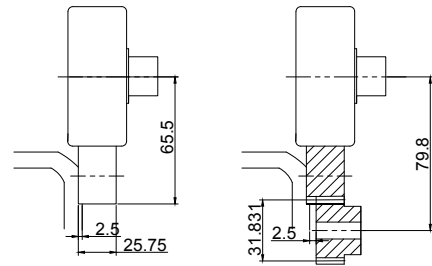
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP20	0.25	M6*16 8.8 級

潤滑罩 Wiper&lubrication unit

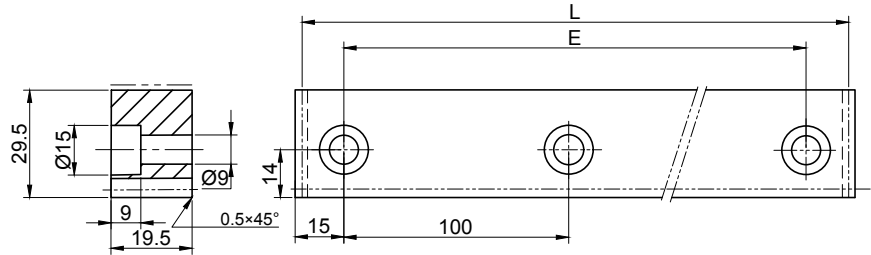


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSB20	0.1	M5*20 8.8 級

20 型平導軌、齒條、齒輪
Size 20 guideway flat rail, guideway flat rail rack, pinion

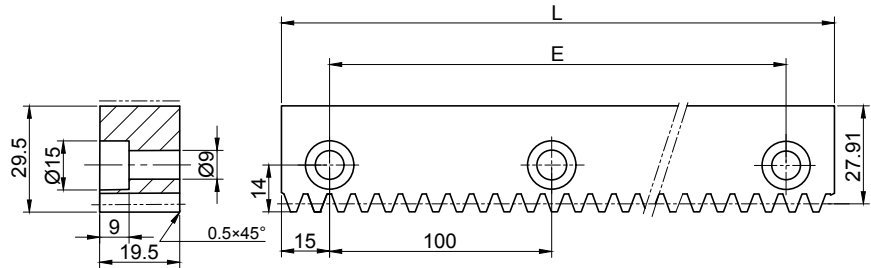


平導軌 **Guideway flat rail**



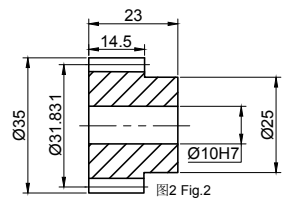
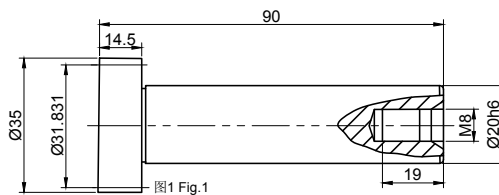
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
ST2006	630	600	S45C	M8*20 8.8 級
ST2010	1030	1000	S45C	M8*20 8.8 級

平導軌齒條 **Guideway flat rail rack**



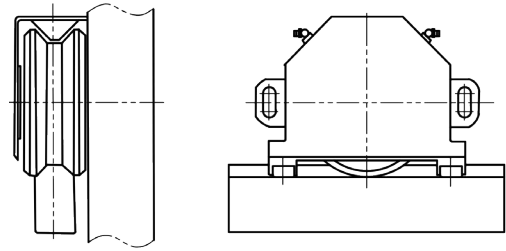
型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
STGH200606	630	600	1.5915	5.0	DIN6	S45C
STGH201006	1030	1000	1.5915	5.0	DIN6	S45C
STFH200609	630	600	1.5915	5.0	DIN9	S45C
STFH201009	1030	1000	1.5915	5.0	DIN9	S45C

齒輪 **Drive pinion**

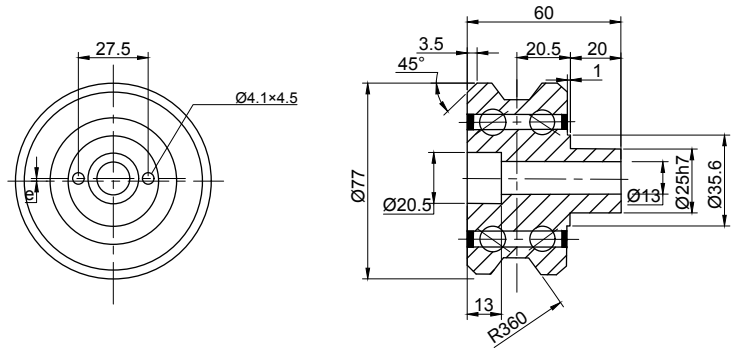


型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP20	20	1.5915	5.0	1	DIN6	4KN
SGSP20	20	1.5915	5.0	2	DIN6	4KN

25 型 V 軌、法蘭、潤滑罩
Size 25 roller for guideway V bars, Mounting flange, Wiper & lubrication unit

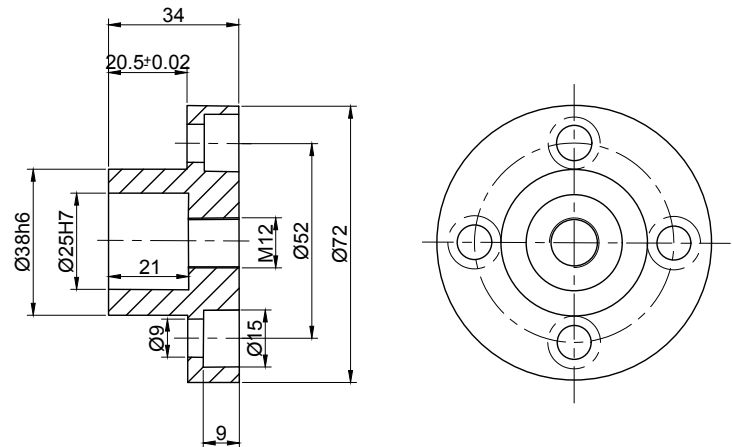


V 型滾輪 Roller for guideway V bars



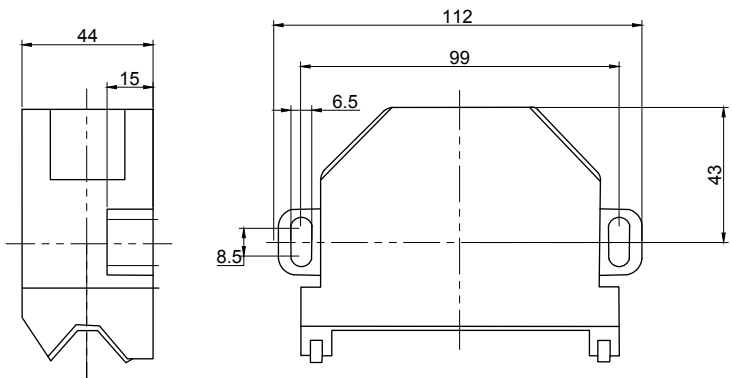
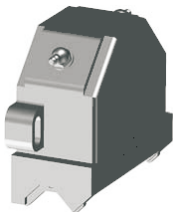
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	Nmax (min^{-1})	螺栓型號 Bolt size
VR25A	1mm	-3/+5	13500	14700	3200	5600	M12*60 8.8 級
VR25B	0	-3/+5	13500	14700	3200	5600	M12*60 8.8 級

法蘭 Mounting flange



型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP25	0.5	M8*20 8.8 級

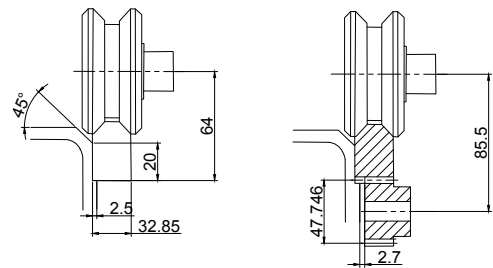
潤滑罩 Wiper & lubrication unit



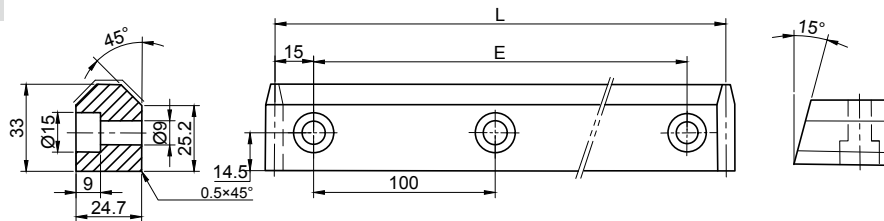
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSA25	0.1	M6*25 8.8 級

25 型 V 型導軌、齒條、齒輪

Size 25 roller for guideway V bars, guideway V bar rack, pinion

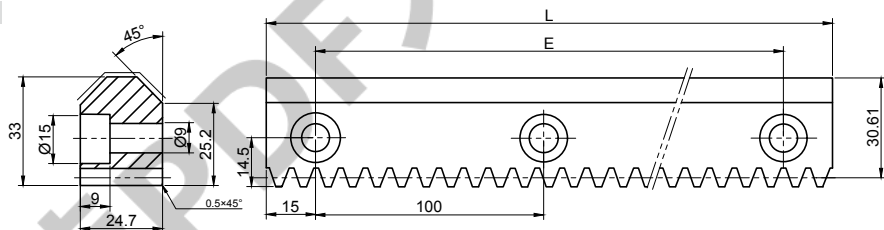


V 型導軌 Guideway V bar



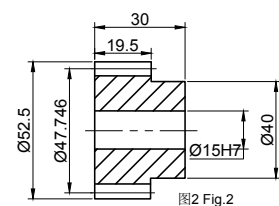
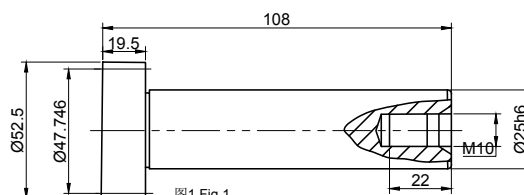
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
SV2506	630	600	S45C	M8*25 8.8 級
SV2509	930	900	S45C	M8*25 8.8 級
SV2510	1230	1200	S45C	M8*25 8.8 級

V 型導軌齒條 Guideway V bar rack



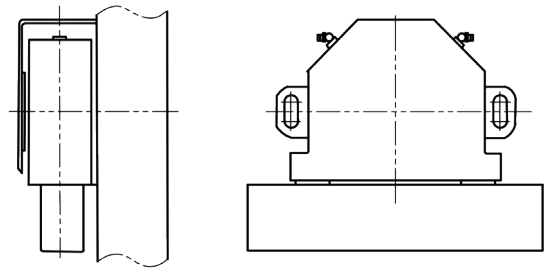
型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
SVGH250606	630	600	2.3873	7.5	DIN6	S45C
SVGH250906	930	900	2.3873	7.5	DIN6	S45C
SVGH251006	1230	1200	2.3873	7.5	DIN6	S45C
SVFH250609	630	600	2.3873	7.5	DIN9	S45C
SVFH250909	930	900	2.3873	7.5	DIN9	S45C
SVFH251009	1230	1200	2.3873	7.5	DIN9	S45C

齒輪 Drive pinion

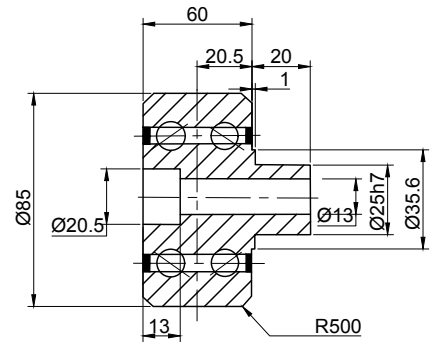
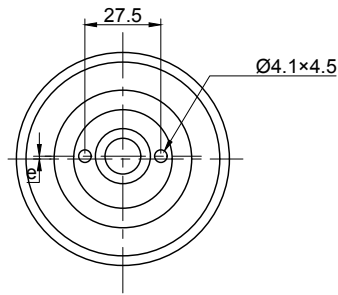


型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP25	20	2.3873	7.5	1	DIN6	3KN
SGSP25	20	2.3873	7.5	2	DIN6	4KN

25 型平滾輪、法蘭、潤滑罩
Size 25 roller for plain roller, Mounting flange, Wiper & lubrication unit

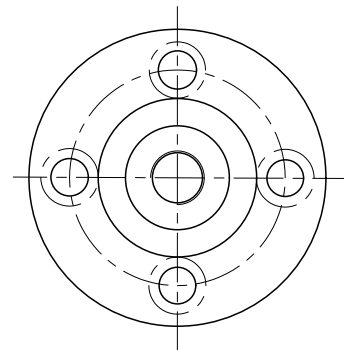
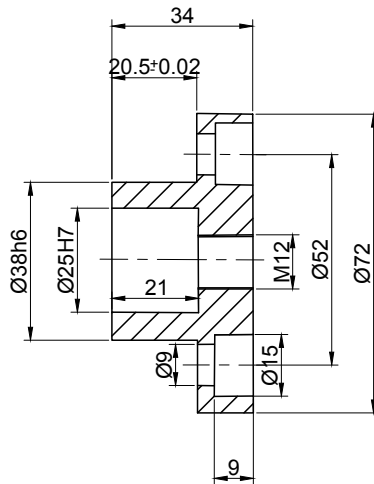


平滾輪 Plain roller



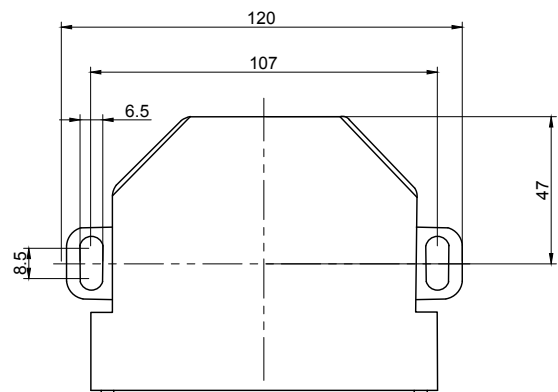
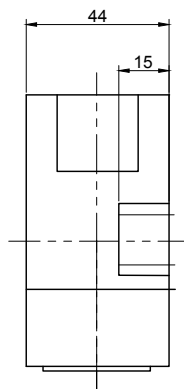
型號 Code	偏心率 Excenter	遊隙 Ga (μm)	C_{ow} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	Nmax (min^{-1})	螺栓型號 Bolt size
FR25A	1mm	-3/+5	13500	14700	3200	5600	M12*60 8.8 級
FR25B	0	-3/+5	15000	16300	3530	5600	M12*60 8.8 級

法蘭 Mounting flange



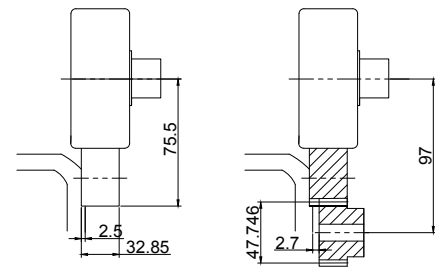
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP25	0.5	M8*20 8.8 級

潤滑罩 Wiper & lubrication unit

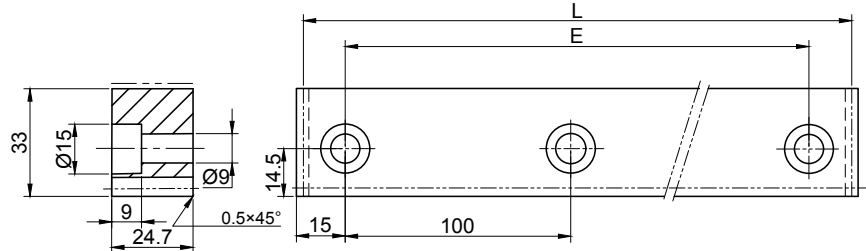


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSB25	0.1	M6*25 8.8 級

25 型平導軌、齒條、齒輪 Size 25 guideway flat rail, guideway flat rail rack, pinion

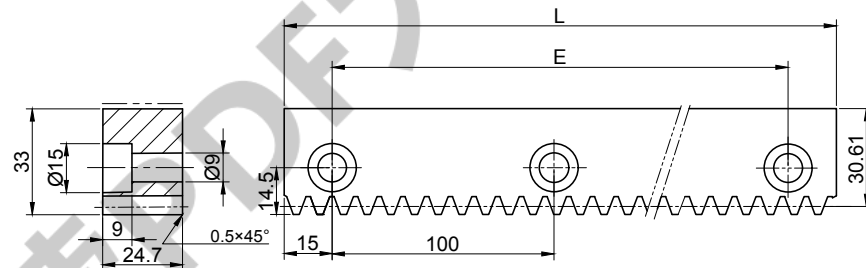


平導軌 Guideway flat rail



型號 Code	L	E	材料 Material	螺栓型號 Bolt size
ST2506	630	600	S45C	M8*25 8.8級
ST2509	930	900	S45C	M8*25 8.8級
ST2510	1230	1200	S45C	M8*25 8.8級

平導軌齒條 Guideway flat rail rack



型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
STGH250606	630	600	2.3873	7.5	DIN6	S45C
STGH250906	930	900	2.3873	7.5	DIN6	S45C
STGH251006	1230	1200	2.3873	7.5	DIN6	S45C
STFH250609	630	600	2.3873	7.5	DIN9	S45C
STFH250909	930	900	2.3873	7.5	DIN9	S45C
STFH251009	1230	1200	2.3873	7.5	DIN9	S45C

齒輪 Drive pinion

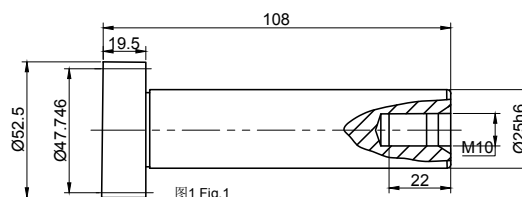


图1 Fig.1

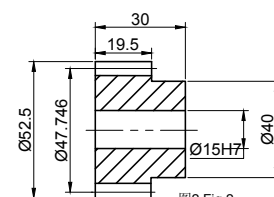
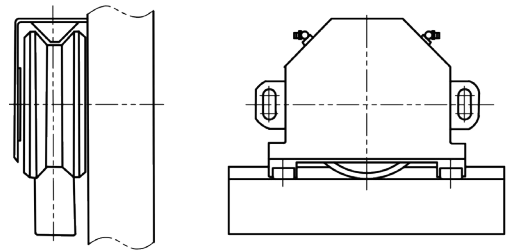


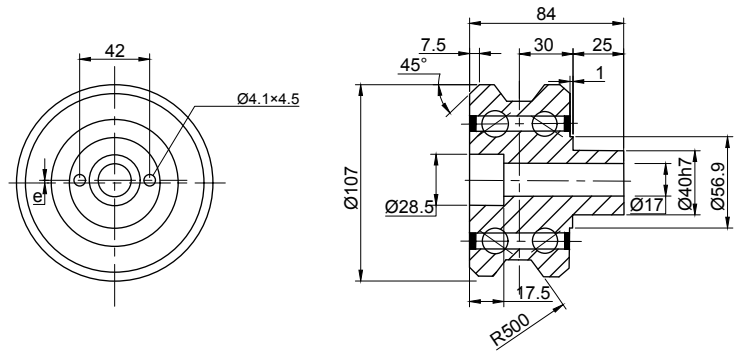
图2 Fig.2

型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP25	20	2.3873	7.5	1	DIN6	3KN
SGSP25	20	2.3873	7.5	2	DIN6	4KN

35 型 V 軌、法蘭、潤滑罩
Size 35 roller for guideway V bars, Mounting flange, Wiper & lubrication unit

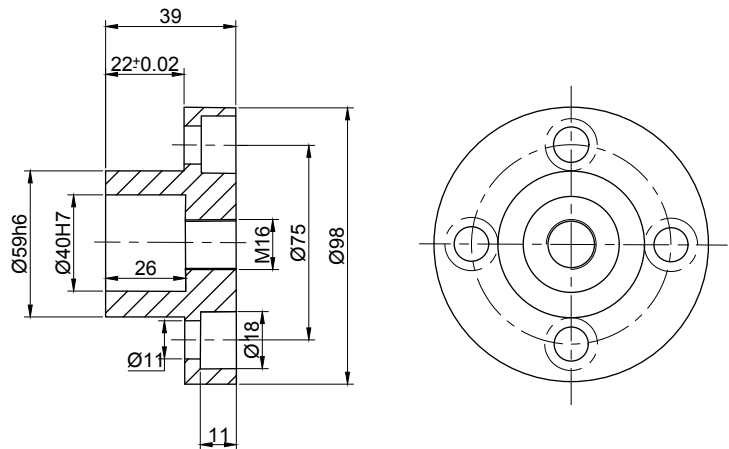


V 型滾輪 **Roller for guideway V bars**



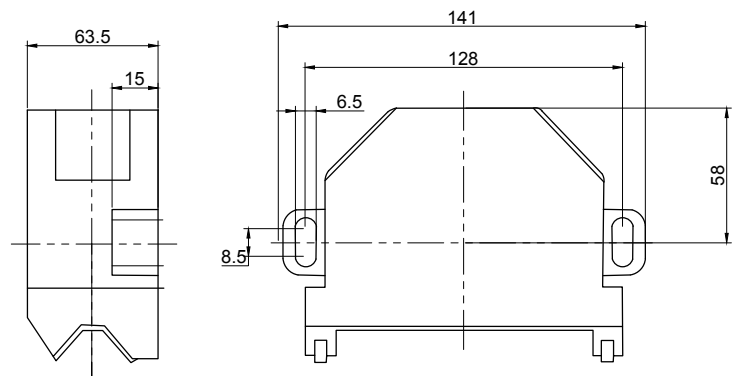
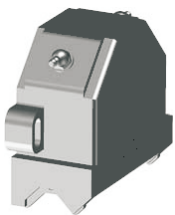
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	Nmax (min^{-1})	螺栓型號 Bolt size
VR35A	1mm	-3/+5	28800	25600	5500	3600	M16*80 8.8 級
VR35B	0	-3/+5	28800	25600	5500	3600	M16*80 8.8 級

法蘭 **Mounting flange**



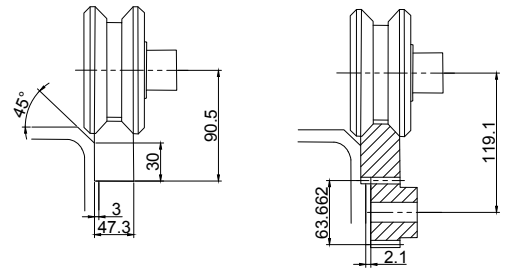
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP35	1.1	M10*25 8.8 級

潤滑罩 **Wiper & lubrication unit**

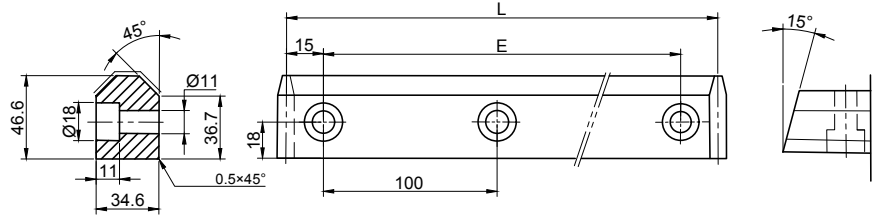


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSA35	0.1	M6*25 8.8 級

35 型 V 型導軌、齒條、齒輪
Size 35 roller for guideway V bars, guideway
V bar rack, pinion

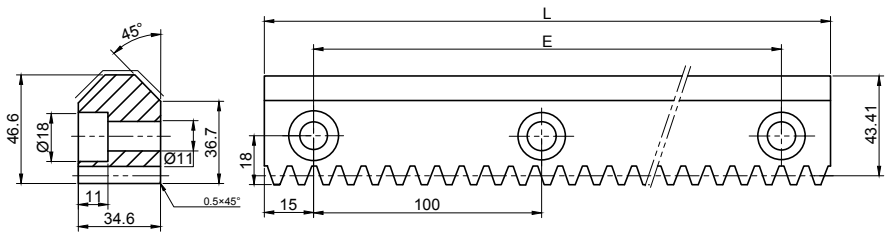


V 型導軌 **Guideway V bar**



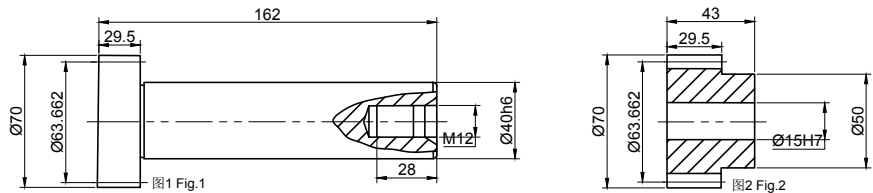
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
SV3506	630	600	S45C	M10*35 8.8 級
SV3509	930	900	S45C	M10*35 8.8 級
SV3510	1230	1200	S45C	M10*35 8.8 級

V 型導軌齒條 **Guideway V bar rack**



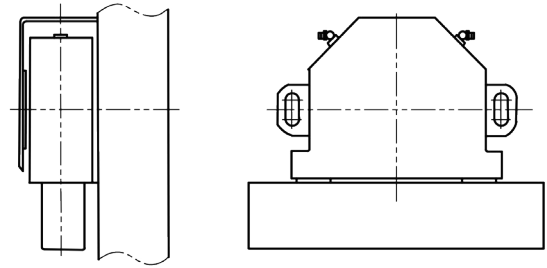
型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
SVGH350606	630	600	3.1831	10	DIN6	S45C
SVGH350906	930	900	3.1831	10	DIN6	S45C
SVGH351006	1230	1200	3.1831	10	DIN6	S45C
SVFH350609	630	600	3.1831	10	DIN9	S45C
SVFH350909	930	900	3.1831	10	DIN9	S45C
SVFH351009	1230	1200	3.1831	10	DIN9	S45C

齒輪 **Drive pinion**

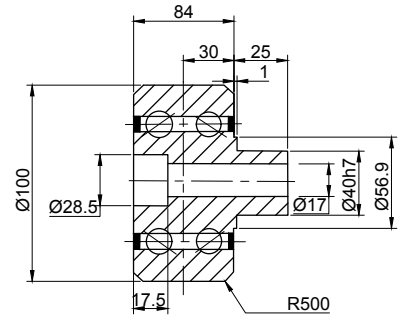
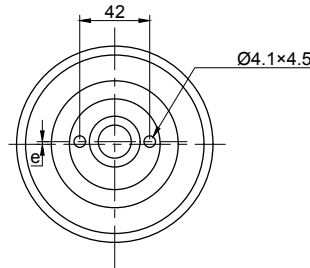


型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP35	20	3.1831	10.0	1	DIN6	18.5KN
SGSP35	20	3.1831	10.0	2	DIN6	18.5KN

35 型平滾輪、法蘭、潤滑罩
Size 35 roller for plain roller, Mounting flange, Wiper&lubrication unit

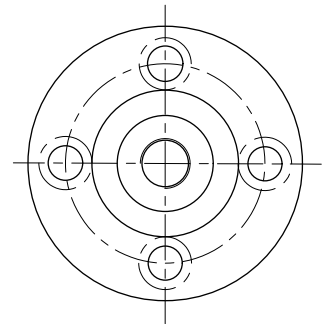
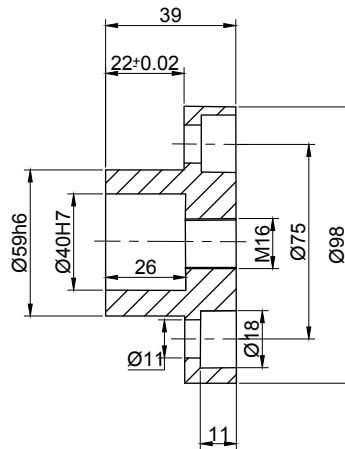


平滾輪 Plain roller



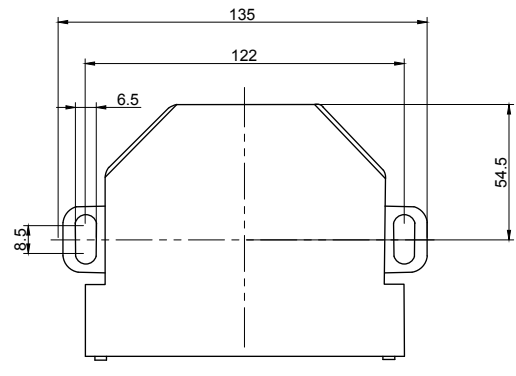
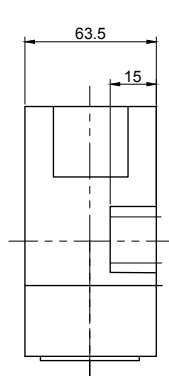
型號 Code	偏心量 Excenter	遊隙 Ga (μm)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	Nmax (min^{-1})	螺栓型號 Bolt size
FR35A	1mm	-3/+5	28800	25600	5500	3600	M16*80 8.8 級
FR35B	0	-3/+5	32000	28400	6150	3600	M16*80 8.8 級

法蘭 Mounting flange



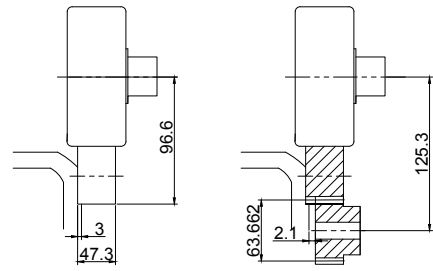
型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSP35	1.1	M10*25 8.8 級

潤滑罩 Wiper&lubrication unit

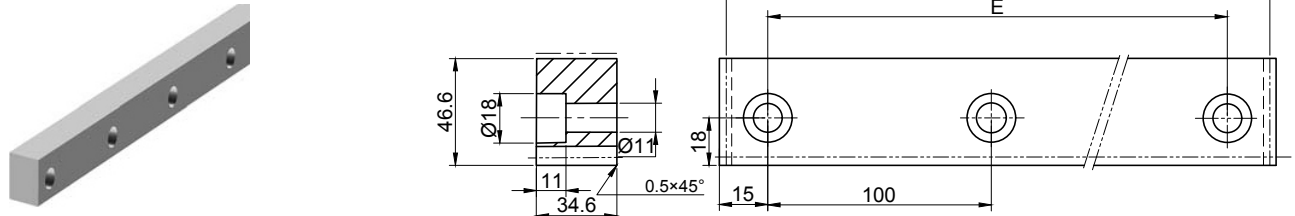


型號 Code	重量 Weight(kg)	螺栓型號 Bolt size
KSB35	0.1	M6*25 8.8 級

35 型平導軌、齒條、齒輪
Size 35 guideway flat rail, guideway flat rail rack, pinion

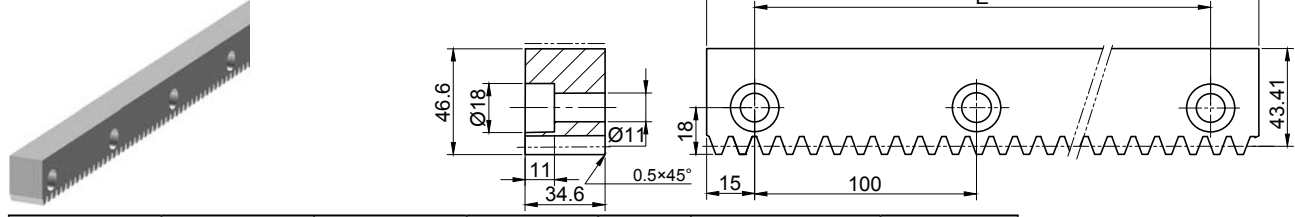


平導軌 **Guideway flat rail**



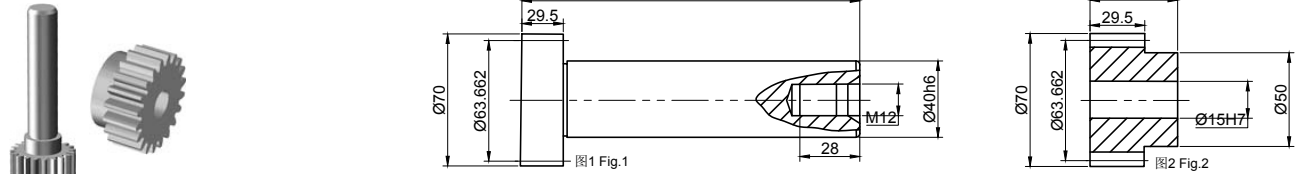
型號 Code	L	E	材料 Material	螺栓型號 Bolt size
ST3506	630	600	S45C	M10*35 8.8 級
ST3509	930	900	S45C	M10*35 8.8 級
ST3510	1230	1200	S45C	M10*35 8.8 級

平導軌齒條 **Guideway flat rail rack**

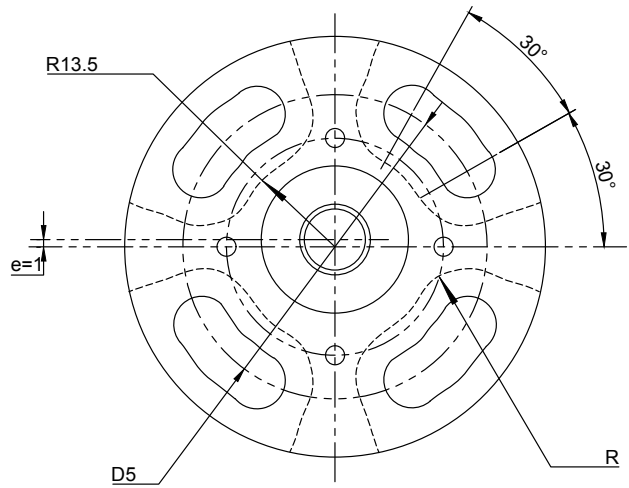
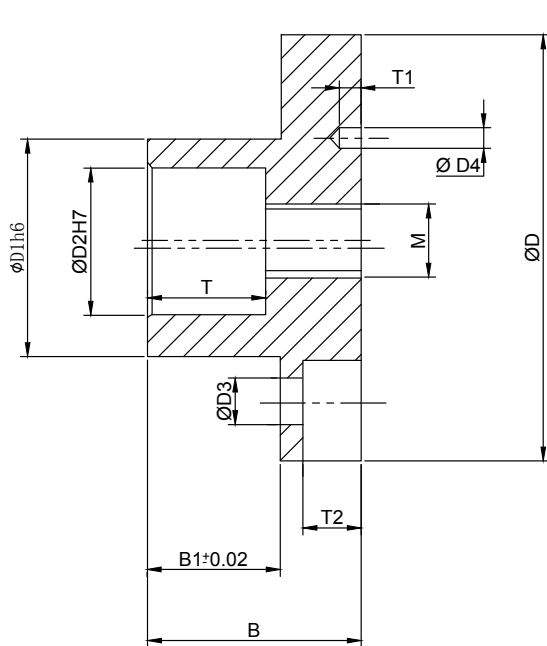


型號 Code	L	E	模數 Module	齒距 Pitch	精度等級 Precision grade	材料 Material
STGH350606	630	600	3.1831	10.0	DIN6	S45C
STGH350906	930	900	3.1831	10.0	DIN6	S45C
STGH351006	1230	1200	3.1831	10.0	DIN6	S45C
STFH350609	630	600	3.1831	10.0	DIN9	S45C
STFH350909	930	900	3.1831	10.0	DIN9	S45C
STFH351009	1230	1200	3.1831	10.0	DIN9	S45C

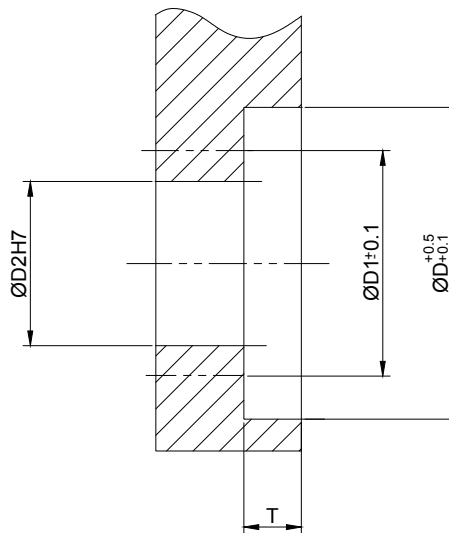
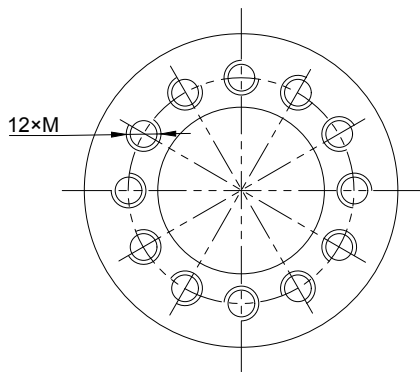
齒輪 **Drive pinion**



型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	最大驅動力 Max drive force
SGLP35	20	3.1831	10.0	1	DIN6	18.5KN
SGSP35	20	3.1831	10.0	2	DIN6	18.5KN

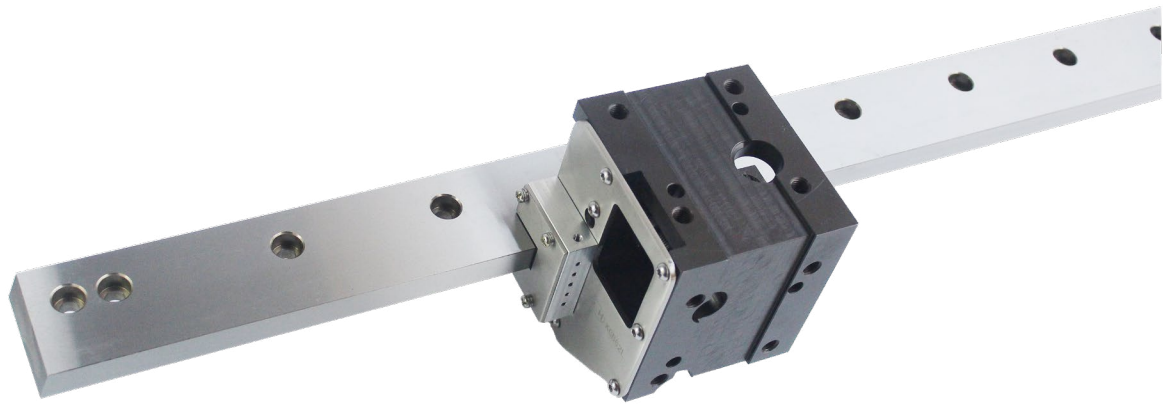


型號 Code	B	B1	D	D1	D2 ^①	D3	D4	D5	M ^①	R	T	T1	T2
KEP15	24.0	14.5	49.0	26.0	15.0	5.3	2.6	36.0	8.0	6.5	12.5	3.0	6.3
KEP20	29.0	18.0	58.0	30.0	20.0	6.4	2.6	42.0	10.0	7.5	16.0	3.0	7.9
KEP25	34.0	20.5	72.0	38.0	25.0	8.4	4.1	52.0	12.0	9.0	21.0	4.5	9.9
KEP35	39.0	22.0	98.0	59.0	40.0	10.5	4.1	75.0	16.0	12.0	26.0	4.5	12.3



型號 Code	D	D1	D2	T	M
KEP15	49	36	26	9.5	5
KEP20	58	42	30	11	6
KEP25	72	52	38	13.5	8
KEP35	98	75	59	17	10

GUIDEWAY SYSTEM FOR HEAVY DUTY APPLICATIONS



重载导轨 & 滚轮箱

重載扁導軌齒條傳動系統

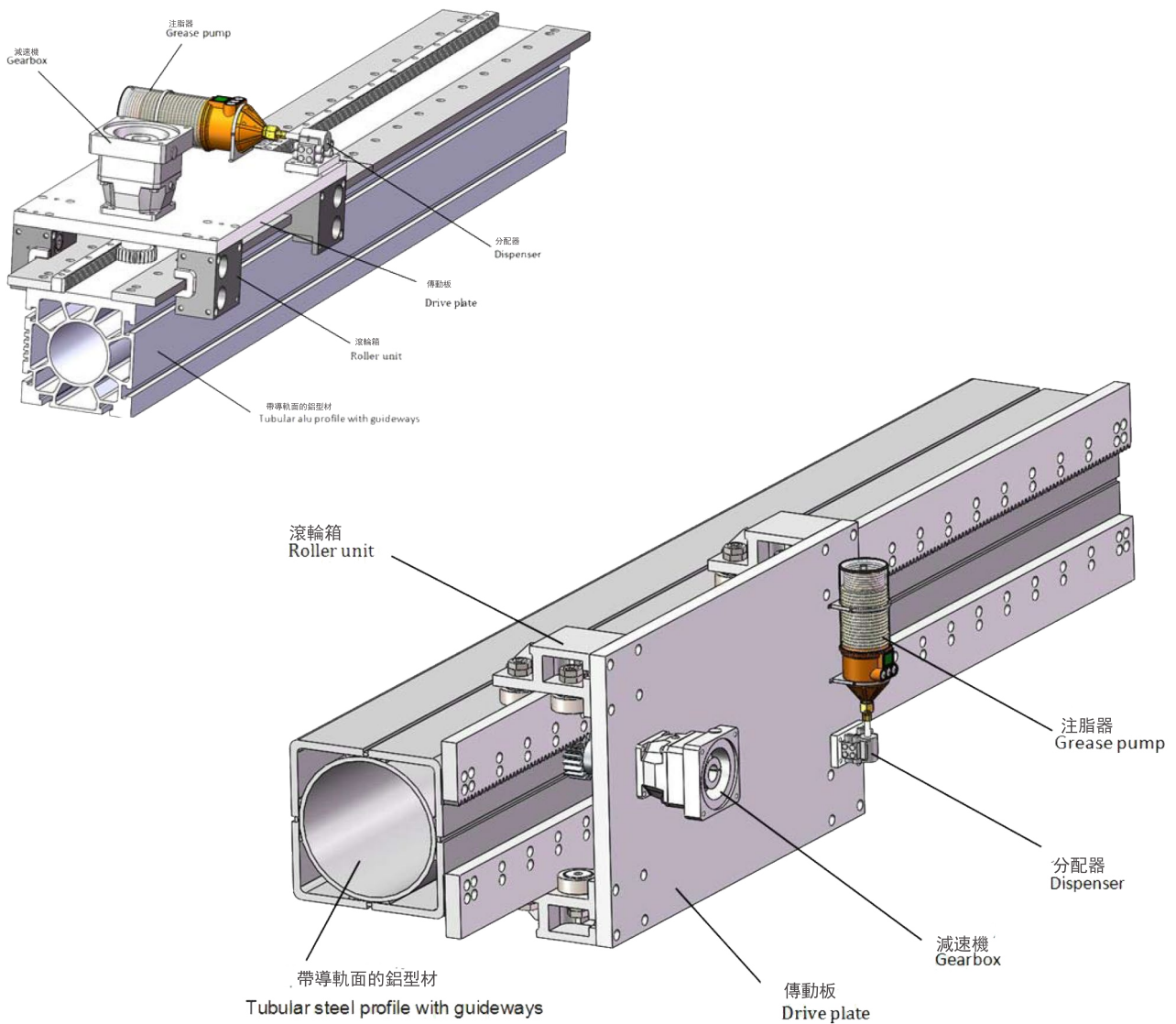
重載扁導軌齒條傳動系統包括扁導軌、扁導軌齒條、滾輪座等部件，適用於重載荷的應用。即可用於重型桁架機器人，也可用於機器人第七軸的直線傳動。

本系統標準型號 40,52,62,72,90 五種型號，為了避免圓周率帶來的影響，齒條均為 CP 齒條。所有導軌面均為高頻淬火，硬度為 HRC50-55。

Guideway systems for heavy duty applications

Guideway systems for heavy duty applications includes guideway flat rail, guideway flat rail rack, rollers support, etc. It can be used for truss robot mobile platform, as well as the seventh axis of the robot.

Our standard code includes 40, 52, 72, 90 sizes. To avoid cumulative pitch tolerance due to π , we use CP racks. The guideways are induction hardened to HRC50-55.



規格選擇

您可以根據以下數據，為您所需的導軌系統做大致的選型。表 1 中列出了在使用壽命 10^6m (1000 公里) 條件下滾輪的徑向載荷。滾輪尺寸表中也給了 C_{0w} 和 $C_w(10^8m)$ 的數值。表 2 為允許赫茲應力為 $1600Nmm^{-2}$ 時的載荷。

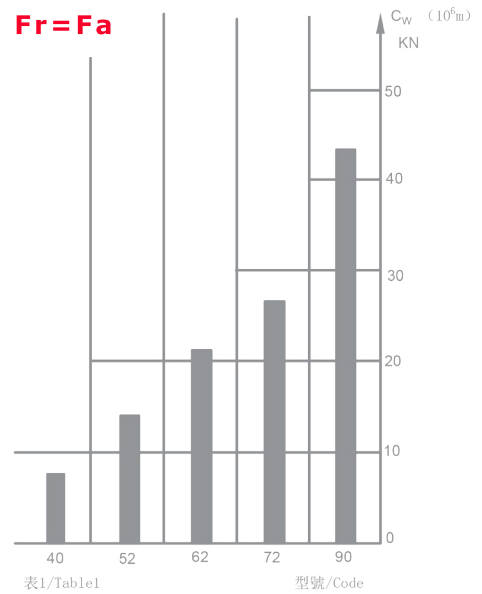
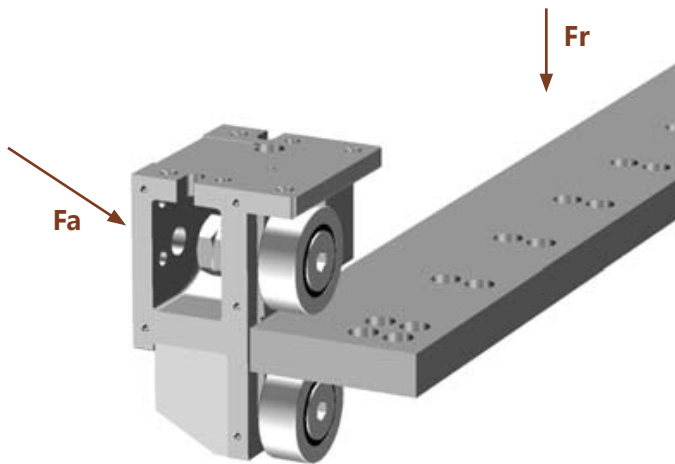
在多向受力和衝擊的情況下，需參考 30 頁中的計算數據，或與我們諮詢。

載荷主要作用在沒有偏心輪的滾輪上。

在懸掛佈置得工況下最大容許徑向載荷降低為以下數值：

KGB40:7KN KGB52:12KN KGB62:13KN

KGB72:17KN KGB90:33KN



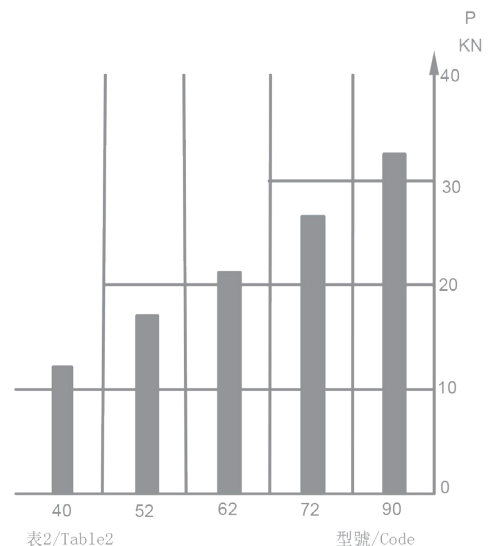
Size selection

This data allows for a rough selection of the size of the required guideway system. The C_w value are listed in table 1 for a nominal service life of 10^6m (1000km), and refer to a roller with radial loading. In the dimensional tables for the rollers, the values for C_{0w} and $C_w(10^8m)$ are also given. Table 2 indicates the load values for an admissible Hertzian stress of $1600 Nmm^{-2}$.

In case of combined loading and shock, the calculation data on page 30 must be consulted, or a calculation verification can be requested from the manufacturer. The main loads are to be taken by track rollers without eccentric hub. In case of suspended arrangement the maximum admissible radial load has to be reduced to the following values.

KGB40:7KN KGB52:12KN KGB62:13KN

KGB72:17KN KGB90:33KN



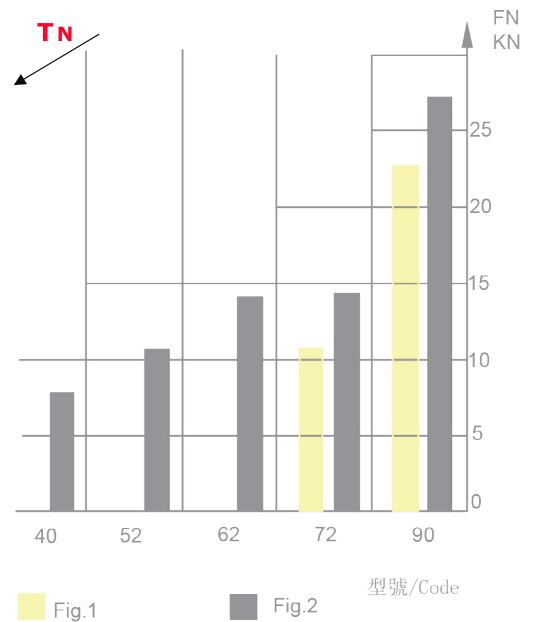
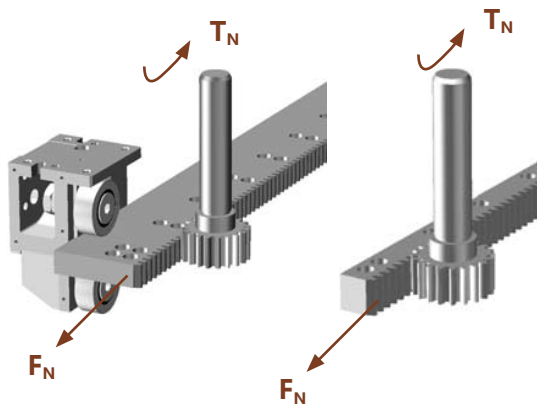
驅動力選擇

在選擇齒條以後，必須檢查齒輪齒數是否和所需驅動力及扭矩相匹配。

此處列出的數據只適用於無振動、潤滑良好和齒輪高剛性的情況。

此處齒根應力安全係數取 $S_F \geq 1.4$ ，赫茲應力安全係數取 $S_H \geq 1.0$ 。

安全係數 $S_B \approx 1.0 \dots 4.0$ ，由用戶根據經驗選取。牽引力 F_N 與齒輪齒數 Z 有關。



Size selection

After selecting the rack, the gear teeth of the guideway system must be checked for compatibility with the required drive forces and torques.

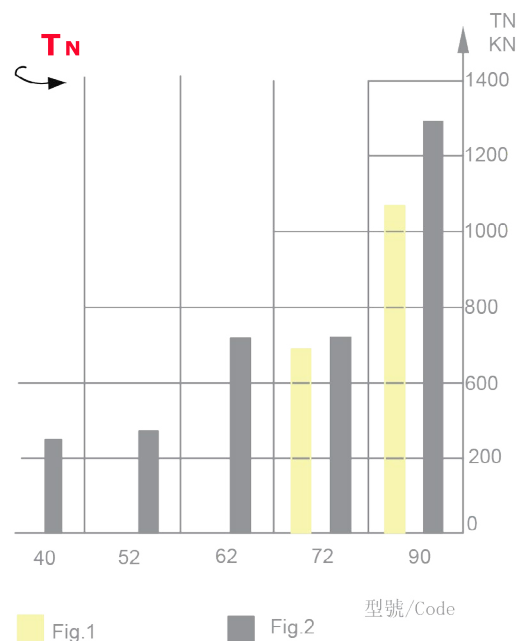
The rack can be supplied precision cut or hardened and ground.

The values given are values for shock-free operation, good lubrication and stiff arrangement of the pinion.

A safety factor for tooth root stress $S_F \geq 1.4$ and a safety factor for Hertzian stress $S_H \geq 1.0$ is taken in account.

Depending on your experience and application a safety factor $S_B \approx 1.0 \dots 4.0$ has to be considered.

The tracking force F_N is related to the number of teeth Z of the pinion



選型確認

高負載情況下必須進行驗證。使用壽命計算值是標稱名義值，90% 以上的滾輪都可以達到該數值。使用壽命 Lh(h) 小時數可以根據滾輪使用的平均速度來計算。

Fr: 外部徑向力 (KN)	External radical force per roller(KN)
P: 當量動載荷 (KN)	Equivalent dynamic load(KN)
Cw: 有效的基本動載荷水平	Effective basic dynamic load rating(KN)
L: 額定壽命	Nominal life time(m)
Kr: 尺寸係數	Size factor
f: 載荷係數 均勻衝擊 中等衝擊 較大衝擊	Load factor Uniform shocks:1.0...1.2 Moderate shocks:1.2...1.5 Heavy shocks:1.5...2.5
fs: 靜載荷係數	Static loading factor
C _{0w} : 最大容許靜態徑向力	Max.admissible static radial force(KN)

$$P = Fr \quad (\text{KN})$$

$$P_w = f \cdot P \quad (\text{KN})$$

$$L = Kr \cdot \left(\frac{C_w}{P_w} \right)^{10} \cdot 10^5 \quad (\text{m})$$

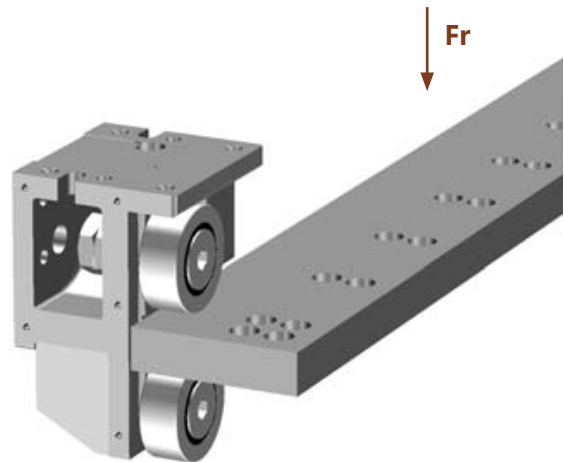
$$fs = 0.7 \cdot \frac{C_{0w}}{P_w} \quad fs \geq 1$$

GBR/GER	Cw(KN)	Kr
40	13.2	1.257
52	24.2	1.634
62	35.0	1.948
72	38.5	2.262
90	63.0	2.827

重載扁導軌齒條系統選型確認

Size verification

The calculation must be done for the roller under the highest load. The life time values calculated are nominal. 90% of all rollers reach these values. The service life Lh (h) hours can be calculated according to the average speed of the roller.

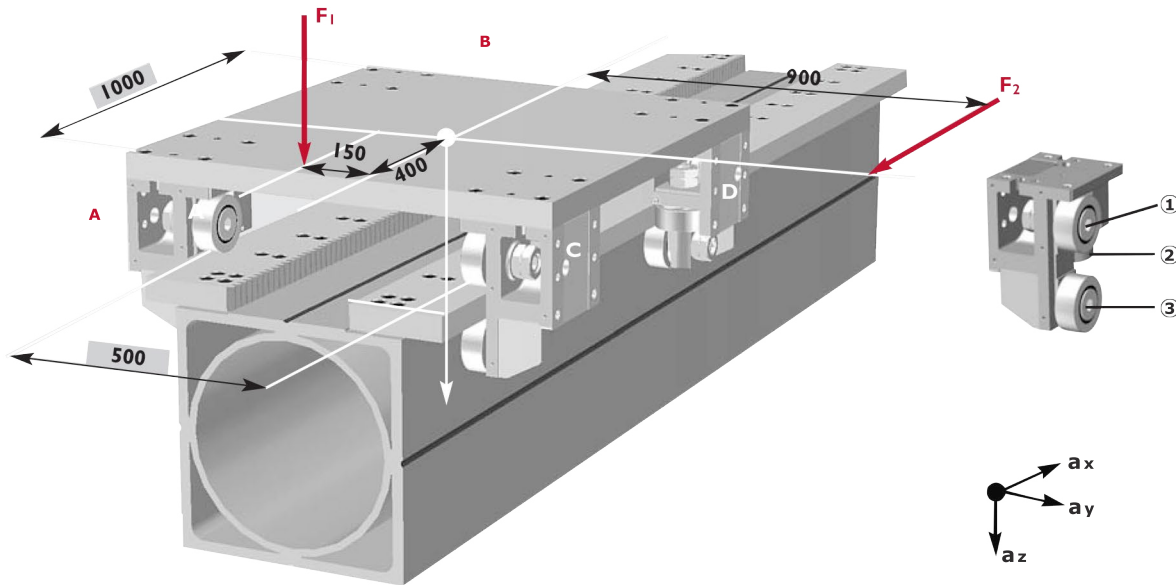


計算舉例

選擇滾輪箱時，以下情況應該滿足：10000km的壽命水平，導軌厚度不超過30mm。

Calculation Example

Choice of the roller support, which under the following conditions should achieve a life rating of about 10000km, whereby the rail thickness should not exceed 30mm.



1. 確定已知參數
 $F_1=16000$ (N)
 $F_2=2000$ (N)
 $F=1.1$
 $L_{min}=10000$ (km)
 $f_s \geq 1$

Determine knows

2. 確認未知數
 $P=?$ (KN)
 $L=?$ (km)

Determine unknowns

3. 初步選擇
 滾輪箱：72
 導軌：KGT72201

Select preliminary
 roller support:72
 guideway bar:KGT72201

4. 樣本值
 $D=72$ (mm)
 $C_w=41.5$ (KN)
 $C_{0W}=48$ (KN)

Catalogue values

5. 計算過程
 F_1 作用下，滾輪 1 和 2 所受負載 Load of rollers 1 and 2 because F_1
 ($F_2=0$ 時，滾輪 1 和 2 所受負載) (Load of rollers 1 and 2 because $F_2=0$)

Calculation according

$$P_{A1:A2}=16 \cdot \left(\frac{1}{2} - \frac{(-150)}{500} \right) \cdot \left(\frac{1}{2} - \frac{(-400)}{1000} \right) + \frac{0}{2} \cdot \frac{0}{1000} + \frac{0}{2} \cdot \frac{0}{500} = 11.52 \text{KN} \quad P_{A1}=11.52 \text{KN}$$

$$P_{B1:B2}=16 \cdot \left(\frac{1}{2} - \frac{(-150)}{500} \right) \cdot \left(\frac{1}{2} - \frac{(-400)}{1000} \right) - \frac{0}{2} \cdot \frac{0}{1000} + \frac{0}{2} \cdot \frac{0}{500} = 1.28 \text{KN} \quad P_{B1}=1.28 \text{KN}$$

$$P_{C1:C2}=16 \cdot \left(\frac{1}{2} - \frac{(-150)}{500} \right) \cdot \left(\frac{1}{2} - \frac{(-400)}{1000} \right) + \frac{0}{2} \cdot \frac{0}{1000} - \frac{0}{2} \cdot \frac{0}{500} = 2.88 \text{KN} \quad P_{C1}=2.88 \text{KN}$$

$$P_{D1:D2}=16 \cdot \left(\frac{1}{2} - \frac{(-150)}{500} \right) \cdot \left(\frac{1}{2} - \frac{(-400)}{1000} \right) - \frac{0}{2} \cdot \frac{0}{1000} - \frac{0}{2} \cdot \frac{0}{500} = 0.32 \text{KN} \quad P_{D1}=0.32 \text{KN}$$

請注意：因為所有的負載均是正的，滾輪 1 總是在受力狀態。
Please note: because all values are positive, roller 1 is always under load.

當 $F_1=0$ 時，滾輪 3 所受負載 Load of rollers 3 because $F_1=0$
在 F_2 作用下，滾輪 3 所受負載 Load of rollers 3 because F_2

$$P_{A_3;C_3}=0 \cdot \left(\frac{1}{2} - \frac{0}{1000}\right) + (-2) \cdot \frac{900}{1000} = -1.8\text{KN} \quad P_{C_3}=1.8\text{KN}$$

$$P_{B_3;D_3}=0 \cdot \left(\frac{1}{2} - \frac{0}{1000}\right) - (-2) \cdot \frac{900}{1000} = 1.8\text{KN} \quad P_{B_3}=1.8\text{KN}$$

6. 滾輪 A1 壽命計算 Life time calculation of roller A1

$$P_w = f \cdot P_{A_1} = 1.1 \cdot 11.52 = 12.67\text{KN} \quad P_w = 12.67\text{KN}$$

$$L = kr \cdot \left(\frac{C_w}{P_w}\right)^{\frac{10}{3}} \cdot 10^5 = 2.262 \cdot \left(\frac{41.5}{12.67}\right)^{\frac{10}{3}} \cdot 10^5 = 11798742\text{m} \quad L = 11800$$

$$L_{\min} = 10000\text{km} < L = 11800\text{km}$$

7. 驗證靜載荷係數 Verify static loading factor

$$f_s = 0.7 \cdot \frac{C_{QW}}{P_w} = 0.7 \cdot \frac{48}{12.67} = 2.65 \quad f_s = 2.65$$

$$F_s = 2.65 > f_{s_{\min}} = 1$$

安裝

滾輪的背隙和預緊是通過 GER 偏心輪轂調整。(圖①)使用六角扳手，轉動和預加載偏心滾輪。使用扭矩扳手擰緊螺母。GBR 系列的滾子是同心型的。

軸承潤滑的滾輪內部開口處有一個指定的位置，該位置與滾輪表面上的 INA 標誌一致。開口處和導軌接觸的滾輪面相相對。適用於同心滾輪。偏心滾輪，開口隨着偏心調整而移動，開口不受到影響(圖②)。

Assembly

The backlash setting and the pre-tensioning of the rollers take place via the eccentric hub of the rollers of the series GER (Fig. ①) By using an Allen key the eccentric of the roller can be turned and preloaded. The nuts are tightened by using a torque wrench. The rollers of the series GBR are in concentric version.

The opening inside the roller for the greasing of the bearing has a defined position which is in line with the INA sign on the face of the roller, This opening has to be opposite the roller face that is in contact with the guide rail-especially in respect of the concentric rollers. On eccentric rollers the opening moves with the eccentric adjustment and cannot be influenced (Fig. ②)



Fig. ①

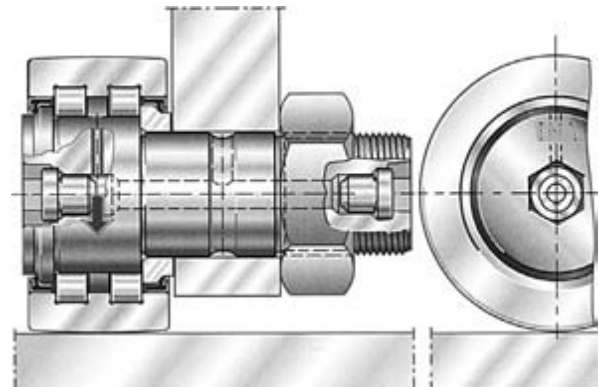
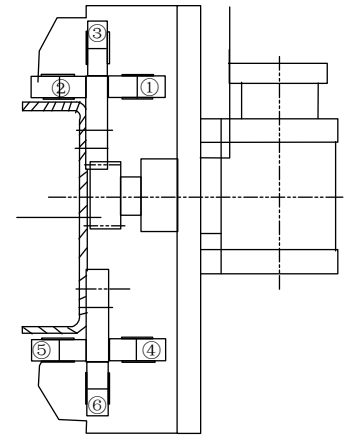
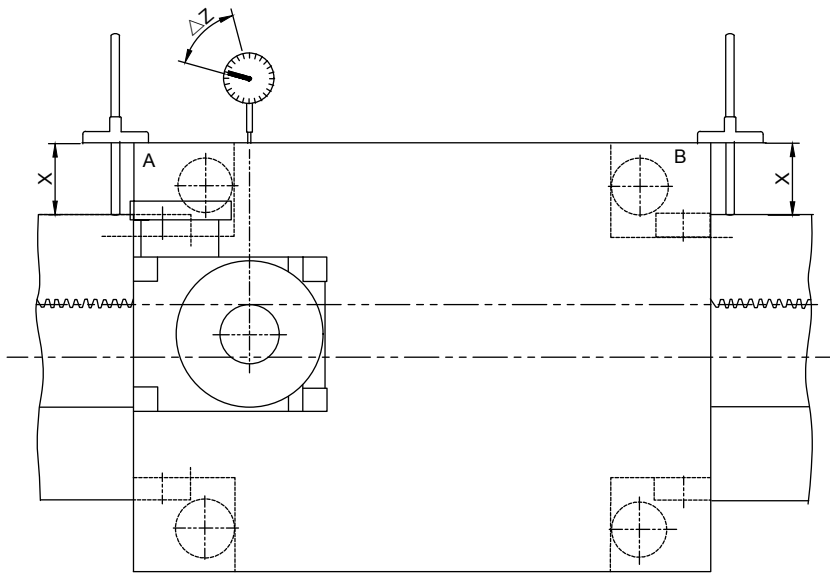


Fig. ②



滾輪預載調整

1. 擰緊滾輪①和④的螺母。鬆開滾輪②, ③和⑤, ⑥的螺母。將偏心輪轉動最小位置。

2. 轉動②和⑤的偏心輪。然後輕輕擰緊螺母。

3. 將千分錶放到驅動齒輪附近。

4. 對齊滑架并消除背隙：調整滾輪③直到滾輪支架 A 和 B 測量值 X 相同。同時，齒隙必須為零。

5. 重置千分錶

6. 調整背隙間隙：鬆開滾輪③，然後轉動偏心軸，使千分錶顯示 $\Delta Z = 0.10\text{mm}$ (結果背隙間隙 -0.07mm)。兩個滾輪支架上的測量 X 必須相等。

7. 擰緊偏心輪使數值保持在 $\Delta Z = 0.10\text{mm}$ 。

8. 檢查預緊力：無負載的滾輪必須能用適度的力轉動，如果不能轉動，則鬆開滾輪②, ⑤, ⑥并再次調整。

Adjustment of preload of rollers

1. Tighten the nuts of the rollers ① and ④. Loosen the nuts of the rollers ②, ③ and ⑤, ⑥. Turn the eccentric hubs to the minimal position.

2. Turn the eccentrics of the rollers ② and ⑤. Then tighten the nuts gently.

3. Position the dial gauge adjacent to the drive pinion.

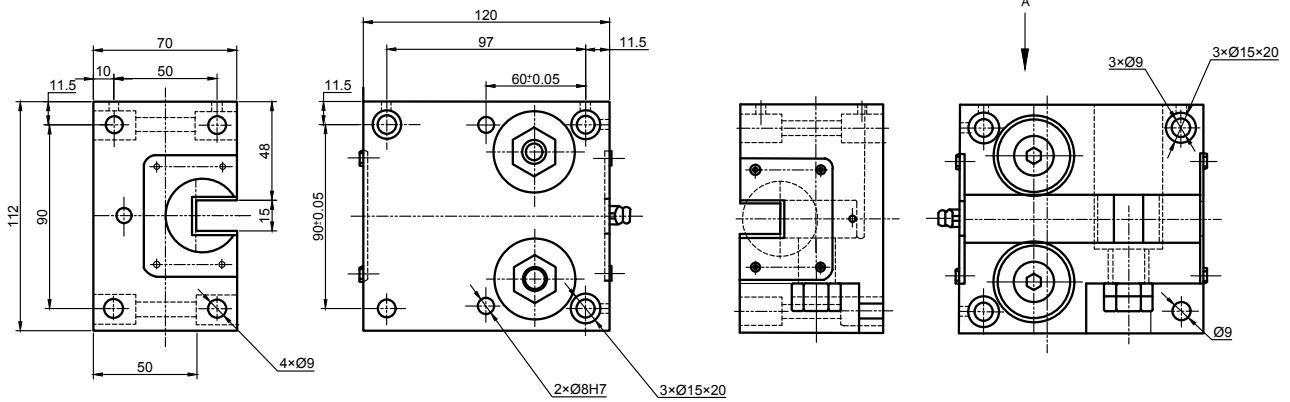
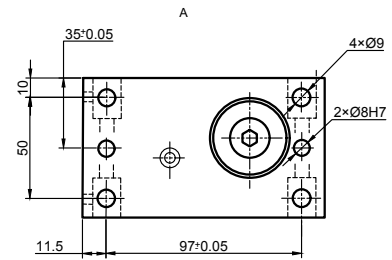
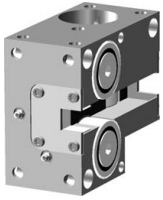
4. Align the carriage and eliminate backlash: Adjust rollers ③ until the measurement X of the roller supports A and B are identical. At the same time, the tooth backlash must be zero.

5. Reset the dial gauge.

6. Adjust the backlash clearance: Loosen rollers ③ and subsequently turn the eccentric hubs so that the dial gauge displays $\Delta Z = 0.10\text{mm}$ (results in a backlash clearance of -0.07mm). The measurement X must be equal again on both roller supports.

7. Tighten the eccentric rollers while the value $\Delta Z = 0.10\text{mm}$ is maintained.

8. Check the pre-tensioning: Rollers that are not under load must be able to turn using moderate force. If they are not free, loosen rollers ②, ⑤, ⑥ and adjust them again.

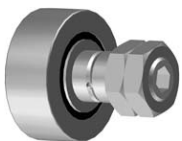


型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB40.1R	GBR	GER	GER	2.5	13800	7000	1800	5000
KGB40.2R	GBR	GER	GBR	2.5	13800	7000	1800	5000
KGB40.3R	GER	GBR	GER	2.5	13800	7000	1800	5000

$CW^{①}$: Normal service life 10^6m $CW^{②}$: Normal service life 10^8m

螺栓型滾輪

Stud roller



型號 Code	圖 Fig.	偏心率 Excenter (mm)	重量 Weight (kg)	螺母擰緊力距 MA (Nm)
GBR40	1	-	0.25	87
GER40	2	1	0.25	87

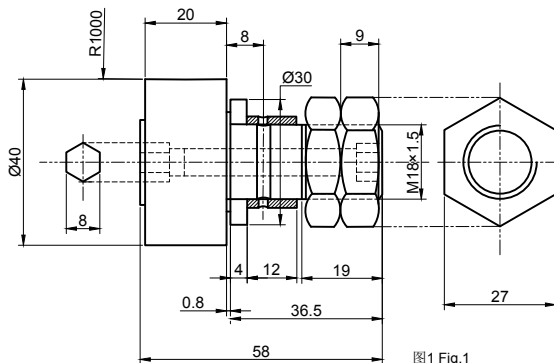


图1 Fig.1

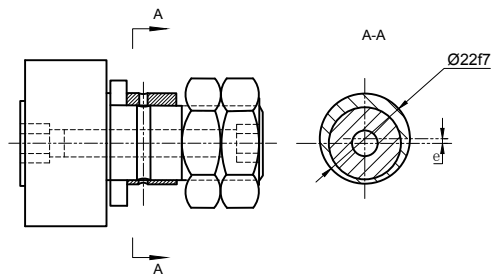
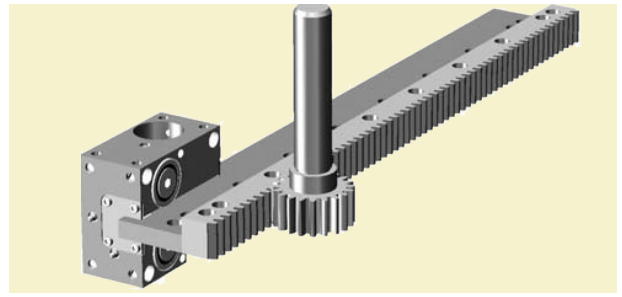
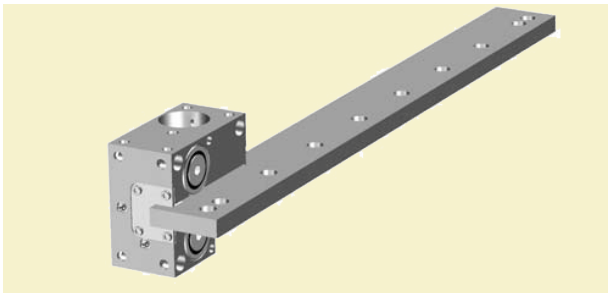
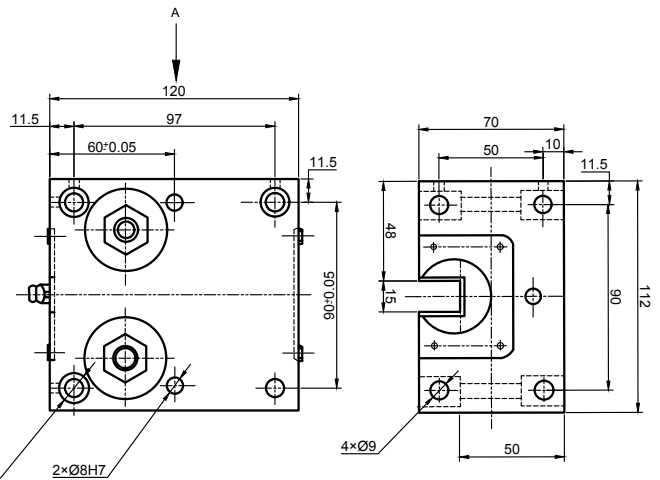
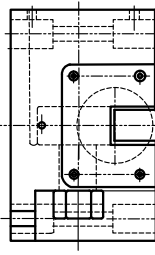
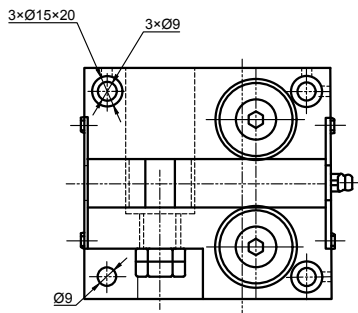
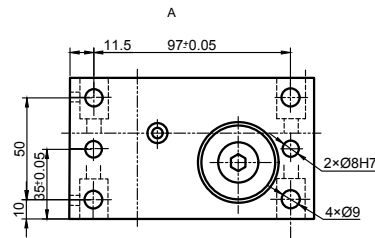
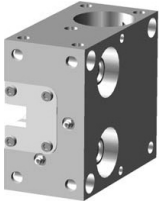


图2 Fig.2



40 型滾輪支座 (左側支座)

Roller support (left hand version)



型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB40.1R	GBR	GER	GER	2.5	13800	7000	1800	5000
KGB40.2R	GBR	GER	GBR	2.5	13800	7000	1800	5000
KGB40.3R	GER	GBR	GER	2.5	13800	7000	1800	5000

$C_W^{①}$: Normal service life 10^6m $C_W^{②}$: Normal service life 10^8m

配件

Accessories

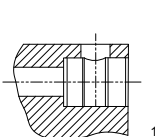
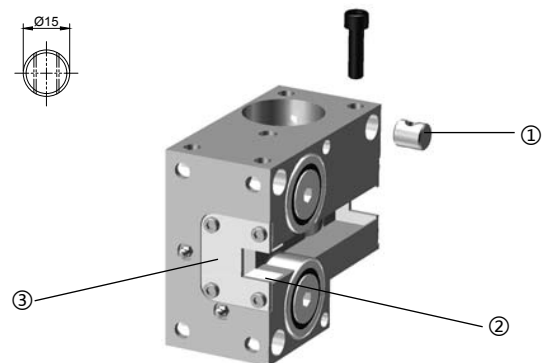
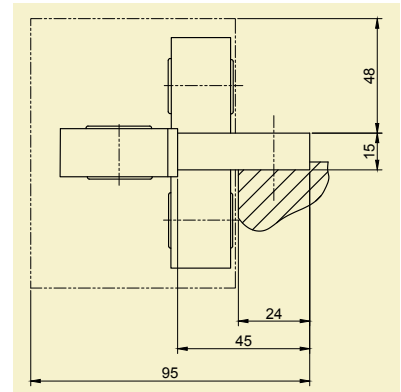


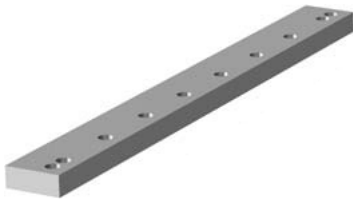
圖 Fig.	材料 Material	重量 Weight (kg)
①	C45	0.01
②	毛氈	
③	Q345B	



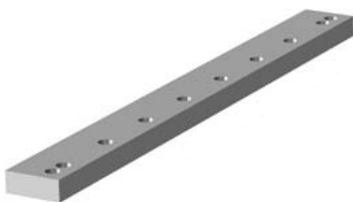
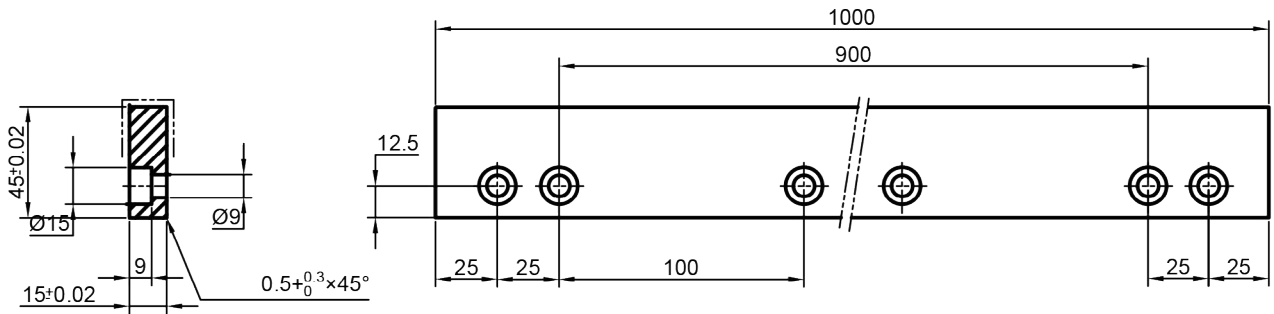


40 型重載扁導軌

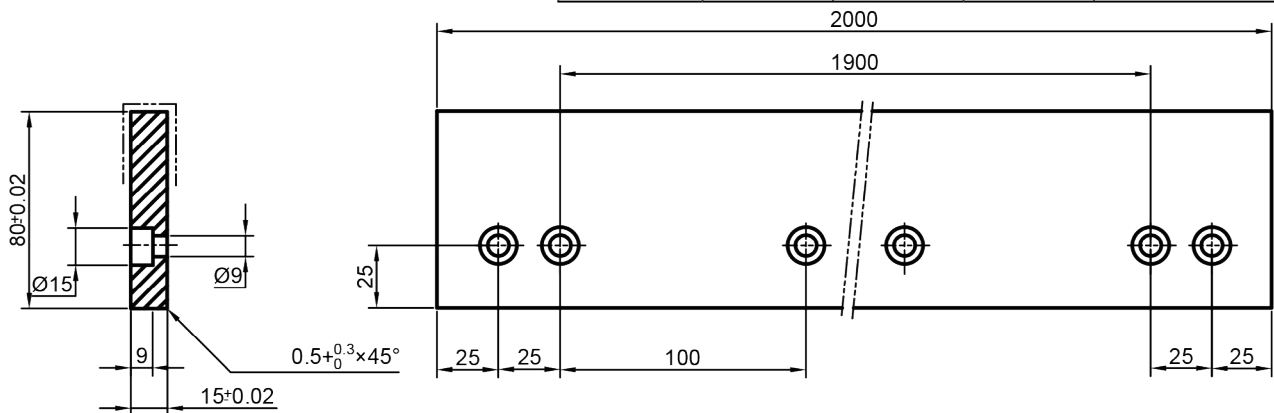
40 Guideway flat rail

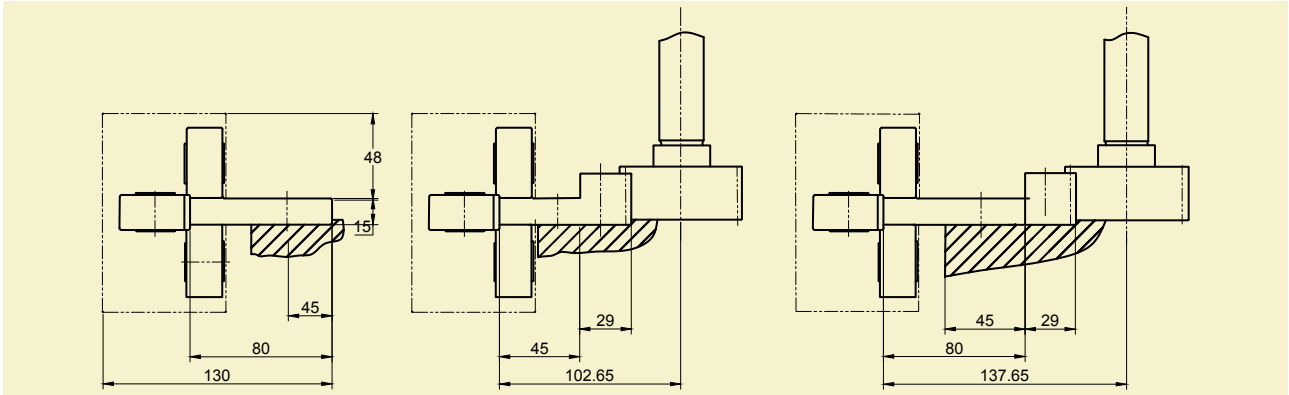


型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT40101	1000	900	S45C	M8×20 8.8 級



型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT40202	2000	1900	S45C	M8×20 8.8 級



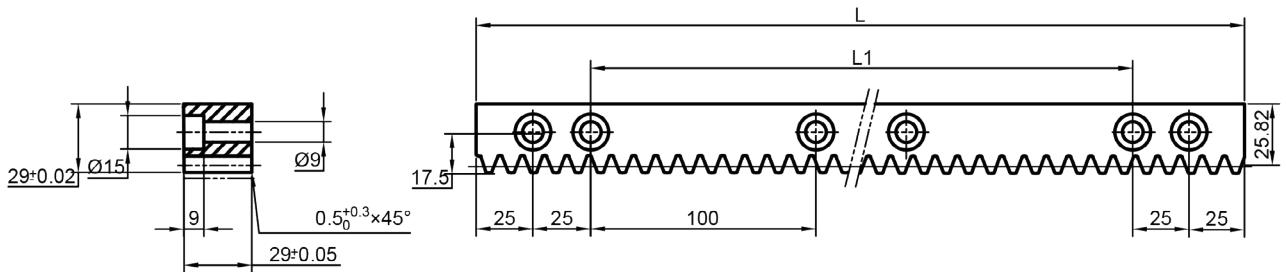


齒條

rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGS40129	1200	1100	3.1831	10.0	S45C	DIN9	M8×35 8.8 級
KGS40209	2000	1900	3.1831	10.0	S45C	DIN9	M8×35 8.8 級



齒輪

Drive pinion

型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	重量 Weight KG
SGLP40-CP10	20	3.1831	10.0	1	DIN6	1.95
SGSP40-CP10	20	3.1831	10.0	2	DIN6	0.9

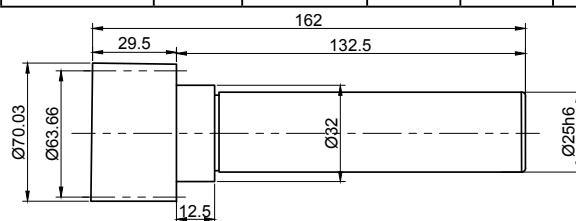


图1 Fig.1

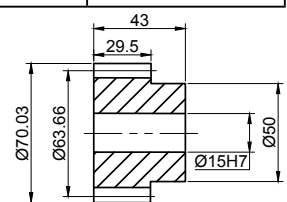
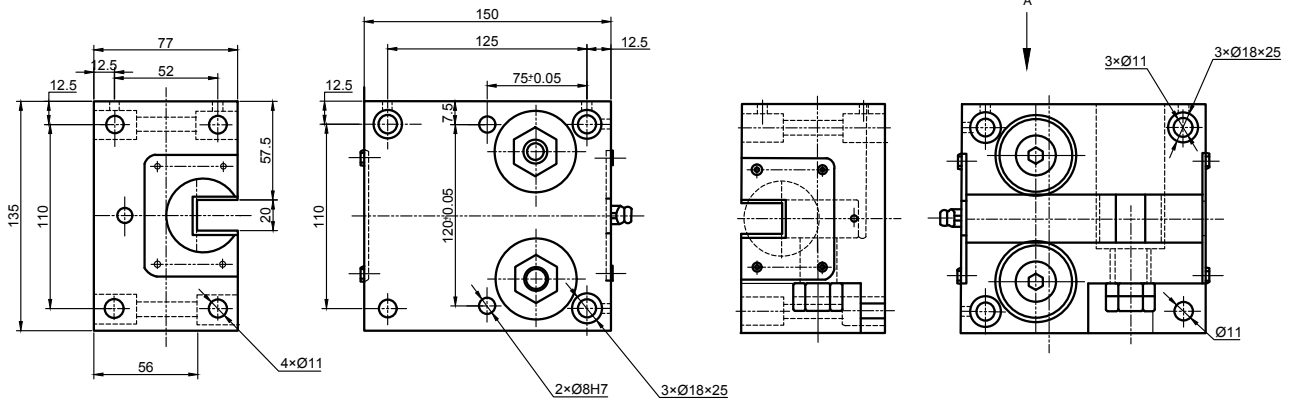
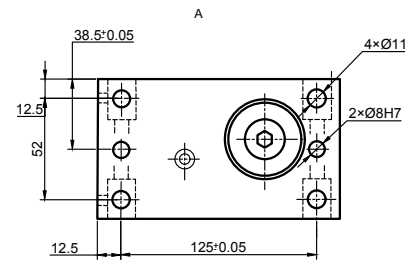
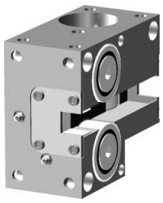


图2 Fig.2

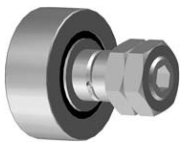


型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB52.1R	GBR	GER	GER	4	28000	14000	3500	3800
KGB52.2R	GBR	GER	GBR	4	28000	14000	3500	3800
KGB52.3R	GER	GBR	GER	4	28000	14000	3500	3800

$C_W^{①}$: Normal service life 10^6m $C_W^{②}$: Normal service life 10^8m

螺栓型滾輪

Stud roller



型號 Code	圖 Fig.	偏心率 Excenter (mm)	重量 Weight (kg)	螺母擰緊力距 MA (Nm)
GBR52	1	-	0.47	120
GER52	2	1	0.47	120

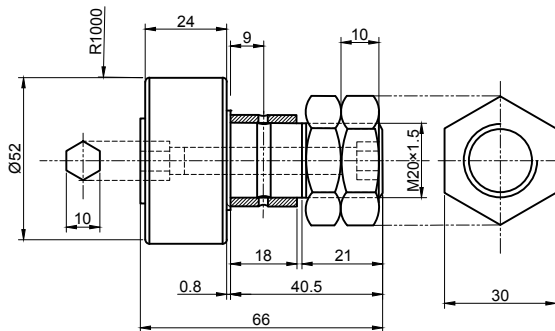


图1 Fig.1

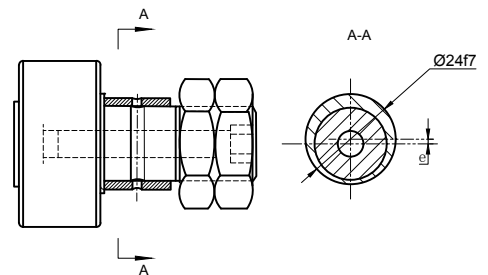
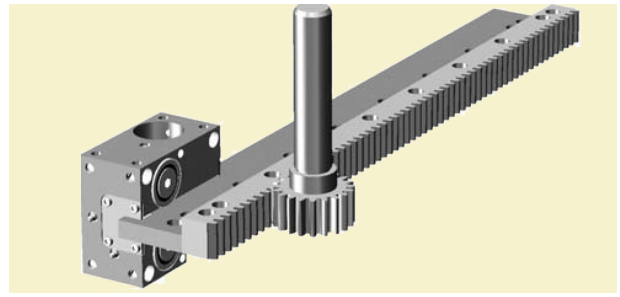
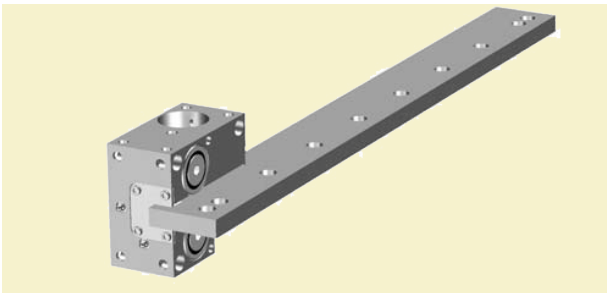
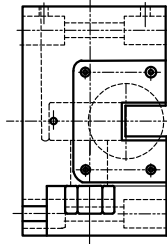
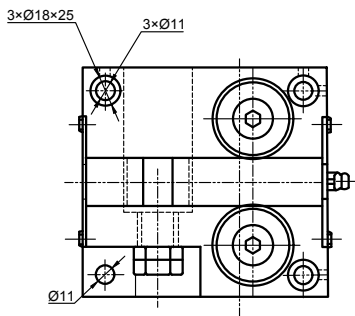
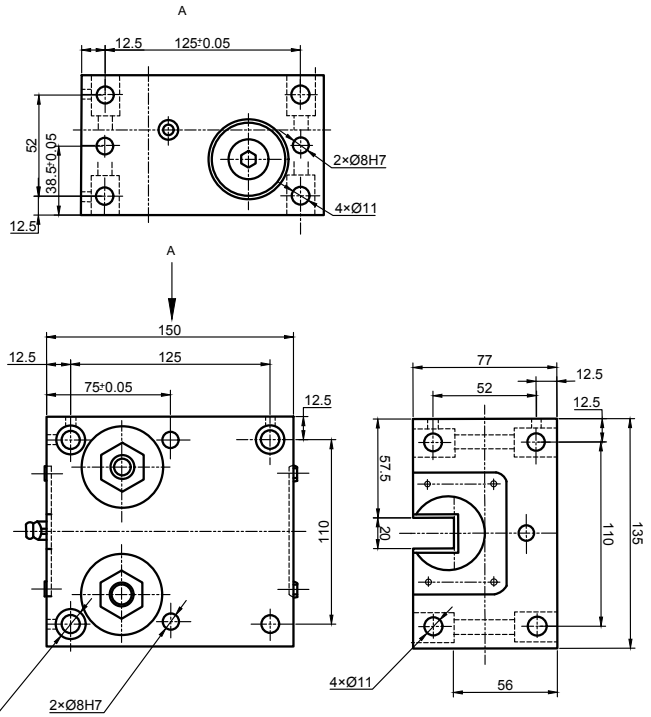
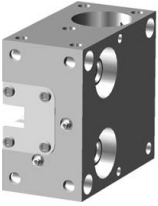


图2 Fig.2



52 型滾輪支座 (左側支座)

Roller support (left hand version)



型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB52.1L	GBR	GER	GER	4	28000	14000	3500	3800
KGB52.2L	GBR	GER	GBR	4	28000	14000	3500	3800
KGB52.3L	GER	GBR	GER	4	28000	14000	3500	3800

$C_W^{①}$: Normal service life 10^6m $C_W^{②}$: Normal service life 10^8m

配件

Accessories

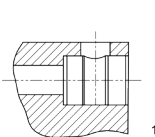
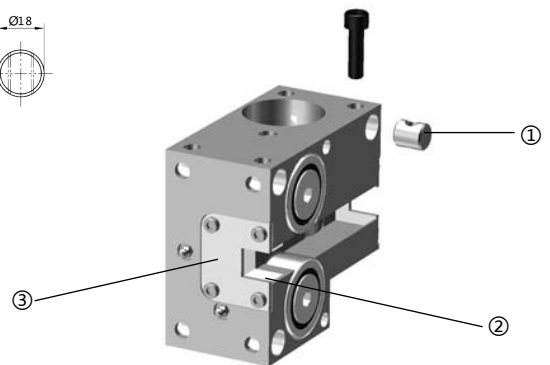
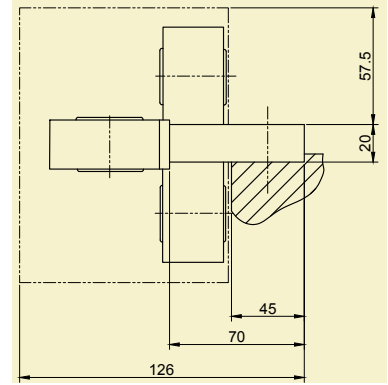


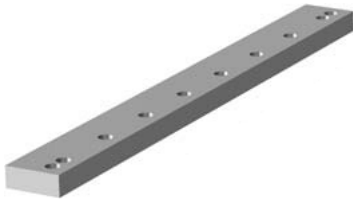
圖 Fig.	材料 Material	重量 Weight (kg)
1	C45	0.01
2	毛氈	
3	Q345B	



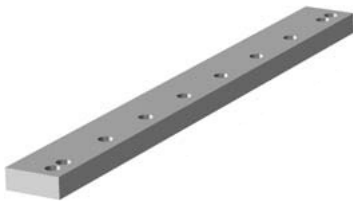
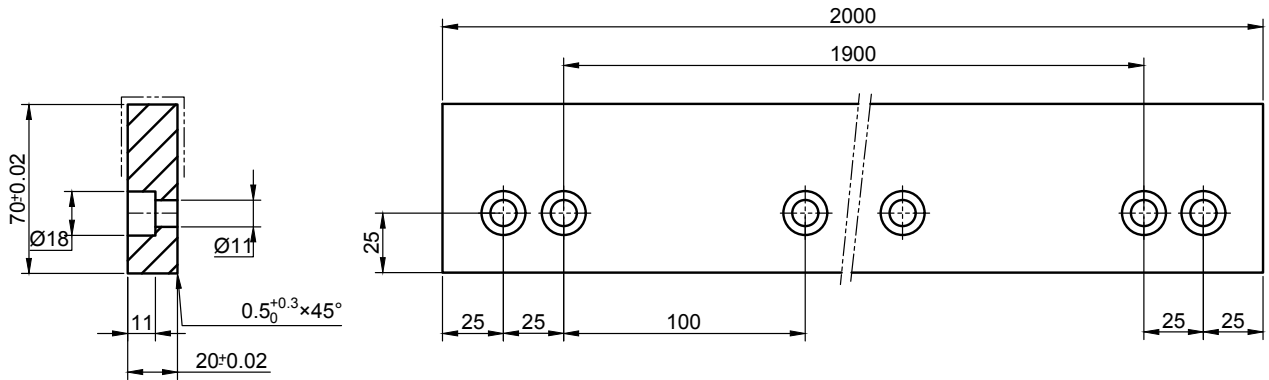


52 型重載扁導軌

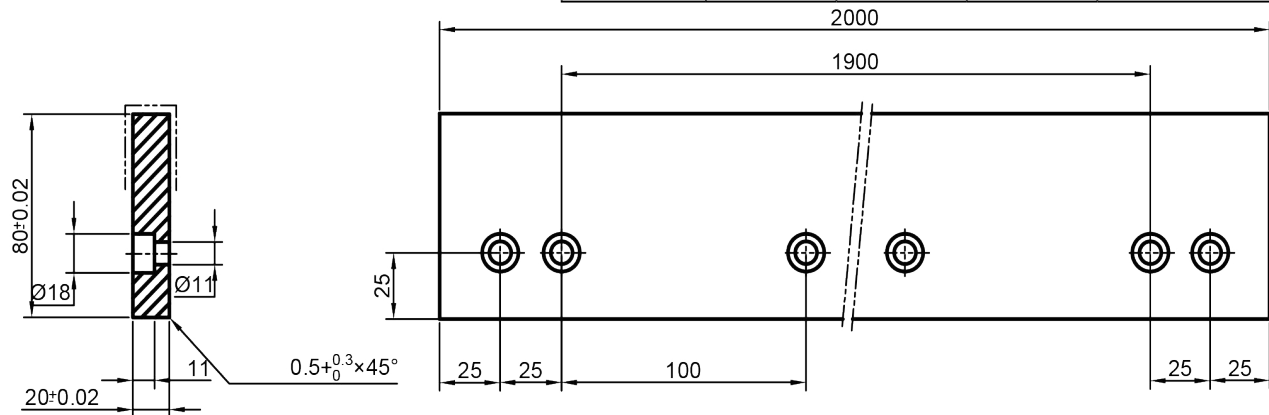
52 Guideway flat rail

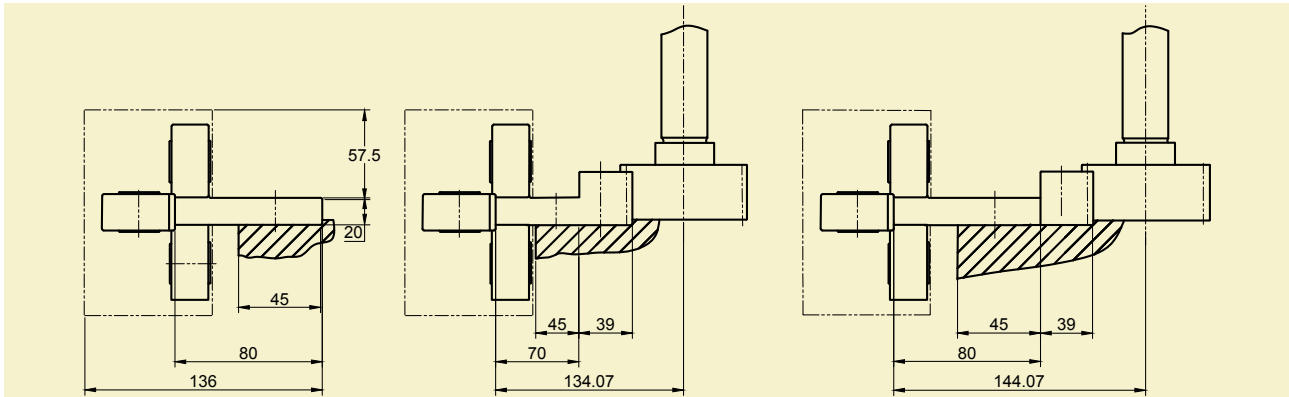


型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT52201	2000	1900	S45C	M10×25 8.8 級



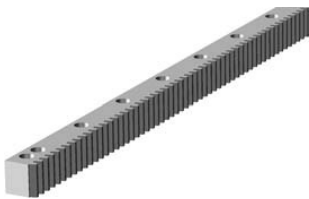
型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT52202	2000	1900	S45C	M10×25 8.8 級



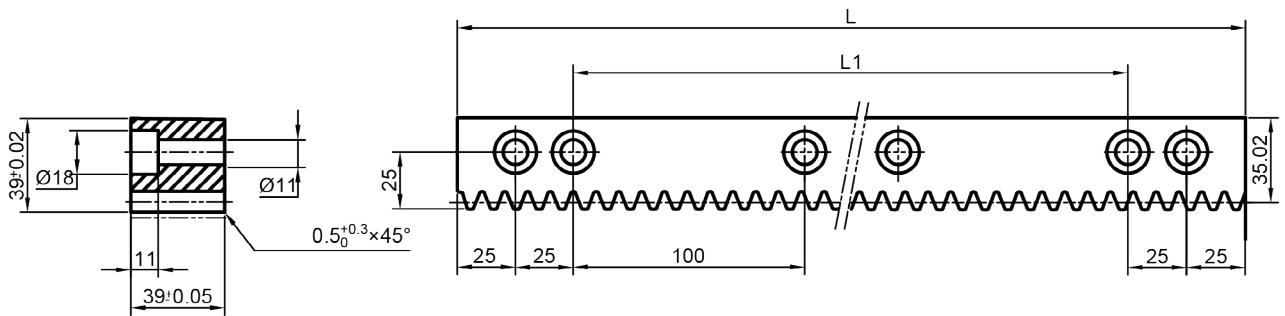


齒條

rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型号 Bolt size
KGS52129	1200	1100	3.9789	12.5	S45C	DIN9	M10×40 8.8 級
KGS52209	2000	1900	3.9789	12.5	S45C	DIN9	M10×40 8.8 級



齒輪

Drive pinon



型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	重量 Weight KG
SGLP52-CP10	14	3.9789	12.5	1	DIN6	5.0
SGSP52-CP10	20	3.9789	12.5	2	DIN6	1.8

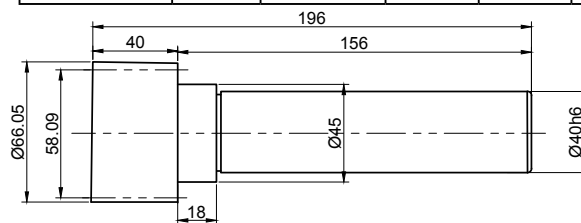


图1 Fig.1

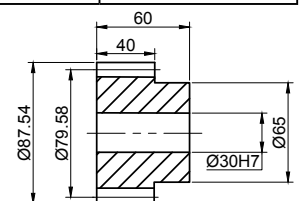
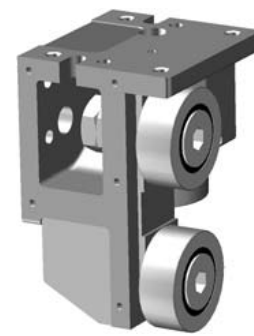
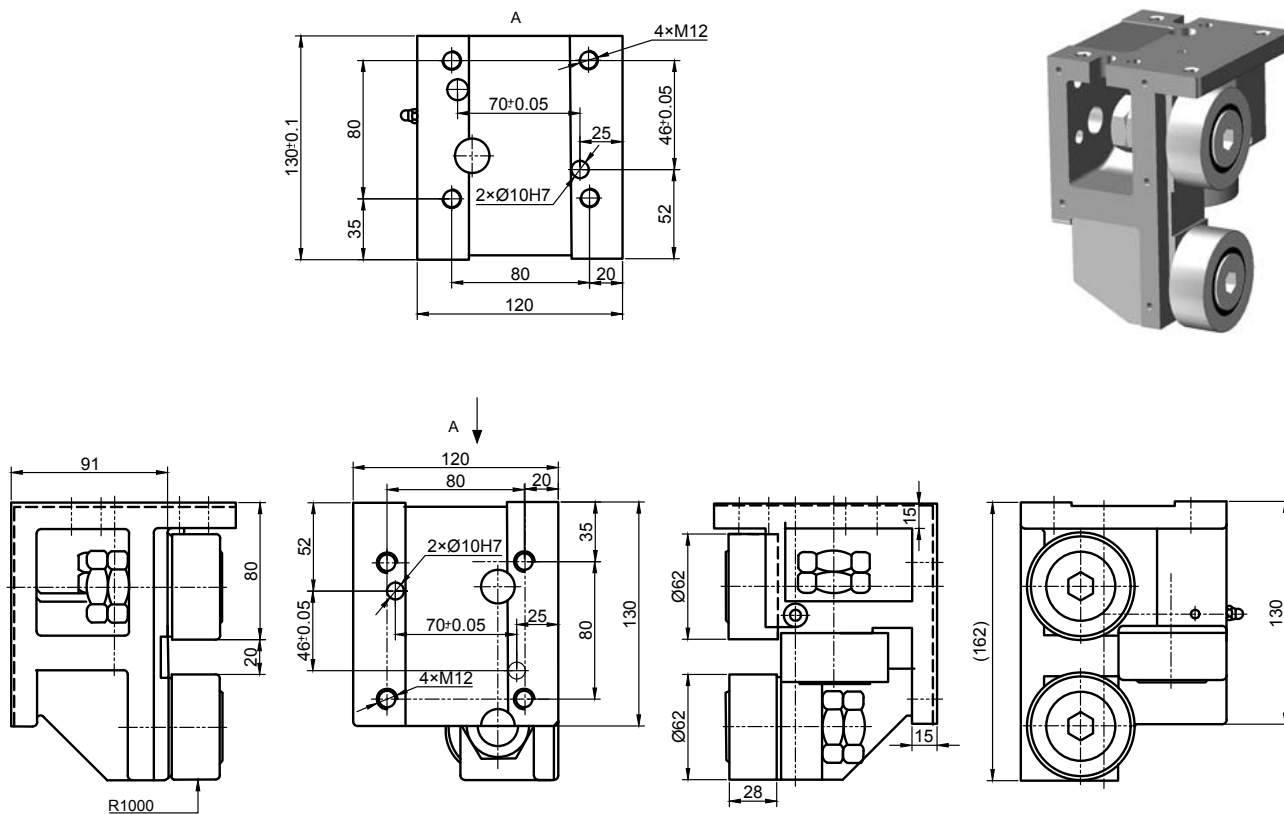


图2 Fig.2

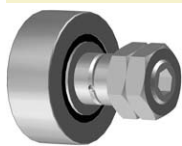


型號 Code	①	②	③	重量 M (kg)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	N_{max} (min^{-1})
KGB62.1R	GBR	GER	GER	7	39500	21400	5400	2200
KGB62.2R	GBR	GER	GBR	7	39500	21400	5400	2200
KGB62.3R	GER	GBR	GER	7	39500	21400	5400	2200

$C_w^{①}$: Normal service life 10^6m $C_w^{②}$: Normal service life 10^8m

螺栓型滾輪

Stud roller



型號 Code	圖 Fig.	偏心量 Excenter (mm)	重量 Weight (kg)	螺母擰緊力距 MA (Nm)
GBR62	1	--	0.82	220
GER62	2	1	0.82	220

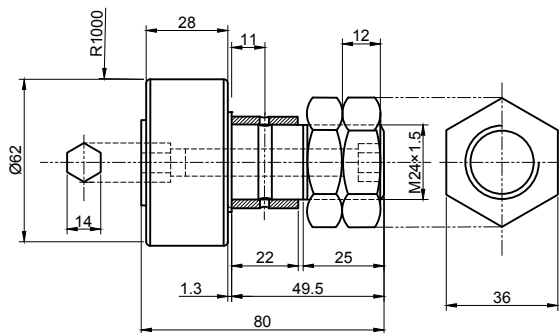


图1 Fig.1

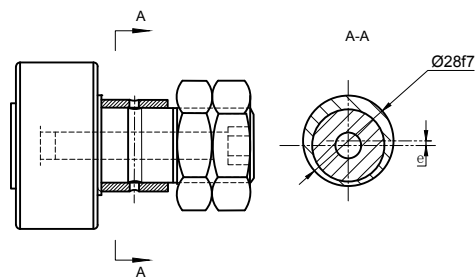
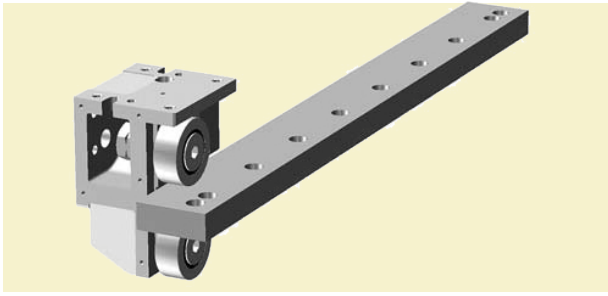
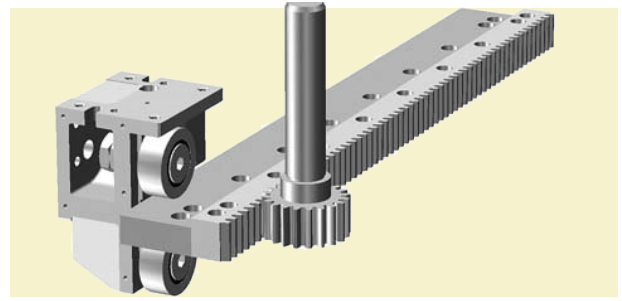


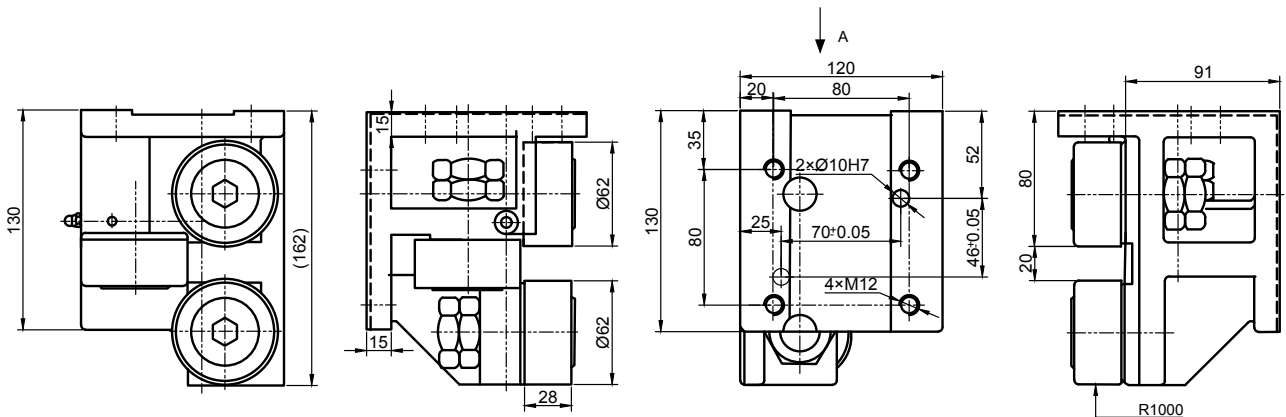
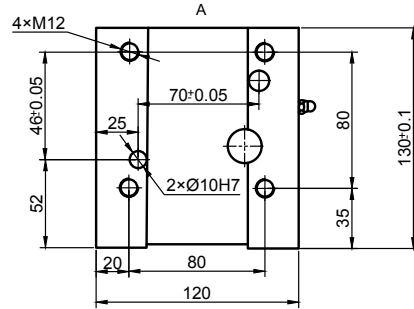
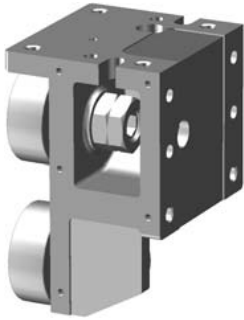
图2 Fig.2



62 型滾輪支座 (左側支座)



Roller support (left hand version)



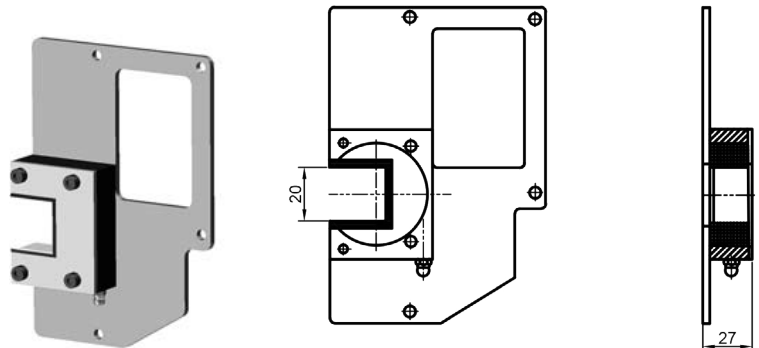
型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB62.1L	GBR	GER	GER	7	39500	21400	5400	2200
KGB62.2L	GBR	GER	GBR	7	39500	21400	5400	2200
KGB62.3L	GER	GBR	GER	7	39500	21400	5400	2200

$C_W^{①}$: Normal service life 10^6m $C_W^{②}$: Normal service life 10^8m

配件

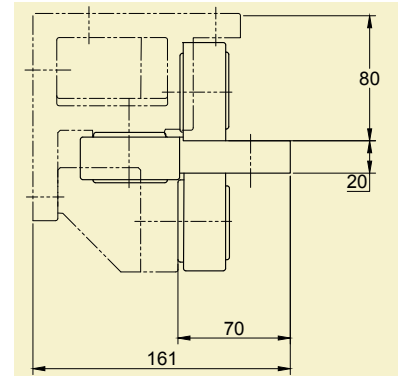
Accessories

型號 Code	重量 Weight (kg)
KA62R	0.3
KA62L	0.3



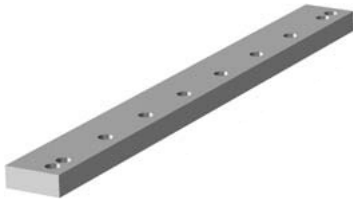
62 型扁導軌安裝圖

62 guideway flat rail mounting dimensions

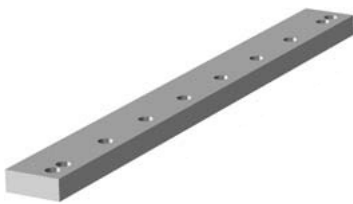
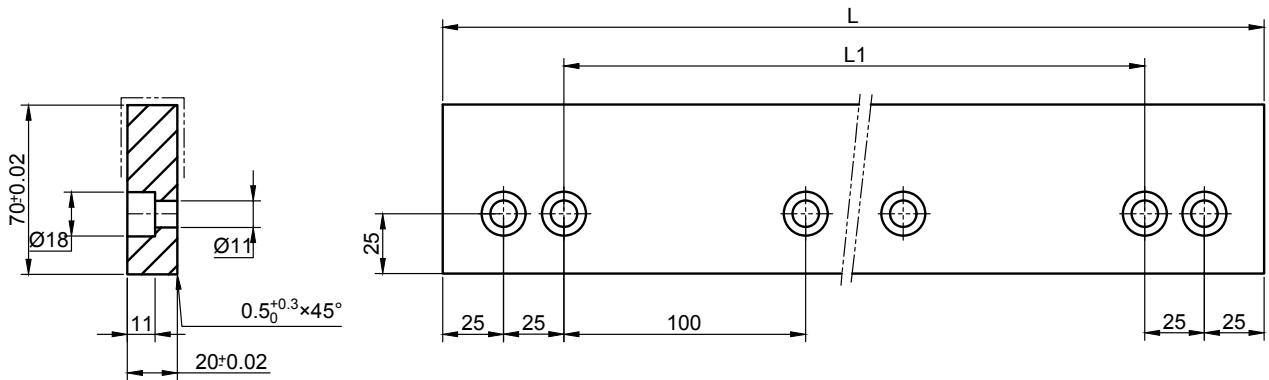


62 型重載扁導軌

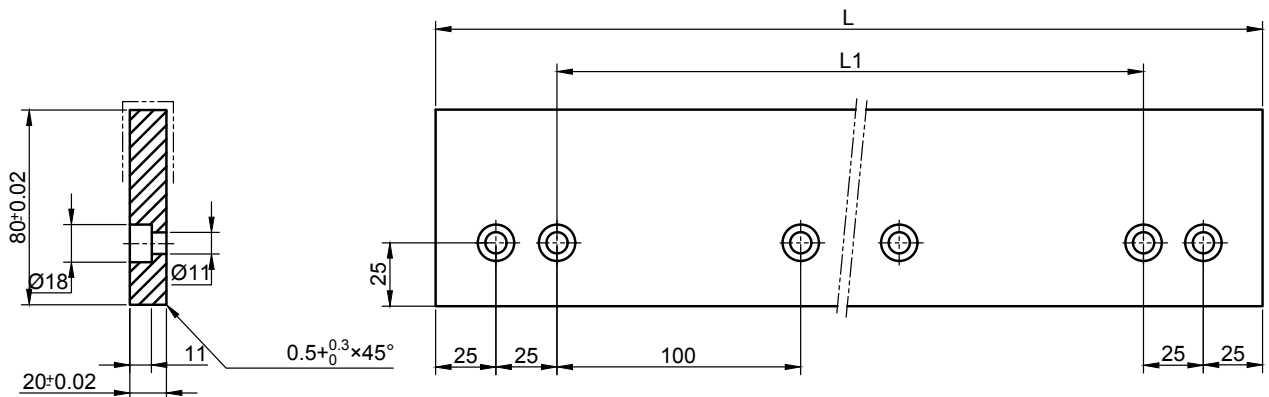
62 Guideway flat rail

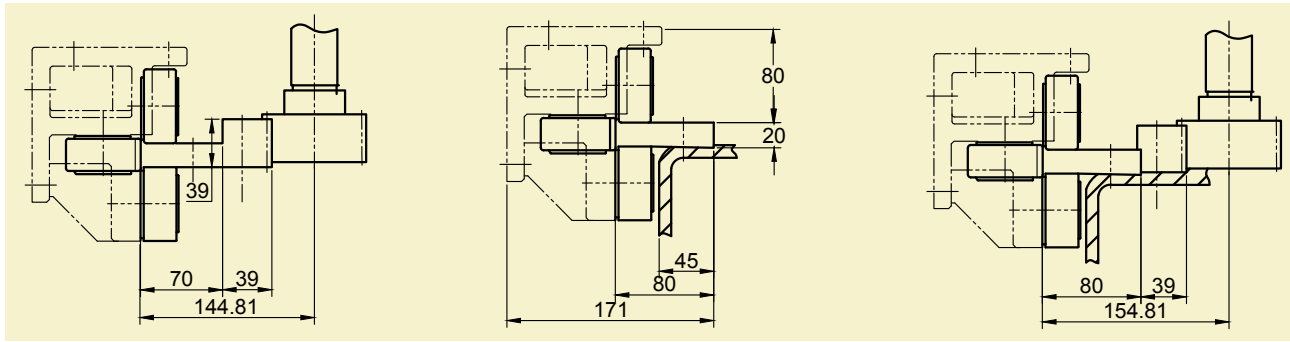


型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT62081	800	700	S45C	M10×25 8.8 級
KGT62121	1200	1100	S45C	M10×25 8.8 級
KGT62201	2000	1900	S45C	M10×25 8.8 級



型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT62082	800	700	S45C	M10×25 8.8 級
KGT62122	1200	1100	S45C	M10×25 8.8 級
KGT62202	2000	1900	S45C	M10×25 8.8 級



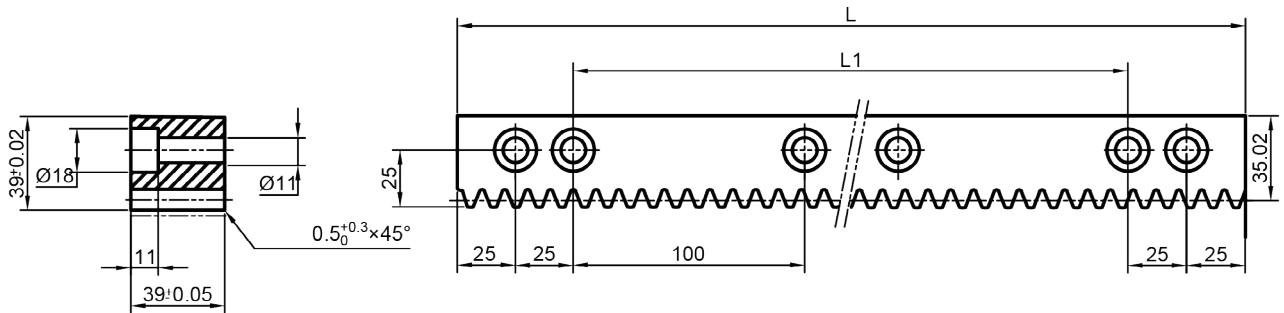


齒條

rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGS62129	1200	1100	3.9789	12.5	S45C	DIN9	M10×45 8.8 級
KGS62209	2000	1900	3.9789	12.5	S45C	DIN9	M10×45 8.8 級



齒輪

Drive pinion



型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	重量 Weight KG
SGLP62-CP10	20	3.9789	12.5	1	DIN6	6.0
SGSP62-CP10	20	3.9789	12.5	2	DIN6	1.8

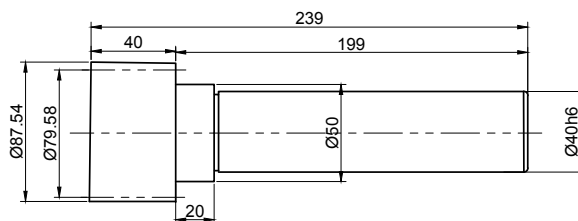


图1 Fig.1

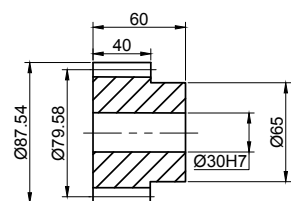
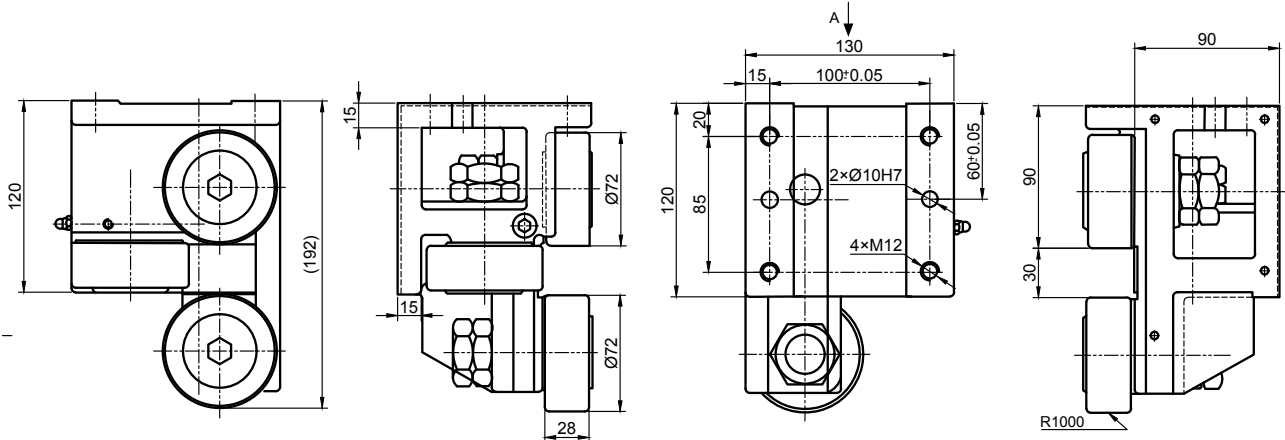
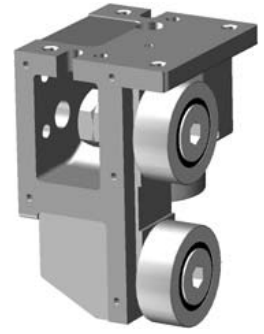
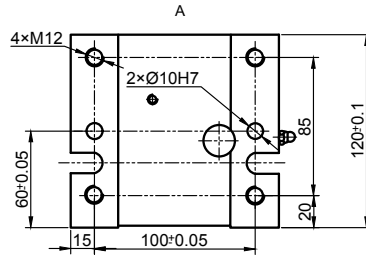


图2 Fig.2

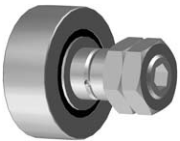


型號 Code	①	②	③	重量 M (kg)	C_{0w} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	N_{max} (min^{-1})
KGB72.1R	GBR	GER	GER	9	46500	24600	6200	2200
KGB72.2R	GBR	GER	GBR	9	46500	24600	6200	2200
KGB72.3R	GER	GBR	GER	9	46500	24600	6200	2200

$CW^{①}$: Normal service life 10^6m $CW^{②}$: Normal service life 10^8m

螺栓型滾輪

Stud roller



型號 Code	圖 Fig.	偏心量 Excenter (mm)	重量 Weight (kg)	螺母擰緊力矩 MA (Nm)
GBR72	1	--	1.05	220
GER72	2	1	1.05	220

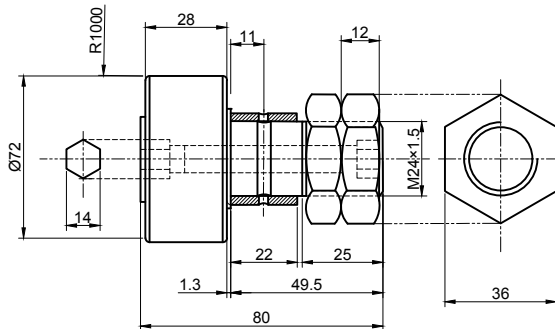


图1 Fig.1

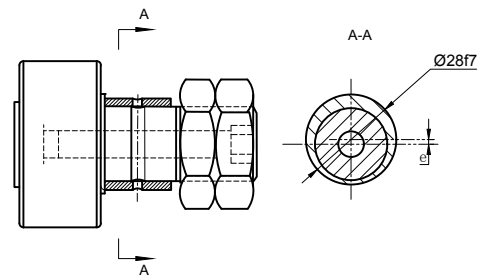
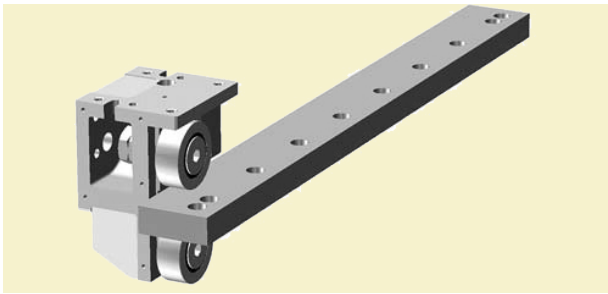
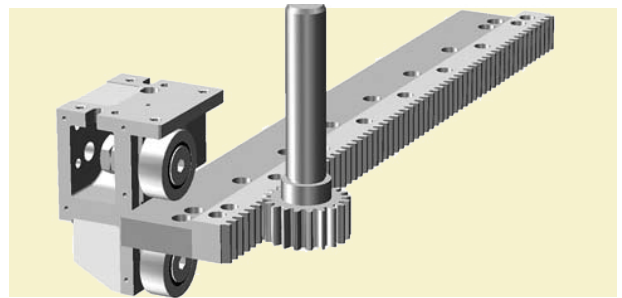


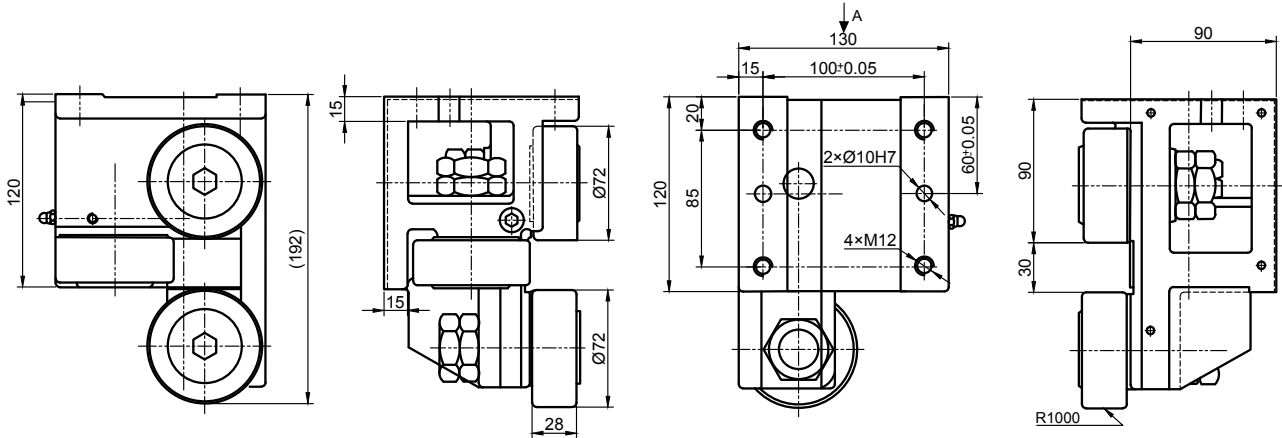
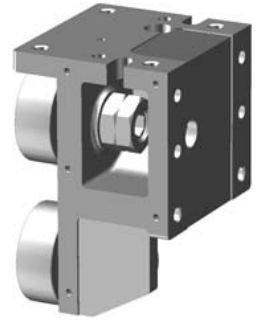
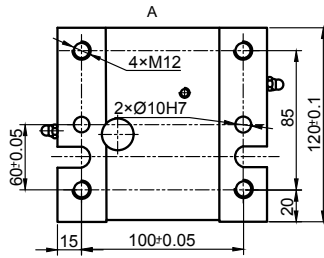
图2 Fig.2



72 型滾輪支座 (左側支座)



Roller support (left hand version)



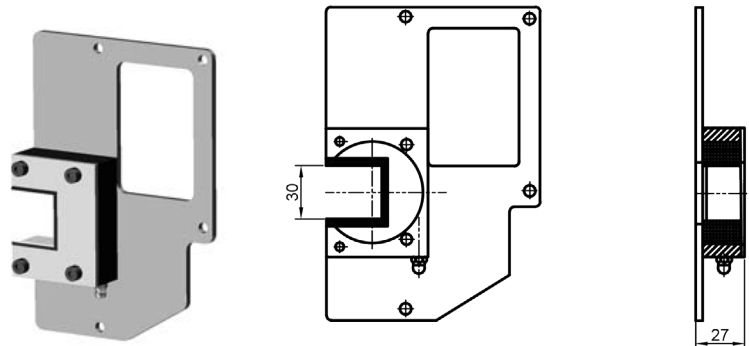
型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_w^{①}$ (N)	$C_w^{②}$ (N)	N_{max} (min^{-1})
KGB72.1L	GBR	GER	GER	9	46500	24600	6200	2200
KGB72.2L	GBR	GER	GBR	9	46500	24600	6200	2200
KGB72.3L	GER	GBR	GER	9	46500	24600	6200	2200

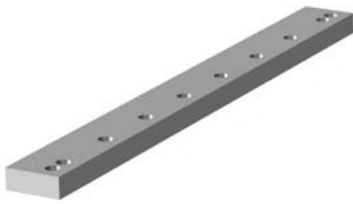
$CW^{①}$: Normal service life 10^6m $CW^{②}$: Normal service life 10^8m

配件

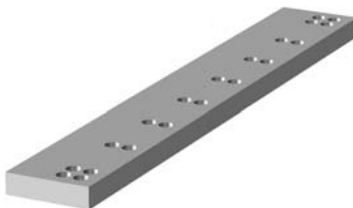
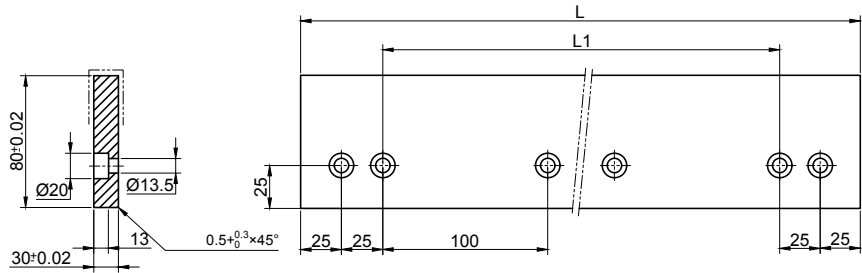
Accessories

型號 Code	重量 Weight (kg)
KA72R	0.3
KA72L	0.3

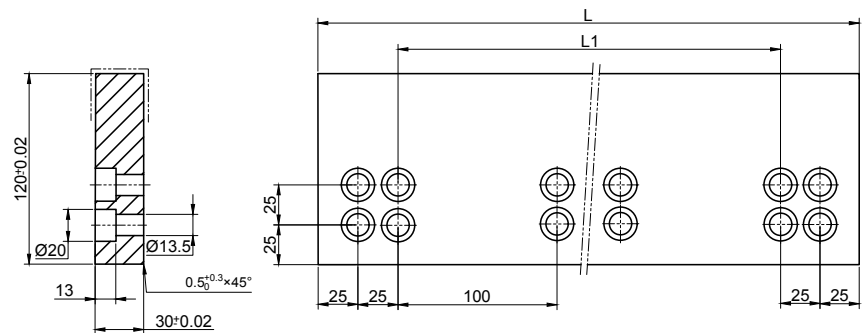


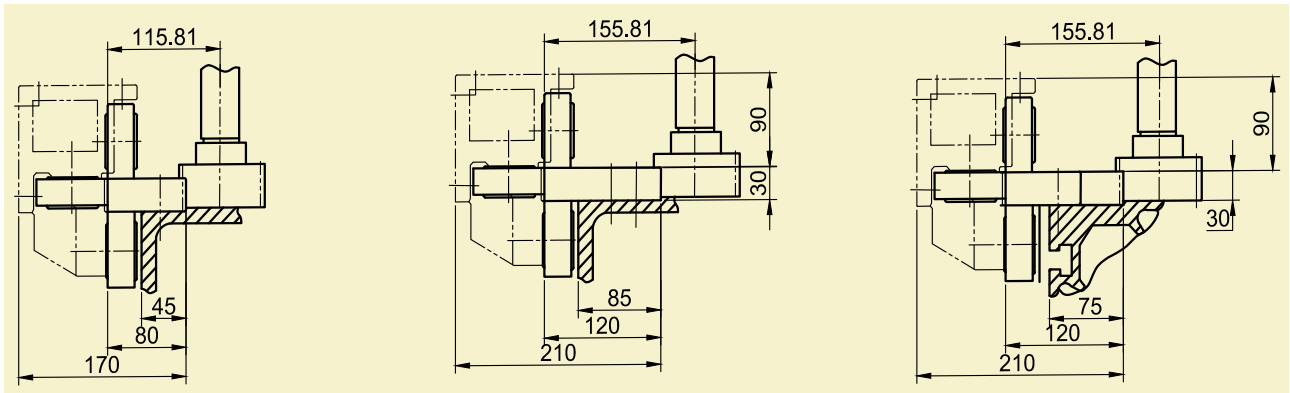


型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT72081	800	700	S45C	M12×35 8.8 級
KGT72121	1200	1100	S45C	M12×35 8.8 級
KGT72201	2000	1900	S45C	M12×35 8.8 級



型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT72082	800	700	S45C	M12×35 8.8 級
KGT72122	1200	1100	S45C	M12×35 8.8 級
KGT72202	2000	1900	S45C	M12×35 8.8 級



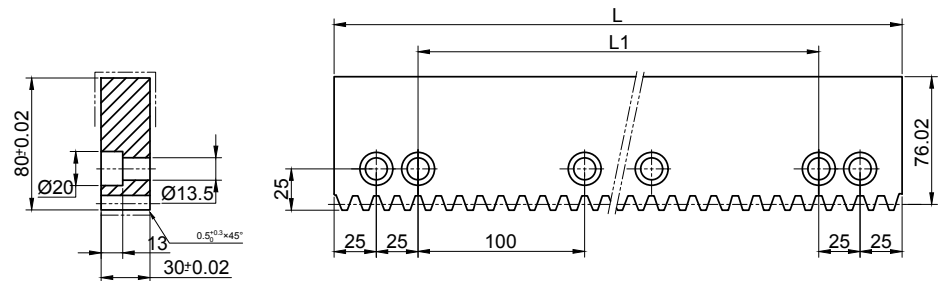


導軌齒條

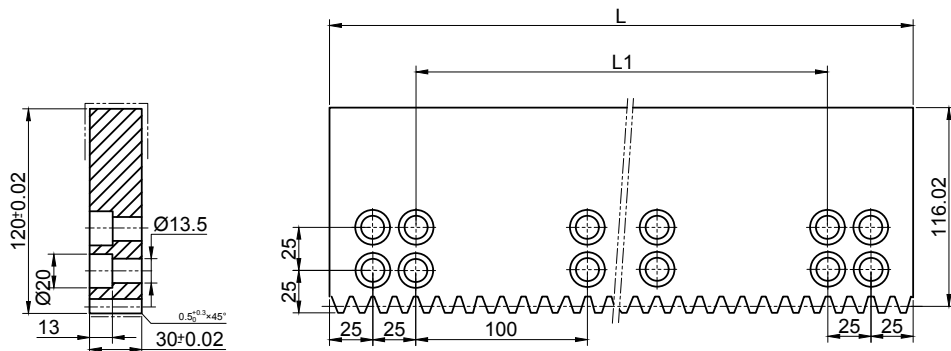
Guideway flat rail rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGK720819	800	700	3.9789	12.5	S45C	DIN9	M12×35 8.8 級
KGK721219	1200	1100	3.9789	12.5	S45C	DIN9	M12×35 8.8 級
KGK722019	2000	1900	3.9789	12.5	S45C	DIN9	M12×35 8.8 級

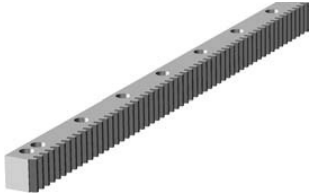


型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGK720829	800	700	3.9789	12.5	S45C	DIN9	M12×35 8.8 級
KGK721229	1200	1100	3.9789	12.5	S45C	DIN9	M12×35 8.8 級
KGK722029	2000	1900	3.9789	12.5	S45C	DIN9	M12×35 8.8 級

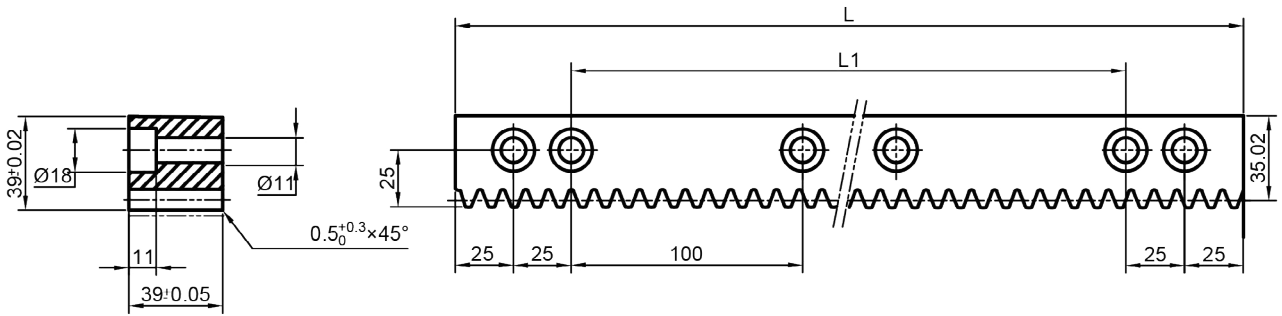


齒條

rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGS72129	1200	1100	3.9789	12.5	S45C	DIN9	M10×45 8.8 級
KGS72209	2000	1900	3.9789	12.5	S45C	DIN9	M10×45 8.8 級



齒輪

Drive pinion



型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	重量 Weight KG
SGLP72-CP10	20	3.9789	12.5	1	DIN6	6.0
SGSP72-CP10	20	3.9789	12.5	2	DIN6	1.8

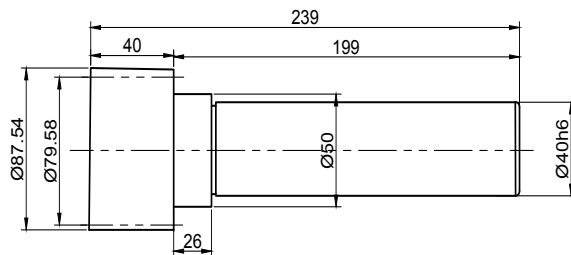


图1 Fig.1

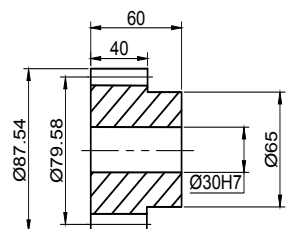
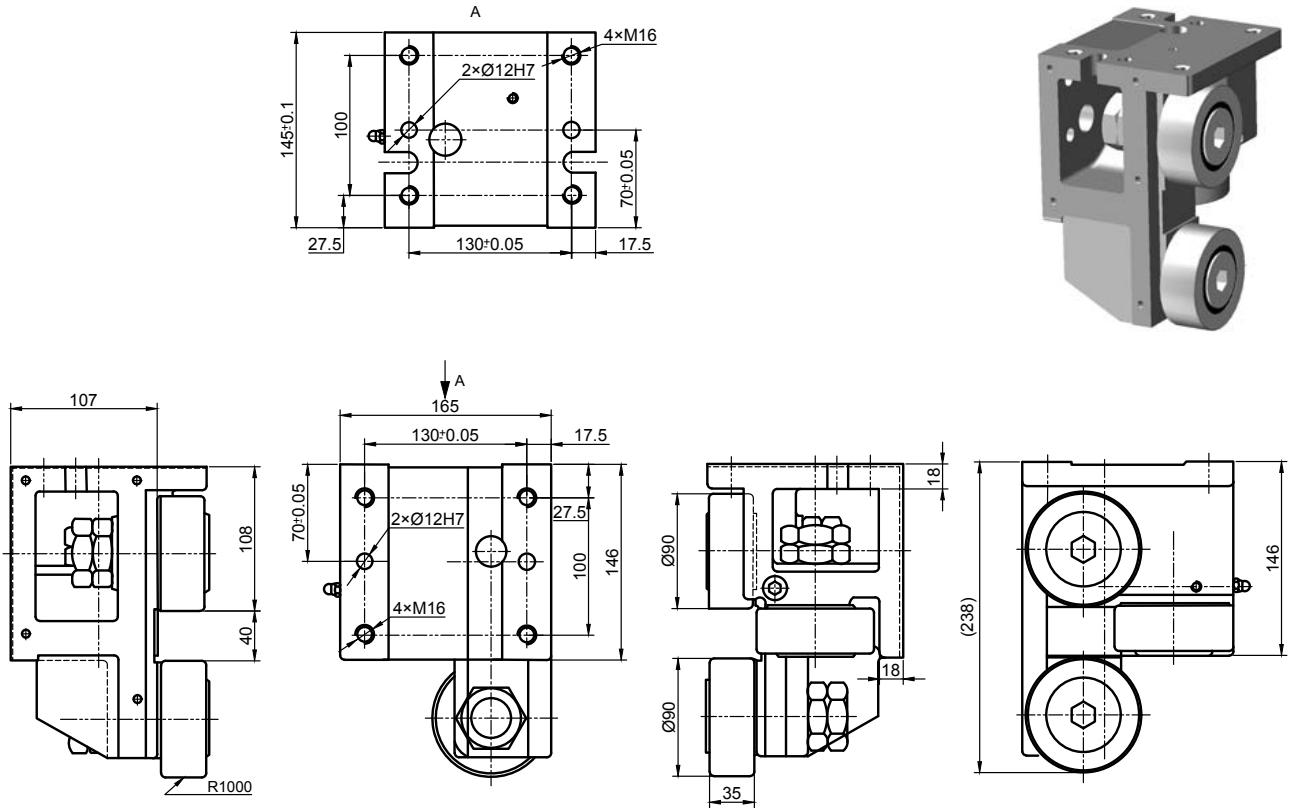


图2 Fig.2

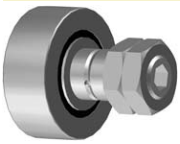


型號 Code	①	②	③	重量 M (kg)	C _{0W} (N)	C _W ^① (N)	C _W ^② (N)	N _{max} (min ⁻¹)
KGB90.1R	GBR	GER	GER	15	82000	43100	10800	1800
KGB90.2R	GBR	GER	GBR	15	82000	43100	10800	1800
KGB90.3R	GER	GBR	GER	15	82000	43100	10800	1800

CW^① : Normal service life 10⁶m CW^② : Normal service life 10⁸m

螺栓型滾輪

Stud roller



型號 Code	圖 Fig.	偏心量 Excenter (mm)	重量 Weight (kg)	螺母擰緊力距 MA (Nm)
GBR90	1	--	2.02	450
GER90	2	1	2.02	450

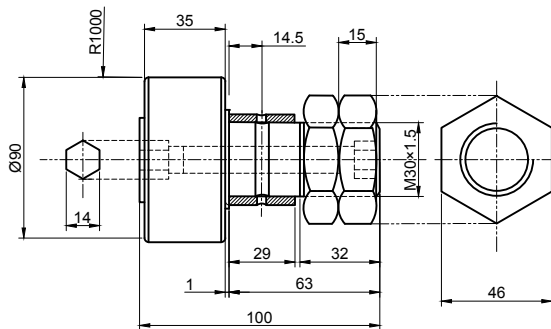


图1 Fig.1

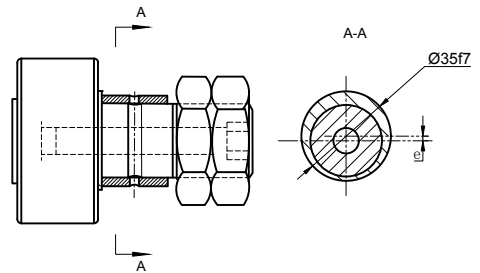
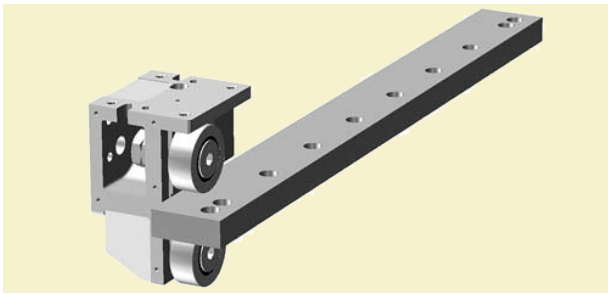
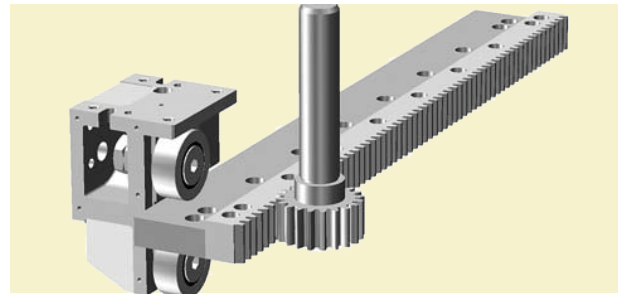


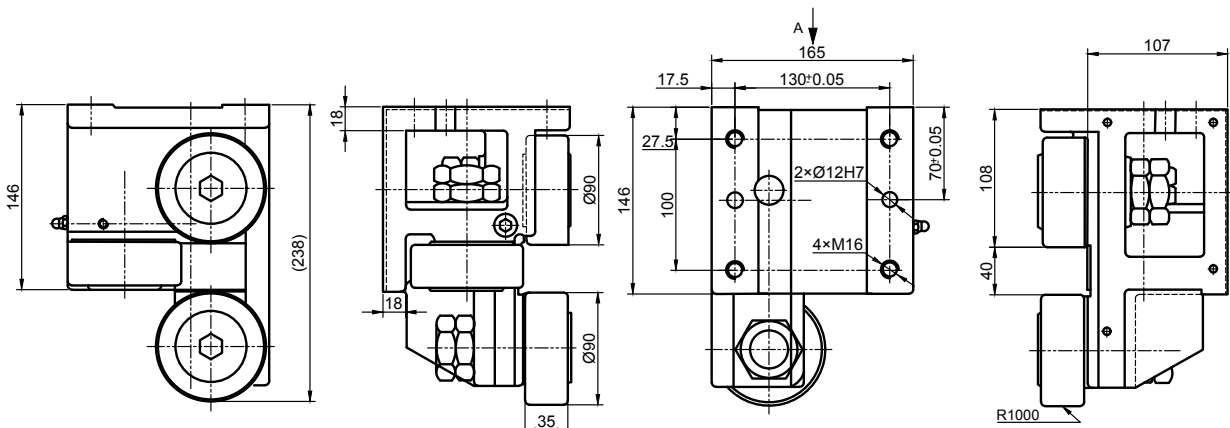
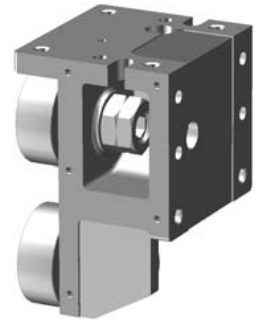
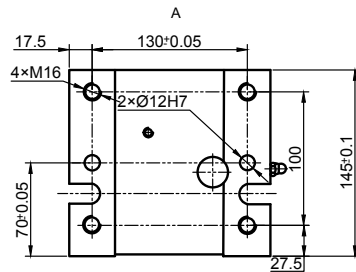
图2 Fig.2



90 型滾輪支座 (左側支座)



Roller support (left hand version)



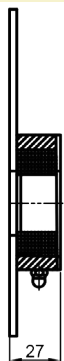
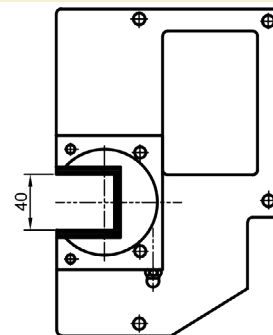
型號 Code	①	②	③	重量 M (kg)	C_{0W} (N)	$C_W^{①}$ (N)	$C_W^{②}$ (N)	N_{max} (min^{-1})
KGB90.1R	GBR	GER	GER	15	82000	43100	10800	1800
KGB90.2R	GBR	GER	GBR	15	82000	43100	10800	1800
KGB90.3R	GER	GBR	GER	15	82000	43100	10800	1800

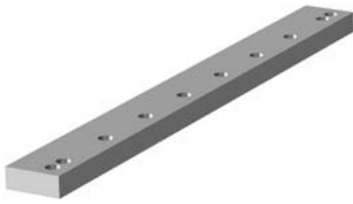
$C_W^{①}$: Normal service life 10^6m $C_W^{②}$: Normal service life 10^8m

配件

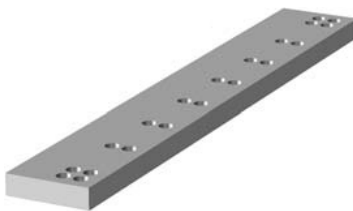
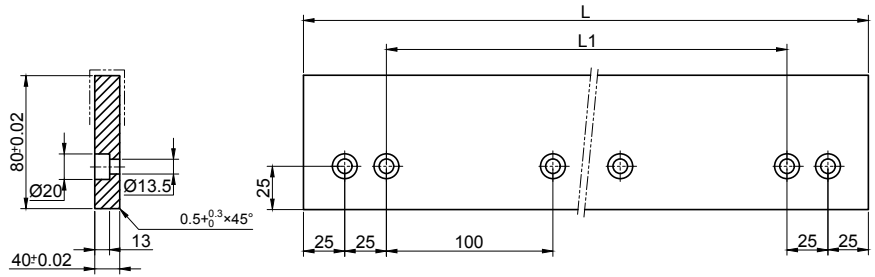
Accessories

型號 Code	重量 Weight (kg)
KA90R	0.4
KA90L	0.4

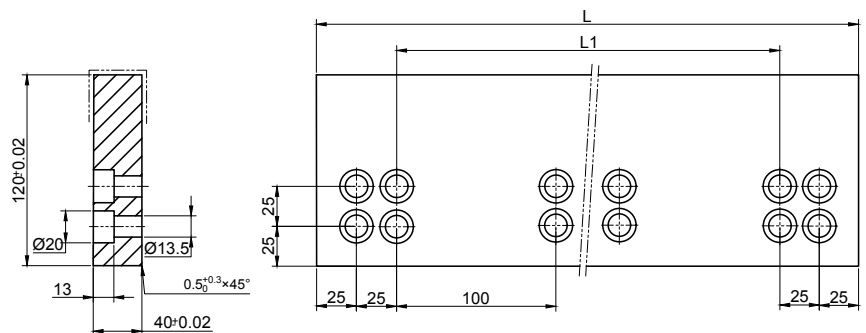


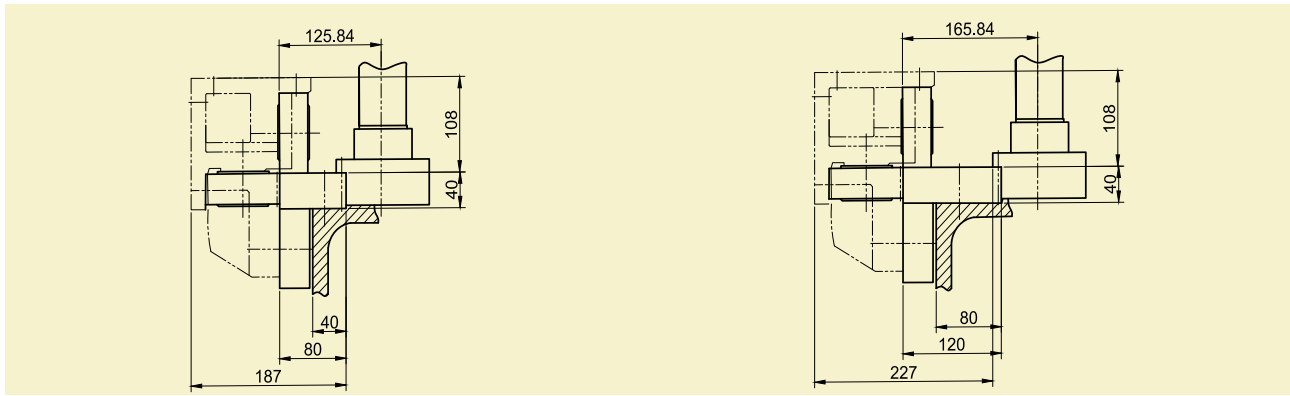


型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT90081	800	700	S45C	M12×45 8.8 級
KGT90121	1200	1100	S45C	M12×45 8.8 級
KGT90201	2000	1900	S45C	M12×45 8.8 級



型號 Code	L	L1	材料 Material	螺栓型號 Bolt size
KGT90082	800	700	S45C	M12×45 8.8 級
KGT90122	1200	1100	S45C	M12×45 8.8 級
KGT90202	2000	1900	S45C	M12×45 8.8 級



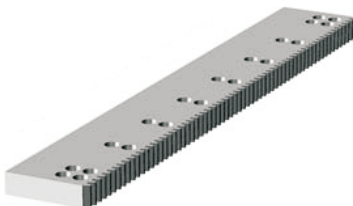
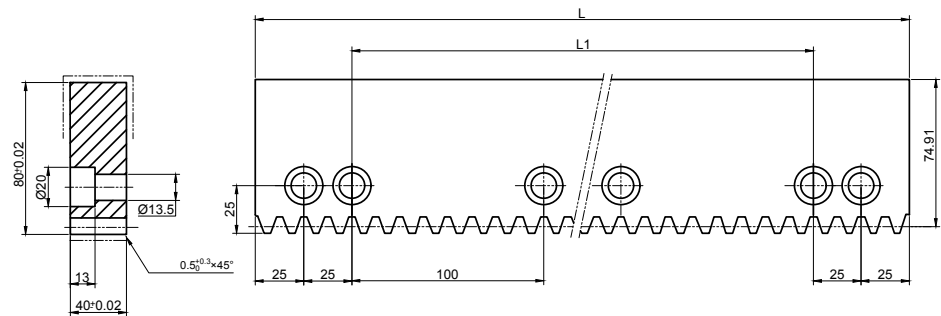


導軌齒條

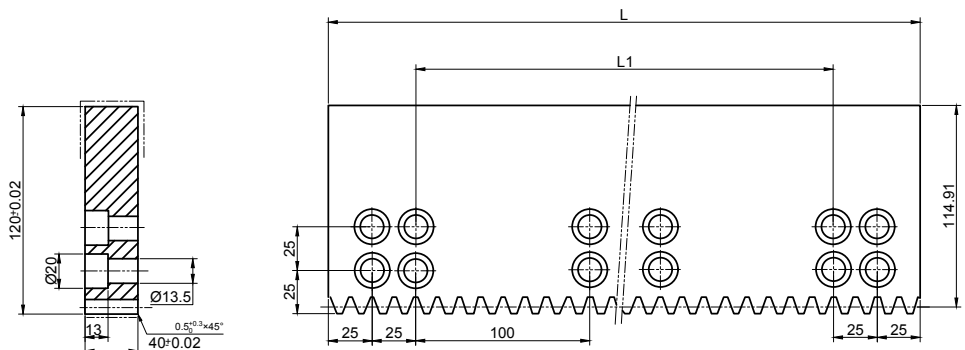
Guideway flat rail rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGK900819	800	700	5.0930	16.0	S45C	DIN9	M12×45 8.8 級
KGK901219	1200	1100	5.0930	16.0	S45C	DIN9	M12×45 8.8 級
KGK902019	2000	1900	5.0930	16.0	S45C	DIN9	M12×45 8.8 級



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGK900829	800	700	5.0930	16.0	S45C	DIN9	M12×45 8.8 級
KGK901229	1200	1100	5.0930	16.0	S45C	DIN9	M12×45 8.8 級
KGK902029	2000	1900	5.0930	16.0	S45C	DIN9	M12×45 8.8 級

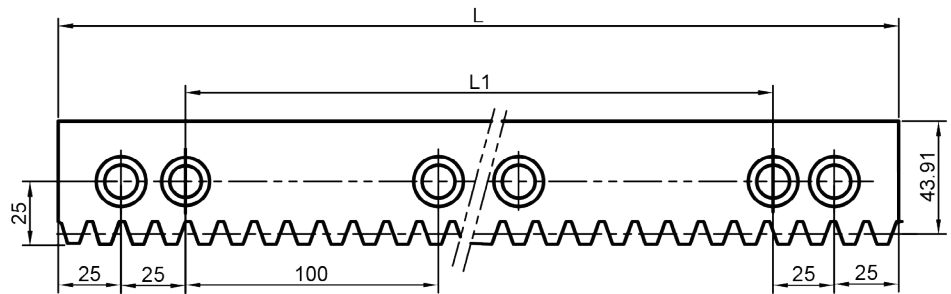
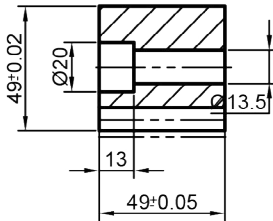


齒條

Rack



型號 Code	L	L1	模數 Module	齒距 P (mm)	材料 Material	精度等級 Precision grade	螺栓型號 Bolt size
KGS90129	1200	1100	5.093	16.0	S45C	DIN9	M12×45 8.8 級
KGS90209	2000	1900	5.093	16.0	S45C	DIN9	M12×45 8.8 級



齒輪

Drive pinion



型號 Code	齒數 Z	模數 Module	齒距 P	圖 Fig.	精度等級 Precision grade	重量 Weight KG
SGLP90-CP10	20	5.0930	16.0	1	DIN6	9
SGSP90-CP10	20	5.0930	16.0	2	DIN6	2.5

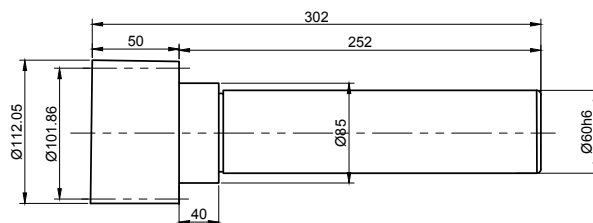


图1 Fig.1

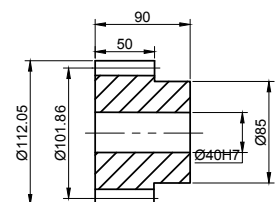


图2 Fig.2

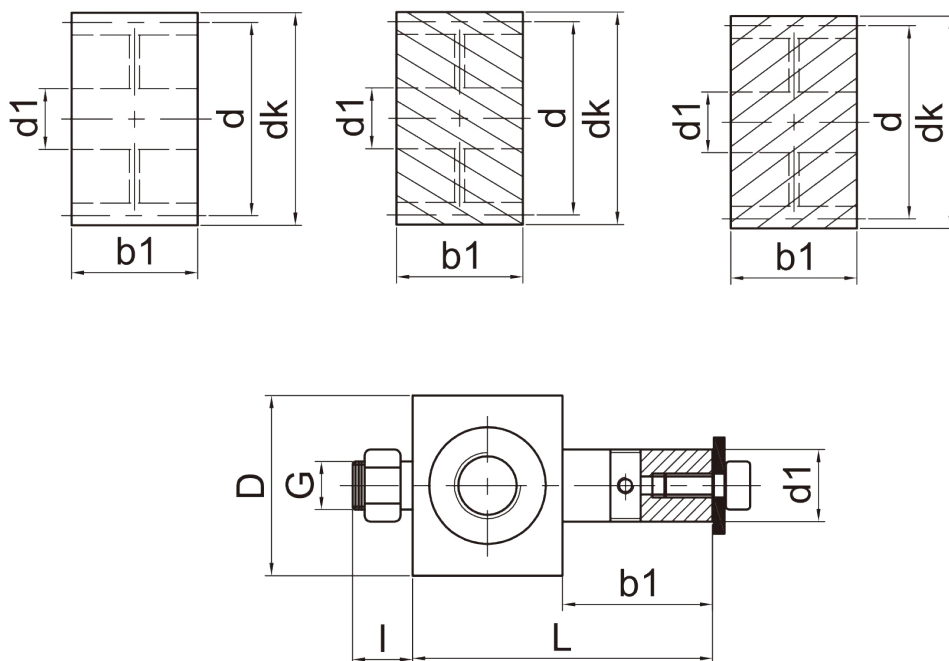


LUBRICATION SYSYSTEM



润滑系统

毛氈輪 & 安裝軸 Felt pinion & Mounting axle



型號 Code	模數 module	齒數 Z	內徑	節圓直徑	外徑	齒幅	安裝軸				圖 Fig.	說明 Description
			Bore d1	Pitch dia d	Out dia. dk	Width b1	D	L	I	G		
MSG152620	1.5	26	12	39	42	20	*	*	*	*	1	直齒
MHR152520	1.5	25	12	39.7	42.7	20	*	*	*	*	2	斜齒右旋
MHL152520	1.5	25	12	39.7	42.7	20	*	*	*	*	3	斜齒左旋
M151245	1.5	*	12	*	*	20	30	45	10	M8	4	安裝軸
MSG021925	2	19	12	38	42	25	*	*	*	*	1	直齒
MSR021825	2	18	12	38.2	42	25	*	*	*	*	2	斜齒右旋
MHL021825	2	18	12	38.2	42	25	*	*	*	*	3	斜齒左旋
M021250	2	*	12	*	*	25	30	50	10	M8	4	安裝軸
MSG031930	3	19	12	57	63	30	*	*	*	*	1	直齒
MHR031830	3	18	12	57.3	63	30	*	*	*	*	2	斜齒右旋
MHL031830	3	18	12	57.3	63	30	*	*	*	*	3	斜齒左旋
M031255	3	*	12	*	*	30	30	55	10	M8	4	安裝軸
MSG041940	4	19	12	76	84	40	*	*	*	*	1	直齒
MHR041840	4	18	12	76.5	84	40	*	*	*	*	2	斜齒右旋
MHL041840	4	18	12	76.5	84	40	*	*	*	*	3	斜齒左旋
M041265	4	*	12	*	*	40	30	65	10	M8	4	安裝軸

分配器 Distributor



ARU-4R-M

Division of point
分配孔數區分
4R:4 point
6R:6 point
8R:8 point
10R:10 point
12R:12 point
Limit switch(Optional)
限位開關 (選擇)
M : Built-in
No mark:none

- ARU-R 型為 1 管式黃油泵分配閥，其可將泵吐出的黃油量依次供給到所需潤滑的地方。
- ARU-R-M 型為限位開關分配閥，可通過限位開關感知其工作是否有異常情況發生。
- 分配器完成一個週期工作以後，指示桿就會前進，後退一次，因此無論哪個吐出口的排管被堵塞分配閥就會自動停止工作，所以可以容易的通過肉眼看出是否有異常產生。
- 使用溫度 -20°C -70°C

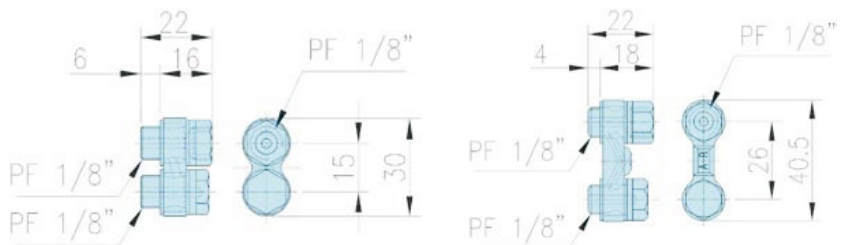
型號 Code	吐出孔數 Discharge point	流量 Discharge volume cc/min	最低壓力 Min.pressure Mpa	最高壓力 Max.pressure Mpa	主管道 Central pipe PF	支管道 Branch pipe PF	編號 NLGI No.	淨重 Net weight kg
ARU-4R	4	0.3	1.5	15	1/4"	1/8"	#000-#1	0.64
ARU-6R	6	0.3	1.5	15	1/4"	1/8"	#000-#1	0.64
ARU-8R	8	0.3	1.5	15	1/4"	1/8"	#000-#1	0.64
ARU-10R	10	0.3	1.5	15	1/8"	1/8"	#000-#1	0.72
ARU-12R	12	0.3	1.5	15	1/8"	1/8"	#000-#1	0.72

輔助裝置 Assistant metal fittings



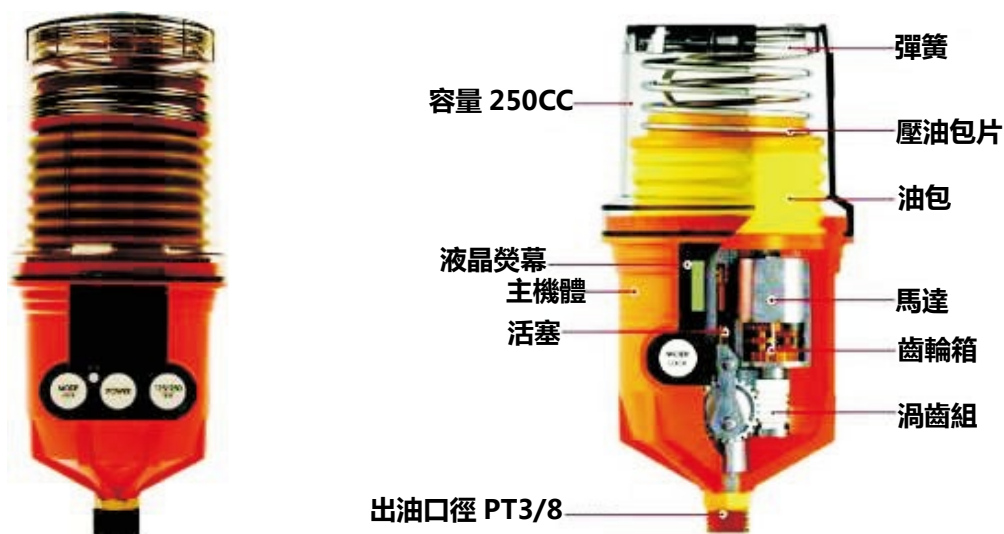
AU-16

AU-26



- ARU-R 型分配閥為順時針轉動，如果只是使用一個吐出口使用，其餘吐出口不可堵塞，並且要使用輔助裝置，此時的吐出量將是 2 倍。

自動單點潤滑注油器 Lubricator



特點

- 1: 全自動單點潤滑注油器，具大型 LCD 螢幕，可顯示：供油週期、油包需更換日期、電源不足、馬達超載、油量不足等，易於檢視動作與異常。
- 2: 全自動單點潤滑注油器包含一個垂直泵浦、馬達、齒輪箱，使得操作時壓力可達 20-60kg/cm²，與一般單點注油器僅有 5-10kg/cm 明顯不同，可潤滑之管路更長，更舒暢。
- 3: 六種供油週期，H (0.5 個月)、1、2、3、6 及 12 個月以供選擇。
- 4: 搭配可拋棄式油包與電池。供油週期結束一并更換，無需費時加油，更易操作與保持清潔。
- 5: 抗震、不易碎裂的設計，使用溫度範圍 -15°C 至 60°C，可應用於環境不理想、不方便人工潤滑之場所與設備。
- 6: 可搭配多種高效能潤滑油，如礦物質多功效油、高承載、高速、高溫及食品級合成潤滑油。

全自動單點潤滑注油器適用範圍

- 1: 適用於抗磨損或日常使用環境具危險性不方便、不能確保潤滑之設備。
- 2: 適用之潤滑設備廣泛：包括滑落架、柱體軸心、輸送機、大型馬達、攪拌機、起重機、空調系統、挖泥機等。
- 3: 一般常應用之產業包括：鋼鐵、水泥業、汽車業、石化工業、紙漿、造紙業、電子業、食品飲料等。

延伸應用多點潤滑

- 1: 全自動單點式潤滑注油器可搭配 CV 型單一循環分配器，達到多點潤滑之目的，最大可潤滑 8 點。
- 2: 單一循環分配器每次僅有一個活塞流出潤滑油，且潤滑油均是流過第一個活塞后再流往第二個活塞，依序作動下去，形成一個潤滑循環系統，若有一個潤滑點沒有潤滑油流出或阻塞，整個注油系統就會停擺，而這可目視檢知棒或加裝微動開關得知。
- 3: CV 型分配器搭配黃油之最低啟動壓力為 15kg/cm² 最高工作壓力為 150kgf/cm²。

型號 Code	油包容量	電源	操作壓力	最大突出壓	適用溫度	油品粘度
PM-250	250cc	DC4.5V(可更換)	20kgf/cm (280psi)	60kgf/cm (850psi)	-15°C -60°C	NLGI1-2 號
PM-500	500cc					

型號 Code	供油週期	供油速率	供油量	供油準確性	出油口徑	重量
PM-250	0.5、1、2、3、6、 12 個月	約 20 秒 / 週期	0.34cc/stroke	±3%	PT3/8	810g(主機) 1050g(含油包)
PM-500						

凱賀精密機械有限公司

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