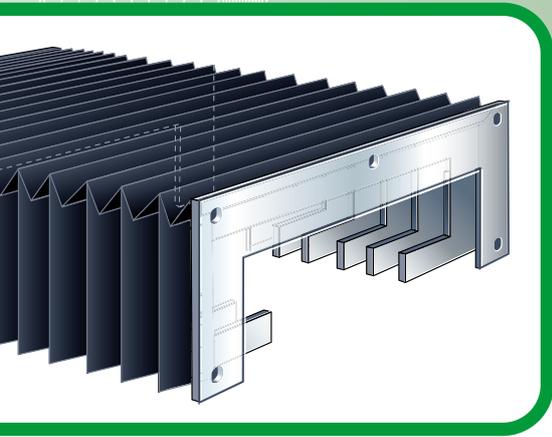


风琴式防护罩

BELLOWS



15.Version





多边形风琴防护罩 POLYGONAL BELLOWS

结构

多边形风琴式防护罩可以水平，垂直或者混合形式使用。根据空间和位置的要求，风琴式防护罩可以制作成6边形，8边形或者12边形。

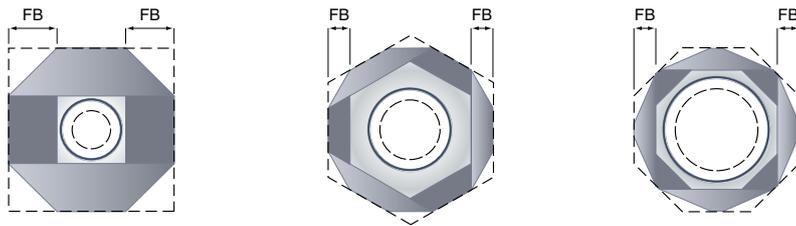
其外形尺寸的稳定性和灵活性的特点可以通过调整相互间的褶皱实现，并且保证了更轻型结构。

多边形风琴式防护罩采用多层压制的方式生产。这种由两种材料组成的结构特点允许所需的外部材料与合适的内部材料相配合。



Construction

The polygonal version of the bellows may be used for horizontal and vertical as well as for mixed forms. Depending on the space available, the bellows can be produced in hexagonal, octagonal or bihexagonal form.



多边形型式 / The polygonal versions

特性

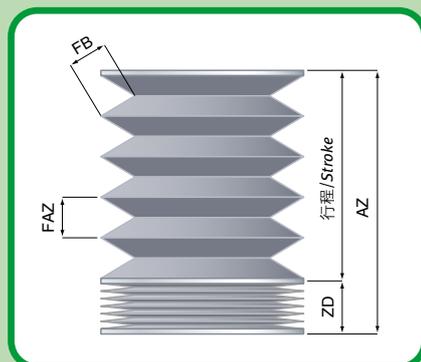
- 根据客户要求定制解决方案
- 根据使用要求选择材料
- 外形多样，尺寸具有稳定性和灵活性的特点
- 轻量化结构
- 遮光

The main advantages of dimensional stability and flexibility are achieved through alternate folding, permitting more lightweight construction.

Polygonal bellows are manufactured with multiple lamination. This two-material composite structure permits the desired external material to be combined with a suitable internal material.

Properties

- Customized solutions, special requests
- Application-specific choice of material
- Variety of shapes, dimensional stability, flexibility
- Lightweight construction
- Light resistant



均质风琴防护罩 BELLOWS HOMOGENEOUS

设计

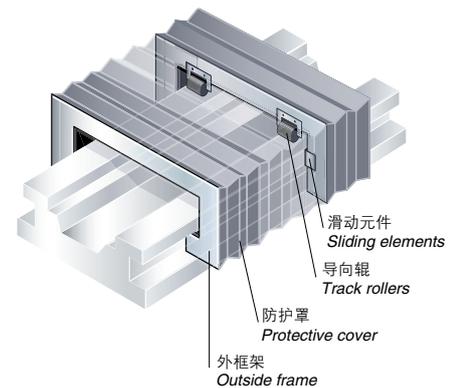
塑料框架和防护罩间的刚性连接采用多点焊接的方式实现。即使承受较高的机械应力，焊缝也不会裂开。焊点连接的方式同时起到防油的功能。此外，塑料框架为每个褶皱提供支撑从而保持其正确形状。

特性

- 外形稳定性高
- 无噪音运行
- 低成本（单层材料）
- 防尘
- 安全功能
- 高速移动

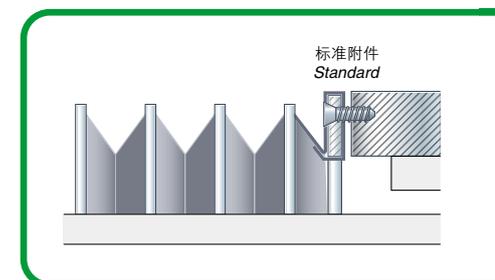
供货方式

导向框架根据顾客的订单要求制造。EITEC专业的工程师团队将为每个客户提供最优化的外形解决方案。

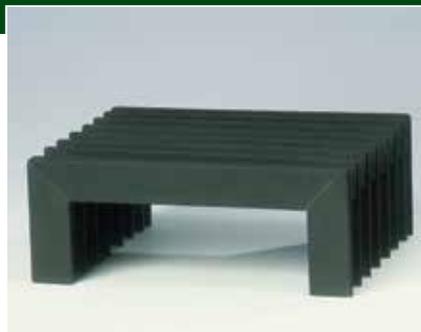


附件示例

Examples of attachment

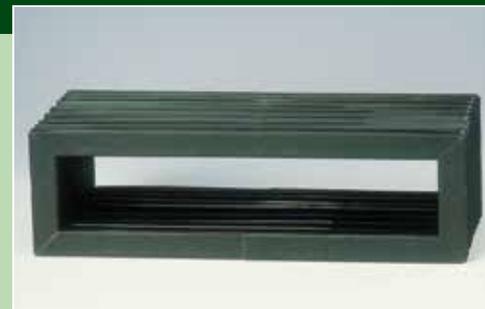


盒式风琴防护罩 BOX BELLOWS



设计

塑料框架和防护罩间的刚性连接采用多点焊接的方式实现。即使承受较高的机械应力，焊缝也不会裂开。焊点连接的方式同时起到防油的功能。此外，塑料框架为每个褶皱提供支撑从而保持其形状。



特性

- 更适合移动机械部件的防护
- 优良的外观
- 拥有从小到大的不同尺寸
- 外形稳定性高
- 工作安全性高

Design

The plastic frame and protective cover are rigidly attached to each other by stitch seam welding. Even when subject to high mechanical stress, this stitch seam will not come apart. The weld joints also provide an oil-proof solution. Additionally, the plastic frame ensures that each fold is supported and thus keeps its shape.

Design

The plastic frame and protective cover are rigidly attached to each other by stitch seam welding. Even when subject to high mechanical stress, this stitch seam will not come apart. The weld joints also provide an oil-proof solution. Additionally, the plastic frame ensures that each fold is supported and thus keeps its shape.

Properties

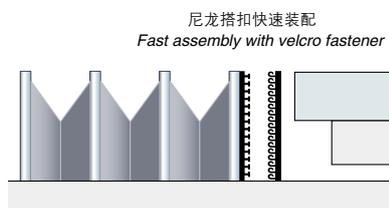
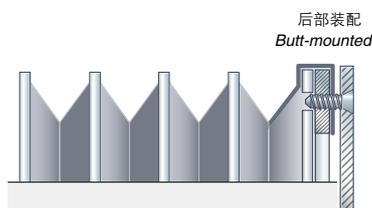
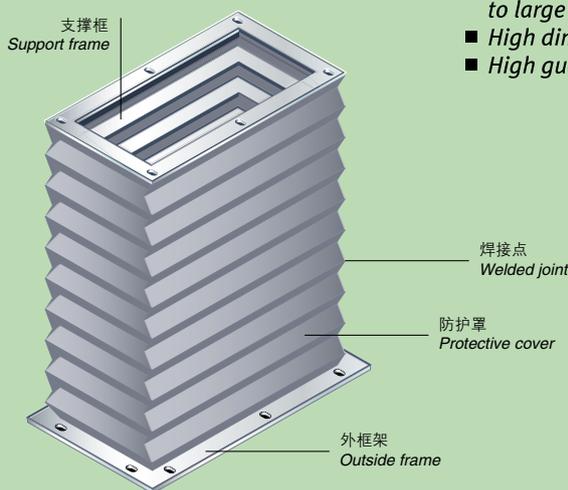
- High dimensional stability
- Quiet running
- Low-cost (single-layer material)
- Dust protection
- Safety function
- High transverse rate

Properties

- Preferred covering of moving machine parts
- Pleasing appearance
- Available from smallest to large dimensions
- High dimensional stability
- High guarantee of workplace safety

Supply forms

The guide frame is manufactured to order according to the customer's requirements. EITEC specialists create optimal individual designs to the customer's dimensions.



计算公式 Calculation formula

$$AZ = ZD + \text{行程} / \text{Stroke}$$

$$\text{褶皱} / \text{Fold} = FB \times k$$

$$\text{褶皱数} / \text{Number of folds} \quad FZ = \frac{AZ}{FB \times k}$$

$$k = \text{拉伸因子} / \text{Extension factor}$$



橡胶盘式风琴防护罩

RUBBER DISK BELLOWS

设计

橡胶盘式风琴防护罩采用无缝粘合方式生产，褶皱间紧密粘合并具有良好的密封性能。除了最常用的圆形之外，也可生产其他不同外形的防护罩。采用额外安装的聚酰胺滑动衬套，可以满足大的行程要求（可达10米）。

特性

- 适用于高机械应力条件。
- 完全密封性

材料: 丁腈橡胶

- 有效防止油，水，燃料和乳化液的侵害
- 短时耐温110°C，持续耐温90°C

材料: 海帕伦橡胶

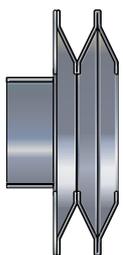
- 完全耐候性和抵抗紫外线侵蚀
- 适合外部使用
- 短时耐温20°C到140°C，长时耐温120°C

标准尺寸

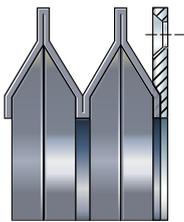
- 内径 20-400mm
- 长度 10-10000mm

联接件

Connections



轴环 / Collar



法兰 / Flange



Design

Rubber disk bellows are manufactured without a stitch seam and are thus perfectly bonded and airtight. Many other shapes can be manufactured besides the most frequently employed circular type. Polyamide guide bushes are additionally provided for larger extension ranges (up to 10 m).

Properties

- Suitable for very high mechanical stress
- Absolutely impervious

Material: nitrile rubber (NBR)

- Guarantees protection against oil, water, fuels and emulsions
- Temporary thermal stability at 110 °C and permanent thermal stability at 90 °C

Material: Hypalon® (CSM)

- Absolutely weather- and UV-resistant
- Suitable for exterior use
- Temporary thermal stability from -20 °C to +140 °C and permanent thermal stability up to +120 °C

Standard sizes

- Internal diameters from 20 – 400 mm
- Lengths from 10 – 10,000 mm

圆形点焊式风琴防护罩

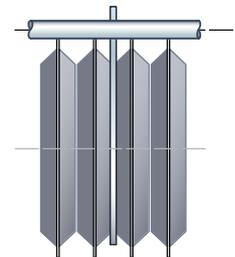
ROUND BELLOWS, TEXTILE

设计

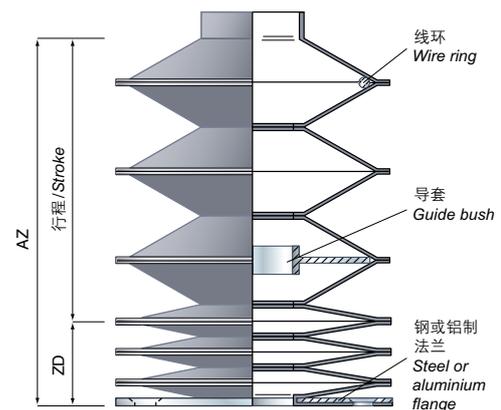
圆形点焊式风琴防护罩采用冲制圆盘组件，特殊的点焊工艺使该防护罩具有极佳的尺寸稳定性和横向刚度。此种防护罩可以水平安装或垂直安装。安装额外的导向环可有效延长其使用寿命。行程限位可根据客户要求或运行速度由我们的工程师来设定。轴环或法兰连接适用于该种形式的风琴防护罩。

特性

- 极好的耐抗性（可外部使用）
- 行程大，压缩小
- 保护免受各种污染损害
- 很好的外形稳定性



水平安装导向
Guide for horizontal mounting



PVC圆形风琴防护罩

ROUND BELLOWS, PVC



设计

PVC (聚氯乙烯) 圆形风琴防护罩采用模制组件。一定的生产数量和合适的形状可以达到经济生产的目的。但EITEC库存多种形式模具, 因此可以在相对较低的生产成本下实现小批量订单的生产。

特性

- 耐油, 强碱, 酸腐蚀
- 防水防尘
- 适合大批量使用
- 可根据应用条件特殊设计
- 可采用钢制法兰



Design

The round seam welded bellows consist of punched plates whose special seam welding gives them extremely good dimensional stability and transverse rigidity. They may be used either horizontally or vertically. The additional fitting of guide rings will extend the serviceable life. Extension stops can be fitted on request and traversing rates set individually by our engineers. Connections as collars or flanges are also possible.

Properties

- Extremely robust
(External use possible)
- Long extension, low compression
- Guaranteed protection from serious contamination
- Good dimensional stability

Design

Round PVC bellows are made of moulded parts. A minimum quantity or appropriate shape is required for cost-effective production. Due to its wide selection of moulds, EITEC is also able to produce small quantities at a relatively low cost.

Properties

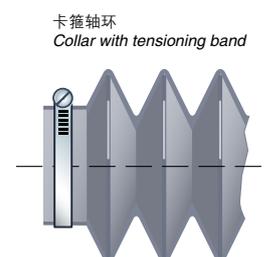
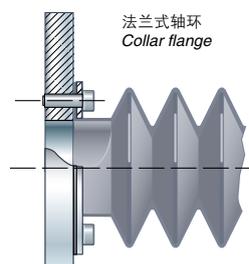
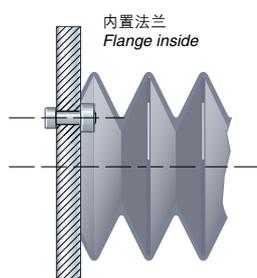
- Oil-, alkali-, acid-resistant
- Water- and dust-proof
- Suitable for use in large series
- Application-specific design
- Use of steel flanges possible

附件示例

Examples of attachment

风琴式防护罩须刚性固定于机械设备需防护的部位, 可采用额外的装配零件, 如卡箍轴环。

Bellows must be rigidly mounted on the machine parts to be protected. Additional mechanical mounting is possible e.g. with the aid of a tensioning band.





柔性鳞甲风琴防护罩

TELESCOPIC BELLOWS, FLEXIBLE

设计

钢板伸缩式风琴防护罩在标准匀质风琴罩基础上生产，每个褶皱通过一个塑料框架支撑。根据覆盖的宽度，在褶皱的边缘采用2个或多个固定铰接点将标准风琴罩连接在伸缩钢片上。

对于防液体的钢板伸缩式风琴防护罩，铰接点或铰链采用焊接的方式与带有聚氨酯涂层的基质材料连接。

特性

- 灵活地采用钢片支撑
- 对较大的金属屑具有良好的防护
- 伸缩钢板可单片更换
- 无粘合连接
- 可根据要求增加防冷却液和乳化液的功能
- 运行速度高
- 可采用防锈和耐酸腐蚀的钢片



Design

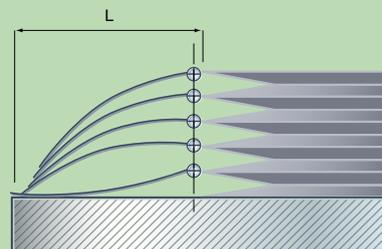
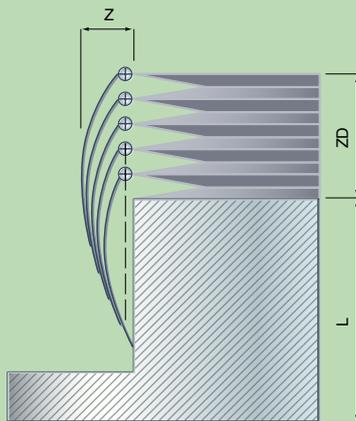
The flexible telescopic bellows are constructed on the basis of the homogeneous bellows. Each fold is supported by a plastic frame.

Depending on the span to be covered, two or more fixing points are attached to the edge of the fold and connected to the telescopic plates.

For liquid-proof bellows with telescopic plates, the flexible points or joints are welded with PU-coated base material.

Properties

- Flexibly supported telescopic plates
- Guaranteed protection in heavy swarf
- Telescopic plates can be replaced individually
- No glued joints
- On request additionally coolant/emulsion-proof
- High traversing rates possible
- Rust- and acid-proof telescopic plates



刚性鳞甲风琴防护罩

TELESCOPIC BELLOWS,

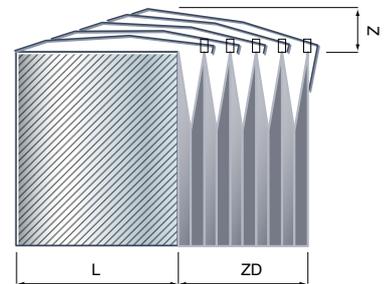
设计

高强度的钢板伸缩式风琴防护罩在标准匀质风琴罩基础上生产，每个褶皱通过一个塑料框架支撑。根据覆盖的宽度，在褶皱的边缘采用2个或多个固定铰接点将标准风琴罩连接在伸缩钢片上。

对于防液体的钢板伸缩式风琴防护罩，铰接点或铰链采用焊接的方式与带有聚氨酯涂层的基质材料连接。

特性

- 伸缩钢片保持恒定的接触压力
- 可采用不同的外形
- 无粘合连接
- 可根据要求增加防冷却液和乳化液的功能
- 运行速度高
- 可采用防锈和耐酸腐蚀的钢片



百叶鳞甲风琴防护罩

TELESCOPIC BELLOWS, LOUVRE-TYPE

RIGID



设计

伸缩钢片与褶皱材料直接连接，因此该种防护结构可采用平面设计。伸缩钢片上的凹槽可起到导向作用，因此该防护结构无需安装导向框和其它类似部件。

伸缩钢板和导向零件的特殊设计可以有效防止切削屑的渗入。导向零件由一个带角度的钢片，一部分或者一个简单的钢片组成。该结构只能垂直安装使用。

特性

- 安装空间小
- 重量轻
- 钢片可单独更换
- 对体积较大金属屑具有很好的防护作用
- 无粘合连接

Design

The rigid telescopic bellows are constructed on the basis of the homogeneous bellows. Each fold is supported by a plastic frame.

Depending on the span to be covered, two or more fixing points are attached to the edge of the fold and connected to the telescopic plates.

For liquid-proof bellows with telescopic plates, the flexible points or joints are welded with PU-coated base material.

Properties

- Constant contact pressure of telescopic plates
- Different shapes possible
- No glued joints
- On request additionally coolant/emulsion-proof
- High traversing rates possible
- Rust- and acid-proof telescopic plates



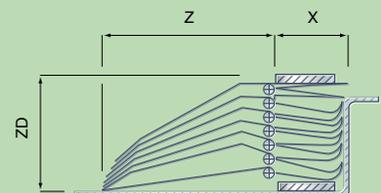
Design

This version permits a flat design, as the telescopic plates are directly connected to the fold material. It dispenses with a guide frame or other basic constructions. A notch in the telescopic plates can be used for guidance.

The special design of the telescopic plates and with the aid of lateral guides prevents the penetration of swarf. The guides may consist of an angle plate, section or a simple plate. Use is limited to vertical mounting.

Properties

- Small mounting dimensions
- Minimum weight
- Single plates replaceable
- High degree of protection from heavy swarf
- No glued joints



材料表

TABLE OF MATERIALS

型号 / Type	001	002	003	004	005	006	007
材料 <i>Material</i>	ALU	PU	PU	PVC	PVC	PU	PU
基材 <i>Base material</i>	玻璃纤维 <i>Fibreglass</i>	Nomex®	Kevlar®	聚酯纤维 <i>Polyester</i>	聚酯纤维 <i>Polyester</i>	聚酯纤维 <i>Polyester</i>	聚酯纤维 <i>Polyester</i>
厚度 <i>Thickness</i>	0,45 mm	0,36 mm	0,36 mm	0,25 mm	0,36 mm	0,20 mm	0,30 mm
耐温范围 <i>Temperature resistance</i>	-20 – 250°C	-100 – 260°C	-30 – 600°C	-30 – 70°C	-30 – 70°C	-30 – 130°C	-30 – 130°C
颜色 <i>Colour</i>	银色 <i>Silver</i>	黑色 <i>Black</i>	黑色 <i>Black</i>	黑色 <i>Black</i>	黑色 <i>Black</i>	黑色 <i>Black</i>	黑色 <i>Black</i>
防水性能 <i>Waterproof</i>	-	-	-	✓	✓	✓	✓
防乳化液性能 <i>Emulsion resistant</i>	✓	✓	-	✓	✓	✓	✓
防油性能 <i>Oil resistant</i>	-	✓	-	✓	✓	✓	✓
防化学腐蚀 <i>Chemical resistant</i>	✓	-	-	✓	✓	✓	✓
防火花 <i>Spark resistant</i>	✓	✓	✓	✓	✓	✓	✓
防热切削屑 <i>Resistant to hot swarf</i>	✓	✓	✓	✓	✓	✓	✓
自熄性 <i>Self-extinguishing</i>	✓	✓	✓	-	-	-	-
应用领域 <i>Area of application</i>	高温焊接 机器人 <i>High temp. Welding robot</i>	激光切割系统 <i>Laser systems</i>		包装行业, 陶瓷行业, 防尘, 耐酸 <i>Packaging industry, ceramics, dust, acids</i>		防油、冷却液、切削屑 <i>Oil, coolants, swarf</i>	

技术规范可更改。
Technical specifications subject to change.

风琴式防护罩咨询表

ENQUIRY FORM BELLOWS

应用:

- 磨床 车床 铣床
 加工中心 升降/切割台面
 其它应用机型 _____

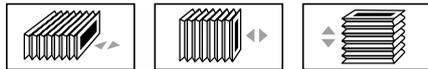
有害介质:

- 钢屑 铸铁屑
 铜屑 铝屑
 木屑 灰尘
 磨削屑 焊接
 蒸汽 冷却液
 矿物油
 其它 _____

落在防护罩上材料温度: _____ °C
 工作环境温度: _____ °C
 最大运行速度: _____ m/min
 最大加速度: _____ g
 每小时工作循环: _____
 每天运行时间: _____ 小时

尺寸

主轴直径(SD): _____ mm
 最大伸长量(AZ): _____ mm
 压缩量(ZD): _____ mm
 褶皱宽度(FB): _____ mm
 褶皱伸长量(FAZ): _____ mm
 褶皱压缩量(FZD): _____ mm



工作位置 水平 正面 垂直

附件

- 金属框架 卡箍
 尼龙搭扣 轴环
 其它 _____

风琴式防护罩需求

材料

001 002 003 004 005 006
 单件用量: _____ 件。
 年用量: _____ 件。
 批次用量: _____ 件。

Application:

- Grinding machine Lathe Milling machine
 Processing centre Lifting bench, cutting table
 Machine for _____

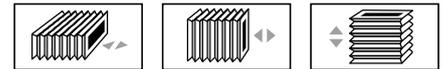
Harmful Agents:

- Steel swarf Casting swarf
 Bronze swarf Aluminium swarf
 Wood shavings Dust particles
 Grindings Weld chips
 Steam Coolants
 Mineral oil
 Other _____

Temperature of material falling onto bellows: _____ °C
 Temperature of working environment: _____ °C
 Maximum process speed: _____ m/min
 Maximum acceleration: _____ g
 Working cycles per hour: _____
 Working hours per day: _____ hrs

Dimensions

Spindle diameter (SD): _____ mm
 Extension max. (AZ): _____ mm
 Compression (ZD): _____ mm
 Width of fold (FB): _____ mm
 Fold extension (FAZ): _____ mm
 Fold compression (FZD): _____ mm



Working position horizontal frontal vertical

Attachment

- Metal frame Tensioning band
 Velcro fastener collar Collar
 Other _____

Desired bellows cover

Material

007 008 009 010 011 012 013
 Single use _____ items
 Annual use _____ items
 Size of batch _____ items

发件人 / SENDER

盖章 / STAMP

公司 / Company

联系人 / Contact

街道 / Street

城市 / City / 区号 / Post Code

电话 / Phone

传真 / Fax

风琴式防护罩一览表

BELLOWS AT A GLANCE

性能/ Properties	多边形风琴防护罩 Polygonal bellows	均质风琴防护罩 Bellows homogeneous	盒式风琴防护罩 Box bellows	圆形点焊式风琴防护罩 Round bellows textile	PVC圆形风琴防护罩 Round bellows PVC	橡胶盘式风琴防护罩 Rubber disk bellows	柔性鳞甲风琴防护罩 Telescopic bellows, flexible	刚性鳞甲风琴防护罩 Telescopic bellows, rigid	百叶鳞甲风琴防护罩 Telescopic bellows, louvre-type
拉伸率 Extension ratio	●	●	●	●	●	●	●	●	●
小空间安装 Low space requirement	●	●	●	●	●	●	●	●	●
快速变换方向 Quick change of direction	●	●	●	●	●	●	●	●	●
寿命 Durability	●	●	●	●	●	●	●	●	●
曳引状态性能 Behaviour under traction	●	●	●	●	●	●	●	●	●
低噪音 Low noise	●	●	●	●	●	●	●	●	●
防尘 Dustproof	●	●	●	●	●	●	●	●	●
防污 Dirt susceptibility	●	●	●	●	●	●	●	●	●
易于安装 Ease of installation	●	●	●	●	●	●	●	●	●
按客户要求定制 According to customer specifications	✓	✓	✓	✓	✓	✓	✓	✓	✓

- = 极好
- = 很好
- = 好
- = excellent
- = very good
- = good

技术规范可更改 / Technical specifications subject to change.

其它产品

FURTHER PRODUCTS



建议和更进一步信息，请联系我们
For advice and further information contact our representative.

风琴式防护罩是单独设计以保护人和机器的安全性，其可能的应用几乎不受限制。由于结构原因，风琴式防护罩均是在动态条件下使用，因此风琴式防护罩的设计目的也是为了达到最佳的使用寿命。

Bellows are individually designed to protect people and machines. Their possible applications are almost unlimited. Bellows are designed for optimum service life and due to their material structure they are subject to wear in dynamic use.