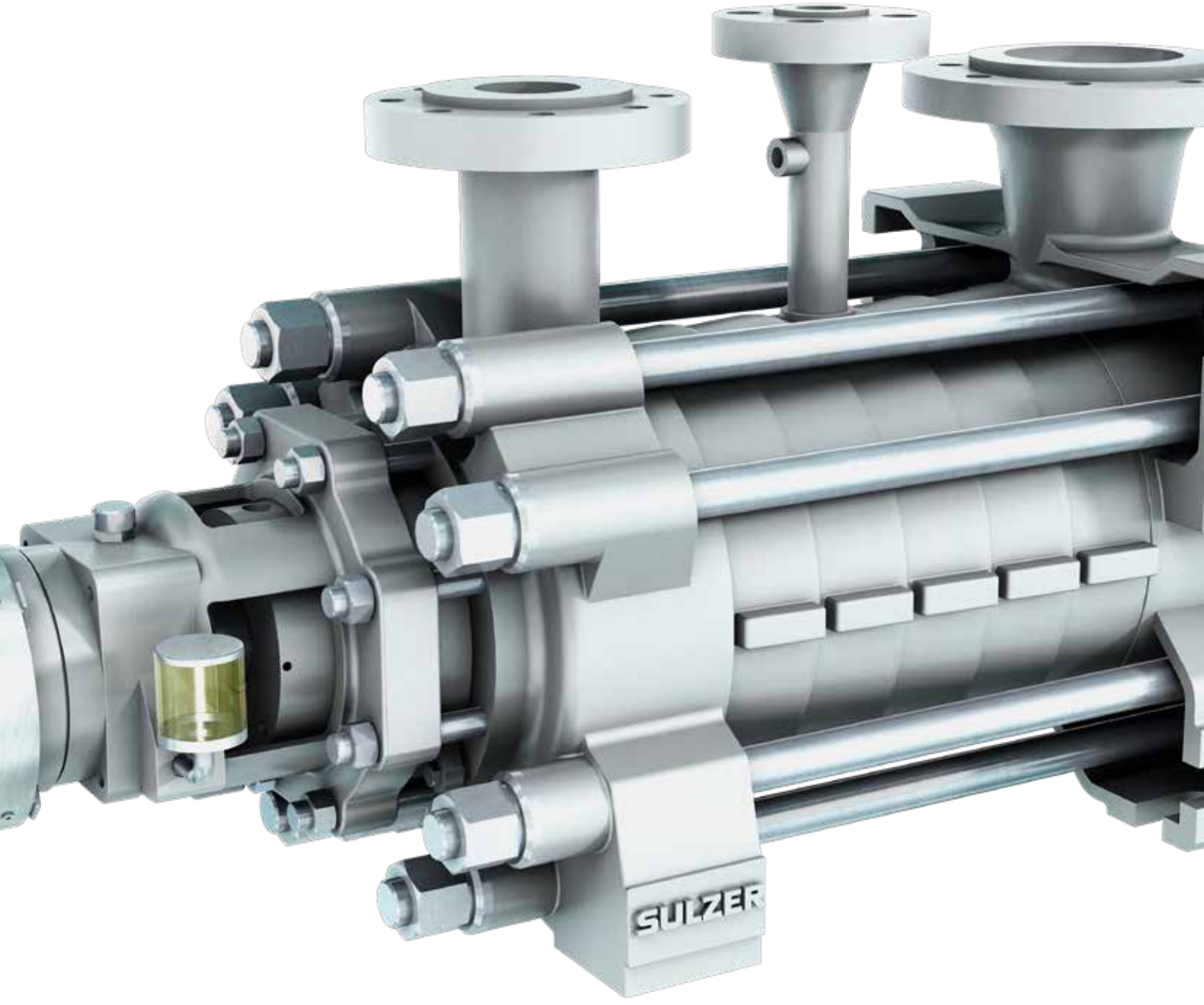
SULZER

MC 高压节段式多级泵
MC high pressure stage casing pump



主要工业和应用
Main industries and applications

The MC pump is primarily designed for power applications, such as auxiliary boiler feed, nitrogen oxides (NOx) abatement and fuel injection in combined cycle, boiler feed for biomass fired and industrial power plants and steam generator feed in concentrated solar. The design is ideal for:

- Boiler feed duties up to 180°C, pre-warming not required
- Condensate extraction service in power stations and industrial power plants (low pressure version with dedicated large sizes)
- Auxiliary services within combined-cycle and industrial power plants
- Hot water service in downstream, pipeline pumps in midstream and small injection pumps in upstream
- High pressure water in the general industry

MC泵主要为电力行业而设计，应用于联合循环电厂的辅助锅炉给水，氮氧化物（NOx）的减排及燃油喷射；生物质发电和工业电站的锅炉给水和太阳能光热发电的蒸汽锅炉给水。应用领域：

- 锅炉温度可达180°C，无需预暖
- 电站和一般工业电厂冷凝水的输送 (较大规格低压设计)
- 应用于联合循环电站辅助系统
- 下游的热水输送，中游的管线泵和上游的小注入泵
- 应用于通用工业高压水

石油天然气
Oil and gas

电力
Power generation

通用工业
General industry

水和污水
Water and wastewater

特征及优点 / Features and benefits

1 壳体支撑 / Casing support
- 地脚支撑，有高温要求和大型泵则采用中心支撑
- Foot or shaft centerline mounted for large sizes and high temperatures

2 管口 / Branches
- 大的入口口径可以优化进口的流动状态
- 通过降低流道中的流速达到降低噪音等级
- 允许更高的力和力矩
- Large suction branches optimize inlet flow
- Reduce noise levels through low branch velocities
- Allow higher forces and moments

3 叶轮 / Impellers
- 模块化水力，使泵在更大运行区域内都具有更高的效率
- 首级更低的必需汽蚀余量（NPSHR），有些规格的泵可以选择首级双吸叶轮
- Modular hydraulics for high efficiency in a wide range of operating conditions
- Low net positive suction head required (NPSHR) first stage; double suction first stage can be provided for selected sizes

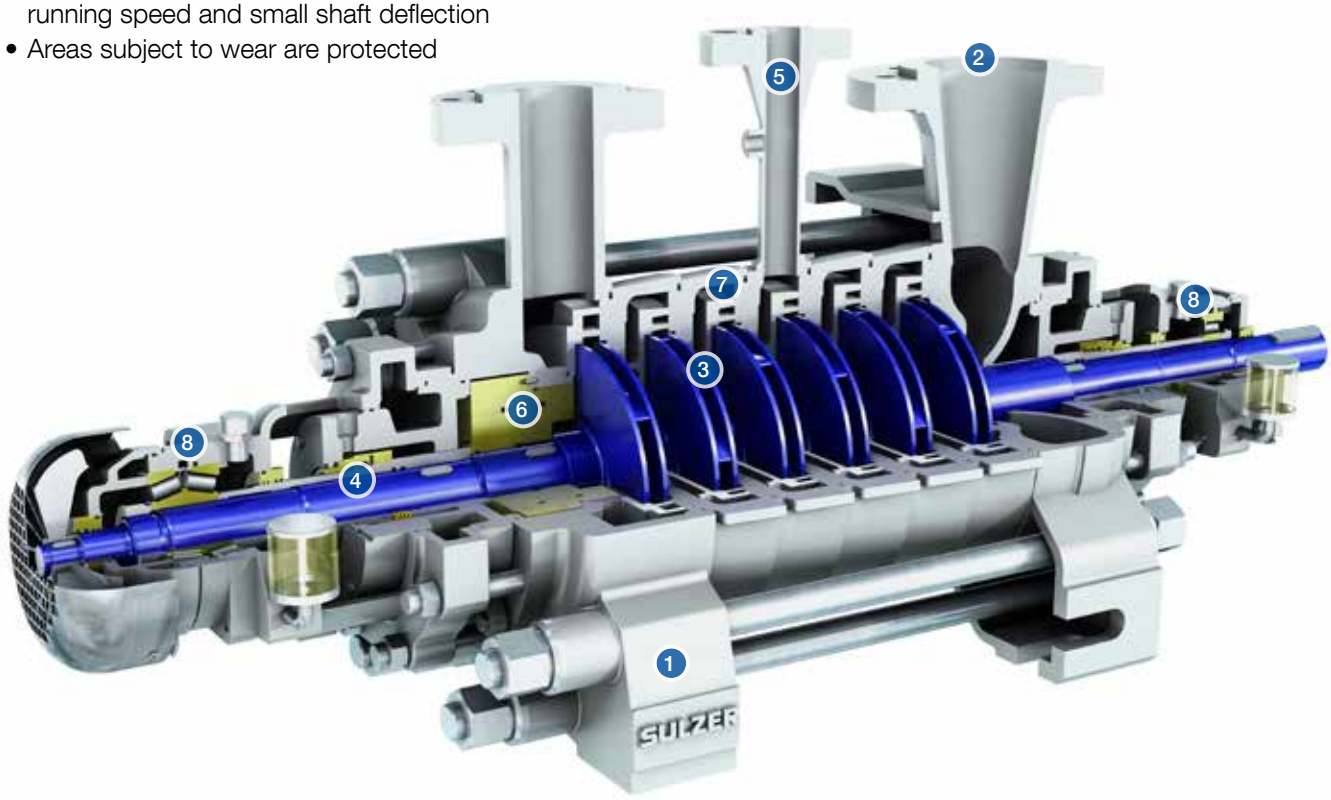
4 轴 / Shaft
- 刚性轴设计使临界转速高于运行转速，轴挠度极小
- 磨损区域受到保护
- Stiff design resulting in higher critical speed than running speed and small shaft deflection
- Areas subject to wear are protected

5 中间抽头 / Intermediate take-off
- 最多可以有两个抽头
- Up to two bleed-off nozzle are possible

6 轴向推力平衡系统 / Hydraulic thrust balancing system
- 轴向力平衡既可以由平衡鼓加推力轴承来实现，也可以由平衡盘无推力轴承实现
- Axial thrust can be balanced by balance drum with thrust bearing or by balance disc without thrust bearing

7 O型圈 / O-rings
- 壳体由O型圈密封，因此，壳体密封不受温度迅速变化和高压的影响
- Casing sealing by confined O-rings, therefore unaffected by rapid temperature variations and high pressures

8 多种轴承设计 / Multiple bearing types
- 滚动轴承低成本和重载滑动轴承设计
- Antifriction bearings for low cost and hydrodynamic bearings for higher energy services



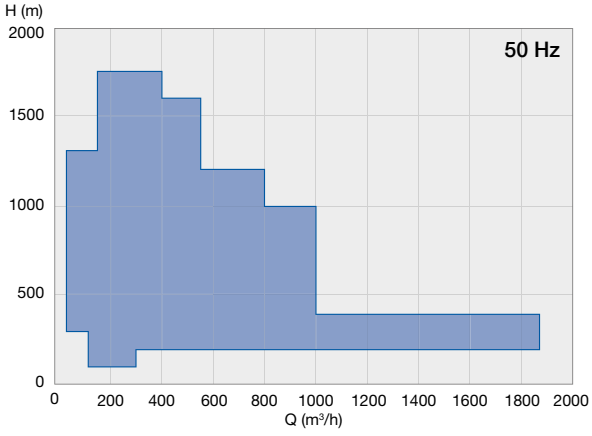
材料 / Materials

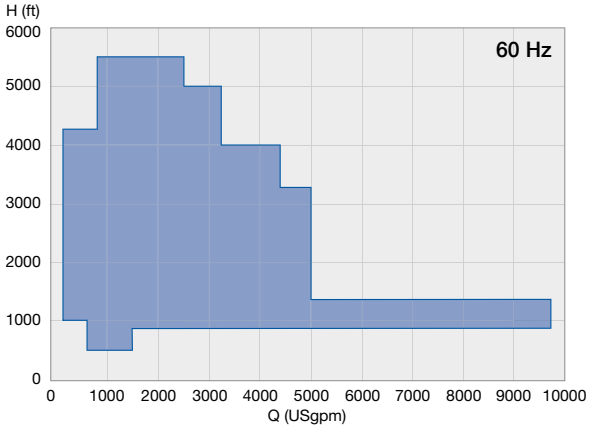
泵部件 / Pump part	材料 / Material
进水壳体、中段和出水壳体 / Suction, stage and discharge casings	碳钢、铬钢、双相不锈钢 / Carbon steel, chrome steel, duplex steel
叶轮和导叶 / Impellers and diffusers	碳钢、铬钢、双相不锈钢 / Carbon steel, chrome steel, duplex steel
轴 / Shaft	铬钢、双相不锈钢 / Chrome steel, duplex steel
平衡系统 / Balancing system	铬钢、双相不锈钢 / Chrome steel, duplex steel

运行数据 / Operating data

	50 Hz	60 Hz
泵规格 / Pump sizes	可达 / up to 350 mm	可达 / up to 14 in.
流量 / Capacities	可达 / up to 1'860 m^3/h	可达 / up to 9'720 USgpm
扬程 / Heads	可达 / up to 1'750 m	可达 / up to 5'500 ft.
压力 / Pressures	可达 / up to 180 bar	可达 / up to 2'610 psi
温度 / Temperatures	可达 / up to 180°C	可达 / up to 356°F

性能范围 / Performance range

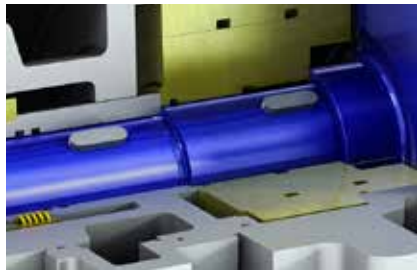




平衡鼓设计下的非驱动端轴承结构
NDE bearing arrangement with balance drum

平衡鼓装置能平衡绝大部分轴向推力。在正常的运行点，通过选择平衡鼓直径，可以使轴向力降到最低。在偏离正常运行点时，残余和额外的轴向力产生，并由推力轴承承受，特别是圆锥滚子轴承。

平衡鼓适用于：
- 在苛刻条件下更长的运行寿命
- 受益于几乎没有磨损，可以用于频繁启停工况



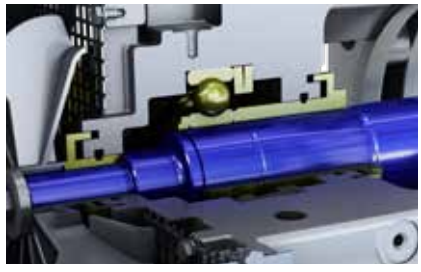
The balance drum device carries the major proportion of the hydraulic thrust. The drum diameters are chosen to minimize the thrust at normal operating point. The residual and additional thrust loads occurring above/below the normal operating point are carried by the thrust bearing, typically a taper roller bearing.

The balance drum is suitable for:
- Long life under extreme operating conditions
- Frequent stop-start applications thanks to nearly wear-free device

平衡盘设计下的非驱动端轴承结构
NDE bearing arrangement with balance disc

通过平衡盘结构轴向力能够完全被平衡，因此不需要轴向推力轴承。每种水力和规格的平衡盘都经过了优化设计。

对于频繁启停的运行工况，可选择安装提升装置 (机械提升装置或者磁力提升装置)。



With the balance disc, the axial force is completely compensated, therefore no axial thrust bearing is required. The disc designs are optimized for each hydraulic and size.

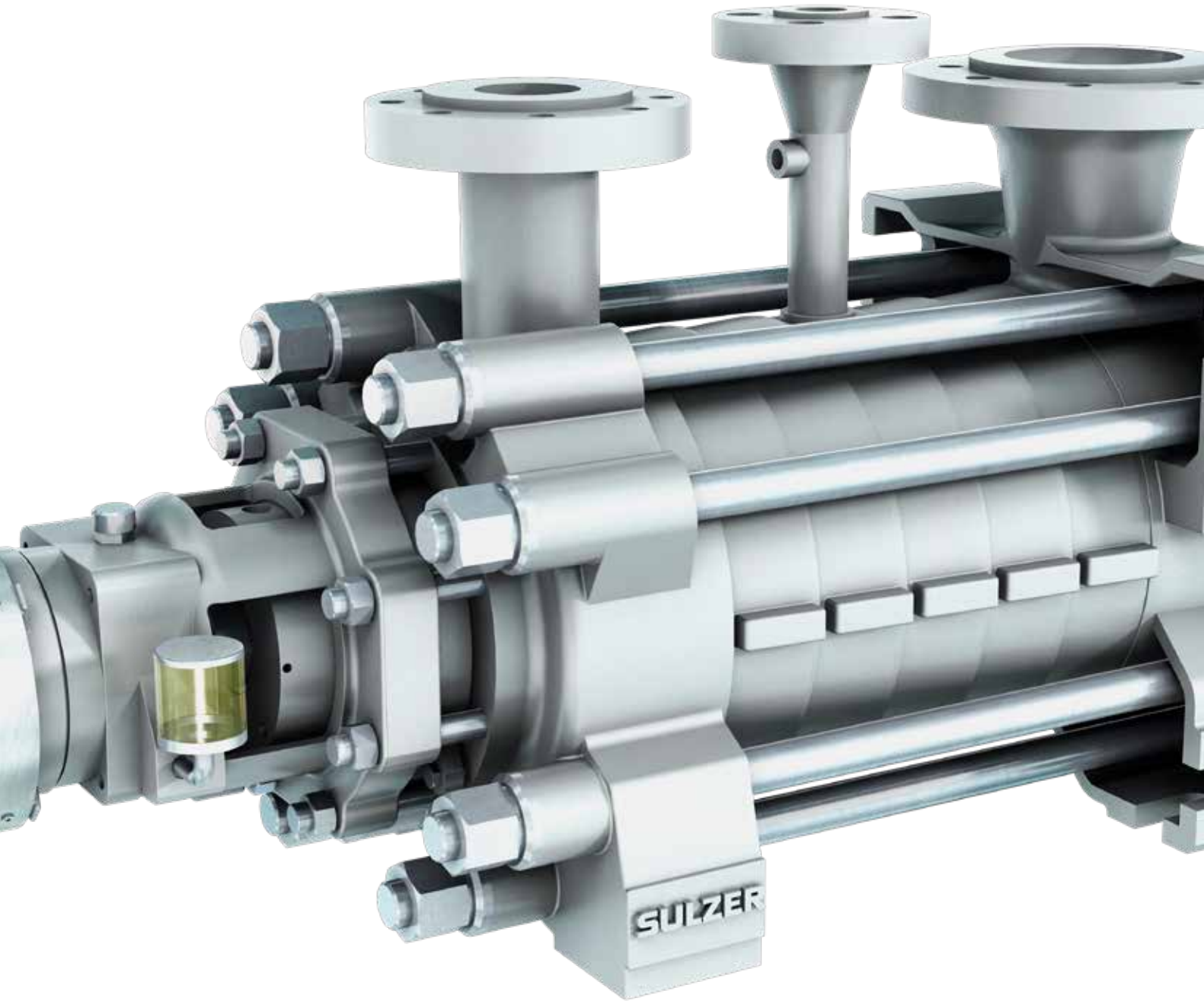
For operation with frequent start and stops, the installation of a lift-off device is available as an option (either mechanical or magnetic).

Mechanical lift-off device

Advantages:
- Prevents touching and wearing of the disc/counter disc during operation at low speed, such as start up and shut down
- Self-controlling passive system
- Reduces load on balance disc under normal operation
- Integrated into the radial bearing housing; no additional power consuming bearings required

机械防磨损装置

优点：
- 在低速运行时，防止平衡盘与平衡板之间的接触和磨损，比如在启动和停车阶段
- 自动控制被动保护系统
- 在正常工况下减少平衡盘的载荷
- 和径向轴承箱整体设计；没有额外的轴承功率损耗



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