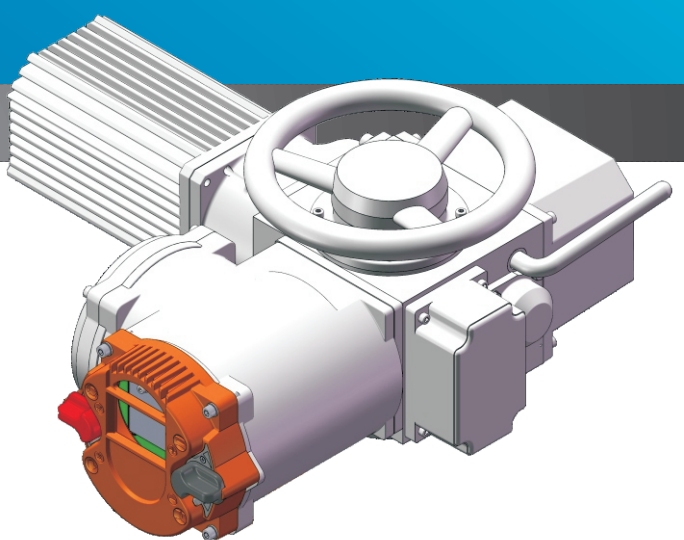


万讯愿景：成为自动化行业受人尊敬的世界级企业
万讯使命：为客户创造价值，为员工创造健康丰盛的生活
经营理念：与您共享世界新技术成果



Intelligent Variable Frequency Electric Actuator

智能变频电动执行机构



Maxonic 万讯

Maxonic 万讯
股票代码：300112

深圳万讯自控股份有限公司

地址: 深圳市南山区高新技术产业园北区3号路万讯大厦
电话: 0755-86250388 传真: 0755-86250389
<http://www.maxonic.com.cn> E-mail: info@maxonic.com.cn



万讯官方微信

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版本号：Ver 202411

更适合中国工况的执行机构



万讯自控成立于1994年，注册资金2.88亿，是一家专注于过程自动化产品研发，生产，销售和服务的国家级高新技术企业、A股上市企业，总部位于深圳高新技术产业园，业务涉及智能自动化仪表、MEMS传感器、机器人3D视觉系统等多个领域。

万讯自控采用“万讯研发，世界创造”的全球化研发战略，在产品研发的8大实现路径上，整合世界范围内的领先科技资源，通过全球化的设计与制造，打造卓越产品。

Maxonic was founded in 1994 with a registered capital of RMB 288 million. Maxonic is A-share listed and headquartered in the Shenzhen High-tech Industrial Park. It is a state-level high-tech enterprise, focusing on the development, production, sales and services of process automation products. Its business involves multiple fields such as intelligent automation instruments, MEMS sensors, and 3D vision systems for robots.

With the global R&D strategy of "Researched and developed by Maxonic which is the global manufacturer", Maxonic is to integrate the world's leading technology resources through 8 major product development approaches, and create superior products through global design and manufacturing.

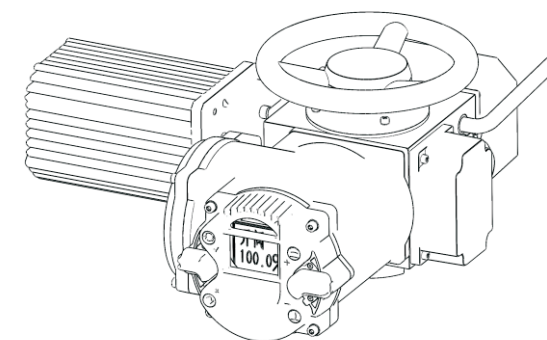
万讯自控扎根中国工业自动化仪表市场超过三十年，凭借多年的技术积累和对中国广大地域各类型工业现场的深刻认知，整合全球最优秀的技术资源，倾力打造MF系列电动执行机构，为客户提供坚固耐用，运行可靠，技术成熟，功能强劲的产品解决方案。

Mf系列电动执行机构可广泛应用于电力、石油化工、冶金、水处理等各行各业，用于实现对闸阀、截止阀、球阀、蝶阀、风门挡板、调节阀等各类装置的开启关闭及自动调节操作。

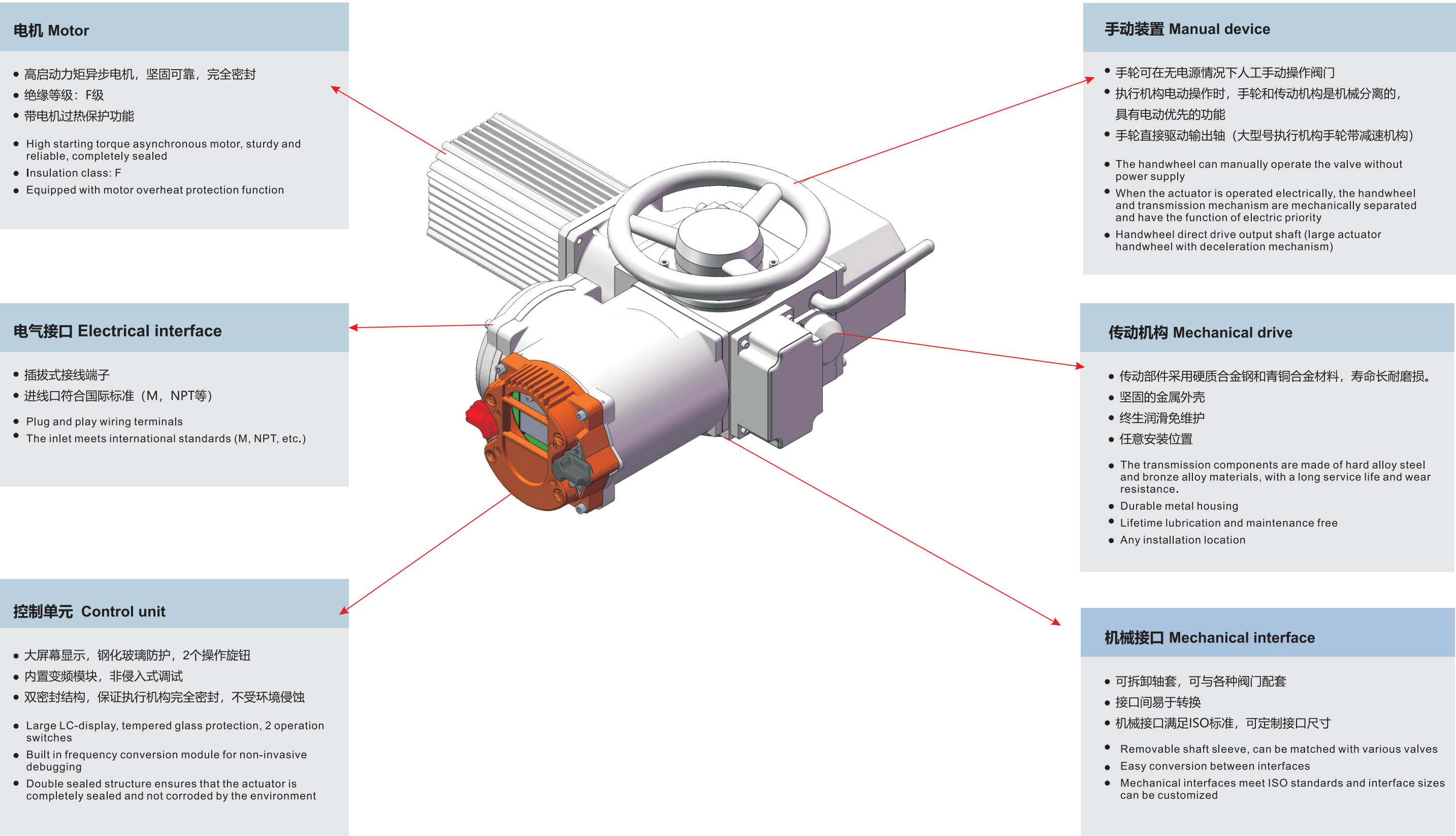
Maxonic has been rooted in the Chinese industrial automation instrument market for more than 30 years. With years of technological accumulation and deep understanding of various types of industrial sites in China, we integrate the world's best technical resources and strive to create the MF series electric actuator, providing customers with sturdy, durable, reliable, technologically mature, and powerful product solutions.

The MF series electric actuator can be widely used in various industries such as power, petrochemicals, metallurgy, water treatment, etc., to achieve the opening and closing and automatic adjustment operation of various devices such as gate valves, globe valves, ball valves, butterfly valves, air dampers, and regulating valves.

- ✎ 成熟可靠的变频调速控制，实现柔性启停和不同的运行速度
- ✎ 非接触式行程检测技术，无磨损可靠测量
- ✎ 电子式力矩检测技术，替代机械位移式力矩测量，恒久可靠
- ✎ 独特的自动排堵功能，保证操作阀门的安全
- ✎ 信号端防浪涌，保证线路安全
- ✎ 双密封、IP68高防护等级，保证密封安全
- ✎ 最高C5-M防腐等级，适用于极端腐蚀性大气环境
- ✎ 3"显示屏、红外遥控器，方便操作

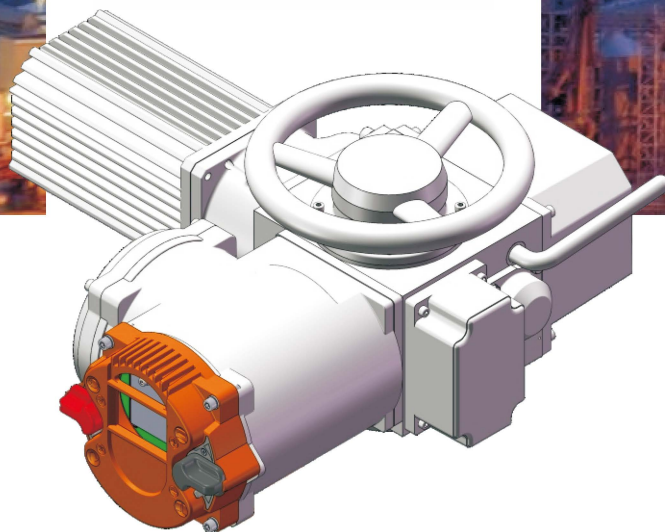


- ✎ Mature and reliable variable frequency speed control, achieving flexible start stop and different operating speeds
- ✎ Non-contact travel detection technology for reliable measurement without wear and tear
- ✎ Electronic torque detection technology, replacing mechanical torque measurement, long-lasting and reliable
- ✎ Unique automatic blockage removal function ensures the safety of valve operation
- ✎ Signal end surge protection to ensure line safety
- ✎ Double-sealed, IP68 high protection level, ensuring sealing safety
- ✎ Max. C5-M anti-corrosion grade, suitable for extremely corrosive atmospheric environments
- ✎ 3" display and infrared remote control for easy operation



深圳万讯始终坚持创新设计，不断发展新产品满足客户需求。现在，MF系列执行机构把成熟可靠的方案与创新性的技术相结合，开创性地将智能变频器控制技术应用于电动执行机构的驱动。我们采用最先进的制造工艺，为您呈现一系列智能，可靠，功能强大的产品解决方案。

Maxonic always adheres to innovative design and continuously develops new products to meet customer needs. Now, the MF series actuators combine mature and reliable solutions with innovative technologies, pioneering the application of intelligent frequency converter control technology to the drive of electric actuators. We adopt the most advanced manufacturing technology to present you with a series of intelligent, reliable, and powerful product solutions.



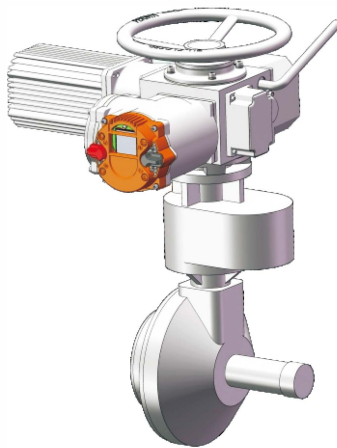
MF 多回转执行机构
MF Multi-turn actuator



多回转执行机构
Multi-turn actuator

MF, 最大力矩: 2000Nm
MF+IB齿轮箱, 最大力矩: 40000Nm
适用于闸阀, 截止阀等

MF, Max. torque: 2000Nm
MF+IB gearbox, Max. torque: 40000Nm
Suitable for gate valves, globe valves, etc.

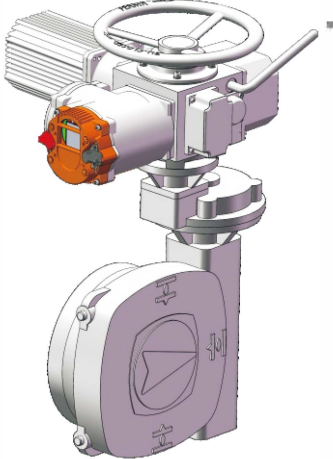


MF+IB 多回转执行机构
MF+IB Multi-turn actuator

角行程执行机构
Part-turn actuator

MF+QS齿轮箱, 最大力矩: 800000Nm
适用于蝶阀, 球阀, 旋塞阀, 风门挡板等

MF+QS gearbox, Max. torque: 800000Nm
Suitable for butterfly valves, ball valves, plug valves, dampers, etc.

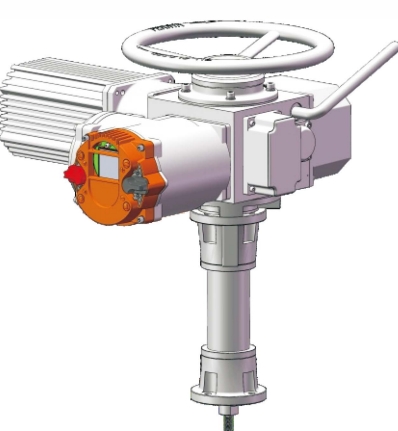


MF+QS 90°角行程执行机构
MF+QS 90° Part-turn actuator

直行程执行机构
Linear actuator

MF+LE线性推力单元, 最大推力217KN
适用于调节阀等

MF+LE linear thrust unit, Max. thrust: 217KN
Suitable for control valves, etc.



MF+LE 直行程执行机构
MF+LE Linear actuator

1. 智能控制

智能变频调速控制：使用变频器对执行机构电机进行全面控制。

- **原理：**采用交-直-交变频方式，通过整流/逆变电路，应用IGBT功率驱动模块和PWM脉宽调制技术，结合万讯自控多年积累的专业算法，调节输出频率和输出电压，控制电机的旋转方向，转速和扭矩。
- **功能：**
 - ✎ 根据不同的控制信号，设定不同的运行速度；
 - ✎ 柔性启动和停止，避免对阀门的冲击；
 - ✎ 低速大力矩启动（最大180%额定力矩）
- **优势：**
 - ✎ 灵活设置运行速度，优化过程设计，实现精准的位置控制。
 - ✎ 无启动浪涌电流，电缆和供电元件可以按额定电流来选择。
 - ✎ 精准的过力矩保护，避免水锤效应，实现智能保护阀门。
 - ✎ 有效避免电源频率和电压波动对输出性能的影响。



1.Intelligent Control

Intelligent frequency conversion speed control: Use a frequency converter to comprehensively control the actuator motor.

- **Principle:** Adopting AC-DC-AC frequency conversion method, through rectification/inverter circuit, applying IGBT power drive module and PWM pulse width modulation technology, combined with professional algorithms accumulated by Maxonic for many years, the output frequency and output voltage are adjusted to control the rotation direction, speed, and torque of the motor.
- **Function:**
 - ✎ Set different operating speeds based on different control signals;
 - ✎ Flexible start and stop to avoid impact on the valve;
 - ✎ Low speed high torque start (maximum 180% rated torque)
- **Advantages:**
 - ✎ Flexibly set operating speed, optimize process design, and achieve precise position control.
 - ✎ No surge start-up current, cables and power supply components can be sized for the rated current.
 - ✎ Accurate over torque protection, avoiding water hammer effects, and achieving intelligent valve protection.
 - ✎ Effectively avoiding the impact of power frequency and voltage fluctuations on output performance.

2.先进技术

行程监测

差分式霍尔多圈绝对位置传感器行程测量技术

- 独创的差分式霍尔多圈绝对位置传感器行程测量技术，避免了普通绝对编码器的复杂结构，而是利用差分传动巧妙设计，结构更简单，性能更可靠，实现非接触式数字信号精确检测执行机构实际位置。运行数据在掉电情况下也可以长期保存，实现数据安全。
- 可选配高精度塑导电位器作为行程传感器，用于特殊工况。
- 记录阀门开度变化曲线。

温度监测

环境高温可严重影响设备的性能和寿命，而且这种影响是随时间的推移而累积的。环境温度是随着不同季节和不同工况而变化的。

MF执行机构内部包含一个温度传感器，用于检测环境温度，并记录温度变化曲线。环境温度达到70℃执行机构将报警，到达80℃可以选择停机保护。

振动监测

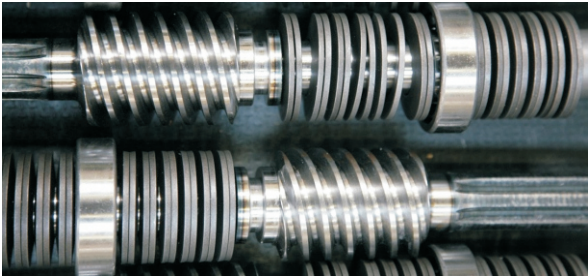
工业现场的振动可以严重影响设备的性能和寿命，而且这种影响会随时间的推移而累积。振动的具体情况会由不同工况而有所不同，这让移动测量设备很难获得准确数据。

MF执行机构内置了高性能数字输出运动传感器，用于测量和记录振动趋势数据。可测量并捕捉频率在5000Hz范围内的振动和在3轴（x,y,z）上的峰值加速度16g。执行机构在检测到加速度超过2g时会发出报警。

力矩监测

通过电参数标定和检测力矩，记录力矩变化曲线。

- 执行机构通过变频器控制电机，在运行期间变频器通过测量电参数监测输出力矩。一旦超限，变频器会切断电机供电并输出故障信息，实现过力矩保护。执行机构不会因堵转而烧毁，阀门不会因执行机构过力矩而损坏。
- 无需机械力矩开关，无磨损免维护。
- 执行机构的输出力矩可通过软件菜单进行设置。
- 记录行程力矩曲线，并以图形显示不同阀门行程时的力矩值。力矩曲线可以存储，比较和分析。采用力矩曲线可以分析阀门的故障点。



2.Advanced technology

Position control

Position measurement technology of differential Hall multi-turn absolute position encoder.

- The original differential Hall multi turn absolute position sensor stroke measurement technology avoids the complex structure of ordinary absolute encoders, but cleverly designs using differential transmission, making the structure simpler and performance more reliable, achieving non-contact digital signal accurate detection of the actual position of the actuator. Running data can also be stored for a long time in the event of power failure, achieving data security.
- High precision plastic conductivity potentiometers can be optionally equipped as travel sensors for special working conditions.
- Record the curve of valve opening change.

Temperature monitoring

High environmental temperatures can seriously affect the performance and lifespan of equipment, and this impact accumulates over time. The ambient temperature varies with different seasons and working conditions.

The MF actuator contains a temperature sensor inside, which is used to detect the ambient temperature and record the temperature change curve. When the ambient temperature reaches 70 ° C, the actuator will sound an alarm, and when it reaches 80 ° C, shutdown protection can be selected.

Vibration detection

The vibration in industrial sites can seriously affect the performance and life of equipment, and this impact will accumulate over time. The specific situation of vibration may vary depending on different working conditions, making it difficult for mobile measuring equipment to obtain accurate data.

The MF actuator is equipped with a high-performance digital output motion sensor for measuring and recording vibration trend data. Can measure and capture vibrations within the frequency range of 5000Hz and peak acceleration of 16g on the 3-axis (x, y, z). The actuator will sound an alarm when it detects an acceleration exceeding 4g.

Torque detection

Calibrate and detect torque through electrical parameters, and record the torque change curve.

- The actuator controls the motor through a frequency converter, and during operation, the frequency converter monitors the output torque by measuring electrical parameters. Once the limit is exceeded, the frequency converter will cut off the power supply to the motor and output fault information to achieve torque protection. The actuator will not burn out due to blockage, and the valve will not be damaged due to excessive torque of the actuator.
- No mechanical torque switch required, wear free and maintenance free.
- The output torque of the actuator can be set through the software menu.
- Record the stroke torque curve and display the torque values for different valve strokes in a graphical format. The torque curve can be stored, compared, and analyzed. The torque curve can be used to analyze the fault points of valves.

3.全面防护

密封防护

MF执行机构的密封防护符合GB/T4208标准中的IP68防护等级，可以实现水下8米，最长浸入时间可达96小时，浸水期间可进行10次操作。

接线端口采用双密封结构，保证执行机构完全密封，有效防止粉尘和水的侵蚀。

防腐保护

MF执行机构的表面在喷漆前会进行整机的喷丸处理，并根据ISO12944标准中的大气腐蚀环境等级和耐久性等级进行多道喷漆处理。

MF执行机构提供如下防腐等级能力：

C3：湿度高且有中度污染的生产车间；中度SO2污染的城市和工业区。高耐久性（标配）

C5-I(工业)：长期有永久冷凝现象和重污染的工业区，高耐久性。

C5-M(海洋)：高盐度，永久冷凝和重污染的沿海和近海地区，高耐久性。

防爆保护

防爆保护涉及在爆炸性环境和可燃性粉尘环境下，电气设备应用的技术要求，MF防爆型产品获得中国国家防爆认证(CNEX)，产品符合下列标准：

GB/T 3836.1-2021，GB/T 3836.2-2021，GB/T 3836.3-2021，GB/T3836.31-2021

防爆标志：ExdbebIICT4Gb，ExtbIIICT130°CDb

防强磁干扰

在具有强烈电磁场干扰的工作环境中，所有与电磁原理相关的元器件都可能面临失效的危险。MF执行机构针对性地做出整体解决方案，允许用户选择防强磁干扰版本的产品，有效避免产品在强磁环境中的控制失效问题。

更好的电磁兼容性能

面对复杂的工业现场环境，采用更高的电磁兼容试验等级。MF电动执行机构通过EMC电磁兼容性测试四级（部分指标最高等级为三级），具备更加优秀的抗电磁干扰能力，更好的防浪涌保护能力。在雷暴天气，露天场合，强磁场干扰环境下，可以更加安全地工作。

3.Comprehensive protection

Enclosure protection

The enclosure protection of the MF actuator meets the IP68 protection level in the GB/T4208 standard, and can achieve underwater 8 meters. The longest immersion time can reach 96 hours, and 10 operations can be performed during the immersion period.

The wiring port adopts a double sealed structure to ensure that the actuator is completely sealed, effectively preventing the erosion of dust and water.

Corrosion protection

The surface of the MF actuator will undergo shot peening treatment for the entire machine before painting, and multiple spray painting treatments will be carried out according to the atmospheric corrosion environment level and durability level in ISO12944 standard.

The MF actuator provides the following anti-corrosion level capabilities:

C3: Production workshops with high humidity and moderate pollution; Cities and industrial areas with moderate SO2 pollution. High durability (standard configuration)
C5-I (Industrial): Industrial areas with long-term permanent condensation and heavy pollution, high durability.
C5-M (Ocean): High salinity, permanent condensation, and heavily polluted coastal and nearshore areas with high durability.

Explosion protection

Explosion protection involves the technical requirements for electrical equipment applications in explosive environments and combustible dust environments. MF explosion-proof products have obtained China's national explosion-proof certification and meet the following standards:

GB/T 3836.1-2021,GB/T 3836.2-2021,GB/T 3836.3-2021,GB/T 3836.31-2021

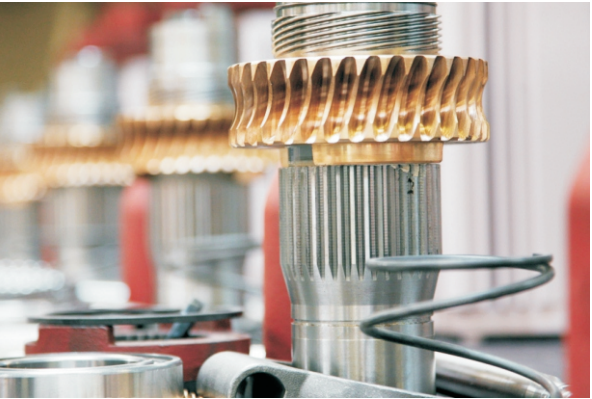
Explosion protection:Ex db eb II C T4 Gb,Ex tb III C T130°C Db

Anti strong magnetic interference

In working environments with strong electromagnetic interference, all components related to electromagnetic principles may face the risk of failure. MF actuators provide targeted overall solutions, allowing users to choose products with anti strong magnetic interference versions, effectively avoiding control failure issues in strong magnetic environments.

Better EMC performance

Faced with complex industrial site environments, higher levels of electromagnetic compatibility testing are adopted. MF electric actuator has passed the EMC electromagnetic compatibility test level four (with some indicators reaching the highest level three), demonstrating superior resistance to electromagnetic interference and better surge protection capabilities. In thunderstorm weather, outdoor environments, and strong magnetic field interference environments, it can work more safely.



4.功能特点

自动排堵

工业现场中，经常会出现阀门由于结焦，结晶，磨损或不经常动作而导致的卡堵现象，MF执行机构的自动排堵功能可以保护阀门和执行机构，确保操作阀门的安全。

当阀门发生卡堵时，执行机构将力矩开关设为旁路，允许执行机构为阀门提供短暂的高达1.2~1.8倍的输出力矩而不发出堵转报警（时间和力矩倍数都可设置）。如果此时不能带动阀门，则执行机构将反向运行1秒再回头重新启动，大部分情况下，为阀门提供额外的加大力矩可以带动卡堵阀门继续运行。如果重复5次还不能带动阀门，则执行机构认定阀门卡堵并停机，防止损坏阀门或烧毁电机。

终端位置限位方式

执行机构运行到终端位置时的停机方式，根据阀门类型，可使用两种不同的停机机制。

●行程限位停机：当执行机构运行到任何一个终端位置的预设停机位置时，执行机构立刻停止运转。

●力矩关断停机：当执行机构在阀门终端位置达到预设力矩时，执行机构立刻停止运转。

例：楔形闸阀和截止阀的关方向适合使用力矩关断。

综合保护

MF执行机构提供完善的综合保护和故障自动诊断报警功能,包括:

- 过压/欠压保护，过流/短路保护；
- 电机温度保护，电路板温度过高保护；
- 过力矩保护，阀门卡堵保护（防堵转保护）；
- 步进动作防水锤保护，瞬时反转保护；
- 接错线保护（包括：自动相位校正功能，电源线误接到信号端保护）；
- 电源缺相/断相保护

柔性启停

当阀门启动时，执行机构以低速大力矩运行，启动时间（到达额定频率的时间）可调。

当阀门接近全关或全开位置时，执行机构自动减速，以低速定位，有效避免由于惯性对阀门造成的冲击，延长阀门的使用寿命。

速度和力矩设定

根据现场的控制需求，可以对执行机构的运行速度和输出力矩做具体设置，以满足不同工艺工程的需求，实现优化控制。

- 运行速度：根据控制信号设置（就地开，就地关，远程开，远程关，紧急开，紧急关）
- 输出力矩：开/关方向可以分别设置输出力矩，设置范围：40%-100%。

行程中间位置限位

满足用户的特殊控制需求。例：调试完执行机构的全关位0%和全开位100%后，实际使用30%开度（可自定义）作为下限位，低于此开度则远程和就地电动均不能再往下操作，只有在手轮和检修时可向下运行。

4.Functional characteristics

Auto blockage removal

In industrial sites, valve blockage often occurs due to coking, crystallization, wear, or infrequent operation. The automatic blockage removal function of the MF actuator can protect the valve and actuator, ensuring the safety of valve operation. When the valve is stuck, the actuator sets the torque switch as a bypass, allowing the actuator to provide a brief output torque of up to 1.2-1.8 times to the valve without issuing a stuck rotor alarm (both time and torque multiples can be set). If the valve cannot be driven at this time, the actuator will run in reverse for 1 second and then turn back to restart. In most cases, providing additional torque to the valve can drive the stuck valve to continue running. If the valve cannot be driven after 5 repetitions, the actuator will determine that the valve is stuck and shut down to prevent damage to the valve or burning of the motor. In interference environments, it can work more safely.

End position limit method

There are two different shutdown method that can be used when the actuator reaches the end position, depending on the type of valve.

- Travel limit stop: When the actuator reaches the preset stop position at any terminal position, it immediately stops running.
- Torque shutdown: When the actuator reaches the preset torque at the valve terminal position, the actuator immediately stops running.

e.g., The closing direction of wedge gate valves and globe valves is suitable for torque shutdown.

Comprehensive protection

The MF actuator provides comprehensive protection functions and automatic fault diagnosis alarm, including:

- Overvoltage/undervoltage protection, overcurrent/short circuit protection;
- Motor temperature protection, circuit board temperature high protection;
- Overtorque protection, valve jamming protection (anti blocking rotation protection);
- Step action waterproof hammer protection, instantaneous reverse protection;
- Wrong line connection protection (including automatic phase correction function, power line wrong connection signal end protection);

Flexible start stop

When the valve is activated, the actuator operates at low speed with high torque, and the start-up time (the time to reach the rated frequency) is adjustable. When the valve approaches the fully closed or fully open position, the actuator automatically decelerates and positions at low speed, effectively avoiding the impact of inertia on the valve and extending its service life.

Speed and torque settings

According to the on-site control requirements, specific settings can be made for the operating speed and output torque of the actuator to meet the needs of different process engineering and achieve optimized control.

- Speed: Set according to control signals (local on/off, remote on/off, emergency on/off)
- Torque: The output torque can be set separately for the on/off direction, with a range of 40% -100%.

Position mid position limit

Meet the special control needs of users. Example: After debugging the fully closed position of the actuator at 0% and fully open position at 100%, a 30% opening (customizable) is actually used as the lower limit. If it is lower than this opening, both remote and local electric operations cannot proceed further, and can only operate downwards during handwheel and maintenance.

5.现场总线 Fieldbus

现场总线通讯的优点包括：大幅降低布线数量，系统自我诊断，高度可靠性，更好的实用性。MF执行机构可以通过总线网络与DCS系统进行通讯，实现远程控制和数据传输。

The advantages of a bus system include a lower amount of wiring involved, self-diagnosis by the system, a high degree of reliability and better availability owing to short signal paths. The MF actuator can communicate with the DCS system through a bus network to achieve remote control and data transmission.



Profibus DP

ProfibusDP是一种高速数据传输的自动化总线标准，采用RS485接口，并遵循IEC61158和IEC61784标准。

- 节点数量：单段最大节点数32个，通过中继器扩展，最多可扩展4段，每个通讯回路最多126个节点
- 支持ProfibusDP-V0，DP-V1
- 单通道或双通道（冗余）设计

Profibus DP is an automation bus standard for high-speed data transmission, using RS485 interface and following IEC 61158 and IEC 61784 standards.

- Up to 126 nodes / max. of 32 nodes per segment /max. of 4 segments
- Profibus DP-V0 and Profibus DP-V1
- Explosion-proof design
- 1-channel or 2-channel (redundant) design



HART

HART：可寻址远程传感器高速通道的开放通讯协议。是在现有的4-20mA模拟量信号上叠加数字信号，利用主/从协议技术，实现双向通信，其最大通讯速率为1.2Kbps。通常来说，4~20mA信号用于控制，而叠加的数字量信号用于反馈、诊断和配置设定。



Modbus RTU

Modbus RTU是一种开放的、简单而功能强大的总线系统。采用RS485接口，并遵循IEC61158和IEC61784标准。

- 传输速率：最快可达1.5M
- 节点数量：单段最大节点数32个，通过中继器扩展，最多可扩展8段，每个通讯回路最多247个节点
- 单通道或双通道（冗余）设计

Modbus RTU is based on the RS485 interface and on the IEC 61158 and IEC 61784 standards. Open and simple bus system, making easy integration possible in existing systems.

- Speeds up to 1.5 MBaud
- Up to 247 nodes / max. of 32 nodes per segment /
- max. of 8 segments
- 1-channel or 2-channel (redundant) design

HART = HIGHWAY ADDRESSABLE REMOTE TRANSDUCER. The basic idea of HART is to superimpose an existing analog 4-20 mA signal with digital data information. It makes use of so-called master/slave technology. This enables communication in both directions, whereby, at a max. of 1,200 bits/s. Generally, 4-20mA signals are used for control, while superimposed digital signals are used for feedback, diagnosis, and configuration settings.

6.就地控制单元 Local control unit

MF执行机构通过清晰简洁的用户界面，实现对执行机构的操作，参数设定和信息显示

- 3" LCD显示屏，适应-30℃~+70℃宽广环境温度
- 显示屏采用钢化玻璃防护，带背光照明
- 5个状态指示灯，2个操作旋钮
- 非侵入式调试，与内部电子元件完全密封隔离
- 电子密码锁，防止未经授权的操作
- 断电时显示屏可显示信息



The MF actuator operates, sets parameters, and displays information through a clear and concise user interface

- 3" display, suitable for a wide range of ambient temperatures from -30 °C to +70 °C
- The display screen is protected by tempered glass and equipped with backlight lighting
- 5 status indicator lights and 4 operation buttons
- Non intrusive debugging, completely isolated from internal electronic components
- Electronic password lock to prevent unauthorized operations
- The display screen can still display information when powered off

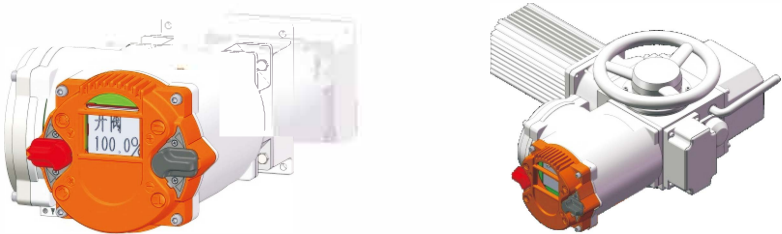
7. 数据日志 Data Logs

- 事件日志：报警、故障、动作事件等各类信息。可存储2000个事件记录。
 - 运行数据：执行机构的通电时间，电机的启动次数和运行时间，振动、温度变化趋势，力矩变化曲线，给定信号变化曲线，阀门开度（反馈信号）变化曲线
 - 状态信息：开关量输入/输出状态，模拟量输入/输出状态
 - 电子铭牌：执行机构的序列号/软件版本等信息，阀门参数信息
 - 内置用于实时时钟记录功能的电池，电池寿命极长，更换成本很低。
-
- Event log: Various information such as alarms, faults, action events, etc. Can store 2000 event records.
 - Operating data: power on time of the actuator, number of motor starts and running time, vibration and temperature trends, torque variation curve, given signal variation curve, valve opening (feedback signal) variation curve
 - Status information: switch input/output status, analog input/output status
 - Electronic nameplate: serial number/software version information of the actuator, valve parameter information, etc
 - Built in battery for real-time clock recording function, with extremely long battery life and low replacement cost.

8.分体控制 Separate mounting

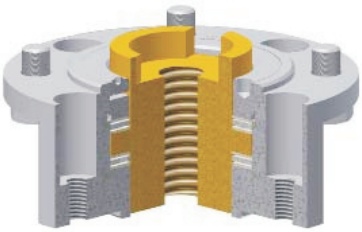
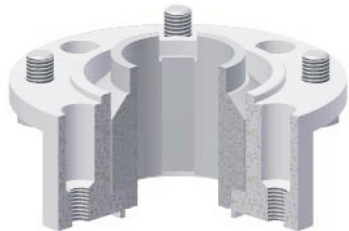
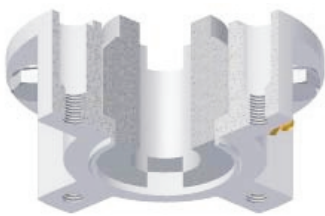
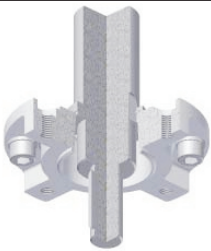
如果阀门的现场安装位置存在不方便就地操作，振动大或环境高温等情况，可选择将控制单元从执行机构本体上分开，通过墙装支架对控制单元进行分体安装。
执行机构和控制单元之间通过电缆连接。最大分体距离可高达100米。

If the on-site installation position of the valve is inconvenient for on-site operation, with high vibration or high environmental temperature, the control unit can be separated from the actuator body and installed separately through wall mounted brackets. The actuator and control unit are connected through cables. The maximum separation distance can reach up to 100m.



MF执行机构有多种机械接口类型可选，均为可拆卸式底座和轴套，便于实现执行机构和阀门的连接。

MF actuators have multiple mechanical interface types to choose from, all of which are detachable bases and shaft sleeves, making it easy to connect the actuator and valve.

A型输出轴（推力型） Output drive A(thrust type) 阀杆螺母用于提升直行程阀门的阀杆。将执行机构的旋转运动通过 阀杆螺母转化为阀杆的直线运动。符合DIN3210和ISO5210标准。 The stem nut is used to lift the stem of a straight stroke valve. The rotational motion of the actuator is converted into linear motion of the valve stem through the valve stem nut, in accordance with DIN3210 and ISO5210 standards.	
B1型输出轴（扭矩型） Output drive B1(torque type) 大圆孔带键槽的空心轴，扭矩通过平键传递给阀门，符合DIN3210和ISO5210标准。 Hollow shaft with large circular hole and keyway, torque is transmitted to the valve through flat keys, in accordance with DIN3210 and ISO5210 standards.	
C型输出轴（扭矩型） Output drive C(torque type) 两爪形连接的空心轴套，扭矩通过两爪传递给阀门。符合DIN3338和DIN3210标准。 三爪形连接的空心轴套，扭矩通过三爪传递给阀门。符合JB2920标准和DZW电装连接尺寸 A hollow shaft sleeve connected in a claw shape, with torque transmitted to the valve through the two claws. in accordance with DIN3338 and DIN3210 standards. A hollow shaft sleeve connected in a claw shape, with torque transmitted to the valve through the three claws. in accordance with JB2920 standard and DZW dimensions.	
D型输出轴（扭矩型） Output drive D(torque type) 带平键连接的自由轴伸，扭矩通过平键传递给阀门，符合DIN3210标准。 Free shaft extension with flat key connection, torque transmitted to the valve through the flat key, in accordance with DIN3210 standard.	
B3/E型输出轴（扭矩型） Output drive B3/E(torque type) 圆孔带键槽的空心轴，扭矩通过平键传递给阀门，符合DIN3210和ISO5210标准。 Hollow shaft with circular hole and keyway, torque is transmitted to the valve through flat keys, in accordance with DIN3210 and ISO5210 standards.	

MF系列 性能参数（MF Performance parameter ）		
外壳防护 Housing Protection	密封防护 Enclosure protection	标配：IP67（Standard） 选配：IP68（8m/96h）（Option）
	双密封保护 Double-sealed	执行机构的控制部分与接线箱完全隔离以保护电子元器件（可选） The control part is isolated from the terminal compartment to protect electronic components (optional)
	环境温度 Ambient temperature	标准：-30℃ ~ +70℃（Standard） 低温：-40℃ ~ +60℃（Option）
	环境湿度Humidity	<95%
	防爆标志 Explosion protection	EX db eb II C T4 Gb, EX tb III C T130℃ Db
	防腐保护 Corrosion protection	标准：C3，符合ISO12944标准（Standard, according ISO12944） 可选：C5-M，符合ISO12944标准（Option, according ISO12944）
	电机技术 Motor technology	全密封交流异步电机，内置过热保护；AC motor with temperature switch 绝缘等级：F级；Insulation class: F
电机 Motor	电机工作制 Mode of operation	符合IEC60034标准（According IEC60034） 短时工作制：S2-20min（Short-time duty） 包括起动的断续周期工作制：S4-40%（Intermittent periodic duty with starting）
	齿轮传动 Gear drive	蜗轮蜗杆传动，部分型号不自锁； Worm gear drive, some models Non self-locking
机械规格 Mechanical Specifications	手轮 Handwheel	电动操作时，手轮不随着转动；手轮操作扭矩符合EN 12570标准 When operated electrically, the handwheel does not rotate. Handwheel operation torque meets EN 12570 standard
	输出法兰 Output flange	多回转：符合ISO5210标准；Multi-turn: according ISO5210 角行程：符合ISO5211标准；Part-turn: according ISO5211 可定制法兰用于阀门的特殊连接尺寸；Customizable flanges for option
	输出轴 Output shaft	可拆卸轴套，详见外形图； Detachable shaft sleeve
	抗振动性能 Vibration	振动：所有在10~1000Hz频率范围内的振动累计少于1g RMS；All vibrations within the frequency range of 10-1000Hz accumulate less than 1g RMS 冲击：峰值加速度5g；Impact: Peak acceleration 5g
	润滑 Lubricant	润滑终生有效，无需特殊的周期性维护； Lubrication is effective for life and does not require periodic maintenance;
电气规格 Electrical Specifications	电源 Power supplies	定速：380VAC±15% / 50Hz±1%（Constant speed） 调速：380VAC±15%/40~70Hz；220VAC(Optional)；(Frequency control)
	电缆接口 Cable Entries	标配：1-M40x1.5；1-M32x1.5；1-M25x1.5（Standard） 选配：NPT等其他规格；（Option NPT）
行程力矩 Position Torque	行程检测 Position	直接在输出轴上测量运动；Measure directly on the output shaft 霍尔多圈绝对位置传感器行程测量技术；Absolute position encoder
	力矩检测 Torque	电机电参数测量技术；Electrical parameters of motors 设定范围：执行机构最大力矩的40~100%，步进精度1%； Setting range: 40-100% of the Max. torque, with an accuracy of 1%
操作控制 Operation Control	显示屏 Display	带背光的显示屏，中英文菜单 Backlit display screen with Chinese and English menus
	就地操作 Local Controls	2个操作旋钮：远程控制/就地控制，就地的开/关/停控制 2 operation knobs: remote/local control, local on/off/stop control 红外接口：通过遥控器对执行机构遥控动作，设定和传输数据 Infrared interface: realizing remote control operation of the actuator
	开关量输入信号 Binary inputs	开关量控制，光电隔离，控制功能可在菜单中自行设定 Switching control, opto-isolated, control functions can be set in the menu 控制方式：点动控制或自保持控制 Control mode：fleeting or self-hold contacts
	开关量输出信号 Binary outputs	继电器输出，可在菜单中自行设定输出功能 Relay output, the output function can be set in the menu 继电器容量：250VAC/5A Relay capacity: 250VAC/5A
	模拟量信号 Analog Signals	输入（Inputs）：4~20mA 输出（Outputs）：4~20mA，最大负载600Ω（Max load of 600 Ω）

性能数据

Performance summary

MF智能开关型							
转速rpm	10	20	40	80	120	额定启动次数	安装法兰
型号Type	阀座力矩Nm*					[1/h]	ISO 5210
MF□□20	60	60	60	60	60	120	F10
MF□□30	100	100	100	100	100	120	F10
MF□□31	150	150	120	120	120	120	F10
MF□□40	200	200	200	200	200	60	F14
MF□□41	300	300	250	250	250	60	F14
MF□□50	450	450	450	450	450	60	F14
MF□□51	600	600	500	500	500	60	F14
MF□□60	900	900	900	900	-	30	F16
MF□□61	1200	1200	1000	1000	-	30	F16
MF□□70	1800	1800	1800	-	-	30	F25
MF□□71	2000	2000	2000	-	-	30	F25

以上数据适用于带三相交流电机的执行器，电机工作制：S2-20min。执行器工作等级：EN15714-2标准中的A类和B类

MF智能调节型								
转速rpm	10		20		40		额定启动次数	安装法兰
型号Type	阀座力矩Nm*	调节力矩Nm	阀座力矩Nm*	调节力矩Nm	阀座力矩Nm*	调节力矩Nm	[1/h]	ISO 5210
MF□□20	60	30	60	30	60	30	1200	F10
MF□□30	100	50	100	50	100	50	1200	F10
MF□□31	150	60	150	60	120	60	1200	F10
MF□□40	200	100	200	100	200	100	600	F14
MF□□41	300	125	300	125	250	125	600	F14
MF□□50	450	220	450	220	450	220	600	F14
MF□□51	600	250	600	250	500	250	600	F14
MF□□60	900	450	900	450	900	450	300	F16
MF□□61	1200	500	1200	500	1000	500	300	F16
MF□□70	1800	900	1800	900	1800	900	300	F25
MF□□71	2000	1000	2000	1000	2000	1000	300	F25

产品系列	产品大类
MF1□□□	MF1000系列非防爆型
MF2□□□	MF2000系列防爆型
MF3□□□	MF3000系列非防爆型
MF4□□□	MF4000系列防爆型

以上数据适用于带三相交流电机的执行器，电机工作制：S4-40%。执行器工作等级：EN15714-2标准中的C类

*阀座力矩是可设定的双向最大力矩，堵转扭矩取决于速度和电压，一般是额定值的1.4~2倍

		MF变频开关型		MF变频调节型		安装法兰
型号	阀座力矩	输出转速	额定启动次数	输出转速	额定启动次数	ISO 5210
型号	Nm	(rpm)	[1/h]	(rpm)	[1/h]	ISO 5210
MF□□20	60	5.2~60	120	5.2~60	1200	F10
		15.6~180				
MF□□30	100	5.2~60	120	5.2~60	1200	F10
		15.6~180				
MF□□31	150	20~40	120	20~40	1200	F10
		60~120				
MF□□40	200	5.2~60	60	5.2~60	600	F14
		15.6~180				
MF□□41	300	20~40	60	20~40	600	F14
		60~120				
MF□□50	450	5.2~60	60	5.2~60	600	F14
		15.6~180				
MF□□51	600	20~40	60	20~40	600	F14
		60~120				
MF□□60	900	5.2~60	30	5.2~60	300	F16
		10~120				
MF□□61	1200	20~40	30	20~40	300	F16
		40~80				
MF□□70	1800	5.2~60	30			F25
MF□□71	2000	5.2~60	30			

设计寿命（耐久度） Design life（Endurance）			
MF输出类型 Output Type	负载等级 Duty Class	力矩/推力 Torque/Thrust	设计寿命 Design Life
多回转 Multi-turn	A/B（开关/点动）	≤700Nm 701~2000Nm	≥10000次循环（500000输出圈数）/30%额定力矩 ≥5000次循环（250000输出圈数）/30%额定力矩
	C（调节）	≤600Nm	≥1800000次启动/40%额定力矩
角行程 Part-turn	A/B（开关/点动）	≤2000Nm	≥50000次循环/30%额定力矩
	C（调节）	≤2000Nm	≥1800000次启动/40%额定力矩
直行程 Linear	A/B（开关/点动）	≤128kN	≥10000次循环/30%额定推力
	C（调节）	≤128kN	≥1800000次启动/40%额定推力

MF系列执行机构的耐久度满足或超过ISO 22153标准的要求

MF series actuators meet or exceed the endurance requirements of ISO 22153

一体化系列 Integratedseries

深圳万讯为恶劣的工业环境现场专门设计了体积更为小巧，结构更加紧凑的一体化执行机构。

一体化系列产品采用优质材料，整机体积小，重量轻，传动效率高，运行噪音低。采用无离合器手轮设计，配置高强度全铝合金箱体，坚固耐用抗冲击。

一体化系列产品采用MCU控制，控制器内部高度集成化和模块化，拥有丰富的功能和便捷的操控方式，更结合了先进的通讯功能，开创了一体化电动执行机构的新格局。

一体化系列产品适用于流体介质切断，工业过程控制中的精确调节等各种场合。广泛应用于电站，石油，化工，冶金，输油管道，水处理等各个行业的自控系统。

Maxonic has specially designed a smaller and more compact integrated actuator for harsh industrial environments on-site.

The integrated series products are made of high-quality materials, with small size, light weight, high transmission efficiency, and low operating noise. Adopting a clutch free handwheel design and equipped with a high-strength all aluminum alloy housing, it is sturdy, durable, and impact resistant. The integrated series products adopt MCU control, with highly integrated and modular controllers, rich functions and convenient control methods, combined with advanced communication functions, creating a new pattern of integrated electric actuators.

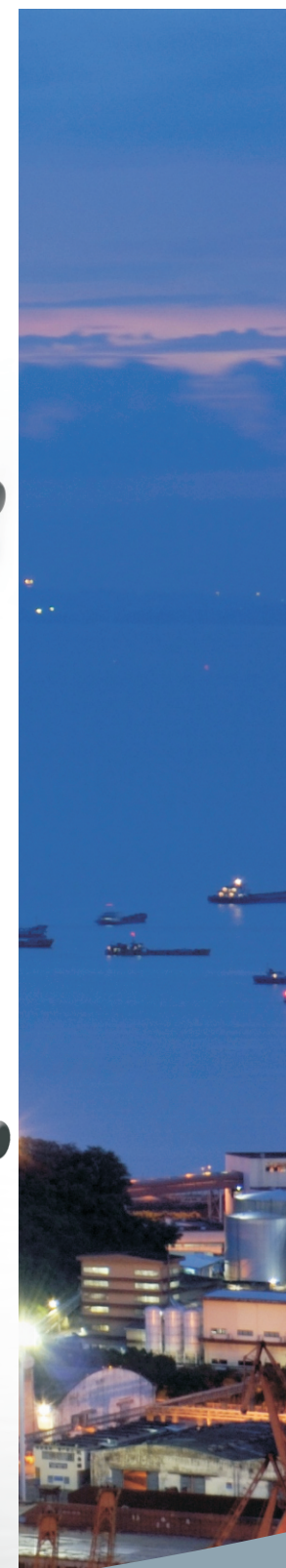
The integrated series of products are suitable for various occasions such as fluid medium cutting and precise adjustment in industrial process control. Widely used in power plants, petroleum, chemical, metallurgical, oil pipeline, water treatment and other industries for self-control systems.



• MFT



• MFL



按钮式按键
Button operation

可现场操作，安全实用（也可通过手机APP操作）

Can be operated on-site, safe and practical (can also be operated through mobile apps)

箱体
Housing

高强度，轻量化，全铝合金箱体。
体积小，散热性好，坚固，耐腐蚀。
High strength, lightweight, all aluminum alloy housing. Compact size, good heat dissipation, sturdy, and corrosion-resistant.

插拔式双密封结构接线盘
Plug in double sealed structure terminal block

双重密封结构设计，保证内部电气空间不受外部侵袭。接插件采用镀银工艺，提高抗氧化性能。

The double sealed structure design ensures that the internal electrical space is not invaded by external factors. The connector adopts silver plating process to improve its antioxidant performance.

机械终端限位调整装置
Mechanical terminal limit adjustment device

内置少齿差行星齿轮传动
Built in planetary gear transmission with small tooth difference

传动比大，机械效率高，结构紧凑，运行平稳，抗冲击振动能力强。

Built in planetary gear transmission with small tooth difference
High transmission ratio, high mechanical efficiency, compact structure, smooth operation, and strong resistance to impact and vibration.

液晶显示
LCD display

大尺寸液晶屏，实时数字显示阀门的开度大小，并实时显示报警信息。

Large LCD screen, real-time digital display of valve opening size, and real-time display of alarm information.

电机
Motor

低惯量，高转矩电机，启动后可迅速达到峰值力矩。

Low inertia, high torque motor, can quickly reach peak torque after starting.

输出连接装置
Output drive

连接法兰符合ISO5211标准，输出轴套为花键连接式，可拆卸，便于快速安装。

The connecting flange meets the ISO5211 standard, and the output shaft sleeve is a spline connection type that is detachable and easy to install quickly.

手轮
Output Handwheel

采用无离合器设计，可随时直接使用手轮操作阀门。手柄可折叠，电动操作时手轮不转动。

Adopting a clutch free design, the valve can be operated directly with a handwheel at any time. The handle is foldable and the handwheel does not rotate during electric operation.

功能特点

1) 3.5"显示屏

清晰明亮，可以适应从-30℃~+70℃的宽广环境温度范围。

2) 高性能微处理器

控制系统采用高性能的STM32系列微处理器，具有高度集成，快速运算，功能丰富的特点

3) 非侵入式操作

执行机构的操作，设定和诊断均通过4个非贯通式按键进行。不开盖，操作简单，上手快。

4) 电路板防水保护

所有电路板均采用多层硅胶防水涂层保护，产品更适合高湿度的应用场合，即使电路板完全进水，仍然可以恢复正常工作。

5) 自动整定

执行机构可以自动整定阀门的行程和死区。操作调试更方便。

6) 自动排堵

执行机构在遇到阀门卡堵的情况时，可以自动实施排堵动作。

7) 历史记录和状态数据

丰富的数据记录，便于事件追踪。包括：通电/运行时间，启动次数，报警记录，输入/输出信号状态等。

8) 故障自诊断

丰富的故障诊断和对策处理保护功能，使用更安全。

9) 现场总线通讯

支持Profibus, Modbus, Hart等现场总线协议，为工厂自动化提供理想的总线解决方案。

10) 分体安装

控制系统可以和机械传动系统分离，在高温、振动等场合实现执行机构的分体安装。

Functional characteristics

1) 3.5" display

Clear and bright, it can adapt to a wide range of ambient temperatures from -30°C to +70°C.

2) High performance processor

The system uses a high-performance STM32 series microprocessor with high integration, fast calculation and feature-rich features

3) Non-intrusive operation

All operations, settings and diagnostics of the actuator are carried out via 4 Non-intrusive buttons. No need to open the cover, easy to operate, quick to get started

4) Circuit board waterproof protection

All boards are protected by a two-layer nano-waterproof coating. The product is more suitable for high humidity applications, even if the board is completely watered, it can resume normal operation.

5) Auto-end limit commissioning

The actuator can automatically adjust the stroke and dead zone of the valve. Operation and debugging is more convenient and simpler

6) Automatically remove jams

When the actuator encounters a valve jam, the actuator can automatically perform the action of eliminating the jam

7) History and status data

Record historical data of the operation of the actuator and current status data for event tracking. Including: power on / running time, number of starts, alarm record, input / output signal status, etc.

8) Automatic fault diagnosis

Rich fault diagnosis and countermeasure processing protection function, safer to use

9) Fieldbus communication

Supports a variety of fieldbus protocols such as Profibus, Modbus, Hart, etc., providing an complete bus solutions for factory automation

10) Split installation

The control system can be separated from the mechanical transmission system to achieve split installation of the actuator in high temperature, vibration and other occasions.

MFT系列 一体式角行程执行机构							
型号 Type	额定力矩 Nm	行程时间 秒/90°	电机功率 W	额定电流 A	连接法兰	输出轴最大 开孔直径	重量 kg
MFT□□10	100	28	40	0.35	F07	Φ22	12.5
MFT□□11*	100	18	40	0.35	F07	Φ22	12.5
MFT□□20	250	28	60	0.45	F07	Φ22	13
MFT□□21*	160	18	60	0.45	F07	Φ22	13
MFT□□30	400	28	120	0.6	F10+F12**	Φ30	21
MFT□□31*	400	18	120	0.6	F10+F12**	Φ30	21
MFT□□40	600	28	120	0.6	F10+F12**	Φ30	21
MFT□□41*	500	18	120	0.6	F10+F12**	Φ30	21
MFT□□50	1000	32	200	1.2	F14	Φ42	36
MFT□□70	2000	32	200	1.2	F14	Φ42	36

*仅开关型（Only On/Off）

**同时配有F10和F12法兰

产品系列	产品大类
MFT30□□	智能开关型
MFT31□□	智能调节型
MFT32□□	变频开关型
MFT33□□	变频调节型

产品系列	产品大类
MFT20□□	防爆智能开关型
MFT21□□	防爆智能调节型
MFT22□□	防爆变频开关型
MFT23□□	防爆变频调节型

MFL系列 一体式直行程执行机构							
型号 Type	最大推力 KN	输出速度 mm/s	电机功率 W	额定电流 A	最大行程-可选 mm	输出轴 连接螺纹	重量 kg
MFL□□13	5	0.6	60	0.45	30, 60	M10x1.5	16
MFL□□30	10	1	90	0.5	60, 100	M20x1.5	25
MFL□□40	16	1	120	0.6	100, 150	M20x1.5	25
MFL□□50	25	1	120	0.6	100, 150	M20x1.5	25

产品系列	产品大类
MFL30□□	智能开关型
MFL31□□	智能调节型

产品系列	产品大类
MFL20□□	防爆智能开关型
MFL21□□	防爆智能调节型

MFT/MFL系列 性能参数（MFT/MFL Series Performance parameter）		
外壳防护 Housing Protection	密封防护 Enclosure protection	标配：IP68（3m/48h）（Standard）
	防爆标志 Explosion protection	Ex db II B T4 Gb, Ex tb III C T130°C Db
	环境温度 Ambient temperature	非防爆：-30°C ~ +70°C（S2）；-30°C ~ +60°C（S4）；（Non explosion proof） 防爆型：-20°C ~ +60°C（Explosion proof）
	相对湿度/Humidity	5%~98%
	防腐保护 Corrosion protection	标准：C3，符合ISO12944标准（Standard, according ISO12944） 可选：C5，符合ISO12944标准（Option, according ISO12944）
	电机技术 Motor technology	绝缘等级：F级；Insulation class：F 内置温控保护装置（135°C），防止电机过热烧毁；Motor with temperature switch
电气规格 Electrical Specifications	供电电源 Power supplies	标配：220VAC（Standard） 选配：380VAC（Option）
	电缆接头 Cable Entries	2-M25x1.5
机械规格 Mechanical Specifications	输出法兰 Output flange	符合ISO5211标准；According ISO5211
	输出轴 Output shaft	可拆卸轴套，详见外形图； Detachable shaft sleeve
	齿轮传动 Gear drive	齿轮设计有自锁功能，可避免阀门反推执行器 The gear design has self-locking function, which can prevent the valve from pushing the actuator back 行星传动：效率高，传动平稳，抗冲击，抗振动强度大，传动比大 Planetary transmission: high efficiency, smooth transmission, shock resistance, high vibration resistance, large transmission ratio
		齿轮组在出厂前已涂抹足够的抗高温润滑脂 The gear set has been coated with sufficient high-temperature resistant grease before leaving the factory
	润滑 Lubricant	手轮操作扭矩符合EN 12570标准，手柄可折叠 The operating torque of the handwheel complies with EN 12570 standard, and the handle is foldable
	手轮 Handwheel	无离合器设计，可直接转动手轮对阀门进行开关操作 No clutch design, can directly turn the handwheel to open/close the valve
		振动：所有在10~1000Hz频率范围内的振动累计少于1g RMS；All vibrations within the frequency range of 10-1000Hz accumulate less than 1g RMS 冲击：峰值加速度5g；Impact: Peak acceleration 5g
操作控制 Operation Control	显示屏 Display	液晶屏，工作温度-30°C~+70°C LCD screen, working temperature -30 °C~+70 °C 带背光的显示屏，中英文菜单 Backlit display screen with Chinese and English menus
	就地操作 Local Controls	4个非贯通式按键：远程和就地切换，就地的开/关/停操作，菜单设定工作 4 buttons: remote/local switching, local on/off/stop operation, menu settings
	模拟量输入信号 Analog input signal	4~20mA；输入阻抗100Ω（Input resistance 100Ω）
	模拟量输出信号 Analog output signal	4~20mA；最大负载500Ω（Max load of 500Ω）
	开关量输入信号 Binary inputs	3路开关量控制，光电隔离，控制功能可在菜单中自行设定 3-channel switching control, opto-isolated, functions can be set in the menu 控制方式：点动控制或自保持控制 Control mode：fleeting or self-hold contacts
		4路继电器无源触点输出，可在菜单中自行设定输出功能 4-channel relay output, the output function can be set in the menu 继电器触点容量：250VAC/5A；Relay capacity: 250VAC/5A
	开关量输出信号 Binary outputs	
	总线通讯协议 Bus Communication	Profibus-DP, Modbus, HART
	灵敏度/Deadband	±（0.1~10%）F.S
	重复精度/Repeatability	1%