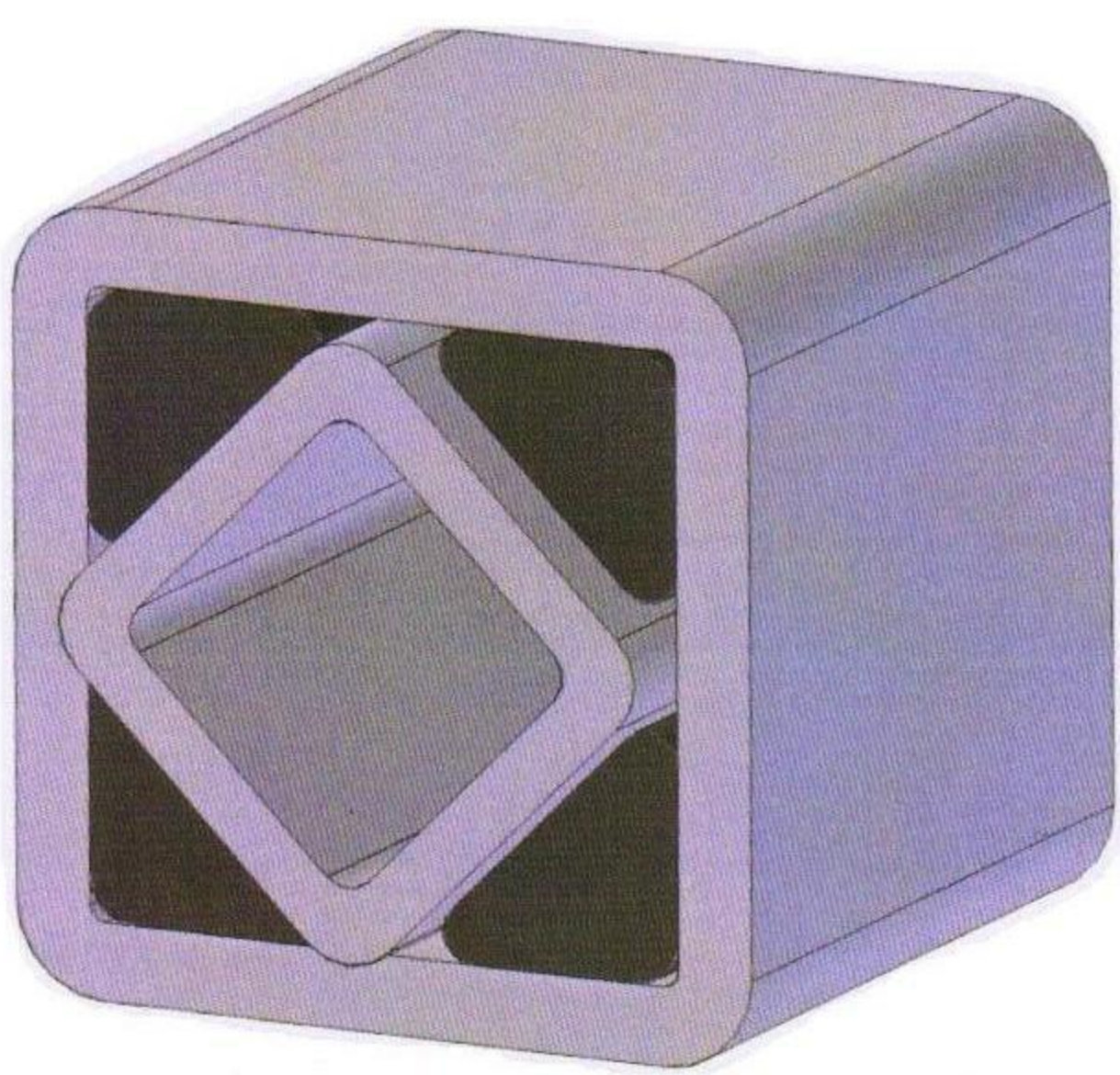
RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
杭州市天目山路310号302室 电话:0571-28006879 传真:0571-85193750 邮箱:sales@resatec-hangzhou.com

瑞沙泰柯
(The RESATEC)

通用弹性装置
(Universal spring system)



技术手册
(General information)

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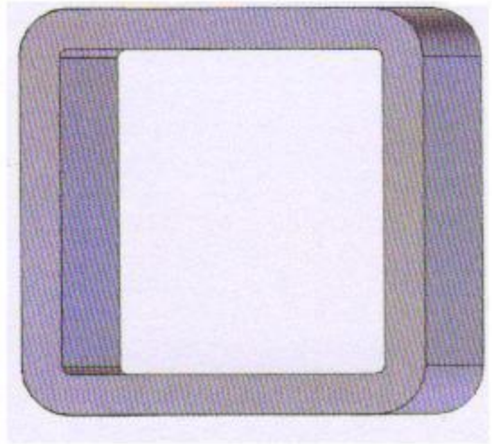
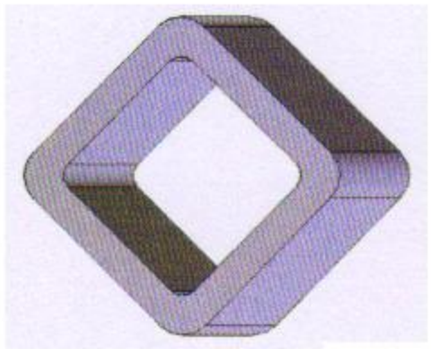
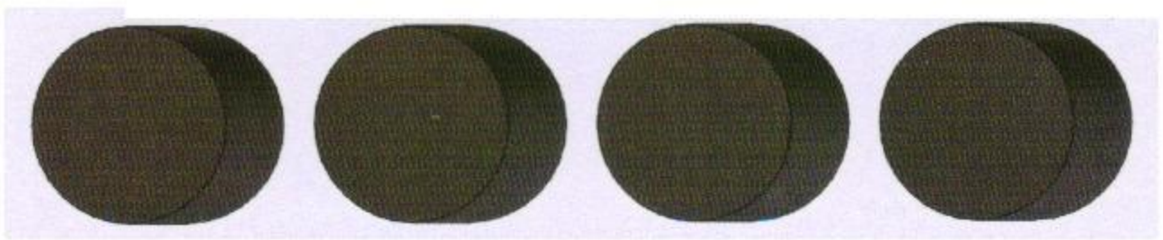
RESATEC 基本单元

(The RESATEC basic unit)

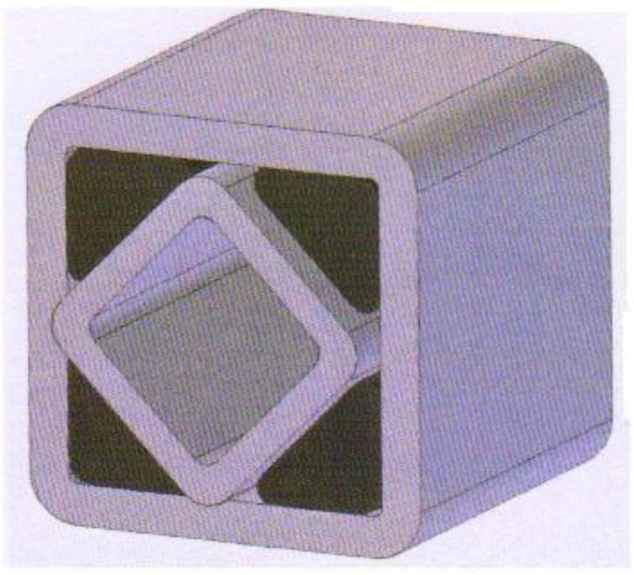






每个单元所包含的部件

(The parts for a unit....)



完整的单元

(The complete unit)

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Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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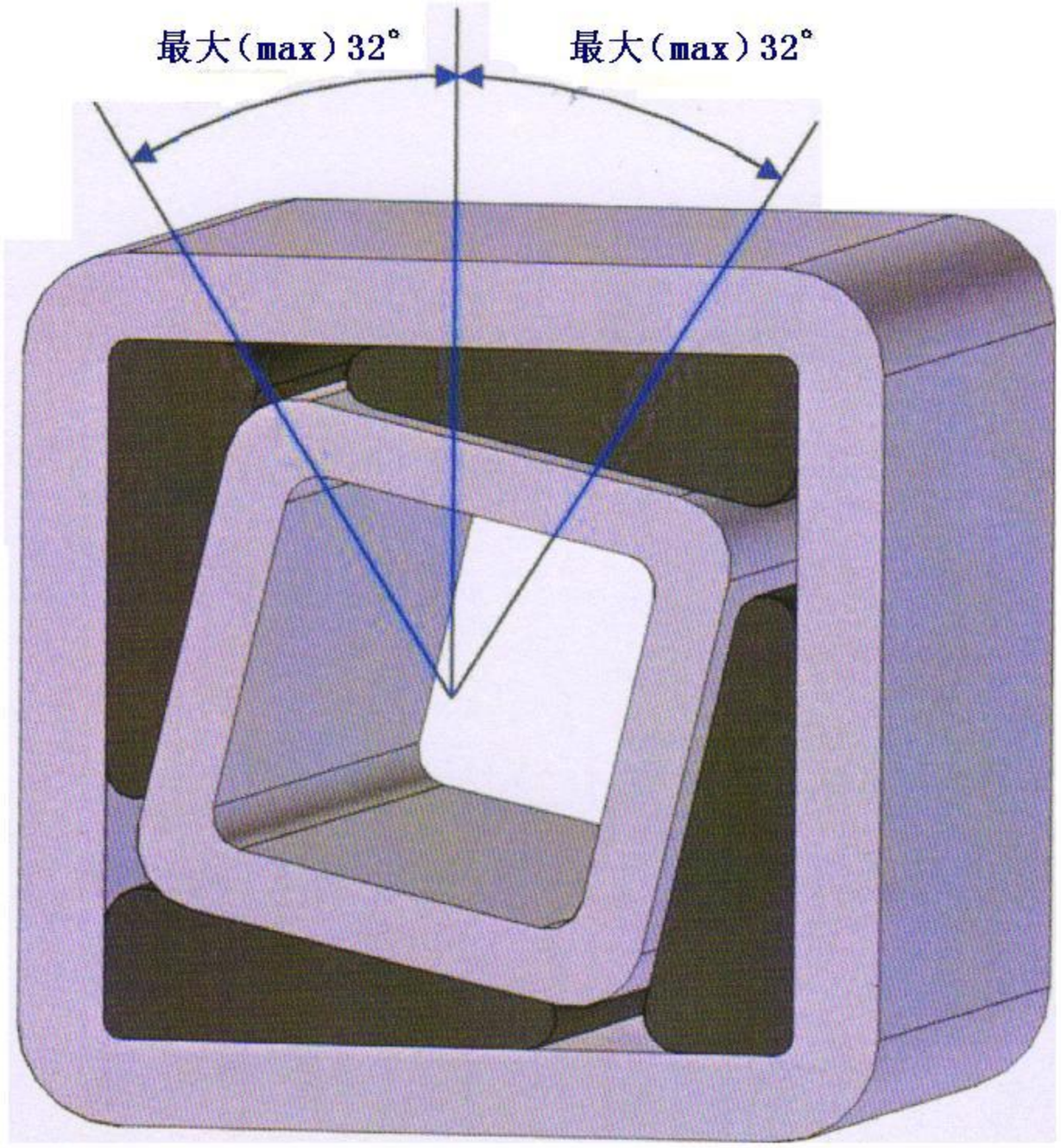
包含的功能
(The way of function)



- 轴承功能 (Bearing)
- 弹簧功能 (Spring)
- 张紧器功能 (Tensioner)
- 缓冲器功能 (Absorber)
- 减震器功能 (Damper)
- 转轴功能 (Pivot)

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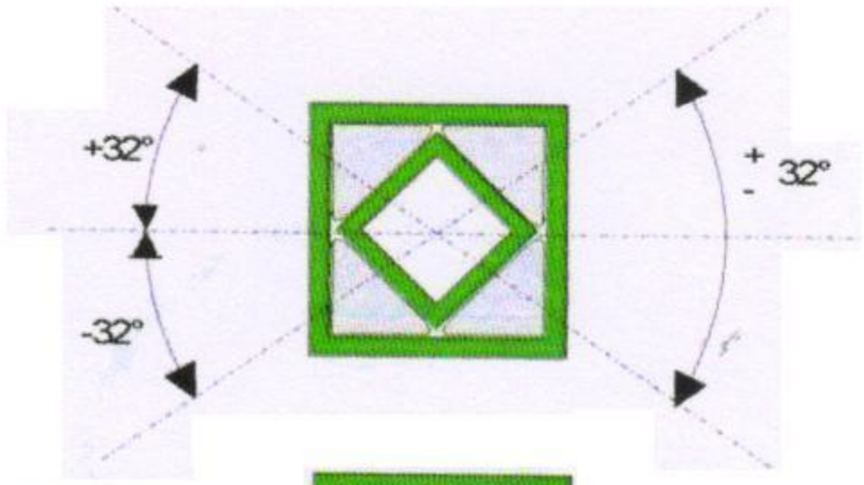
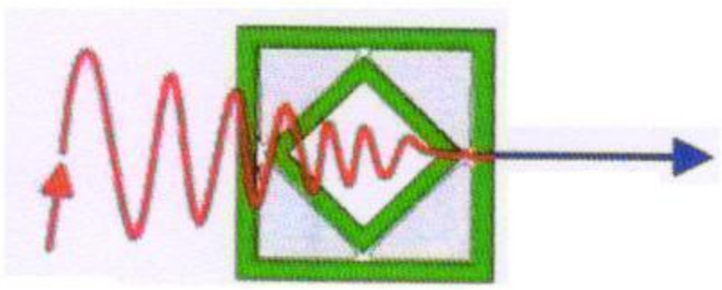
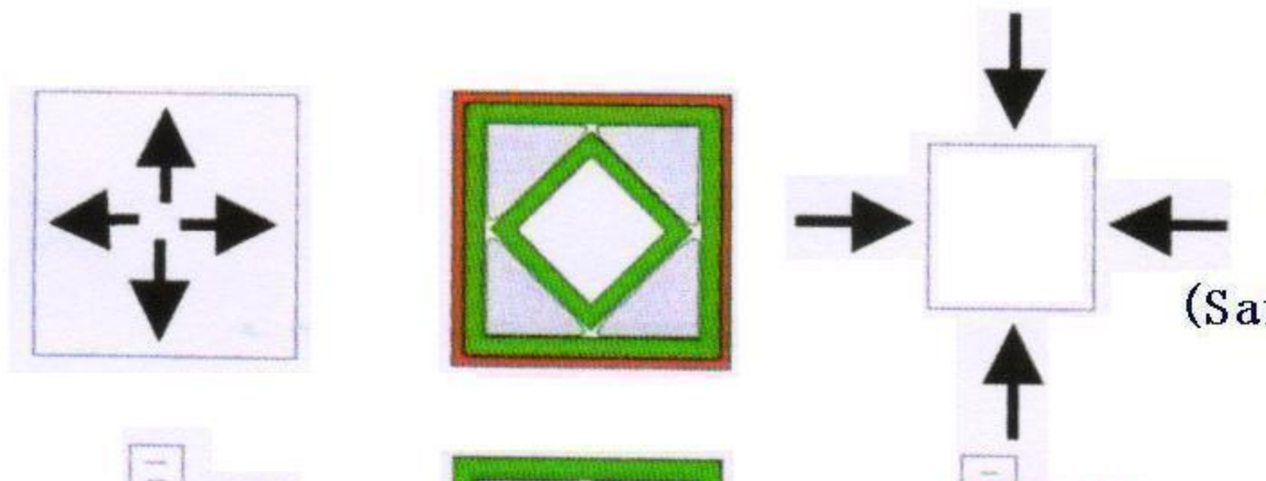


可操作角度大
(Large operating angle)

平稳的弹性特征
(Progressive spring chatacteristics)



噪音和震动的衰减
(Noise and vibration damping)



任何角度操作都安全
(Safe in operation at any position)

使用温度范围广
(Resistant to temperature)

无需维护(Maintenance free)

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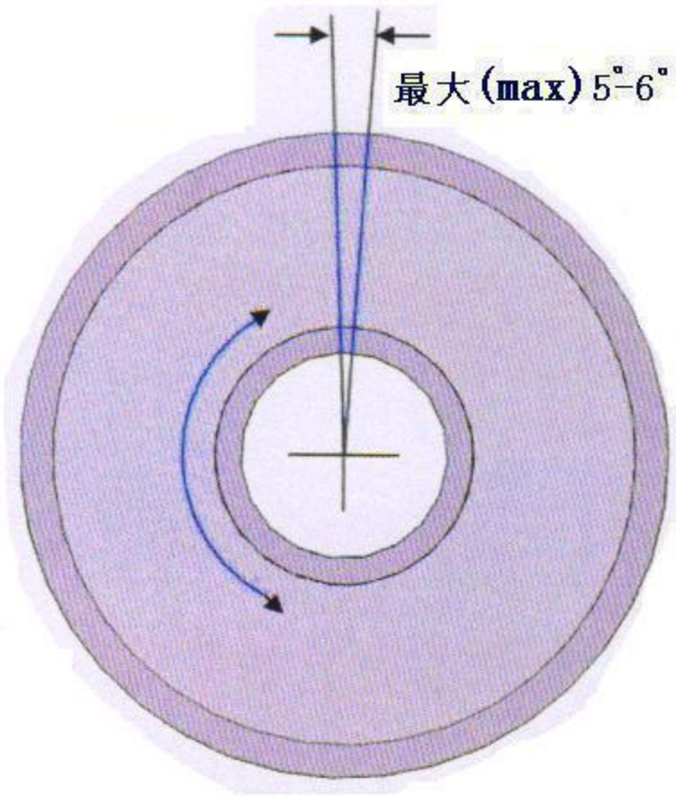
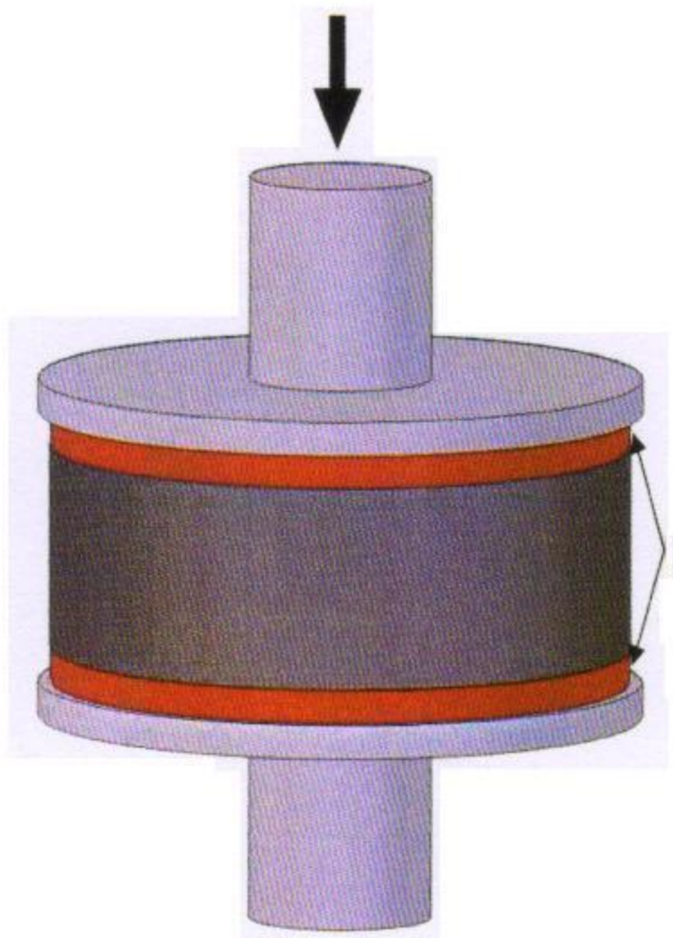
竞争对手的产品(The competitors):



硫化橡胶！ (Vulcanized)

- 操作角度小 (Reduced torque angle)
- 易破损 (Danger for tear and shear)
- 装配费用高 (Expensive mounting)



常规的硫化橡胶！
(Vulcanized "silent bloc")

- 暴露在外面，易破损
  (Exposed to shear and tear)
- 只能上下的操作
  (For compression only)
- 我们的产品同时具有
  这两种装置的功能
  (Only the combination of both above units compare with our universal spring system)

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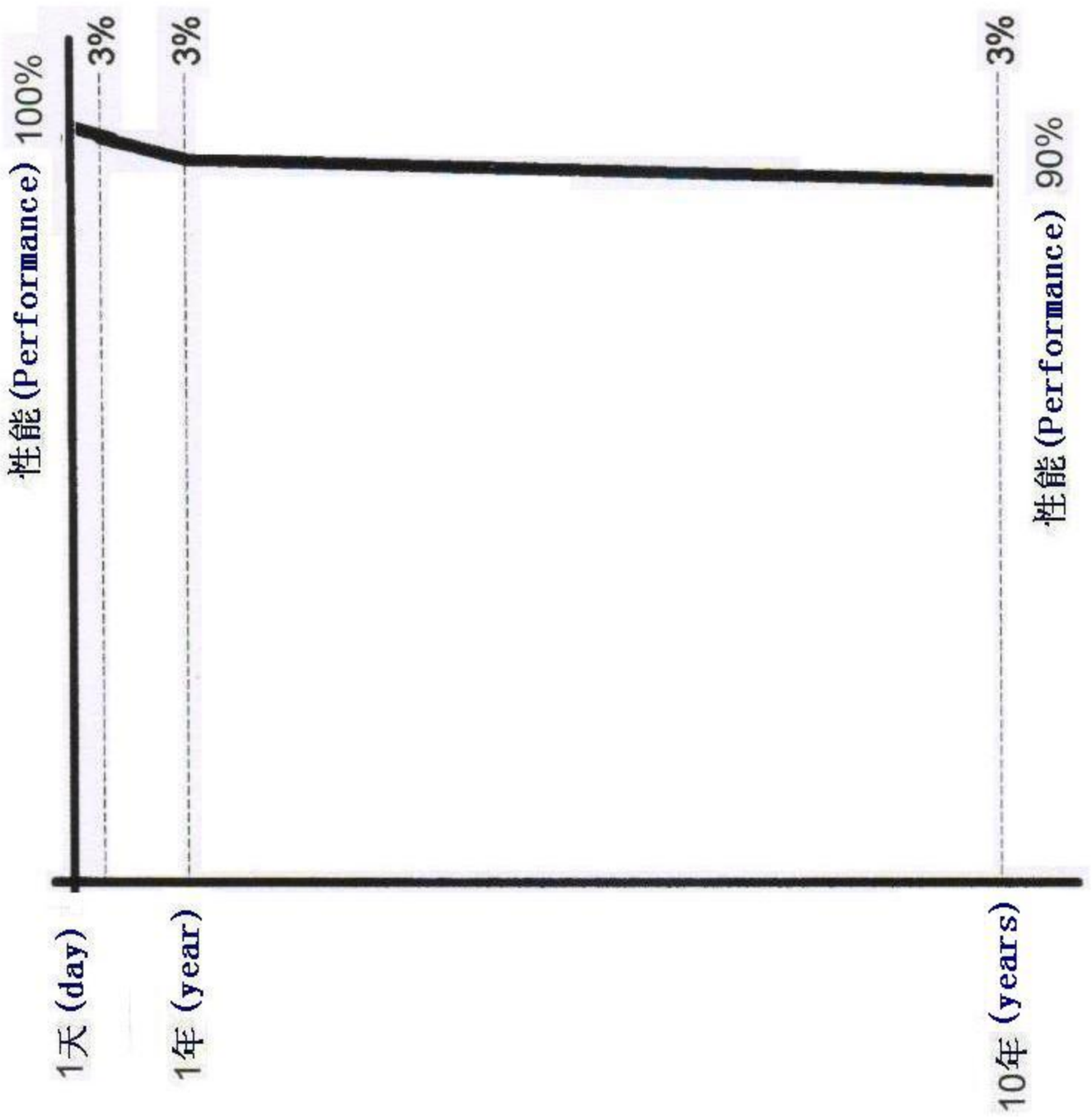
橡胶特性 (Characteristics of rubber)

橡胶的压缩永久变形性能(Cold flow and setting)

[使用寿命一般超过10年(average lifespan of element:10 years+)]



使用**10**年后，橡胶的压缩永久变形也只有**10%**

(Static deformance of molecules has to be considered by the designer~10%)

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扭矩图 (Torque-chart)

RESATEC通用橡胶装置相关的扭矩和扭矩角

(Relation of torque force and torque angle of the RESATEC Universal rubber suspension)

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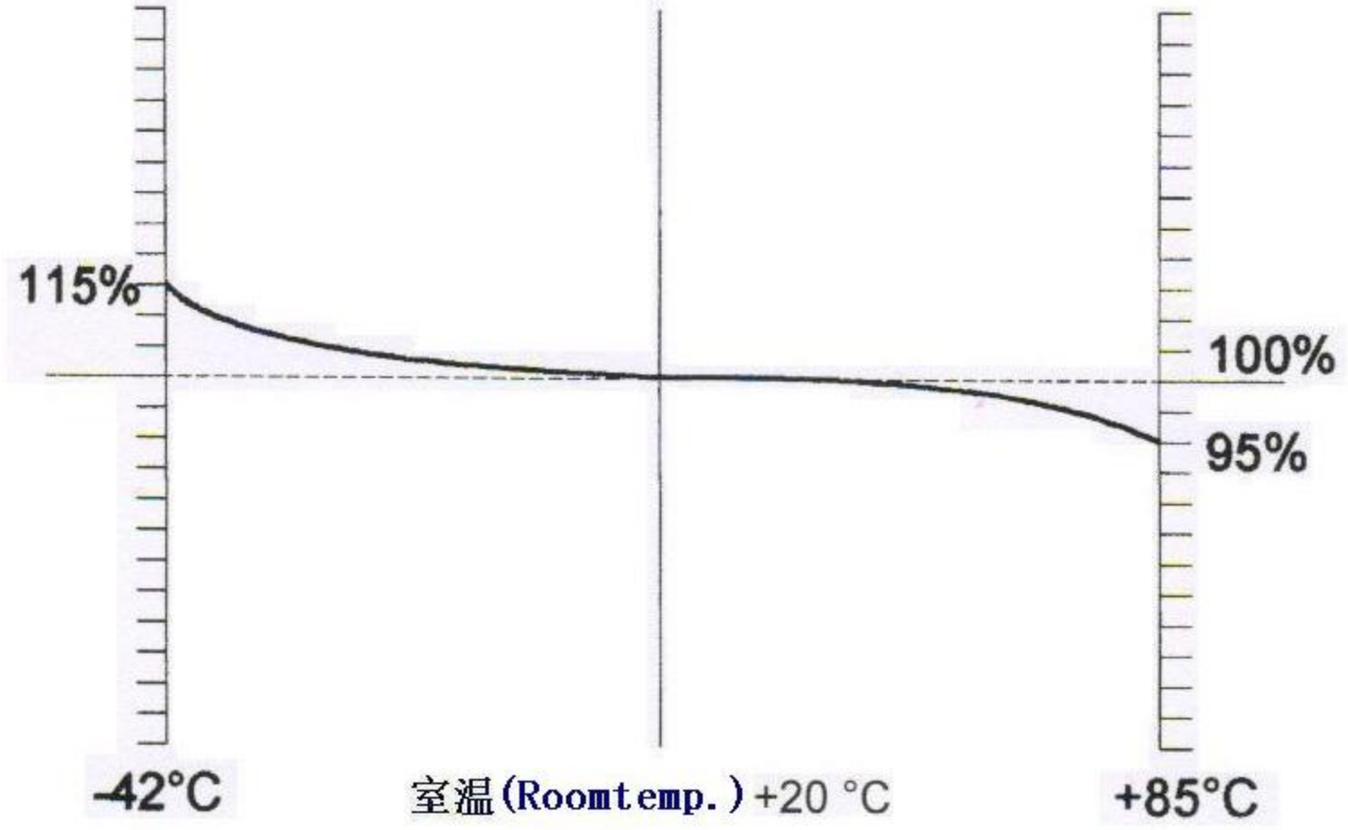
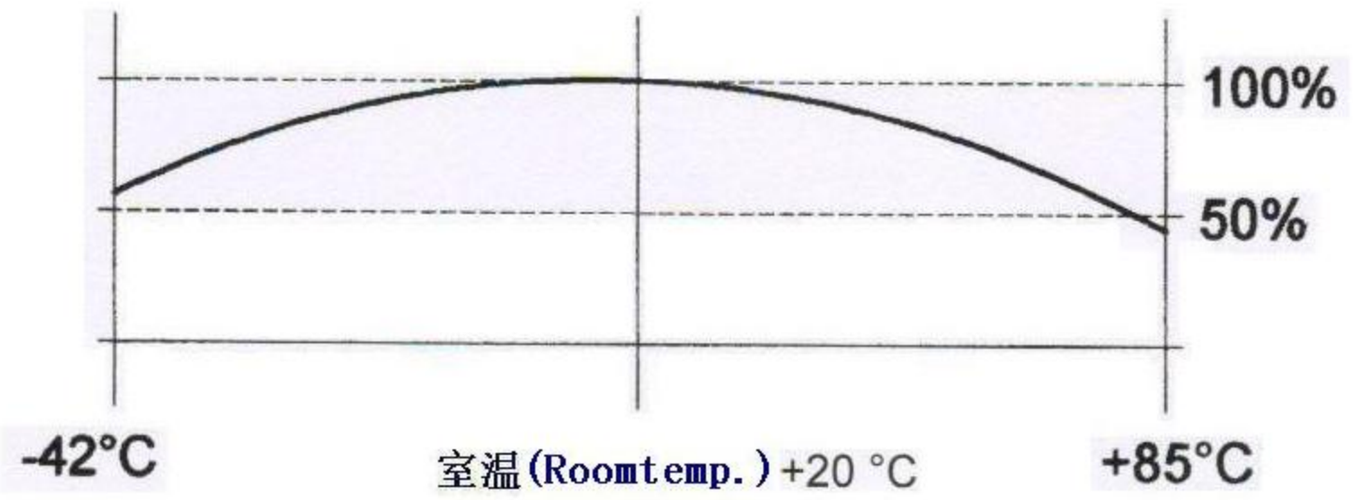
扭矩随温度的变化

(Characteristics under temperature influence:Torque reaction)



使用寿命随温度的变化

(Service life under temperature influence)



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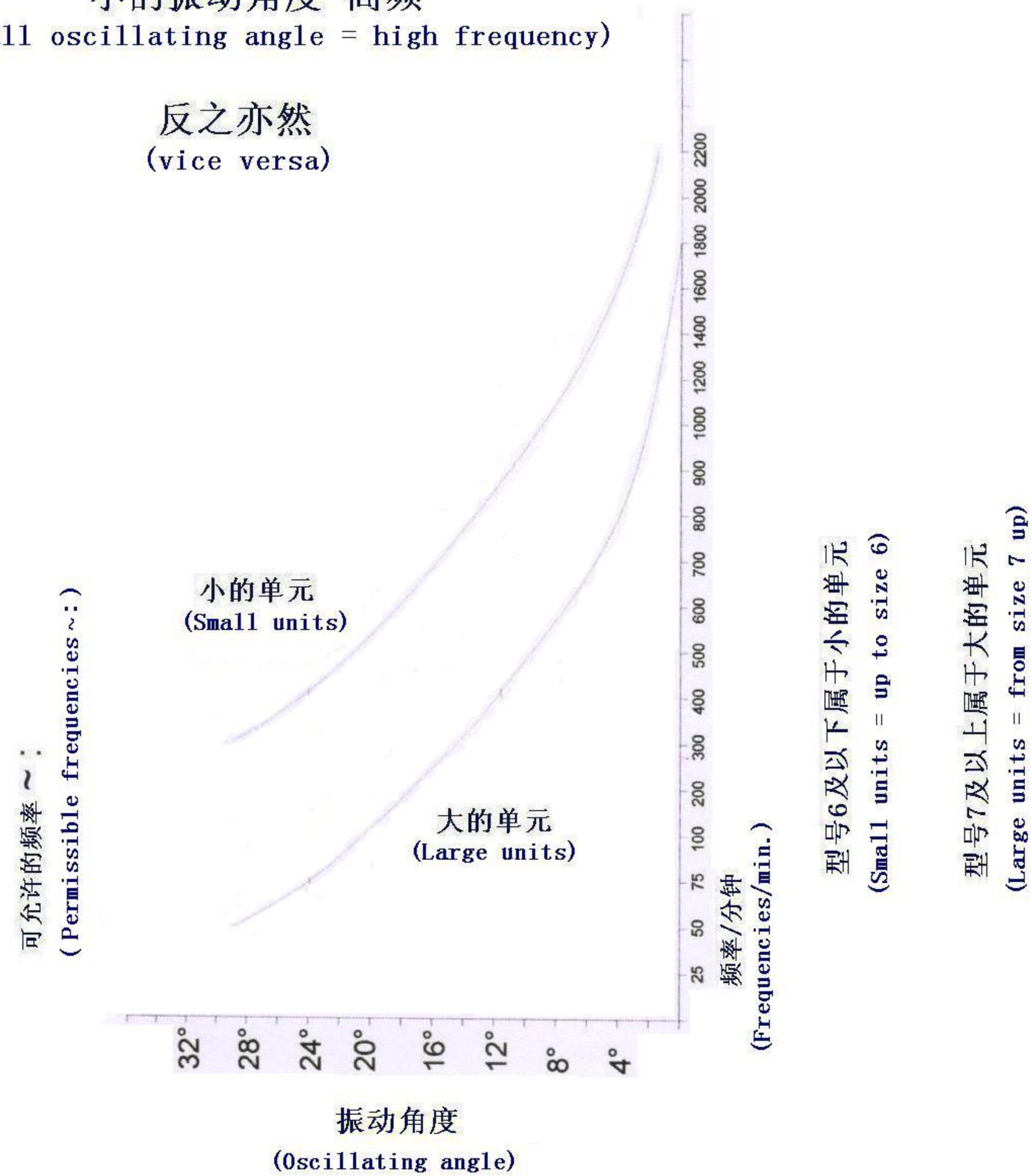
小的振动角度=高频
(Small oscillating angle = high frequency)

反之亦然
(vice versa)



型号6及以下属于小的单元
(Small units = up to size 6)

型号7及以上属于大的单元
(Large units = from size 7 up)

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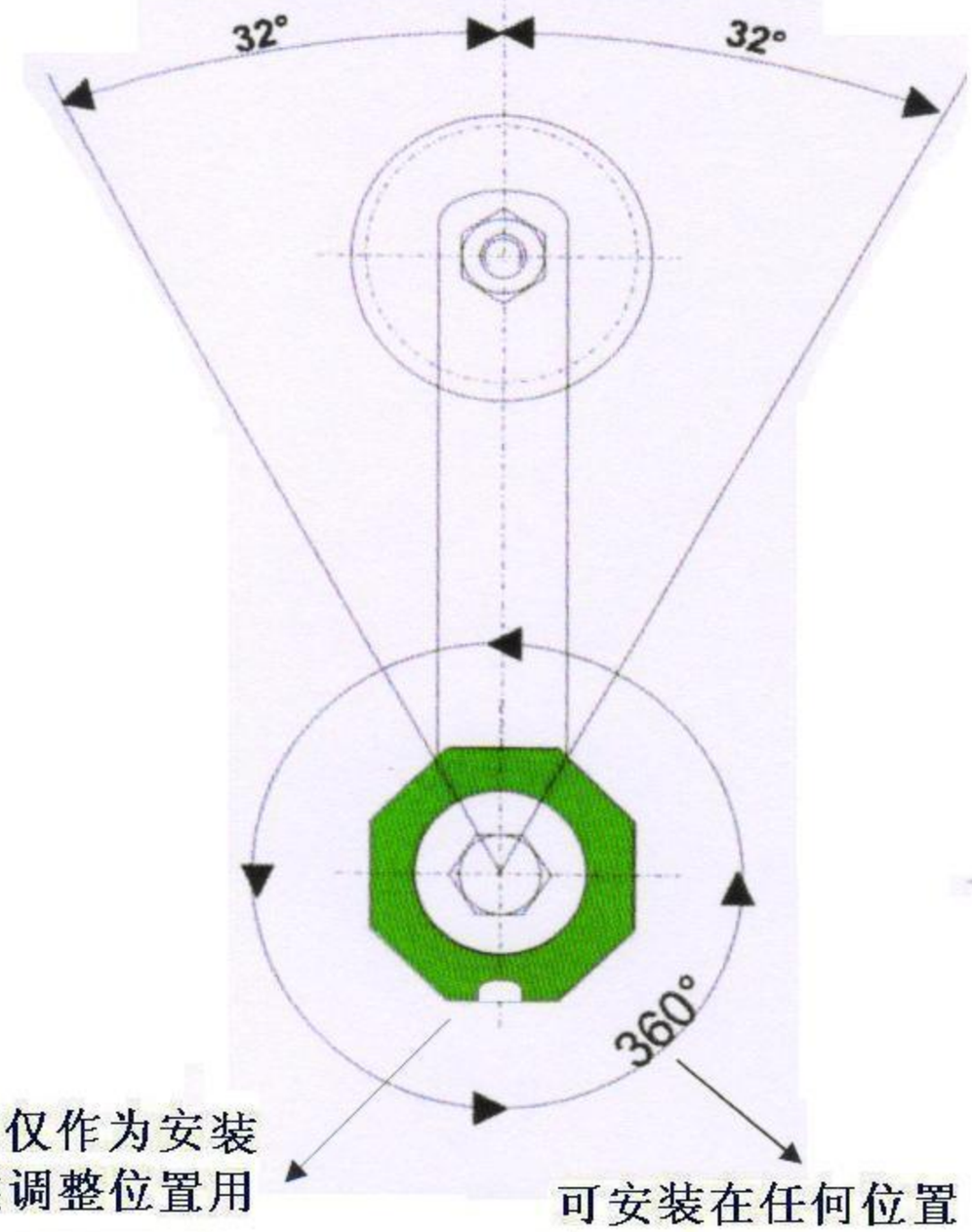
RESATEC通用链条张紧器
(The RESATEC universal chain tensioner)

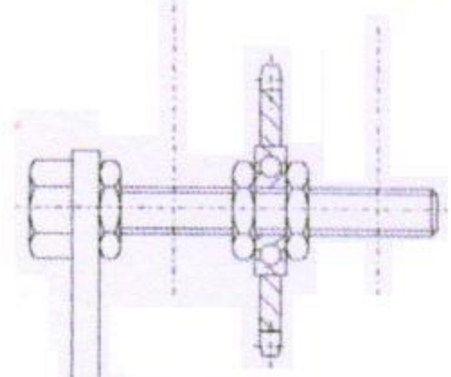
0-32°的张紧角度调整
(Tension adjustable from 0-32°)



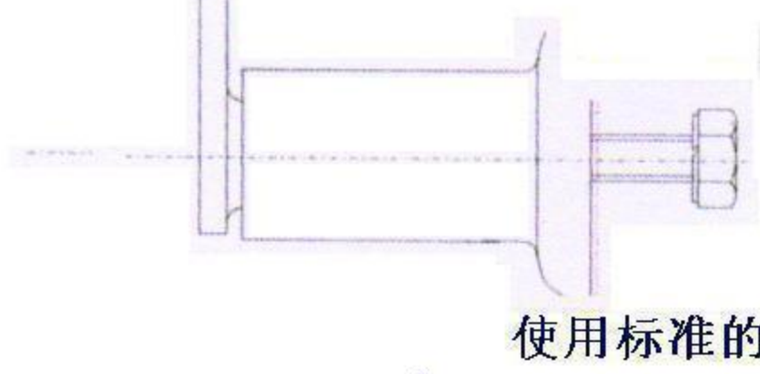
该缺口仅作为安装的时候调整位置用
(Only for positioning /installation)

可安装在任何位置
(Mounting at any position)

←→ 可调整的链条轨道
(Adjustable Chain-track)



可以是不同尺寸的，也可以是双排或者三排的链轮
(Different size of chain wheels possible. Also duplex and triplex arrangements)



用一个螺栓来固定
(Friction hold with one bolt)

使用标准的工具 进行安装
(Use standard tools for tensioning)

- 能持续、自动的调整链条的伸长度
  (Continuous, automatic adjustment of chain elongation)
- 噪音和震动缓冲器
  (noise and vibration damping)
- 可延长链条的使用寿命
  (Extending the service life of chains)

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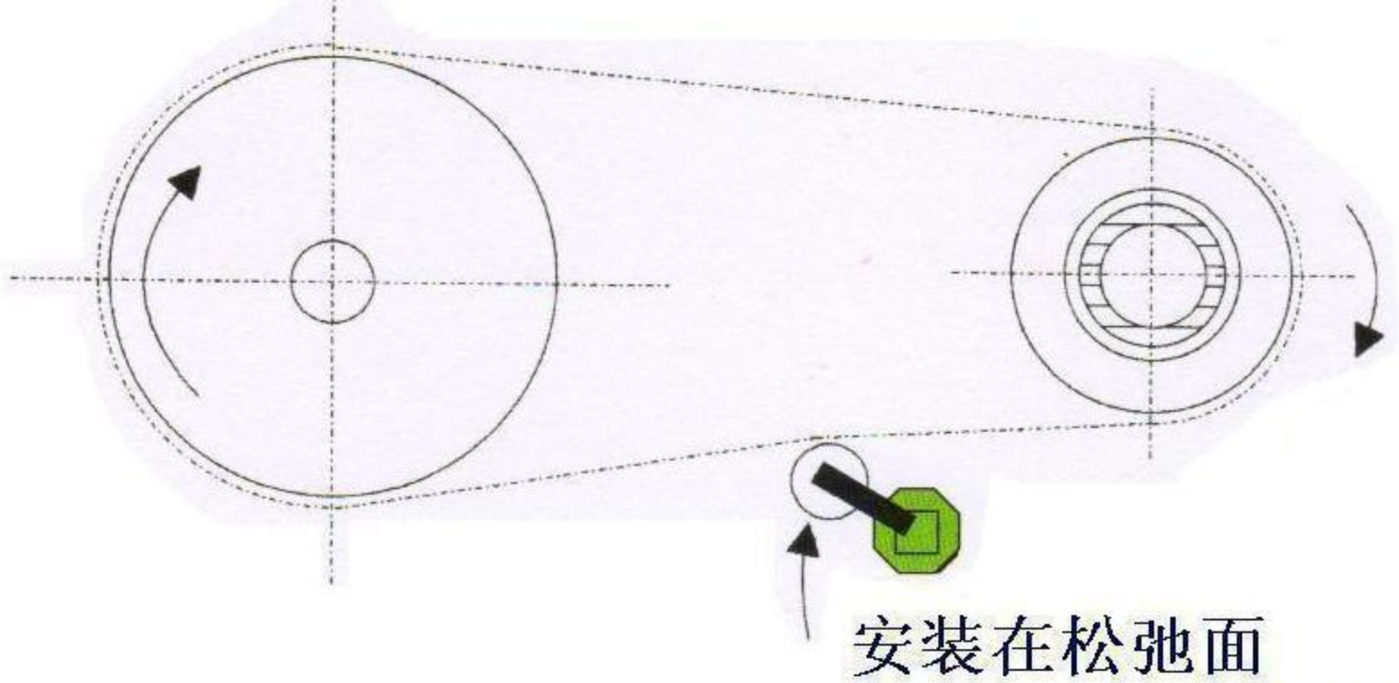
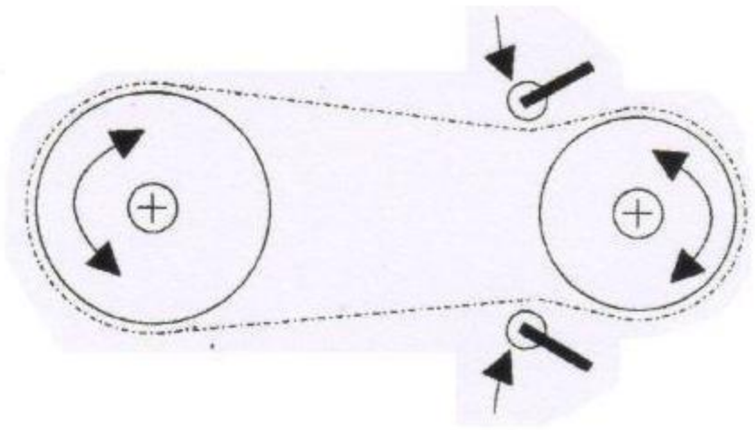
RESATEC 链条和皮带张紧器的安装说明

(Mounting instruction for RESATEC Universal chain- and Belttensioners.)

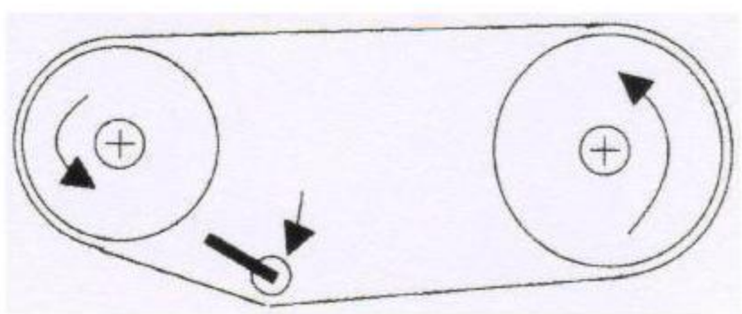


驱动电机
(Drive,Motor)

安装在松弛面
(Tensioner on slack side)



双驱动链条=2个张紧器
(Reversible Chain drives=2 Tensioner)



V型皮带从里面张紧
带滚筒的从外面张紧
(V-Belt tensioning with
pulleys from inside;
with roller from outside)

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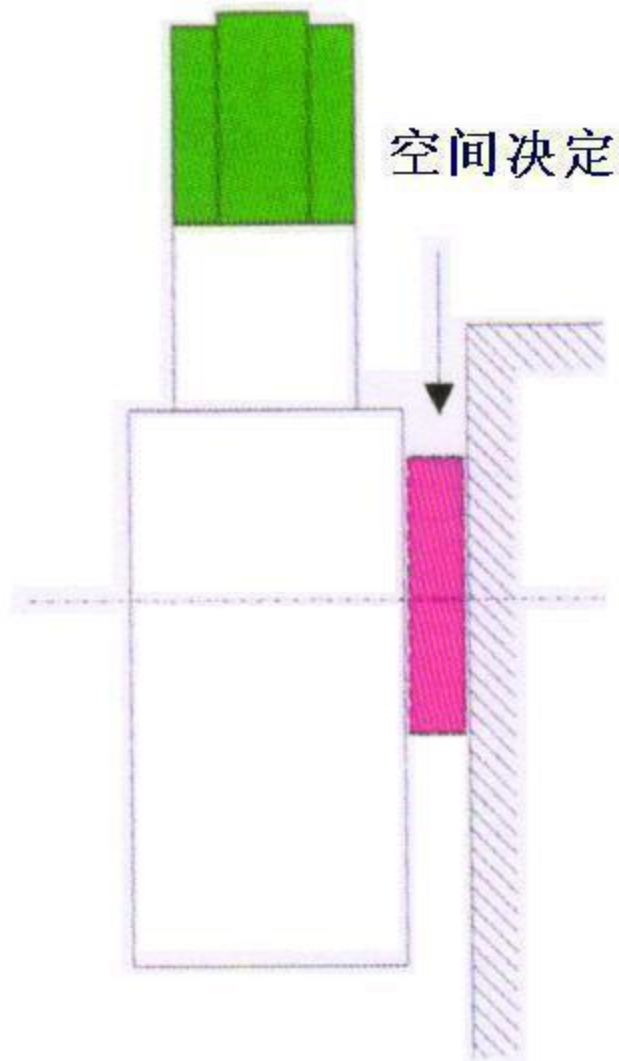
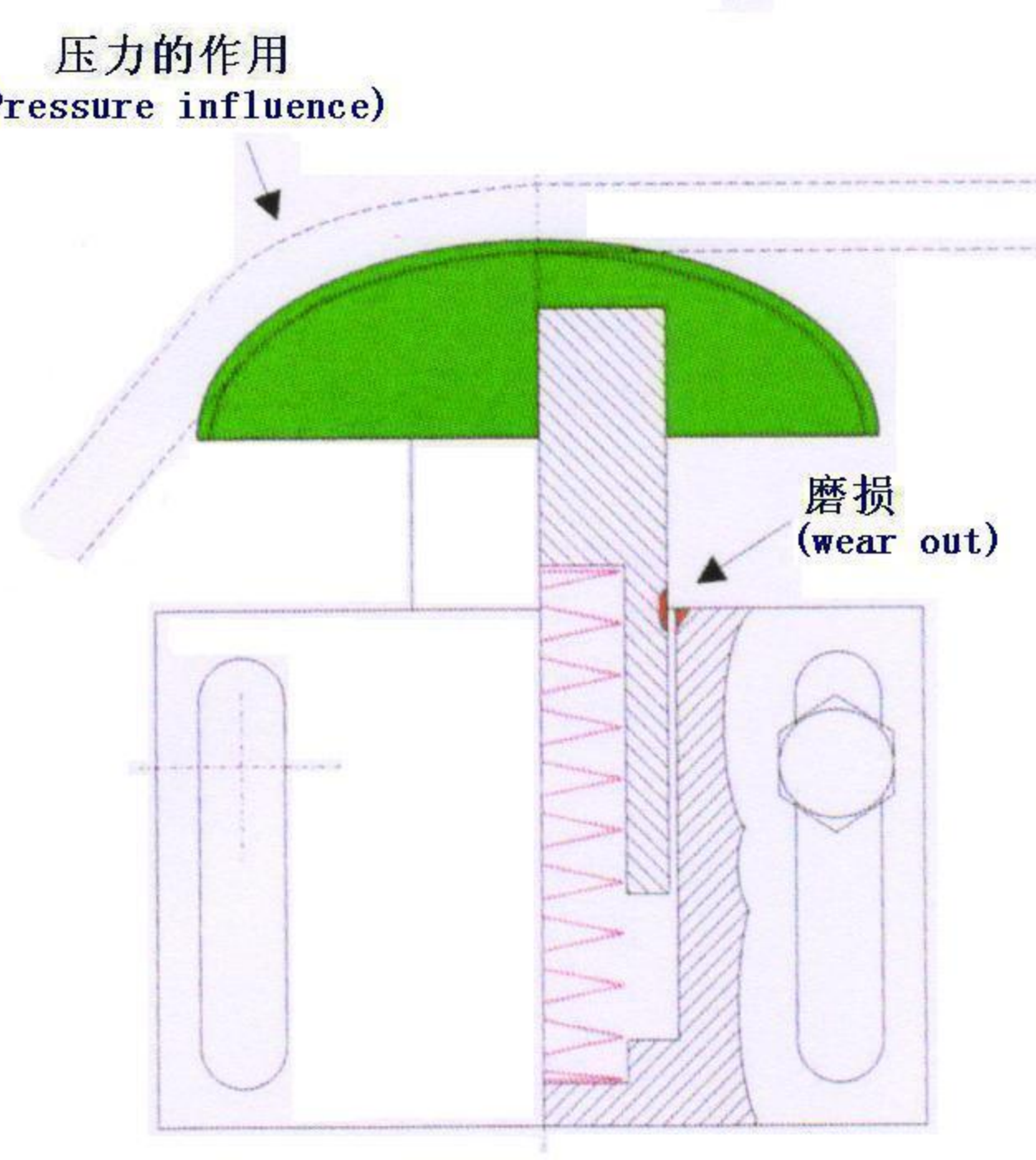


空间决定需求 (Distance setting required)

- 装配链轮的空间不够
(Chain tracking not possible)

- 由于空间限制，只能用2个螺栓和垫片来安装
(Mounting with two bolts and spacers requ. limited due to space)

压力的作用
(Pressure influence)



- 无法消除噪音和震动
(No noise- and vibration damping)

- 尺寸非常有限
(Size very much limited)

- 不能安装链轮
(No chain wheel possible)

- 没有多余的配件来替换
(No spare part exchange possible)

- 成本较高
(Rather expensive)

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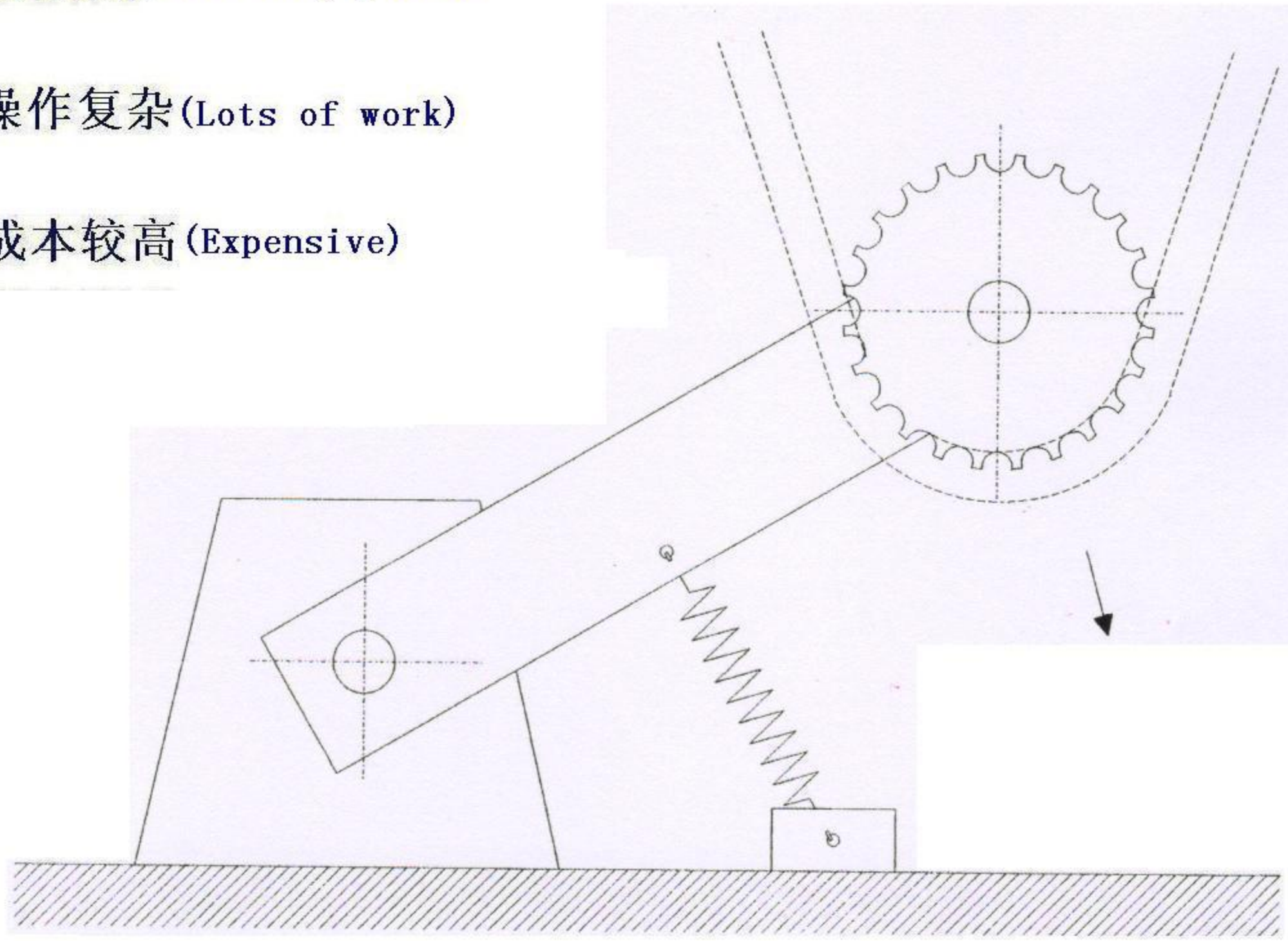
自制的机械张紧器(Mechanical selfmade tensioner)

- 配件众多(To many parts)
- 操作复杂(Lots of work)
- 成本较高(Expensive)



- 很难调整(Difficult to adjust)
- 无法消除噪音和震动(No noise- and vibration damping)

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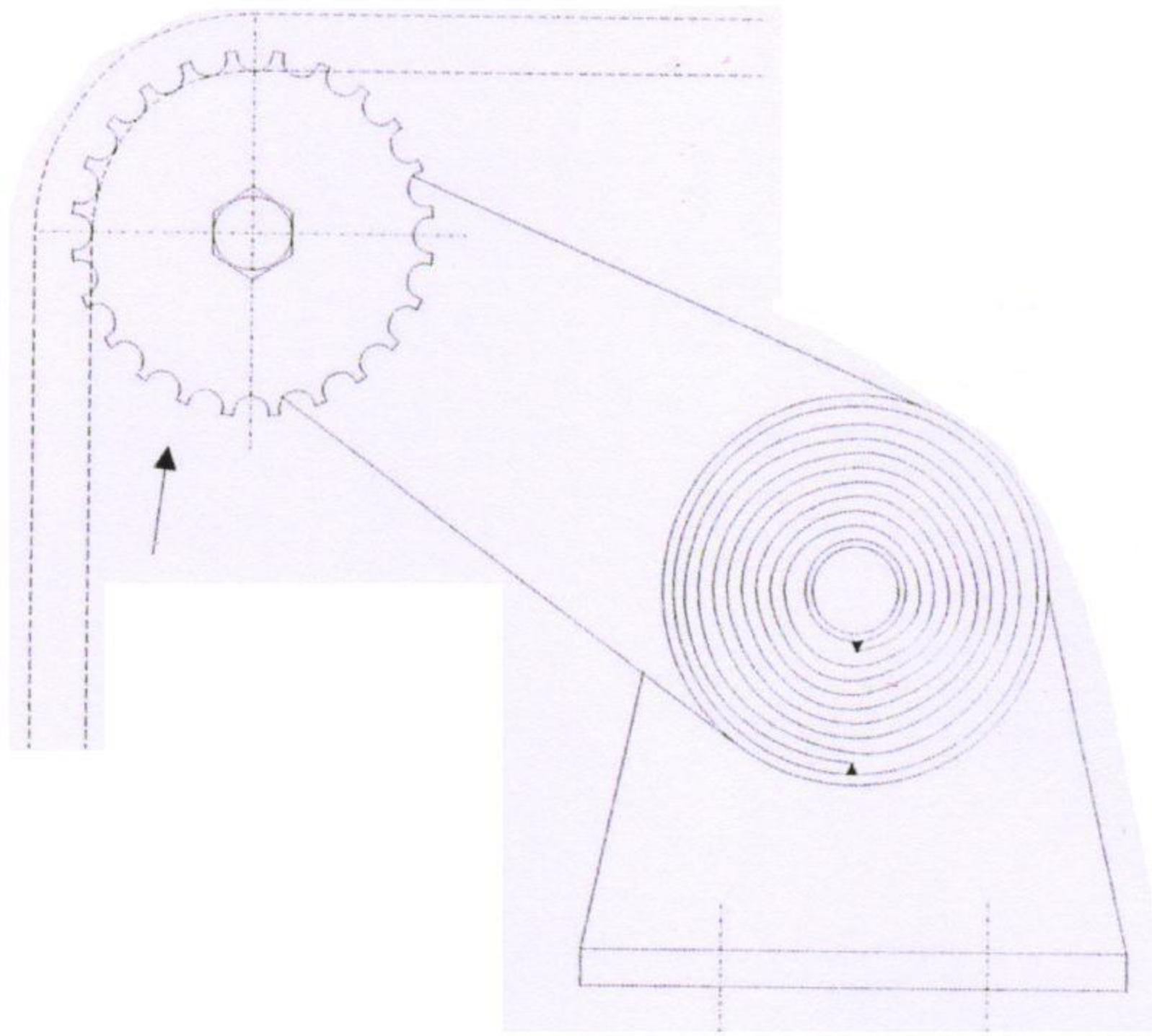
发条张紧器 (Leaf - spring Tensioner)

- 很重、会抖动、成本较高(Very heavy,"flutters",expensive)



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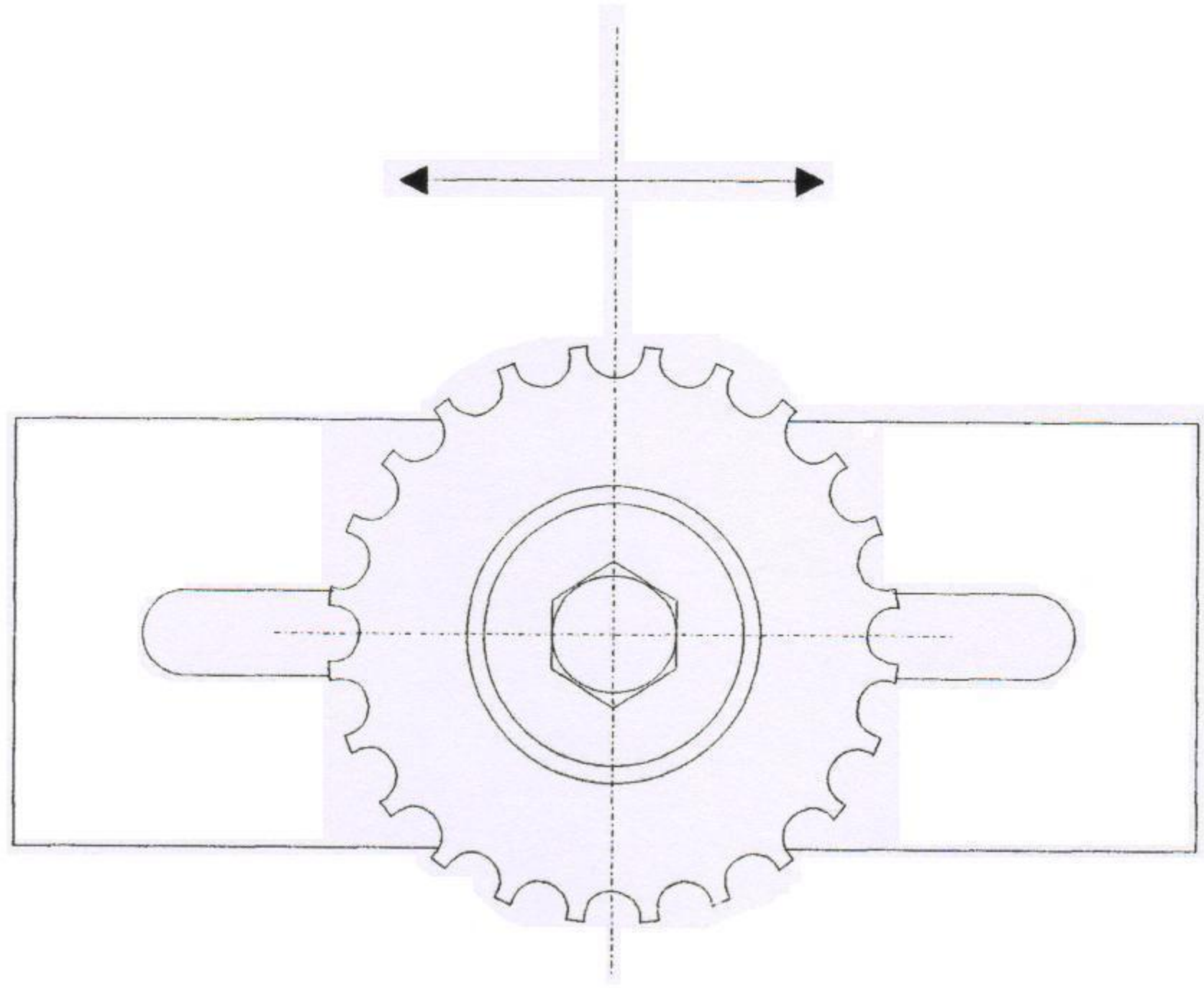
- 无法补偿链条的伸长 (No compensation of chain elongation)
- 无法消除噪音和震动 (No noise- and vibration damping)
- 需要经常调整 (Adjustment always required)
- 需要维护 (Not maintenance free)



链条杀手!
(Chain Murderer)

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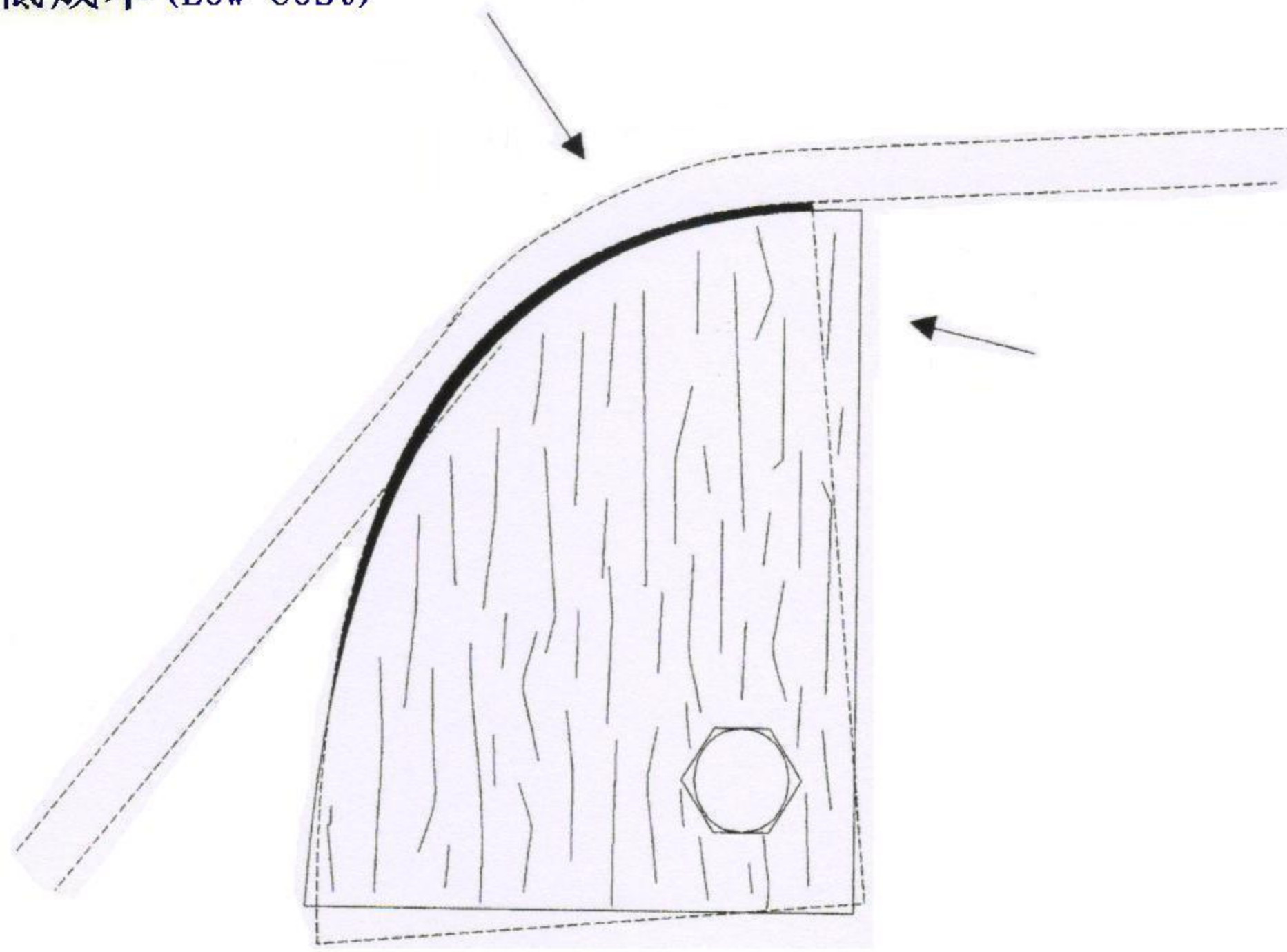
- “农夫的乐趣”(The "Farmers - delight")

➔低成本(Low cost)



- 只起到导向作用，没有张紧功能(No tension;guide only)
- 没有缓冲功能(No damping)
- 不可靠(No reliable)

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用途(Areas of application):

链条张紧器(Chain tensioner):

- 适用于从3/8″到$1\frac{1}{2}$″的BS链条
  (可根据链条的尺寸来配链轮)
  [For chain drives from 3/8″-1 1/2″ BS (Chain wheels for smaller and large chain on requse)]

皮带张紧器(Belt tensioner):

- 适用于各种皮带
  (平皮带、齿形皮带、V形皮带和多楔皮带)
  [For any size of belts(flat, tooth-,V- and multiple belts)]

- 可使用于各种传动装置
  (Used for any type of transmission)
- 农用机械(Agricultural machinery)
- 搬运设备(Handling equipment)
- 输送设备(Conveying systems)
- 木业和食品机械
  (Wood-,food processing machines)
- 建筑设备(Construction equipment)

张紧器(Tensioner):

- 输送带刮板(Belt scrapers)
- 棘爪簧(Spring clicks)
- 弹性导向(Elastical guides)
- 悬挂架(Suspensions)
- 缓冲器(Stoppers)

等等(etc.)

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Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
杭州市天目山路310号302室 电话:0571-28006879 传真:0571-85193750 邮箱:sales@resatec-hangzhou.com

防震装置(Antivibration mountings):

必须了解的(A few facts you need to know):...

固有频率:
(Natural frequency)

每种材料都有它的固有频率(钢铁、木头、石头 等等),因此每种防震装置也有它自己的固有频率,如型号是DVM6的固有 频率大约是5Hz。

[Each material has it's own natural frequency (Steel,Wood, Stone etc.).Therefore each antivibration mounting has it's own natural frequency.Nat. frequency of type DVM 6=~5Hz.]

驱动力频率:
(Interfering frequency)

这个频率起源于运动的物体(如压缩机、泵、空调、输送带等等)的每分钟转速。 驱动力频率 $=\frac{U/min}{60}=xHz$

[This Frequency originates from a moving/runing object (compressor, pump, air conditioner, press, chillier, conveyor etc.) and results from the rpm. Interfering frequency $=\frac{U/min}{60}=xHz$]

频比:
(Mistuning or frequency ratio)

固有频率和驱动力频率必须要进行调整,这就是频比(见图表)。大的频比能带来更好的阻尼/更小的震动。

[The natural frequency has to be mistuned with the interfering frequency which gives you the frequency-ratio(see chart), A large radio gives better damping/less vibration.]

共振:
(Resonance)

假如不对频比进行调整,就可能会产生共 振,导致设备/材料受到严重的损坏。

(The resonance arises if a frequency ratio cannot be established, it will destroy all material/machinery.)

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频比表(Frerquency-ratio chart):

比例(Ratio)	隔离性能(Isolation efficiency)	
1 : 1	0%	共振=损坏(Resonance=destroying)
1 : 1,4	20%	接近损坏(near resonance)
1 : 1,6	35%	不够(insufficient)
1 : 1,9	55%	足够(sufficient)
1 : 2,3	75%	好(good)
1 : 2,8	85%	好－非常好(good-very good)
1 : 3,5	90%	非常好(very good)
1 : 5	94%	非常好(very good)
1 : 7	98%	优越(excellent)
1 : 9	99%	优越(excellent)

从理论上说隔离性能达到98%以上就足够了，100%达到是不可能的，这和周围的环境有密切的关系。

(A calculated isolation efficiency 98% is a theoretical value only. 100% efficiency is not possible as it is influenced by the surrounding environment.)

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防震机(座)的计算:
(Calculation for antivibration mountings)

需要知道以下信息(The following information are required):

设备类型/商标名称(Type of machine/brand name)

用途(location)

总重量(total weight)

重心(center of gravity)

可能的支撑点的数量(number of possible support points)

驱动力频率(interfering frequency)

可能的替换位置:已经在用的是哪种类型?
(in case of replacement:what type had been used ?)

数量多少?有什么问题?(How many? What was the problem ?)

设备的大小:支撑点间的距离
(Size of machine:also distance between supports)

用什么连接的?(管子、轴等)
[Any connections ? (pipes,shafts etc.)]

防震机(座)的最小最大高度
(Min./max. height of antivibration mountings)

RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
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例如(Examples):

压缩机(Compressor)

总重量(Total weight):	1000	公斤(Kg)
每分钟转速(rpm of piston):	850	转/分钟(U/min.)
可能的支撑点(poss. support points):	4	个(Points)
连接方式(connection):	软管(flexible pipes)	

适用装置(foreseen units):

4个固有频率是5Hz的类型是DVM6的产品，每个能承载2500N。
(4 pc. Type DVM6 with natural freq. of ~5Hz, load of each support 2500N)

压缩机的驱动力频率(Interfering freq. compressor) $= \frac{850}{60} = 14.2\,Hz$

频比(Frequency ratio) $= \frac{14.2}{5} = 1:2.8 = 85\%$

隔震性能(Isolation efficiency): 85% = 好-非常好(good-very good)

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Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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计算(Calculations):

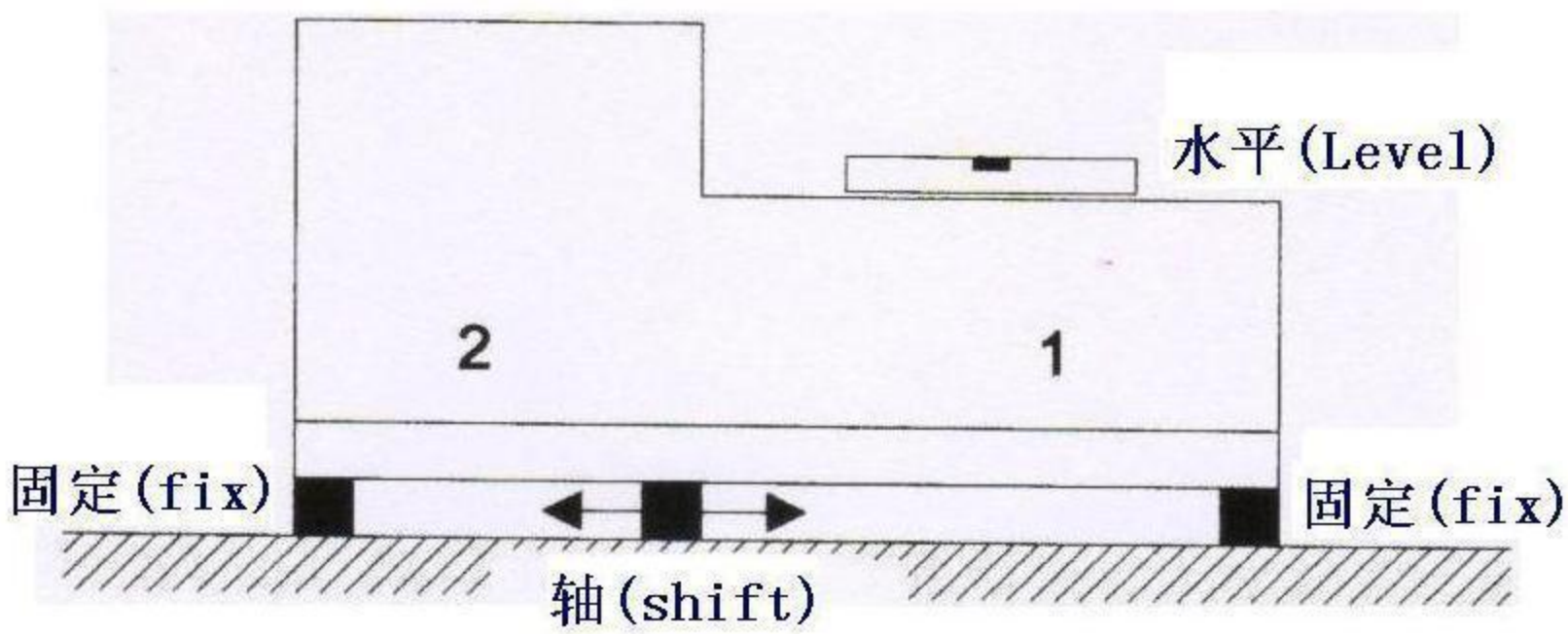
空调:
(Airconditioner)

总重量(Total weight):	1700Kg
风扇每分钟转速(rpm fan):	1200
可能的支撑点(poss.Support points):	6 个(Points)
重心点(point of gravity):	2: 1

适用装置(forseen units):
6个DVM6,固有频率约5Hz,每个承载2833N。
(6pc.Type DVM6 natural frequency of ~5Hz load of each support:2833N)

驱动力频率(Interfering frequency zircon.) = $\frac{1200}{60}$ = 20Hz

频比(Frequency ratio) = $\frac{5}{20}$ = 1:4 = 93% 非常好(very good)



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举例(Examples):

锯床(Crank saw):

总重量(Total weight): 1300Kg

每分钟转速(rpm crank): 300

重心点(point of gravity): 1:1

支撑点(Poss.Support points): 4 个(Points)

适用装置(forseen units):

4个DVM6，固有频率约5Hz，每个承载3250N
(4 Stk.Type DVM6 with natural freq. of ~5Hz,
load of each support:3250N)

驱动力频率(Interfering frequency crank) = $\frac{300}{60}$ = 5Hz

频比(Frequency ratio) = $\frac{5}{5}$ = 1:1 = 共振(Resonance)!

请要求我们更换(Please ask us for alternatives)!

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振动筛和输送机(Screens and conveyors)

需要知道以下信息(Information required):

振动筛和输送机的类型(Type/make of screen/conveyors)
筛板的尺寸(长X宽)[size and amount of decks(l x b)]
承载的重量(weight of moving mass)
重心的位置(center of gravity)
支撑点(points of support)
现有的支撑方式(existing supports)
驱动类型(type of drive)
非平衡曲柄/轴的转速(rpm of unbalanced shaft/crank)
振动幅度(oscillating amplitude in mm)
振动筛的角度(angle of screen)
材料类型(type of material)
材料重量(weight of material)
每小时生产的产品(production per hour)
材料是干的还是湿的(material dry or wet)

我们将会为你选择适合的RESATEC防震装置的尺寸和所需的数量。
(We will select the size and amount of RESATEC Oscillating-mountings for you.)

RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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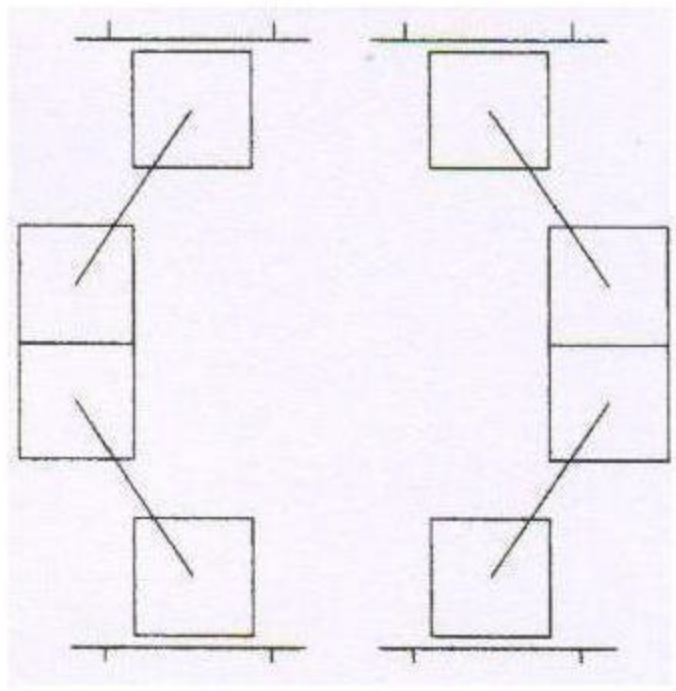
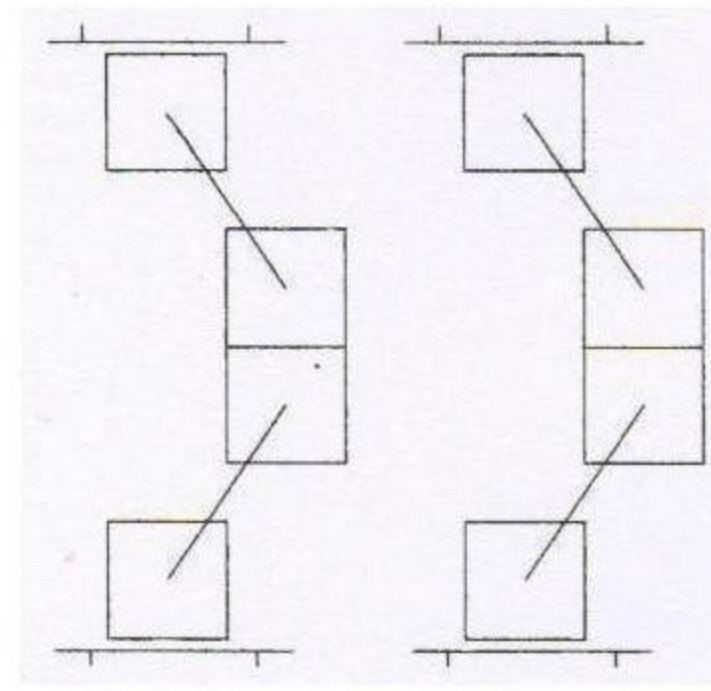
防震装置CH的安装
(Mounting arrangement for oscillating mountings type CH)

•可以在张紧或者压缩状态下使用，可以安装在垂直或者水平的方向上。
(Installation possible under tension, compression, vertical or horizontal)

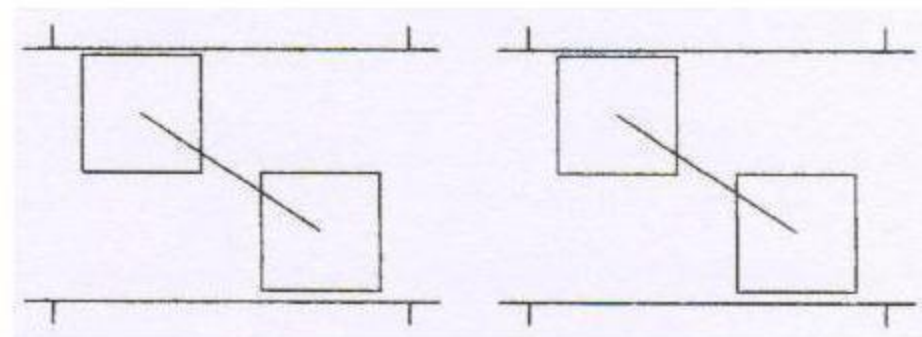




可以安装在任意方向(Installation possible in any direction)

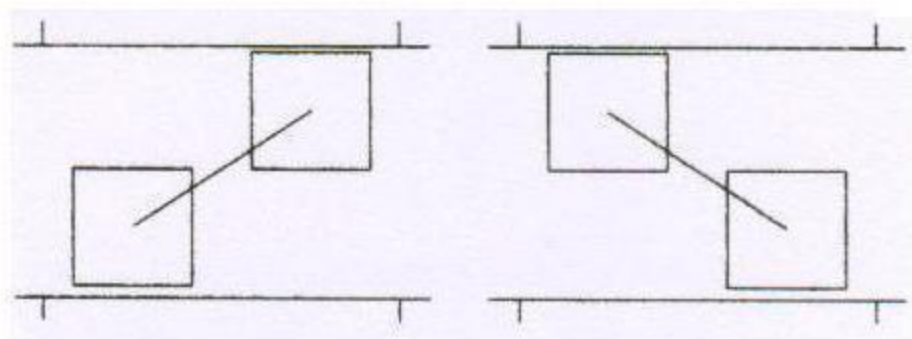
防震装置 DVM 的安装
(Mounting arrangements of vibration damper type DVM)

•可以在张紧或者压缩状态下使用，可以安装在垂直或者水平的方向上。
(Installation possible under tension, compression, vertical or horizontal)



正确(correct)

只能安装在同一个方向上(Installation in one direction possible only)!



错误（wrong）

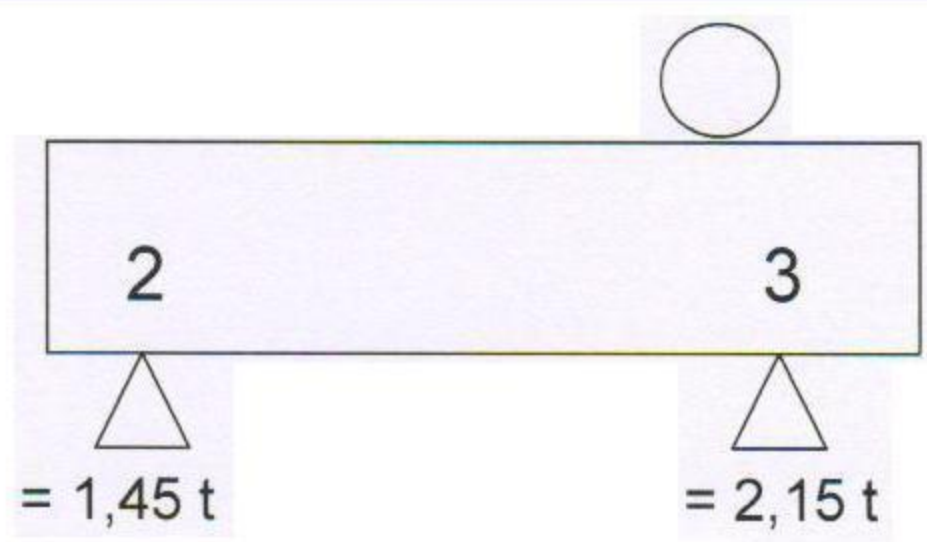
RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
杭州市天目山路310号302室 电话:0571-28006879 传真:0571-85193750 邮箱:sales@resatec-hangzhou.com

用于振动筛、矿山、采石场的RESATEC防震装置的计算(类型、等级、净化、排水等)

[Calculation of RESATEC Oscillating-mountings for screens, in mines, gravel pits, etc. (sorting, grading, cleaning, dewatering, ect.)]

需要知道的信息(Technical information from the client):

振动筛(Screen):	尺寸(Size):	2m x 4.8m
	重量(Weight):	3600Kg[振动重量(oscil.mass)]
	重量比(Weight ratio):	2:3
	每分钟转速(RPM):	900[外心(Excenter)]
	振幅(Osc.amplitude):	10mm
材料(Material):	碎石(Gravel):	1.8
	产量(Production requ.):	750t/h [湿的材料(wet material)]



材料计算(Calculation for material):

湿的材料的重量(production with wet material):

=750t/h+50%水(water)=1125t/h=18.75t/min

材料的耦合重量(Coupling effect on screen):

=~18.75t/min x 30% = 5.625t/min

材料的运送速度(Speed of material on screen):

=每分钟转速(RPM) x 振幅(Osc.amplitude)=900x10mm=9m/min

振动筛的实际重量(actual weight on screen)= $\frac{5.625}{9}$ x 4.8=3t

- 重量比(Weight ratio) 2:3 =1.2t+1.8t
- 设备自身重量(the weight of screen): 3.6t
  重量比(Weight ratio) 2:3 = 1.45t+2.15t
- 承载在CH装置上的总重量(load on CH-mountings):
  =(1.45+1.2)t+(2.15+1.8)t= 6.6t

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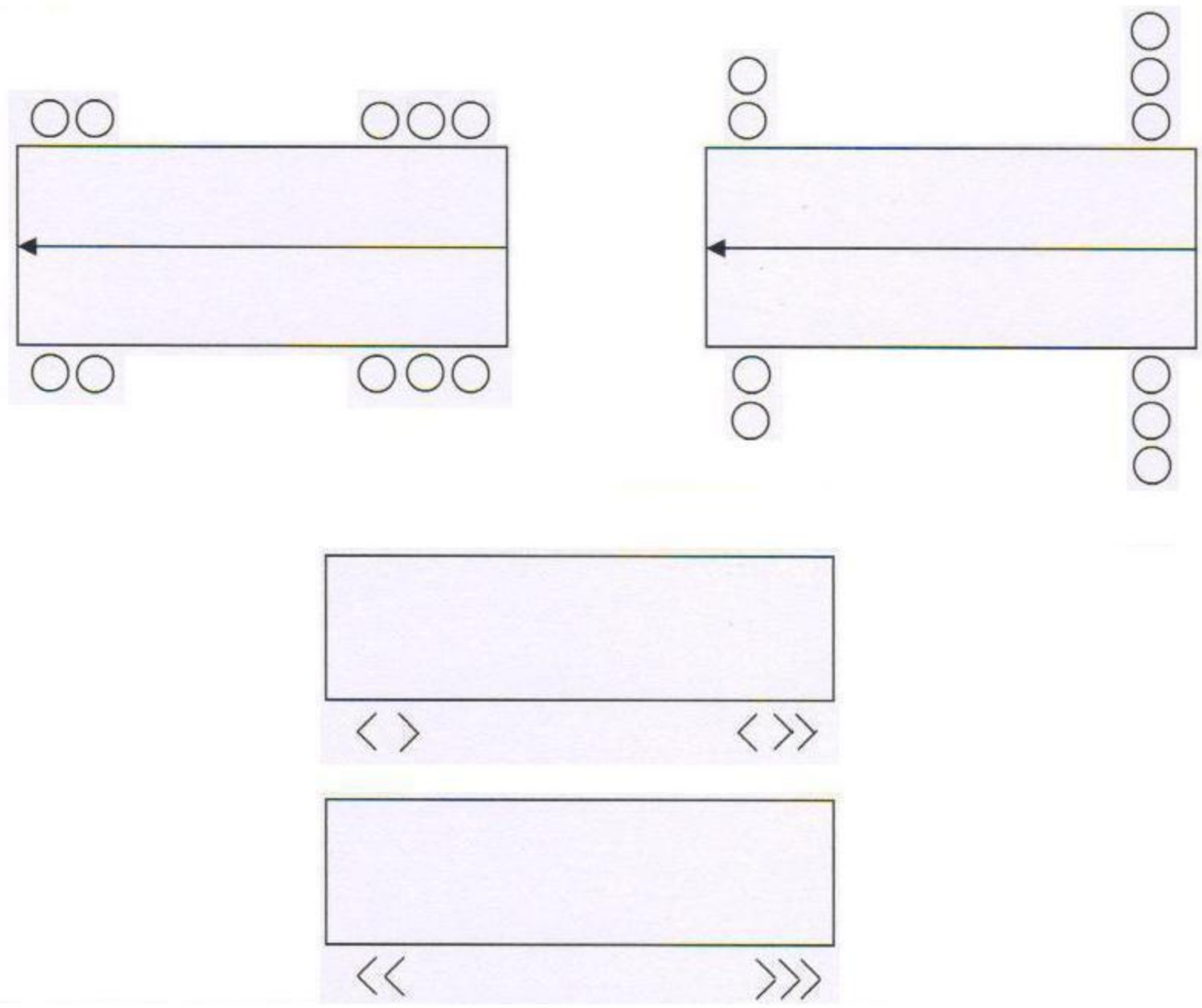
防震装置的选型(Choice of oscillating mountings): CH8

所需的数量(amount of mountings): 2 x 2CH8 + 2 x 3CH8 = 10CH8



震动缓冲器:

- CH8的固有频率(空载)[Natural frequency of Type CH8(under load)]=~ 2.2Hz
- 振动筛的驱动力频率 [Interfering frequency(screen drive)]= $\frac{900}{60}$ =15Hz
- 频比(Mistuning ratio) = 1:6.8
- 隔震性能(Efficiency acc.chart)=97%=非常好/优越(very good/excellent)

RESATEC Co. Ltd. 瑞沙泰柯有限公司
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材料的耦合重量(Coupling effect of Materials):

低振幅(Low amplitudes) → 高转速(high RPM)

高振幅(High amplitudes) → 低振幅(low RPM)

转速/分钟 (RPM)	振幅 (Amplitude)	参数 (Factor)	耦合系数 (Coupl.Mat.)
300 x	30 mm	9000	25%
500 x	20 mm	10000	18%
700 x	14 mm	9800	20%
800 x	12 mm	9600	20%
900 x	10 mm	9000	25%
1000 x	8 mm	8000	30%
1200 x	7 mm	8400	27%
2400 x	4 mm	9600	20%
3000 x	2 mm	6000	33%
3600 x	1 mm	3600	36%

[湿的材料(wet production)+5%]

参数表(Guide):	参数(Factor)	耦合系数(Coupl.Mat.)
	- 5000	36%
	- 7000	33%
	- 8500	30%
	- 9500	25%
	-10000	20%
	->10000	18% 或更少(or less)

- 轻的材料耦合系数小(Light material even less couplingeff)
- 重的材料耦合系数大(Heavy material even more couplingeff)

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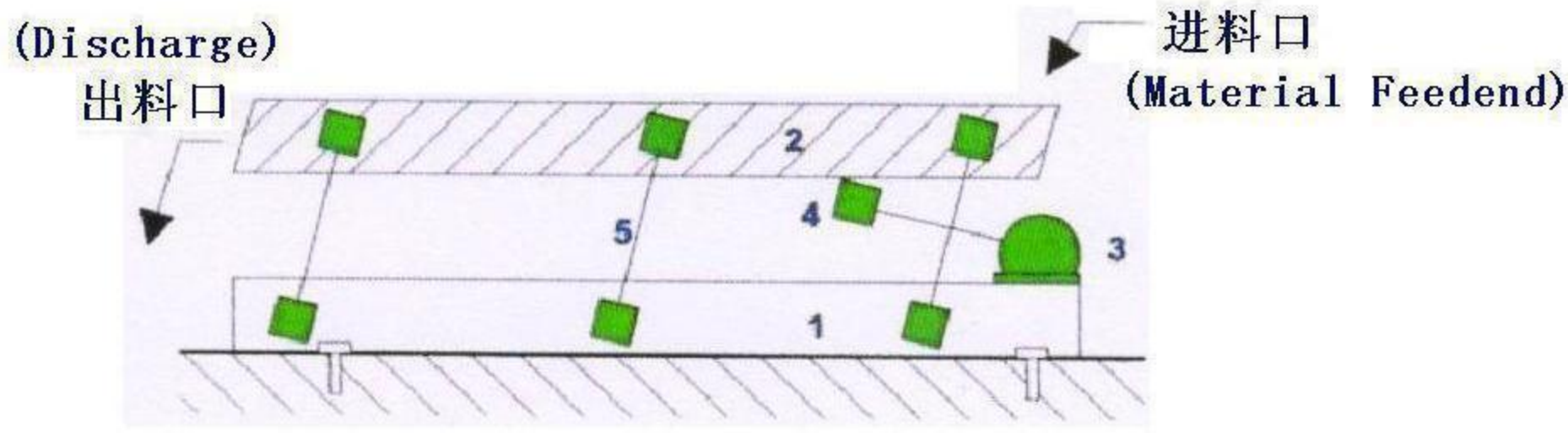
输送系统(Conveying systems)

指导方针、设计、计算(Guidelines, designs, calculation)

A) 单输送系统(The "One-mass" oscillating systems)

单输送系统主要由输送槽、进料器和振动筛组成。

[Conveyor-, Feeder- and Screening units
with one oscillating mass only(Trough)]



单输送系统包含(The conveyor with the "one-mass" system consists of):

1. 固定支架(Base frame)
2. 输送槽(Trough)
3. 离心驱动(Excentrice drive)
4. 驱动杆和驱动头[Drive rod with Drive head(Type DH)]
5. 摇杆和振动装置(OM型号)
[Rocker arms with Oscillating mountings(Type OM)]

注意(Note):

单输送单元-从移动的角度来说也称作“雷鸟”, 这些类型的设备必须要有坚固的固定支架。

(One-mass conveying units-so called "thunderbirds", tend to "move", These type of machines must be fitted to the basement or to sturdy base frames.)

RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
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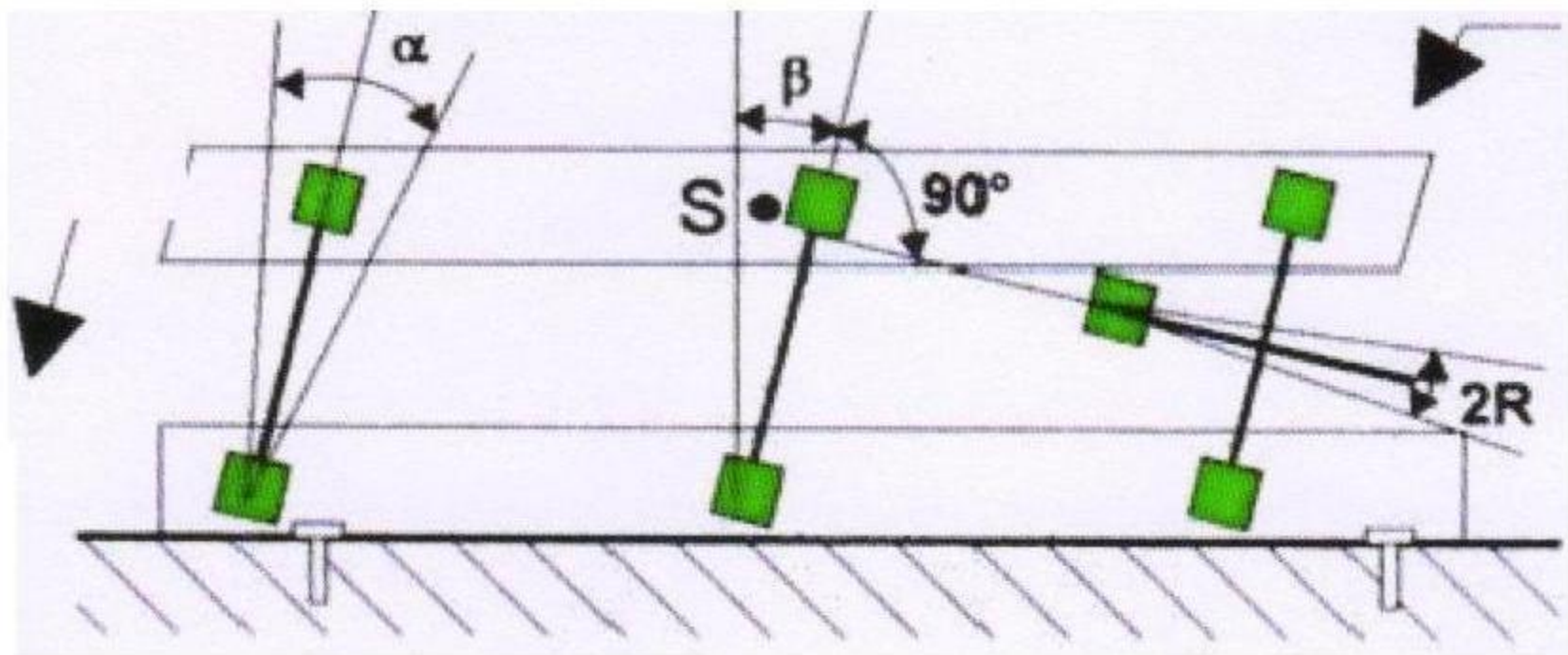
一般来说，加速度不能超过2G。
(In general the acceleration should not exceed 2G.)

振动装置OM的摇杆的角度必须要调整到20-30°
(The rocker arms with oscillating mountings
Type OM should be fitted at the angle 20-30°)

对于输送槽，倾斜角度大致20°
(For feeders, conveyors rather at b 20°)

对于振动筛，倾斜角度大致30°
(For screens, sorters rather at b ca. 30°)



最有效的方法(Best efficiency with)：

高的振幅和低的驱动速度
(High amplitude and low speed of the drive rod.)

例如：30mm的振幅和每分钟300转的速度
(i.e. Amplitude 30mm and 300 rpm)

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Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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输送槽的长度可以有15m长，有特殊应用的地方可以达到20m长。
(Conveyors can be built up to 15m trough lengths;for special applications up to 20m.)

如果需要更长，则要分段输送，每一段都必须有自己的驱动。
(For longer arrangements the conveyors have to be split in several sections with separate drives.)

总长度超过4m的输送槽需要用额外增加的横杆来校直,当然输送槽需要被加固。对于非常长的输送槽，在出料口需要安装双倍的摇杆。
(Conveyors with a total length of more than 4m length must be straightened with additional rips and crossbars. Also the area where the drive road is fixed has to be reinforced. Conveyors with very long trough need double rocker arms at the discharge end.)

振动装置的选择(Selection of oscillation mountings):
摇杆(振动装置OM)的选择取决于静态负荷。
[Rocker arms (Osc. Mountings OM) are determinated from the static load.]

1. 取决于输送槽的重量（包括其它支撑物）。
[Determination of trough weight(with all reinforcement)]

2. 取决于材料(Determination of material)。

3. 所有输送重量(输送槽和材料的重量)。
(Total moving mass;trough- and material weight)

4. 总重量决定摇杆的需求数量，摇杆的需求数量又决定了OM的需求数量。
(The total weight divided in neccesary rocker arms - The number of rocker arms doubled up gives the number of oscillating mountings type OM required.)

RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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摇杆的型号一般是根据以往的经验或者设备的长、宽、高、重量来选择的。

摇杆之间的距离最大不能超过1m，自由悬挂端要尽可能的短。

(The rocker arms should be selected with common sense, if possible from past experience and under consideration of lenth, width, height and weight. The distance between rocker arms should not exceed 1m max. keep free hanging ends as short as possible!)

例如(example):

长4m宽0.6m的输送槽的重量(The weight of trough 4m long x 0.6m wide) =120Kg

材料重量(Material/product) =30kg

总重量(Total) =150Kg

估算(Layout forseen): 8个摇杆(8 Rocker arms) $\frac{150kg}{8}$ =18.75Kg=~190N

选择(Selection):

8根摇杆,每根摇杆带2个OM4,共计16个OM4(每个OM4的承载能力是210N)。

[8 Rocker arms with each 2 x OM4 = total 16pcs OM4(Load permitted OM4 = 210N)]

也可以选择OM5：这时可以只用6根摇杆，每根受的力= $\frac{150Kg}{6}$ G =250N。

每根摇杆带2个OM5，共计12个OM5(每个OM5的承载能力是420N)。

[Alternative with OM5: $\frac{150kg}{6}$ =25kg=250N select 6 rocker arms with each 2 x OM5 = total 16pcs OM5(Load permitted OM5 = 420N)]

RESATEC Co. Ltd. 瑞沙泰柯有限公司
Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
Fax 0571-85193750 › sales@resatec-hangzhou.com
杭州市天目山路310号302室 电话:0571-28006879 传真:0571-85193750 邮箱:sales@resatec-hangzhou.com

注意(Note):

1.这种选择方式是建立在每根摇杆的距离不超过1m的基础上的。
(This layout is not realistic as the distance between the rocker arms will be more than 1m by far.)

2.而且必须要确认选择的振动装置OM是在允许的频率范围内。
(Make sure you stay within the permitted frequency of the selected Oscillating mountings type OM.)

驱动头的选择(selection of drive heads):

取决于静态负荷(The drive head is determinated from the static load)。

1.取决于输送槽和材料的总重量
(Determination of trough weight with material = G)

2.取决于驱动杆的每分钟转速
(Determination of rpm of drive rod)

3.取决于振幅 = 2R = SW
(Determination of amplitude = 2R =sw)

计算(Calculation):

A)圆周运动速度V的计算，用m/秒做单位。
(Calculation of circumferential speed v in m/sec followed by)

B)驱动力F的计算，用N做单位。
(Calculation of Acceleration speed F in N)

C)驱动头DH型号的选择(Selection of drive head type DH)。

举例(Example):

取决的数据(Determinated datas):

-输送槽的重量(Weight of trough) = 150kg = 1500N

-驱动杆的速度N(Speed of drive rod N) = 300U/min

-振幅(Oscillating amplitude) SW = 2R = 2x10mm = 0.02m

RESATEC Co. Ltd. 瑞沙泰柯有限公司
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$$V=2\pi R\frac{N}{60}=\frac{0.02\times3.14\times300}{60}=0.314m/s$$

$$F=m\frac{V^2}{R}=\frac{150kg\times(0.314m/s)^2}{0.01m}=\sim1500N$$

选择驱动头:1xDH-6(每个驱动头的承载能力是2100N)
[Selection of drive head:1 x DH-6(perm.load 2100N)]

或者2XDH-5(每个驱动头的承载能力是1100N)
[Alternative 2 x DH-5(perm.load 1100N each)]

安装成本相对高一点,但是对槽有更好的导向作用,主要用于较宽的槽。
(The installation will be what more expensive but allows a better guidance of the trough;manly for very wide troughs.)

注意:要确认驱动头的选择符合频率要求。
(Note:Make sure you stay within the permitted frequency of the selected drive head.)

驱动力的计算/电机(Calculation of driving power/motor):

1.计算扭矩M(Nm)=驱动力F(N)x外圆半径R(m)
(Calculation of torque M in Nm
= Force F in N x excentr.Radius R in m)

2.计算驱动功率(KW)=FV/1000
(Calculation of driving power in KW = FV/1000)

$$或者(or)=M\frac{V}{R}\Big/1000=M\frac{2\pi N}{60\times1000}=\frac{M\times每分钟转速(rpm)}{9550}$$

3.选择电机的功率:用KW或者PS来表示,1KW=1.36PS
(Determination of the motor in KW or x 1.36 in PS)

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例如(Example):

F=1500N

R=0.01m

N=300U/min

扭矩(Torque) M=1500x0.01=15 Nm

电机功率(Driving Power) = $\frac{M \times N}{9550} = \frac{15 \times 300}{9550}$ =0.47KW

0.47 x 1.36=0.639PS

选择0.5KW或者0.75PS的电动机。
(Selection of motor:0.5KW or 0.72PS)

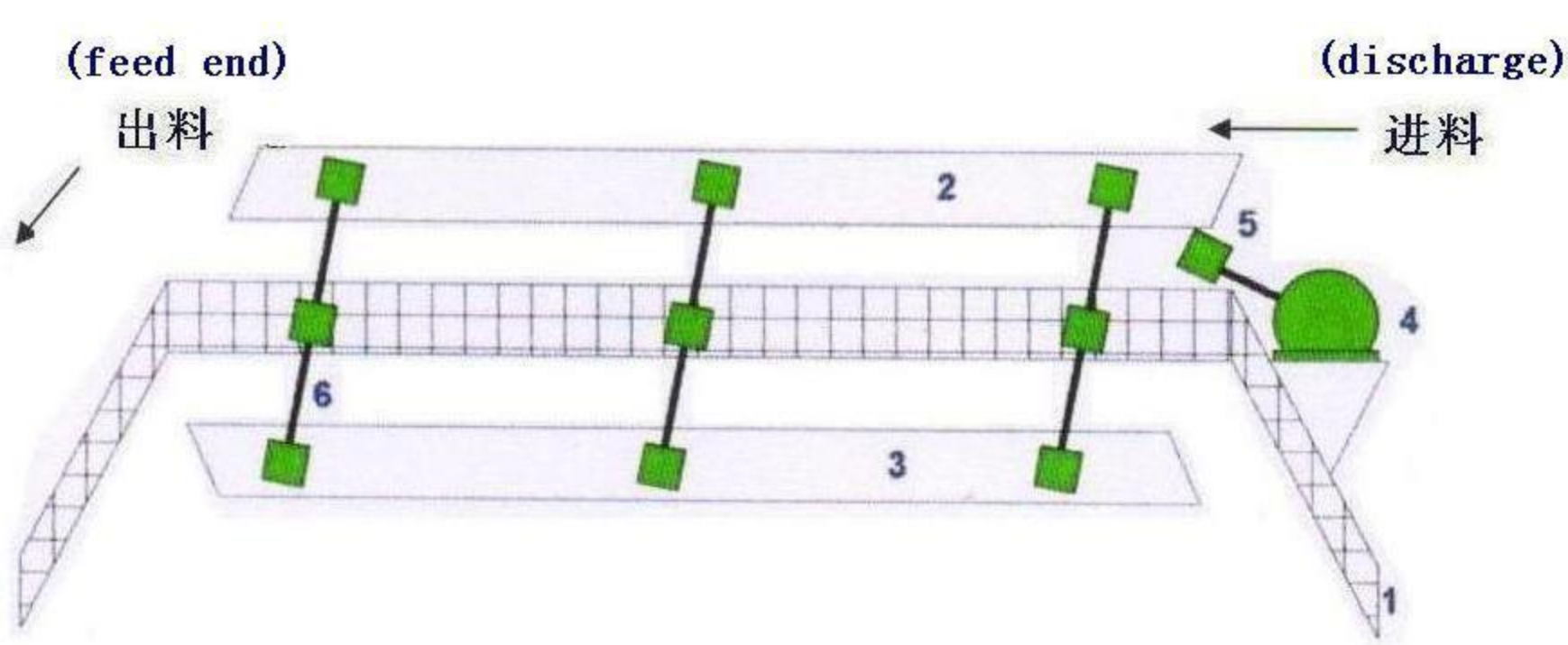
计算加速度(Calculation of acceleration force):

$$a = \frac{F}{m} = \left[\left(m\frac{V^2}{R}\right)\right]/m = \frac{V^2}{R} = \left[2\pi R\frac{N}{60}\right]^2 / R = \sim 9.8 = G$$

B)双输送系统(也叫平衡输送系统)

[The "Two-mass"oscillating system(also called "counter-mass" system)]

带双振动装置设备的输送带、出料和振动筛单元
(Conveyor-,Feeder and Screening units with two oscillating)



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Room 302 › No. 310 Tianmushan Road › 310013 Hangzhou China › Tel. 0571-28006879 ›
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双输送系统包含(The conveyor with the"two-mass"system consists of):

1.固定支架(Base frame)

2.输送槽(Material-trough)

3.平衡块-能用作第二个振动筛(Counter mass-can be second screen)

4.离心驱动(Excentric drive)

5.驱动杆和驱动头（型号DH)[Drive rod with drive head(type DH)]

6.摇杆和振动装置(型号TB)[Rocker arms with built in(type TB)]

注意(Note):

双输送系统比单输送系统的噪声要小，主要是双输送系统不需要很重的固定到地面的支架。

(Conveyor systems with two oscillating masses are considerable more quiet than the one mass conveyors. There for the base frame doesn't need heavy fixing to the ground.)

-加速度可以被提升到5G(The acceleration can be raised up to 5G)。

更多优点(Further advantages):

普通的输送设备是带一个材料和输送槽相同重量的平衡块，我们这里的平衡块可以用另一个输送槽来代替。此输送槽的摇杆可以按照一定的比例来设计，这样的话，两个输送槽之间就可以通过摇杆来协同工作。

(The usual conveyor is built with a counter mass of the same weight as the material trough. The counter mass can be made as an additional trough.
The conveyor can be designed with a certain ratio of the rocker arms. In this case the weight of the trough/counter mass has to be coordinated with the rocker arms.)

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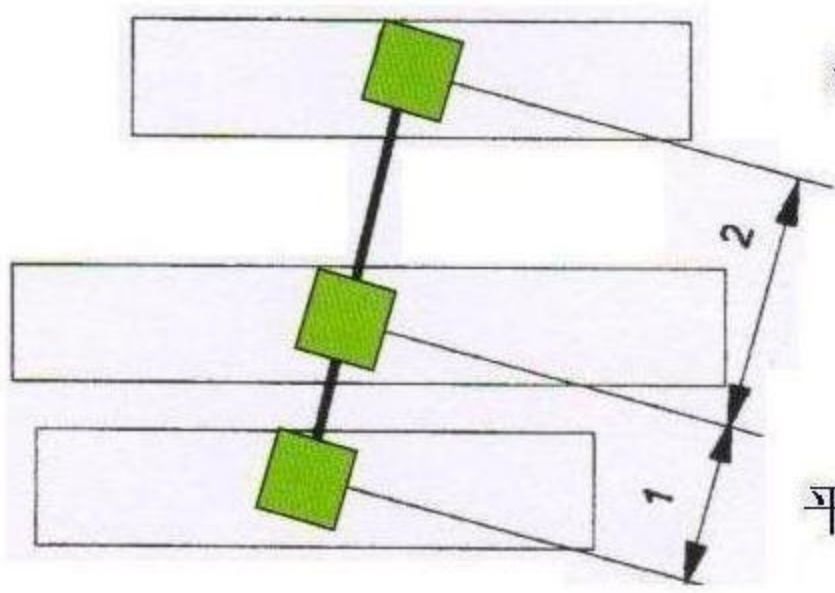
举例(Example):

比例(Ratio) 2:1



输送槽的重量(weight of the trough)=1

固定支架(base frame)

平衡块的重量(weight of the counter mass)=2

在这种设计方式下，被连接到平衡块的驱动杆的振幅比较小(由于半径R比较小)。

[In this case of design the drive rod should be connected at the counter mass with the actual shorter amplitude(Due to the smaller excenter costs are reduced drastically.)]

双传输系统的计算方法是建立在单传输系统的计算方法之上的。

(In general,the calculation for the two mass system is based on the calculation of the one-mass system.)

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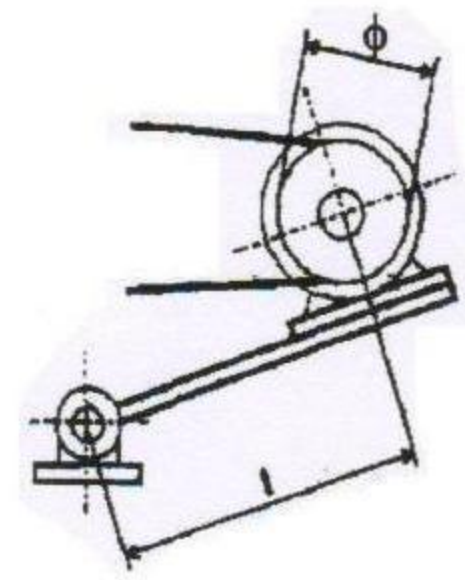
电机座的计算(Calculation of the motor base)

所需的数据(required technical datas):

1. HP-电机(motor)，1HP=0.735KW
2. 驱动轮的直径(ϕ drive pulley)
3. 驱动轮转速(Rpm drive pulley)
4. 中心距(centerdistance)
5. 电机的重量(weight of motor)

举例(Example for calculation):

电机功率(motor)	22HP
驱动轮直径(ϕ drive pulley)	240mm
驱动轮转速(Rpm drive pulley)	1460n
中心距(centerdistance)	450mm
电机重量(weight of motor)	130Kg



A) 功率(power) = 22 X 735= $\frac{1460}{60} 2\pi RF = \frac{1460}{60} 2\pi M$

扭矩(Torque force) $M = \frac{22 X 735}{\frac{1460}{60} 2\pi} = 105.8Nm$

B) 皮带驱动力(pulling force of Belt drive) F

$F = \frac{M}{R} = \frac{105.8Nm}{0.12m} = 882N$

电机向下的压力约是重量的一半(Share of Motor's weight)=637N

RESATEC产品需要承受的力(Total weight)：882+637=1519N

C) 计算RESATEC产品的扭矩(Calculation of torque)

扭力 X 中心距=1519N X 中心距 =1519N X 0.45m =~684Nm

(Pulling force x Centerdistance=1519N x 0.45m =~684Nm)

D) 选择RESATEC产品-张紧装置要预拉伸20-25°

(selection of RESATEC-tension unit with pretensioning of 20-25°)

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RESATEC产品的应用领域(Application-Area for RESATEC units)

TE-单元: (TE-units)	一般木工机器	Woodworking machines in general
	木材切割和加工设备	Timber cutting and handling
	型材切割机，家具	Profilcutters,Furniture production
	门窗生产机器	Window production
	滚子链输送机	Steel roller conveyors with chain
	带式铲土机	drive,Belt scrapers
	农业机器如	Agricultural machines in general
	收割机	Harvesters,Lilling machines
	制冰机，烘培设备	Ice cream machines,Backey
	所有带链条、V型	equipment,all mechanical
	皮带、平皮带和同	machinery with Chains,V-belts,Fiat
	步带轮等的设备。	belts,timing belts etc.
CH-单元: (CH-units)	各种类型的输送机、振动筛	For any type of Feeders,Screens,
	砂石筛选机	Sorters:Sand- and Gravel pits
	矿山(煤、铁、铜、金等)机械	Mines(Coal,Ironer,Copper,Gold
	硬纸板工厂	etc.) Chipboard factories
	鱼类分拣机、锯木机	Fish sorting,Sawmills
	冷冻食品机器	Frozen food production
	铸造设备	Foundries
	油煎快餐机器	French-fries/Snacks,Paper
	纸加工设备等	production etc.
OM+DH单元: (OM+DH units)	任何输送、筛选设备，	Any type of conveyors/sorter:
	木料粉碎设备	Wood waste
	锯屑设备	Chips
	切削设备	Sawdust/off cuts
	蔬菜、水果、鱼类加工厂	Vegetables,Fruits,Fish
	砂石加工设备	Sand/Gravel
	化学设备工厂	Chemical plants
	意大利面食设备	"Pasta" factories
	压缩式垃圾车	Compaters