IP6500系列定位器

IP6500 Series Intelligent Valve Positioner Brief Introduction

POWERFLOW

Expertise in flow control

IP6500系列智能阀门定位器和气动调节阀配套使用。定位器通过PROFIBUS PA总线，接收来自控制系统的设定值，并采集位置传感器信号得到实际的阀位值。通过控制软件的计算处理，控制气动执行机构的进气和排气，从而驱动阀位到达设定点。

1 技术描述

常规型直行程

- **外壳材质**
  铝合金
- **压力表组件**
  铝,阳极氧化
- **供电电源及信号传输**
  DP/PA耦合器
- **本安供电电压**
  17.5V DC
- **工作电压范围**
  9~32V DC
-
- **数字通讯协议**
  PROFIBUS PA
- **稳态耗气量**
  ≤0.4 L/min

1 技术描述

● 行程范围
常规型直行程：10~100mm
常规型角行程：30~100°
分体式：5~25mm
安装支架可选：硬连接或软连接
注：远传型行程范围同常规型一致

● 气动数据
空气质量符合ISO 8573-1标准
气源压力：0.14-0.7MPa
固体颗粒大小和密度：等级3
压力露点：等级3
含油量：等级3

● 流量
进气：
2 bar　4.8 Nm^3/h
4 bar　8.0 Nm^3/h
6 bar　11.2 Nm^3/h
排气(复位）：
2 bar　5.9 Nm^3/h
4 bar　9.8 Nm^3/h
6 bar　13.7 Nm^3/h
排气(保位)：
2 bar　6.6 Nm^3/h
4 bar　11.1 Nm^3/h
6 bar　15.6 Nm^3/h

● 电气接口
NPT1/2（默认）
M20×1.5

● 气动接口
G1/4

● 防护等级
IP69K

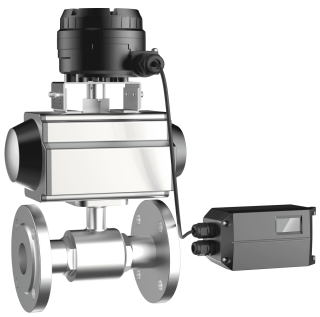
● 抗震动性
0.15mm，10Hz-60Hz，20次循环/轴
20m/s^2，60Hz-500Hz，20次循环/轴
整个控制阀连续运行时的推荐范围≤20 m/s^2， 无谐振峰值

● 线性度及回差
线性度：≤0.5%
回差：≤0.5%

● 环境温度
非防爆常规版本：-20° C～+80° C
非防爆低温版本：-40° C～+80° C


分体式


常规型角行程


远传型角行程

2 优点及应用

优点

- 安装简单，一键初始化
- 德国原装进口，成熟可靠的压电式气动模块
- 操作简便，使用4个按键和LCD进行本地操作
- 多种菜单功能配置。如特性曲线，行程限制等
- 稳态工作耗气量可忽略不计
- 紧密关闭功能
- 保位功能（根据产品选型选择）
- 直行程和角行程执行机构采用同一型号的定位器
- 抗震性好
- 极端环境可选择外部远传型位置传感器

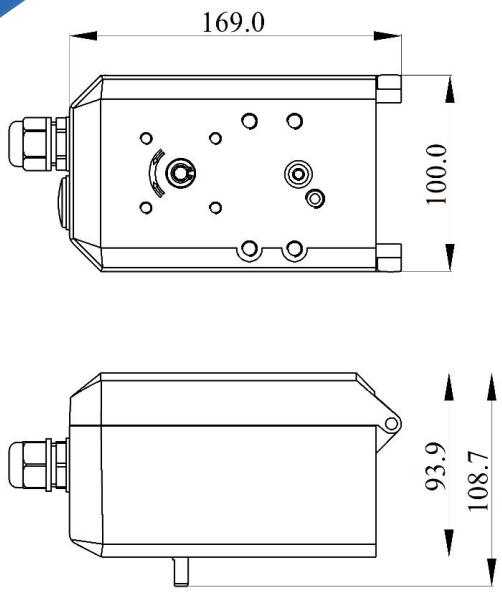
应用

IP6500定位器应用行业：

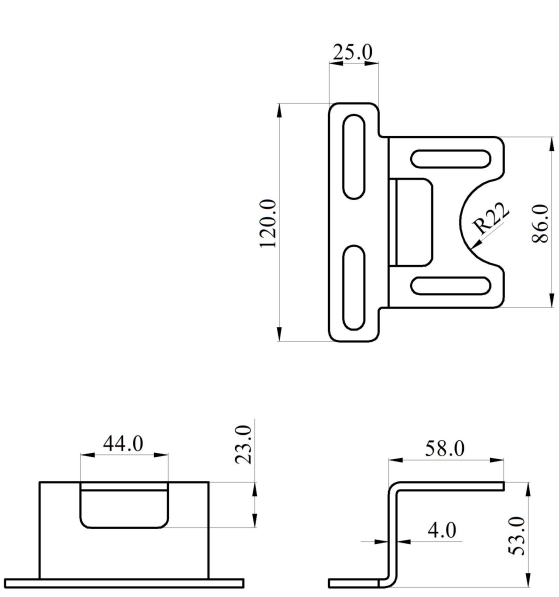
- 炼油/石化/核电/电厂
- 造纸和玻璃/水和污染
- 食品和制药
- 海上平台

远传型直行程

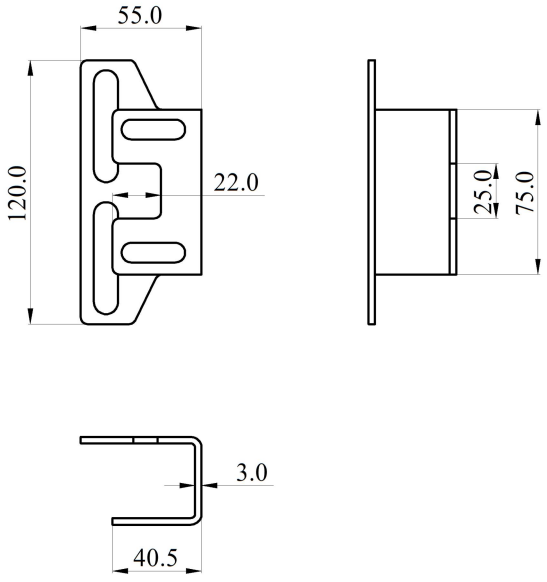
3 机械尺寸



外形尺寸

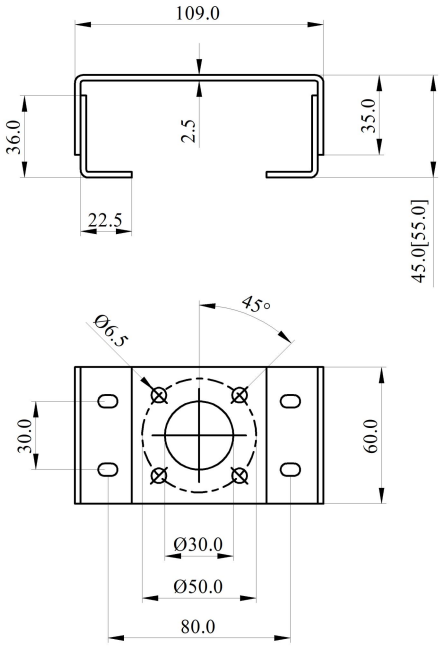


常规型直行程安装支架

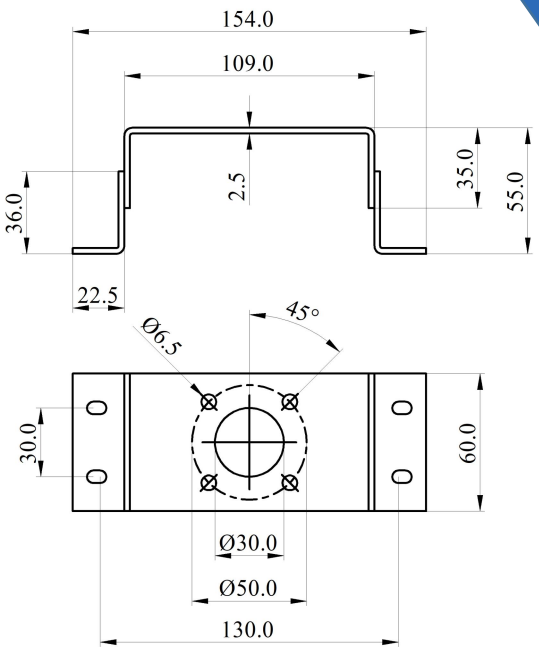


远传型直行程安装支架

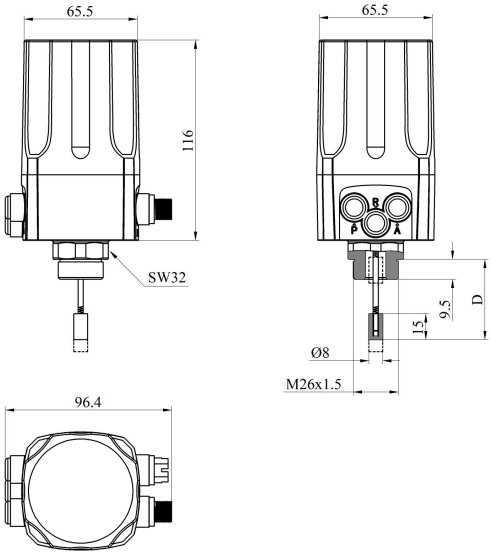
3 机械尺寸



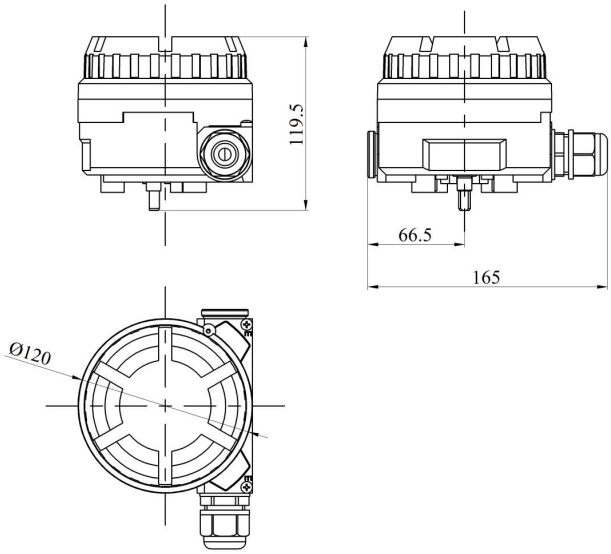
角行程安装支架A型



角行程安装支架B型

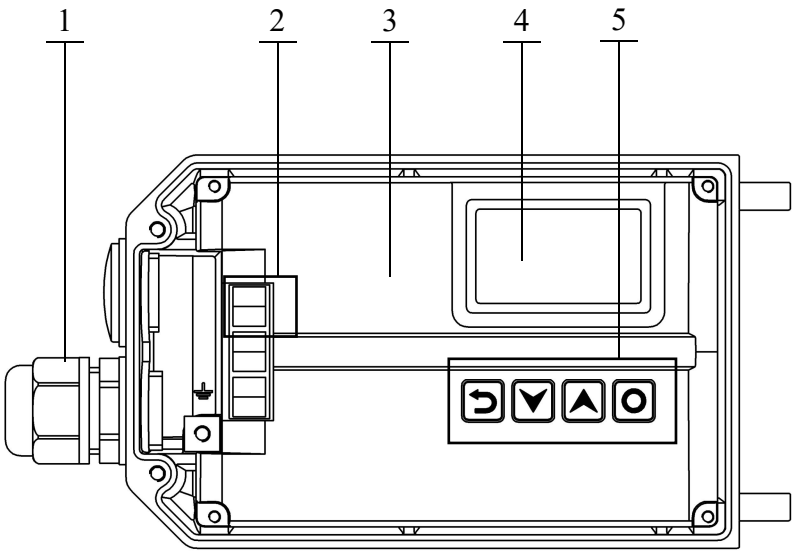


分体式传感器尺寸



远传型传感器尺寸

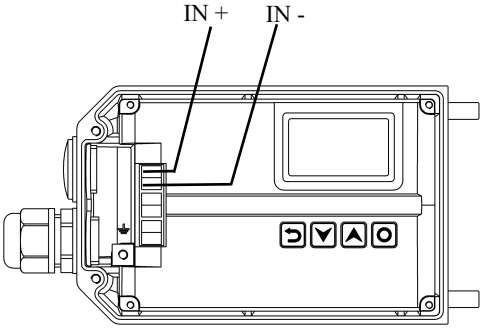
4 产品结构

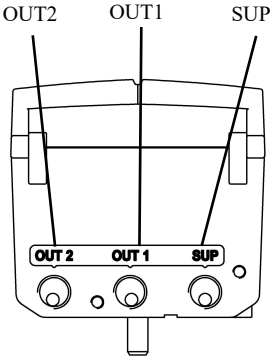


1. 电气线缆接入
2. 电气接线位置
3. 保护盖
4. 液晶显示
5. 按键

本安版产品结构

5 接口说明



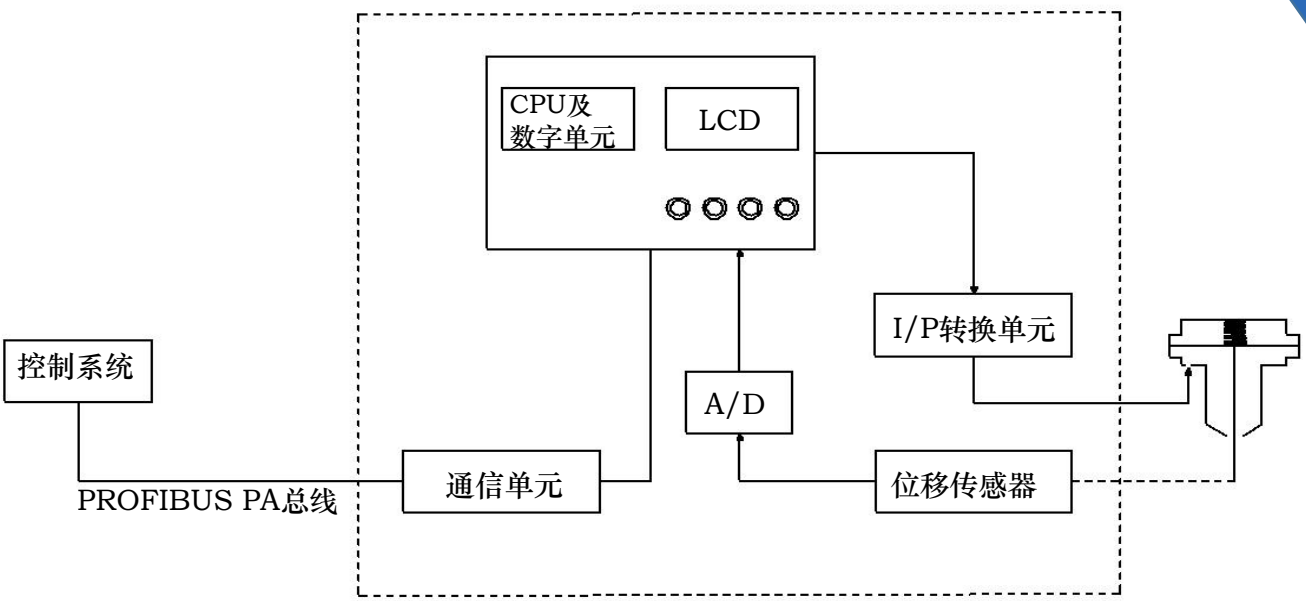


备注:
分体式OUT1和OUT2堵住不用

电气接口	描述
IN+	总线信号 +
IN-	总线信号 -

气动接口	描述
SUP	气源进入
OUT1	先导气口1
OUT2	先导气口2，双作用时使用

6 原理框图



软件附加功能

- 安全位置设置
- 死区设置
- 紧闭功能
- 行程限制
- 特性曲线选择和设置
- 设定值方向设置
- 显示的设定值和位置值的动作方向设置
- 恢复出厂设置

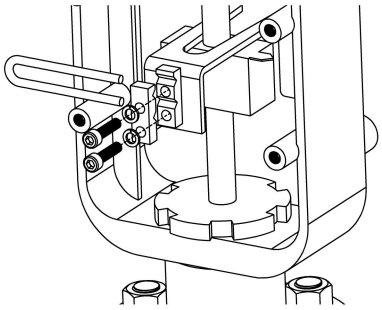
产品优势

IP6500系列智能阀门定位器采用微处理器和新型压电阀代替传统定位器中的喷嘴、挡板调压系统来实现对输出压力的调节控制。定位器通过PROFIBUS PA总线与控制系统通信来替代传统的4-20mA信号以实现对阀门开度的设定。适用于本质安全的Eex应用区域。压电阀由于质量小，可以释放很短的控制脉冲，从而达到很高的定位精度，且压电阀只有在阀门有偏差并执行调节动作时才耗气，所以可以实现低耗能的目的。

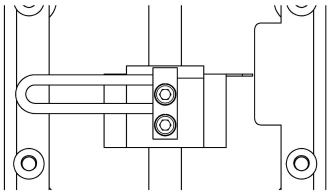
7 安装组件

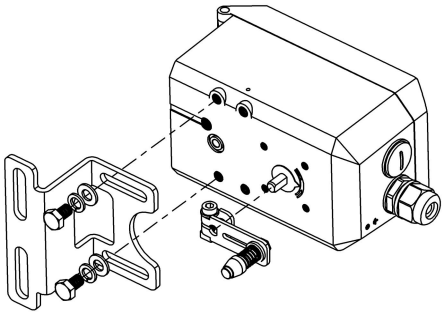
直行程执行机构安装组件：

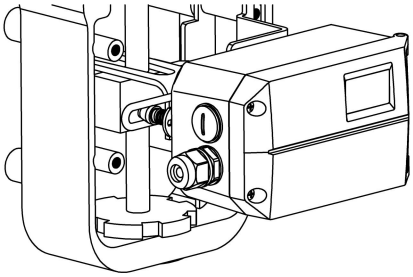
1. U型杆*1
2. 夹板*1
3. M6内六角螺钉*2
4. M6弹簧垫圈*2
5. 反馈杆*1
6. M6内六角螺栓*1
7. 直行程安装支架*1
8. M8六角头螺栓*2
9. M8弹簧垫圈*2
10. M8平垫圈*2
11. 匹配反馈杆B的传动销*1



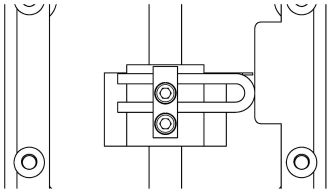
U型杆安装

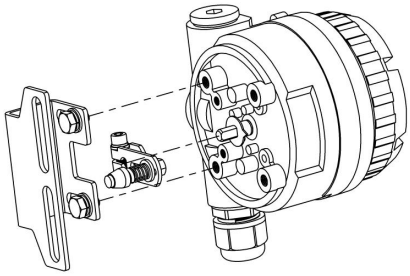


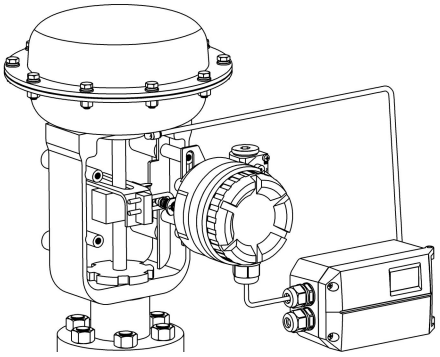




直行程常规型





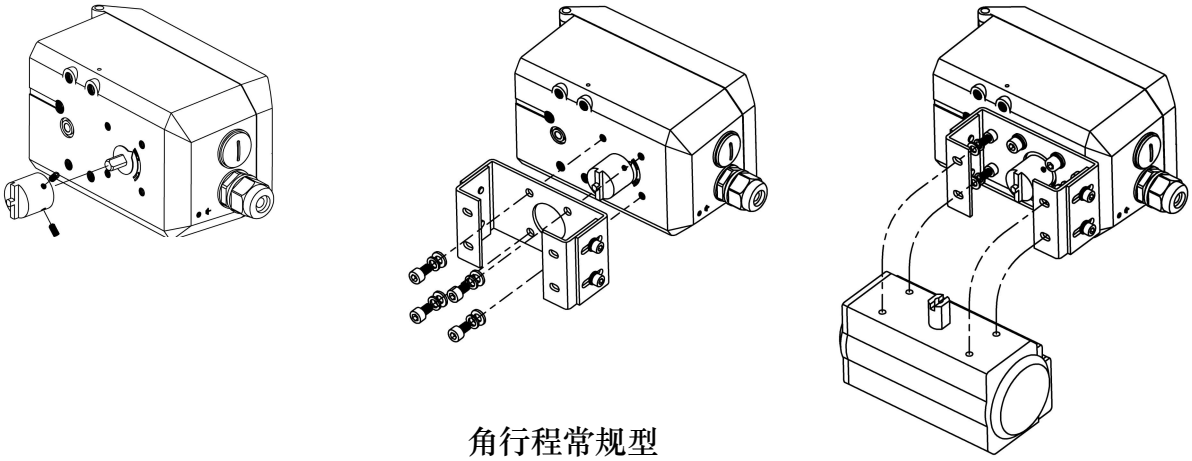


直行程远传型

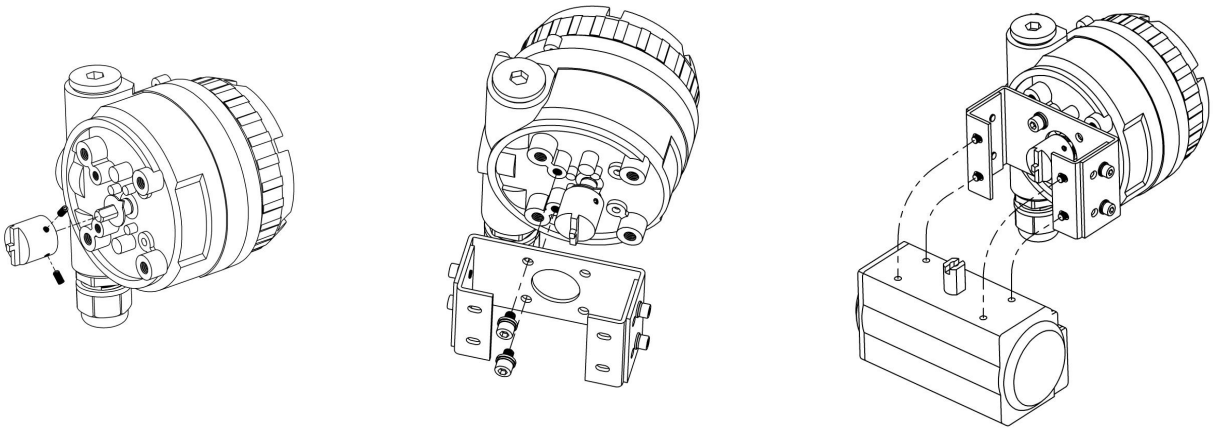
7 安装组件

角行程执行机构安装组件：

1. 适配器*1
2. 内六角紧定螺钉*2
3. 角行程安装支架*1
4. M6平垫圈*4
5. M6弹簧垫圈*4
6. M6内六角螺钉*4
7. M5内六角螺钉*4
8. M5弹簧垫圈*4
9. M5平垫圈*4



角行程常规型

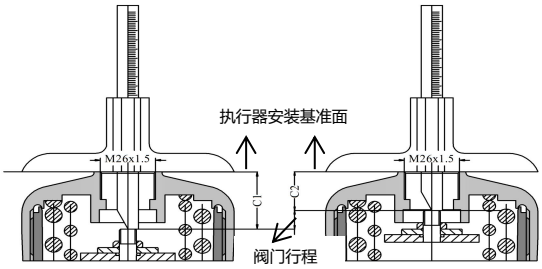


角行程远传型

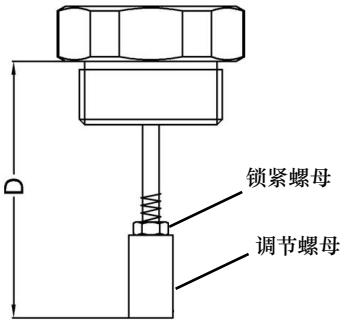
7 安装组件

分体式安装组件：

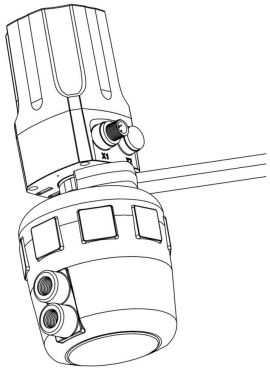
1. 传感器*1
2. 安装板*1
3. O型圈*2
4. 固定件*2
5. M8六角头螺栓*4
6. 传感器接头*1



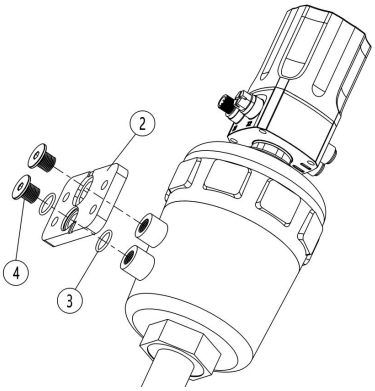
阀门完全关闭　　阀门完全打开



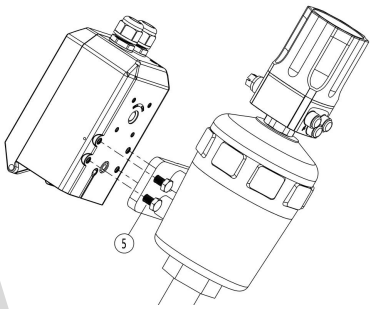
调节D值



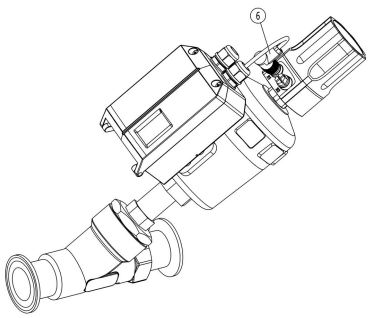
传感器安装



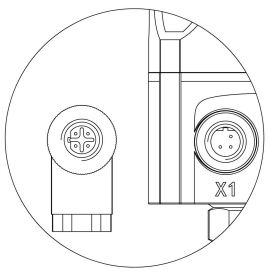
固定安装板



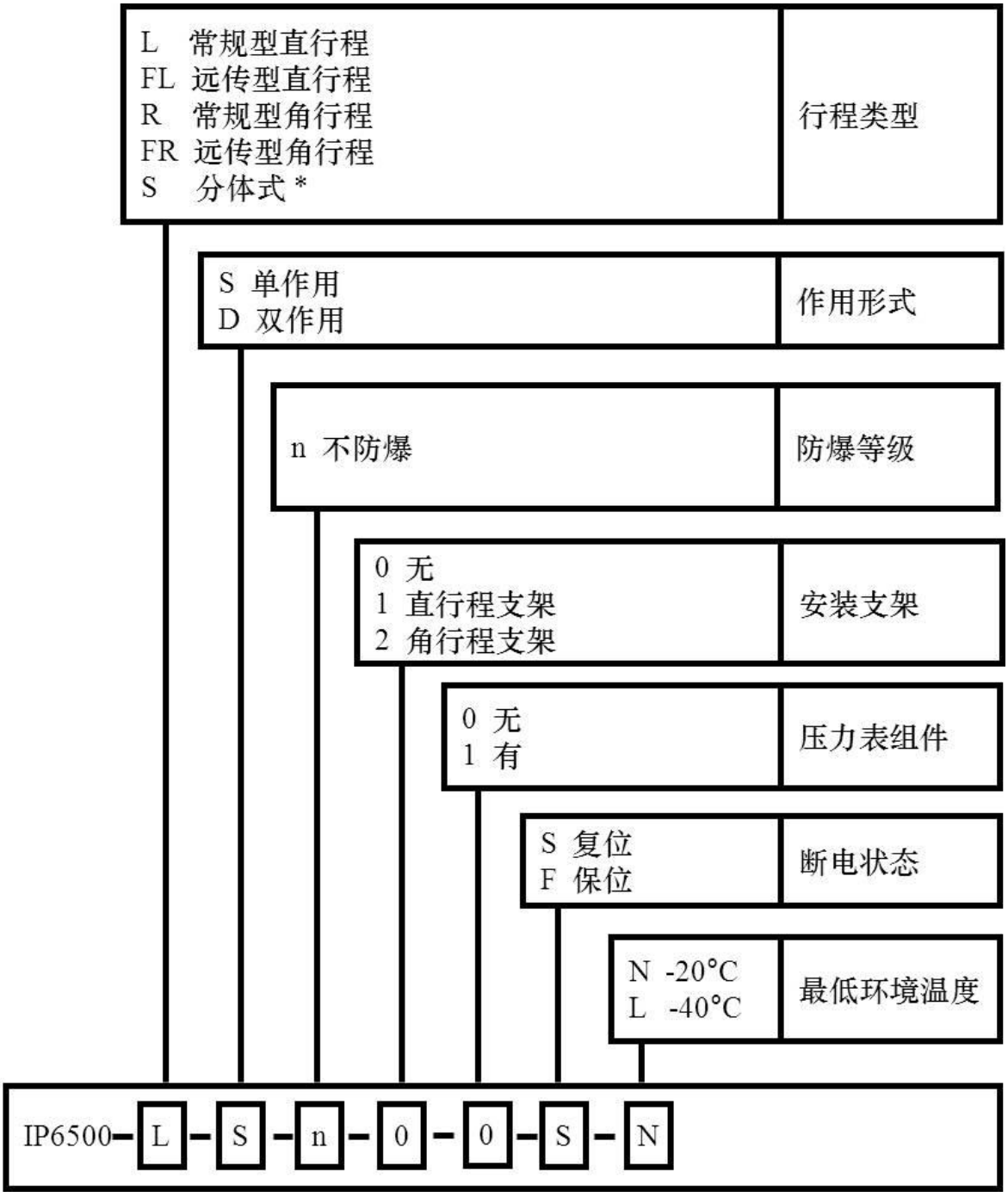
固定定位器



连接传感器



传感器接头



备注:

行程类型选项中，*标记选项**S(分体式)**不支持**最低环境温度**选项**L（-40°C）**。

IP6500 series intelligent valve positioner is used in conjunction with pneumatic control valves. The positioner receives the set-point value from the control system via the PROFIBUS PA bus and collects the position sensor signal to obtain the actual valve value. Through the calculation and processing of the control software, the inlet and exhaust air of the pneumatic actuator are controlled, so as to drive the valve position to the set point.

1 Technical Description

Linear type

- **Enclosure material**
  Aluminum
- **Pressure gauge block material**
  Aluminum, anodized
- **Power supply and signal transmission**
  DP/PA coupler
- **Intrinsically safe power supply**
  17.5V DC
- **Operating voltage range**
  9~32V DC
- **Digital communication protocol**
  PROFIBUS PA
- **Steady state air consumption**
  ≤ 0.4 L/min

1 Technical Description

● Stroke range

Default linear type: 10~100mm
Default rotary type: 30~100°
Separate type: 5~25mm
Optional mounting bracket: Hard connection or soft connection
Note: The stroke range of remote type is the same as that of default type

● Pneumatic data

Air quality meets ISO 8573-1 standard
Supply pressure: 0.14~0.7MPa
Solid particle size and density: Grade 3
Pressure dew point: Class 3
Oil content: Class 3

● Flow rate

Intake:
2 bar 4.8 Nm³/h
4 bar 8.0 Nm³/h
6 bar 11.2 Nm³/h
Exhaust (fail-safe):
2 bar 5.9 Nm³/h
4 bar 9.8 Nm³/h
6 bar 13.7 Nm³/h
Exhaust (fail-freeze):
2 bar 6.6 Nm³/h
4 bar 11.1 Nm³/h
6 bar 15.6 Nm³/h

● Electrical connection

NPT1/2(default)
M20×1.5

Pneumatical connection

G1/4

● Protection class

IP69K

● Vibration resistance

0.15mm，10Hz-60Hz，20 cycle/axis
20m/s2，60Hz-500Hz，20 cycle/axis
Recommended range for control valve
≤ 20 m/s2，no resonance peak

● Linearity & Hysteresis

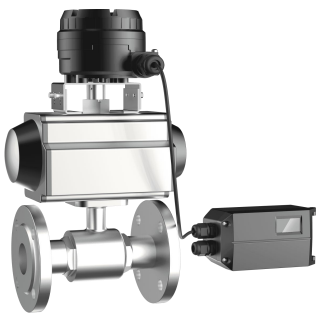
Linearity: ≤ 0.5%
Hysteresis: ≤0.5%

● Ambient temperature

Normal version for non-explosion-proof:
-20℃ ~ +80℃
Optional version for non-explosion-proof:
-40℃ ~ +80℃

Separate type

Default rotary type



Remote rotary type

2 Advantages & applications

Advantages

- Simple mounting and one-key automatic commissioning
- Mature and reliable piezo module, imported from Germany
- Simple operation and configuration of the device using 4 buttons and LCD local display
- Numerous functions can be activated(e.g. characteristic curves and limits)
- Negligible air consumption in stationary operation
- Tight closing function
- Fail-freeze function (Optional according to product selection chart)
- One device variant for linear and rotary actuators
- Excellent shock resistance
- External remote sensor as option for extreme ambient conditions

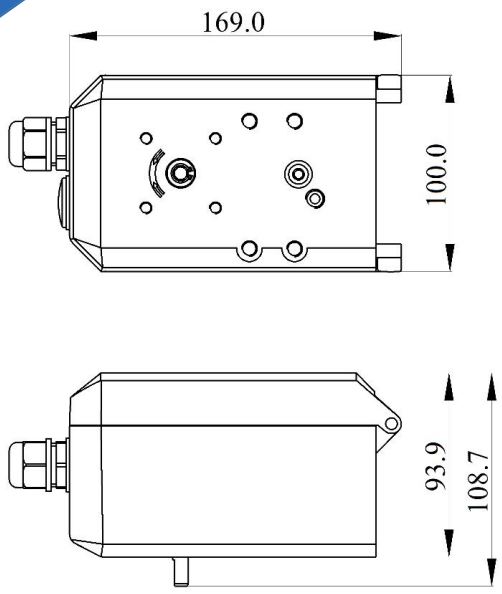
Applications

IP6500 positioner application industry：

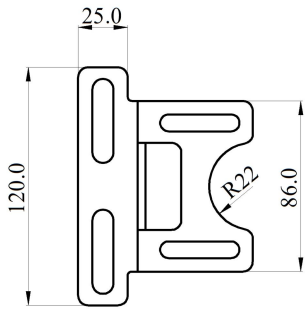
- Refining/Petrochemical/Nuclear Power/Power Plant
- Paper and glass/water and wastewater industry
- Food & beverage, pharmaceutical industry
- Marine Industry

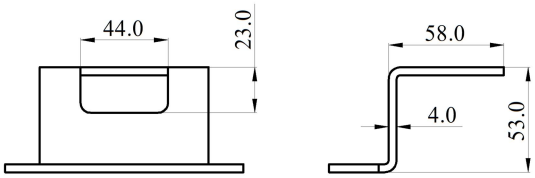
Ex ia remote linear type

3 Mechanical Dimensions

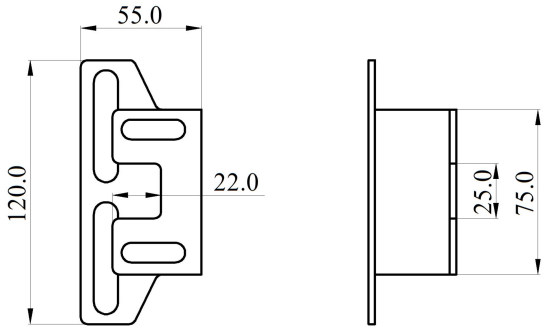


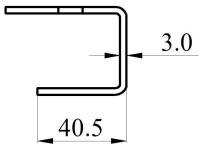
Mechanical dimension





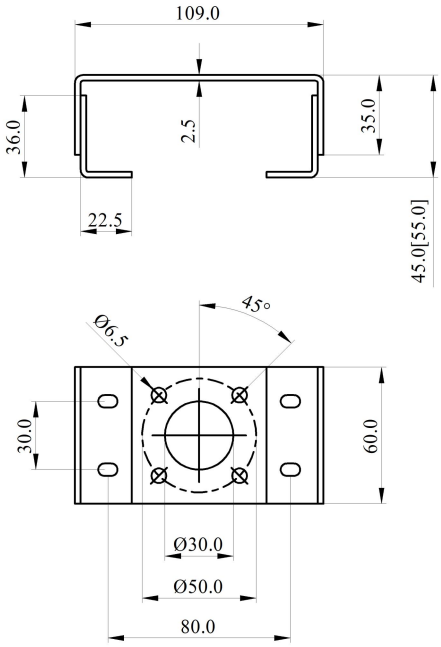
Normal linear mounting bracket



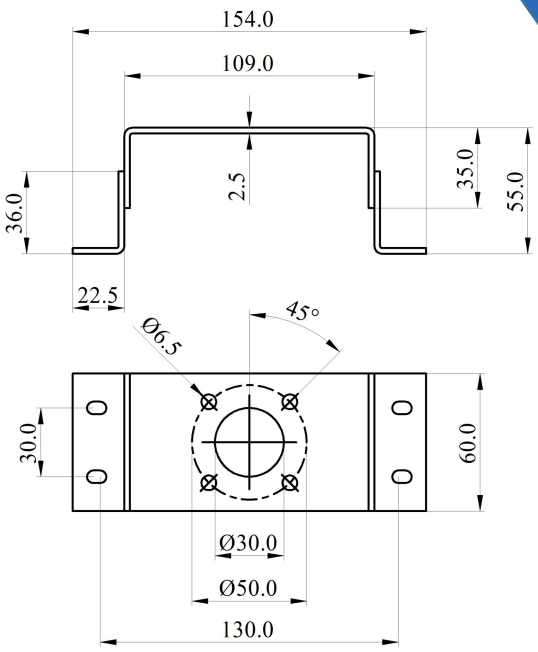


Remote linear mounting bracket

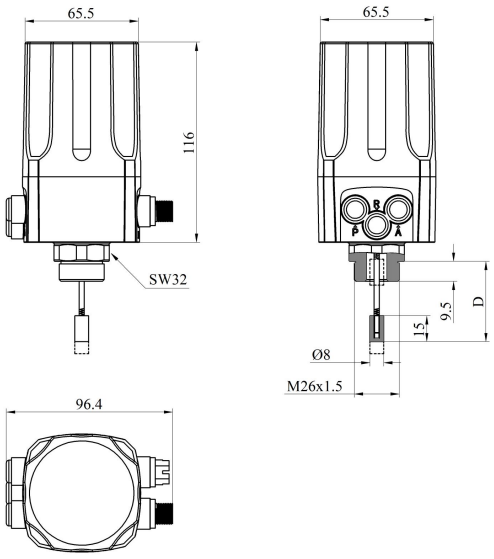
3 Mechanical Dimensions



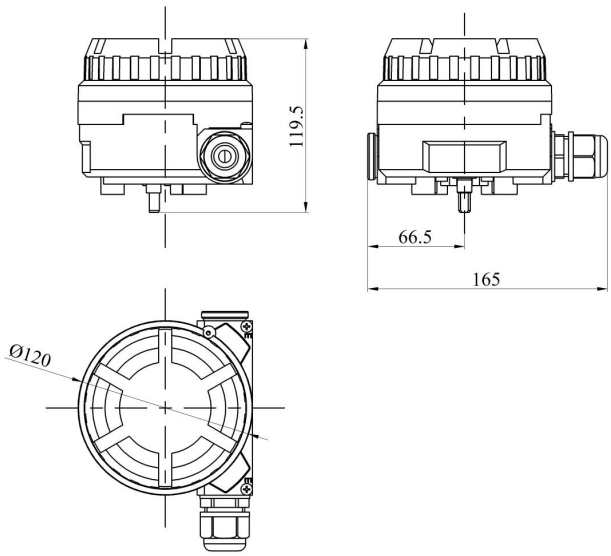
Rotary mounting bracket (Type A)



Rotary mounting bracket (Type B)

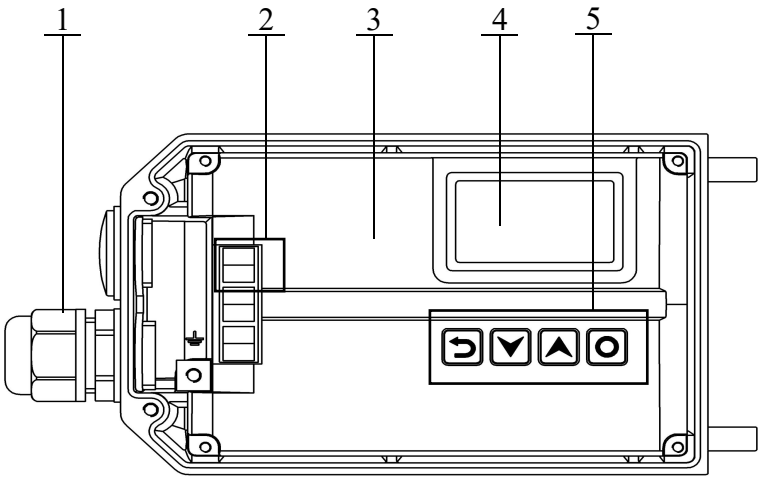


Sensor dimension for separate type



Sensor dimension for remote type

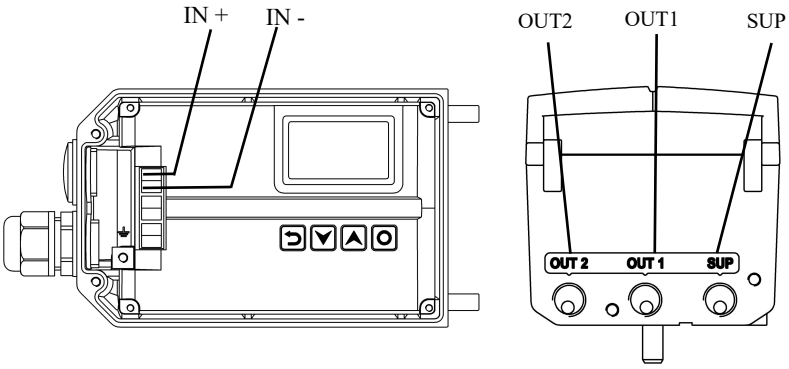
4 Structure



1. Electrical cable access
2. Electrical wiring position
3. Shell
4. LCD screen
5. Buttons

positioner structure

5 Connection Description

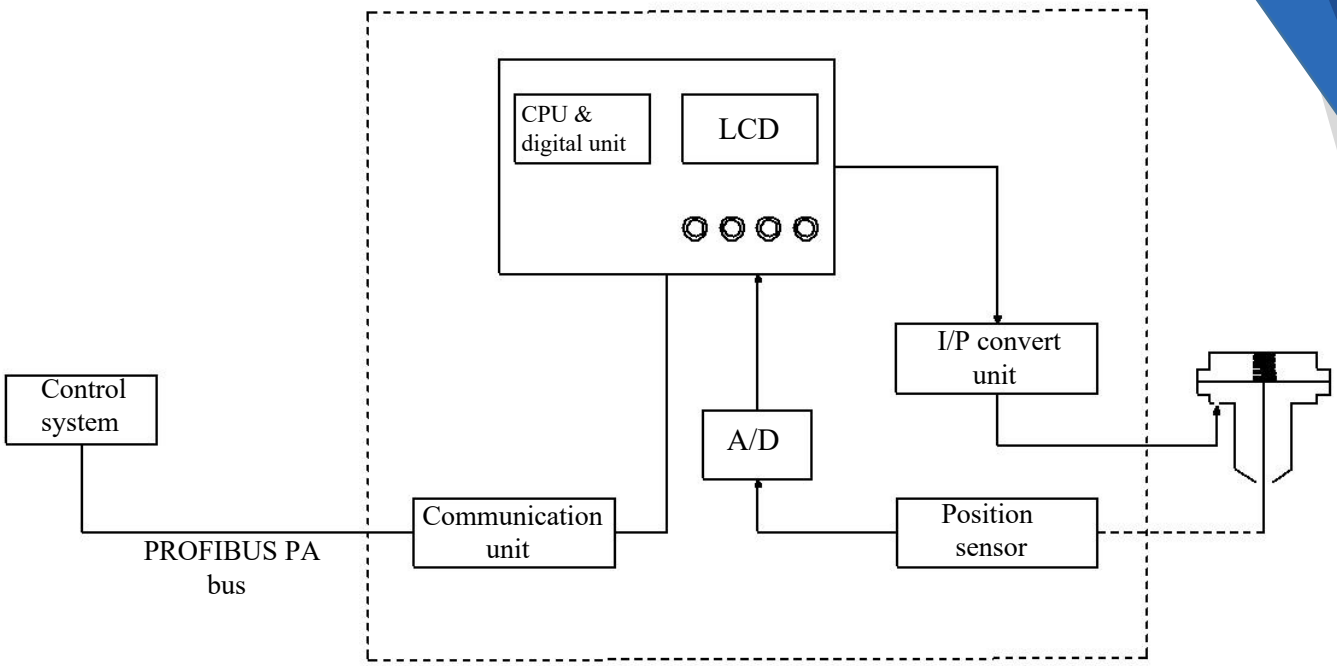


Remarks:
For the separate type of the positioner, OUT1 and OUT2 are blocked and not used.

Electrical	Description
IN+	Bus signal +
IN-	Bus signal -

Pneumatic Connection	Description
SUP	Air supply enter
OUT1	Pilot air outlet 1
OUT2	Pilot air outlet 2, used for double acting type.

Principle Block Diagram



Additional Software Functions

- Safe position setting.
- Dead band setting.
- Tight closing function
- Stroke limit function
- Setting and selection of characteristic curves
- Set-point value direction setting.
- Movement direction setting of displayed set value and position value
- Reset function

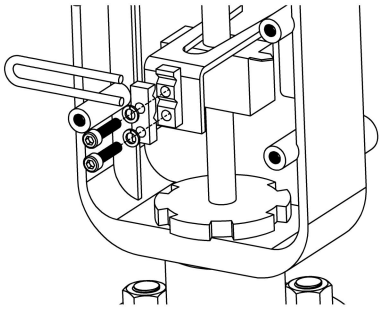
Advantages

The IP6500 series intelligent valve positioner uses a microprocessor and a new type of piezo valve to replace the nozzle and baffle pressure regulating system in the traditional positioner to realize the regulation and control of the output pressure. The positioner communicates with the control system via the PROFIBUS PA bus instead of the traditional 4-20mA signal to set the valve opening. Suitable for use in Eex applications in intrinsically safe areas. The piezo valve can release a short control pulse due to its small mass, thereby achieving high precision, and the piezo valve consumes air only when the valve is deviated and performing adjustment actions, so there is a low consumption.

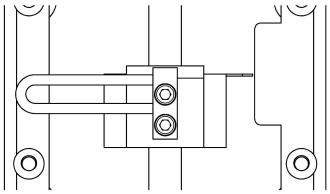
7 Mounting components

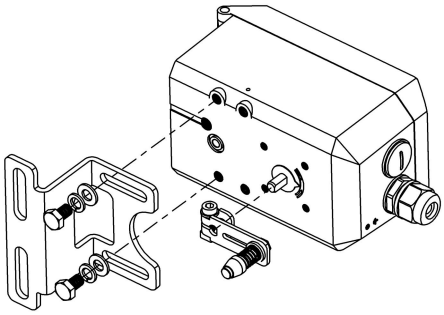
Linear actuator mounting components:

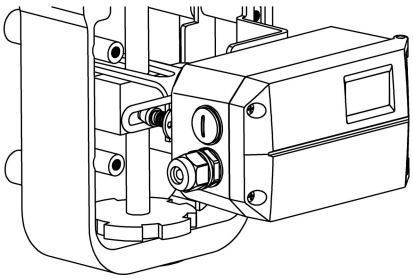
1. U-shaped rod*1
2. Clamping assembly*1
3. M6 hexagon socket screw*2
4. M6 spring washer*2
5. Feedback lever*1
6. M6 hexagon socket bolt*1
7. Linear stroke mounting bracket*1
8. M8 hexagon head bolt*2
9. M8 spring washer*2
10. M8 flat washer*2
11. Driving pin for feedback lever B*1



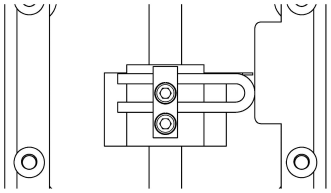
U-shaped rod installation

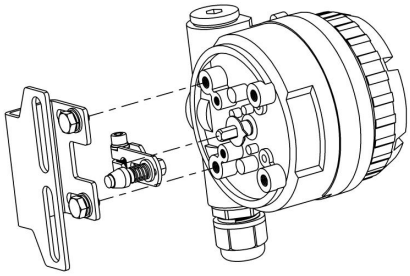


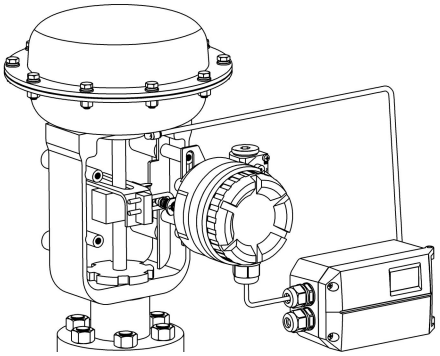




Linear stroke normal type





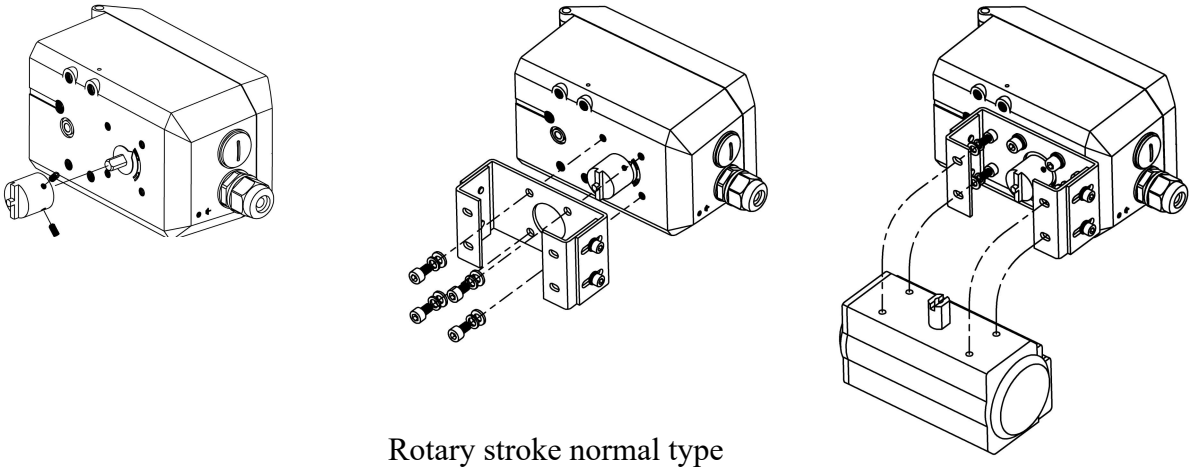


Linear stroke remote type

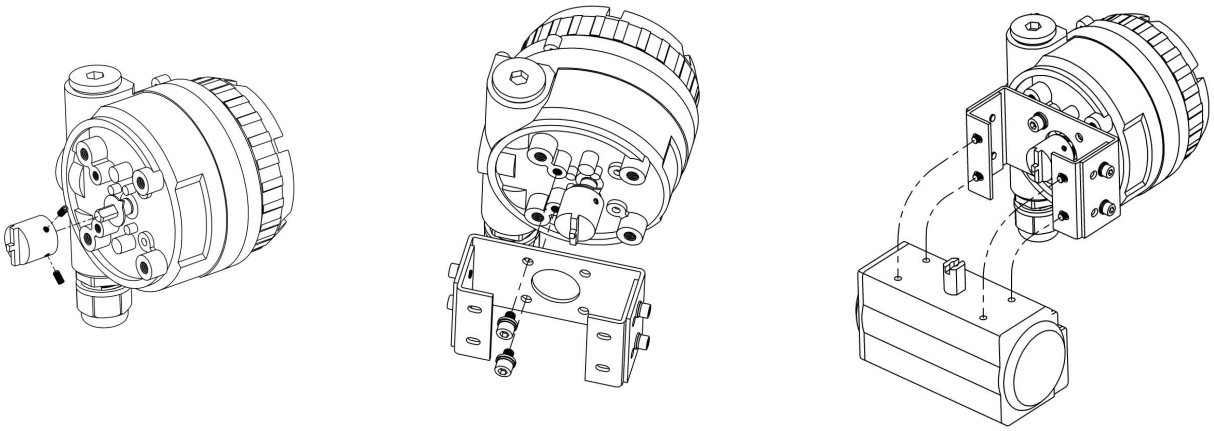
7 Mounting components

Rotary actuator mounting components:

1. Adapter*1
2. Hexagon socket set screw*2
3. Rotary stroke mounting bracket*1
4. M6 flat washer*4
5. M6 spring washer*4
6. M6 hexagon socket screw*4
7. M5 hexagon socket screw*4
8. M5 spring washer*4
9. M5 flat washer*4



Rotary stroke normal type

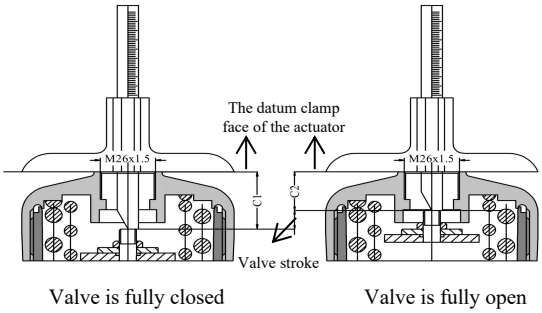


Rotary stroke remote type

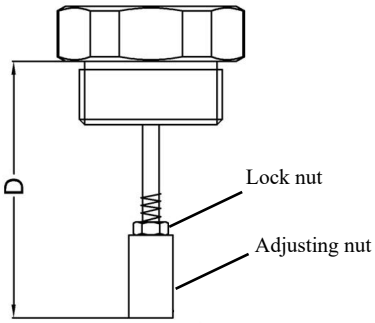
7 Mounting components

Separate type mounting components:

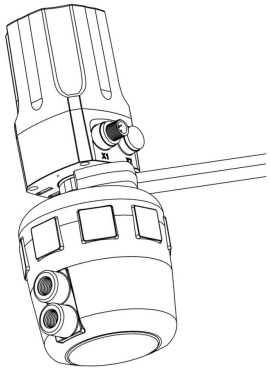
1. Sensor*1
2. Mounting plate*1
3. O-ring*2
4. Fastener*2
5. M8 hexagon head bolts*4
6. Sensor connector*1



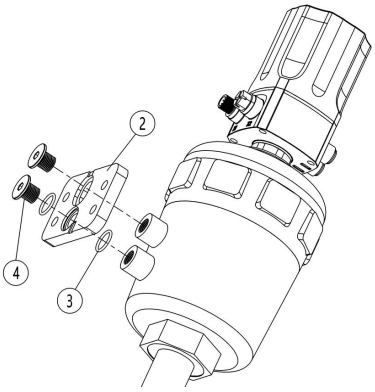
Valve is fully closed　　Valve is fully open



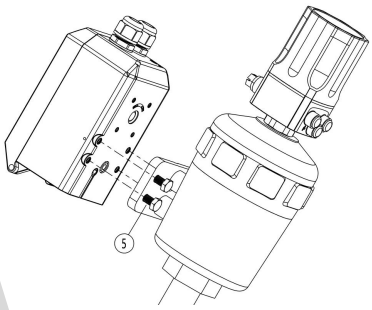
D value adjustment



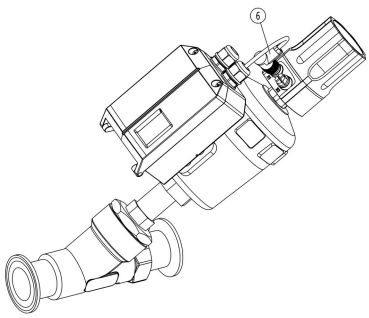
Sensor installation



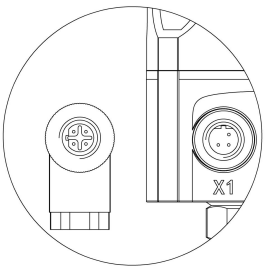
Fix the mounting plate



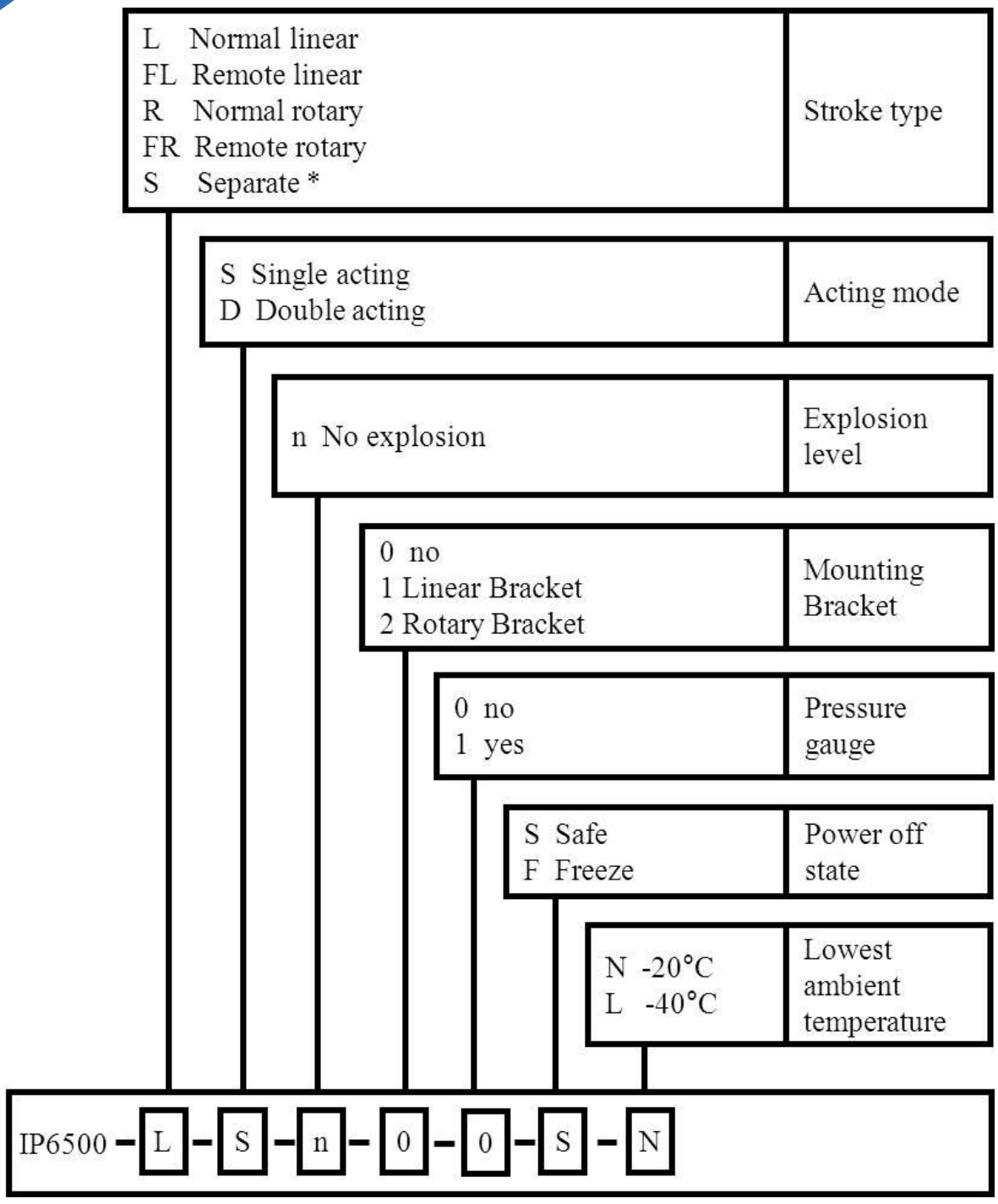
Fix the positioner



Connect the sensor



Sensor connector



Remarks:

In **Stroke type** options, the option **S(Separate)** marked with * does not support **Lowest ambient temperature** option **L(-40°C).**