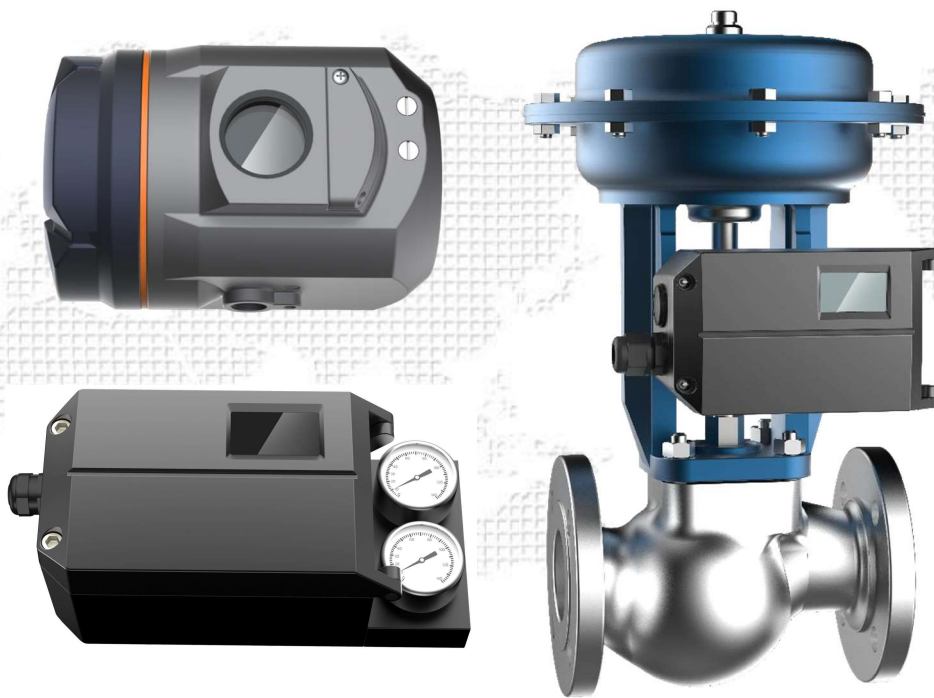


IP6000 ***GLOBAL INSTRUMENTS***

IP6000 Series Intelligent Valve Positioner Brief Introduction



GLOBAL INSTRUMENTS

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IP6000 intelligent valve positioner is mounted on pneumatic actuators. It's used to control air intake and exhaust of the pneumatic actuators to drive the valve position to the set point by calculating both data from 4-20mA DC signal and feedback position.



1 Technical Description



Ex d linear type



Ex ia linear type

- **Enclosure material**
Aluminum
- **Pressure gauge block material**
Aluminum, anodized
- **Input signal**
Input resistance: 120Ω
Limit voltage: 28V
- **Output signal**
Feedback type: 2-wire 4~20mA signal,
internal resistance 120Ω
- **Digital communication protocol**
HART 7
- **Minimum operating current**
3.8mA
- **Steady state air consumption**
≤ 0.4 L/min

- **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**

Auxiliary power (air supply): compressed air, carbon dioxide, nitrogen, inert gas, clean natural gas
 Air quality meets ISO 8573-1 standard
 Pressure range: 1.4~7bar(20.3~101.5psi)
 Solid particle size and density: Grade 3
 Pressure dew point: Class 3 (minimum 20K (36° F) lower than the ambient temperature)
 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
 The value of the flameproof type (IP6000d) is reduced by about 20%

- **Electrical connection**

M20×1.5

- **Pneumtical connection**

G1/4

- **Protection class**

IP66

- **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

- **Basic error & Hysteresis error**

Basic error: ≤ 1%
 Hysteresis error: ≤ 1%

- **Ambient temperature**

Default type: -20°C ~ +70°C
 Low temperature type: -40°C ~ +70°C
 Highest explosion proof temperature of Ex ia type for T4 area is +60°C
 Highest explosion proof temperature of Ex ia type for T4 area is +60°C
 Ex d default type: -20 °C ~ +60 °C
 Ex d low temperature type : -40 °C ~ +60 °C



Ex ia type



Technical Description

● Explosion-proof grade and applicable zone

Intrinsically safe: Ex ia IIC T4/T6 Ga
 Apply to Zone 0, Zone 1, Zone 2
 Flameproof: Ex d IIC T6 Gb
 Apply to Zone 1, Zone 2



Ex d type

Intrinsically safe type electrical parameters

Circuit name	Max input voltage U _i (v)	Max input current I _i (mA)	Max input power P _i (W)	Max internal equivalent parameters	
				C _I (nF)	L _I (mH)
4~20 mA Input	28	93	0.66	≈ 0	≈ 0
4~20 mA Output	28	93	0.66	≈ 0	≈ 0

Summary of electromagnetic compatibility results

Object	Description	Standard	Test level	Result
Ex ia type	Electrostatic discharge immunity	GB/T 17626.2	±4kV 触点 ±8Kv 空气	Pass
Ex ia type	Radio frequency electromagnetic field radiation immunity	GB/T 17626.3	3V/m, 80%AM (1kHz), 80MHz~1000MHz	Pass
Ex ia type	Power frequency magnetic field immunity	GB/T 17626.8	50Hz, 100A/m	Pass
Ex ia type	Electrical fast transient pulse group immunity	GB/T 17626.4	±1.0 kV	Pass
Ex d type	Radio frequency electromagnetic field radiation immunity	GB/T 17626.3	10V/m, 80%AM (1kHz), 80MHz~1000MHz	Pass

● Rated conditions-height

2000m above sea level.
 At locations above 2000m above sea level, please use a suitable power supply.

● Rated conditions-installation position

Anywhere. In a humid environment, the pneumatic connector and exhaust port are not facing upwards, please install correctly

● Position feedback module

For position feedback DC output, 2-wire connection

Current output	Terminals OUT1 and OUT2
Output rated signal range	4~20mA, short-circuit proof
Dynamic Range	3.8~20.5mA
External load R_B [k Ω]	$\leq (U_{Aux}[v]-12v)I$ [mA]
Transmission error	$\leq 0.5\%$
Temperature effect	$\leq 0.1\%/10K$ ($\leq 0.1\%/18^\circ F$)
Resolution	$\leq 0.1\%$
Effective internal capacitance	C_i =Approximately 0
Effective internal inductance	L_i =Approximately 0



Ex d rotary type



Ex ia separate type



Ex ia default rotary type



Ex ia 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-free 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
- On-site calibration of 4-20mA input signal can be performed
- Can use pure natural gas or other inert gas as air supply



Applications

IP6000 positioner application industry :

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

IP6000 positioner application form :

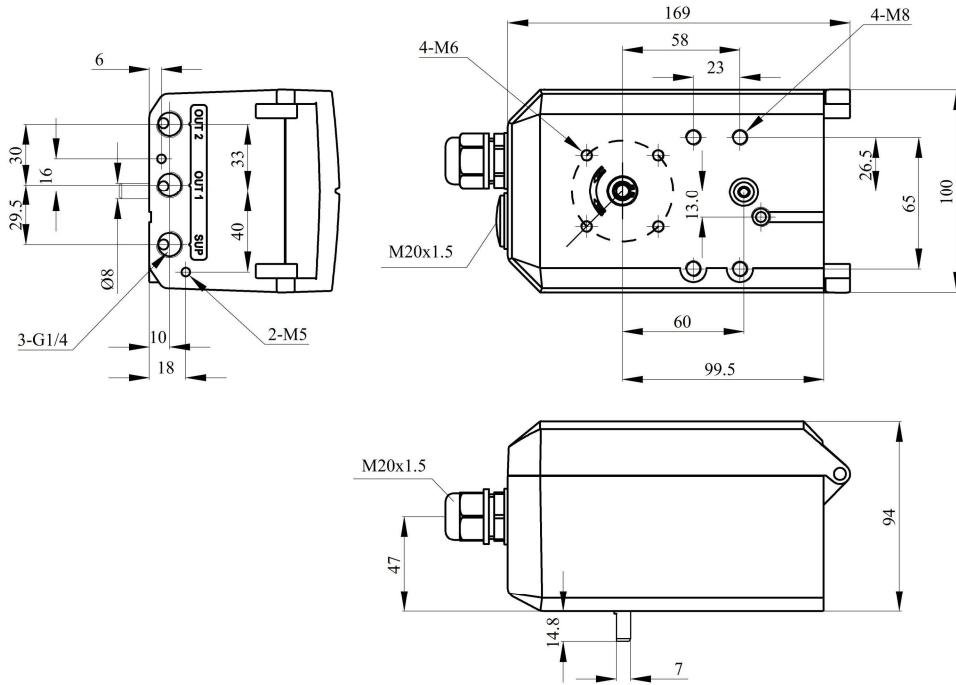
- For single/double acting actuators: aluminum enclosure and flameproof aluminum enclosure
- Used in non-hazardous locations
- Types used in hazardous locations: Intrinsically safe explosion-proof type "Ex ia"
Flameproof type "Ex d", aluminum flameproof enclosure



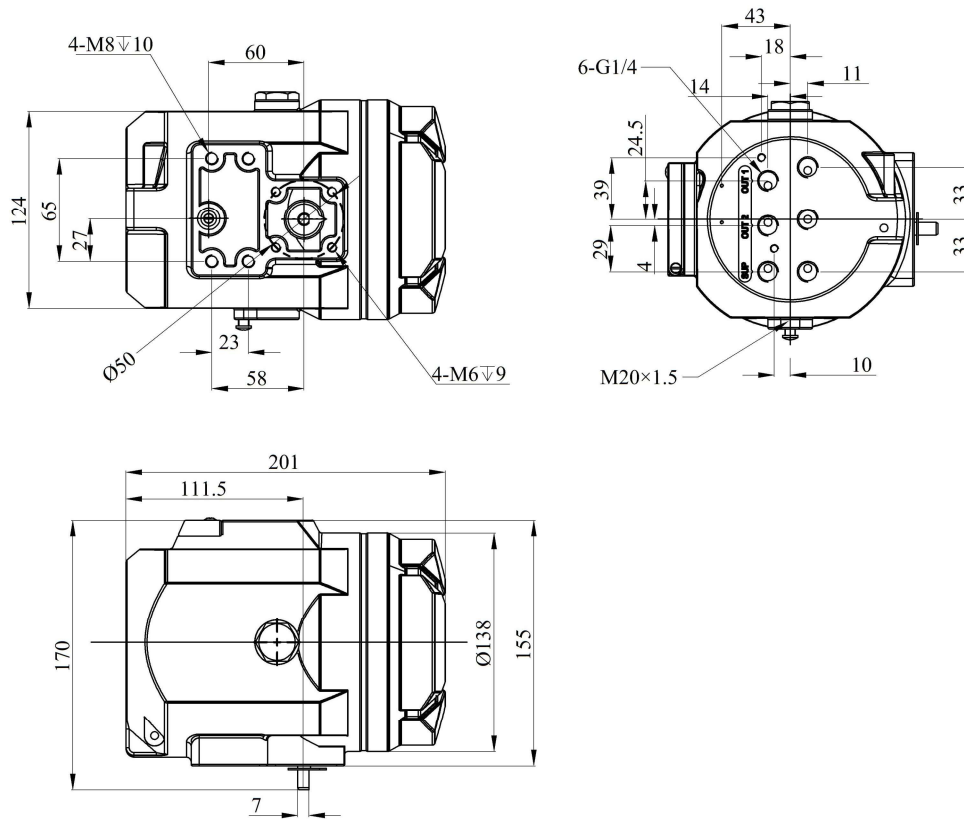
Ex ia remote linear type

3

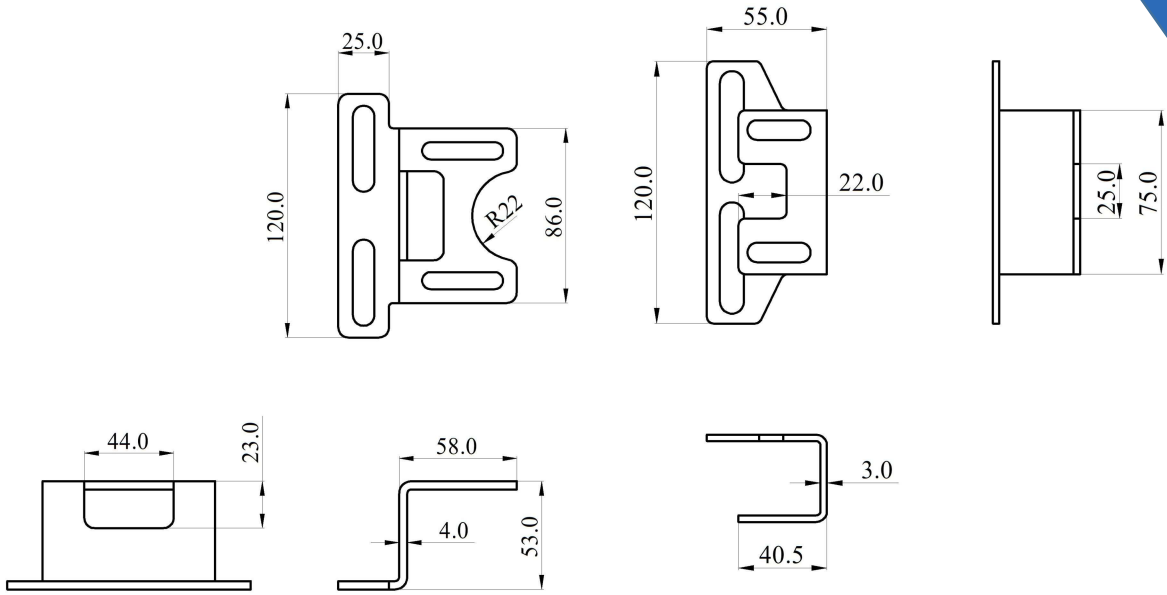
Mechanical Dimensions



Ex ia type mechanical dimensions

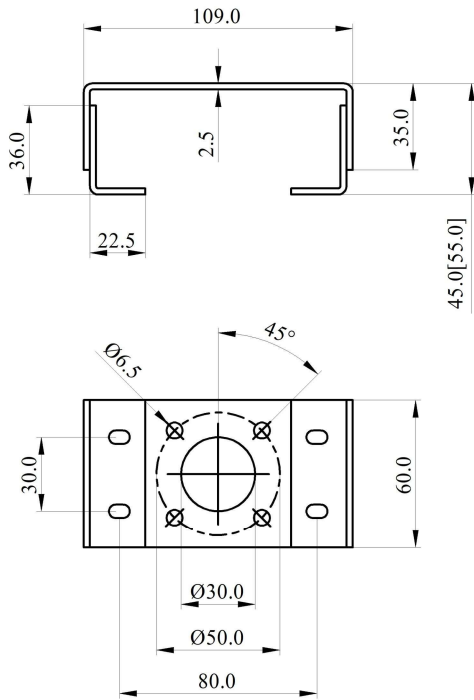


Ex d type mechanical dimensions

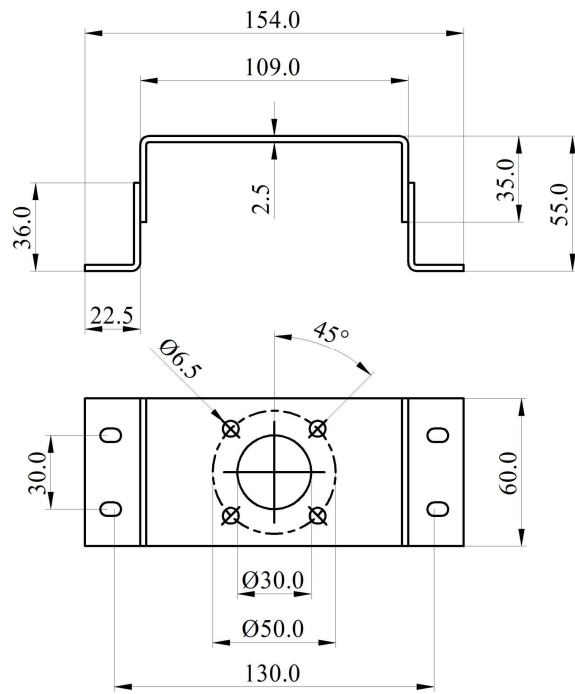


Linear mounting bracket

Remote type linear mounting bracket

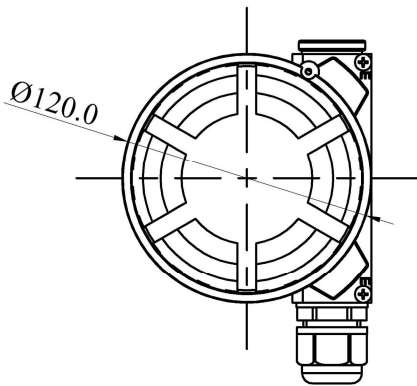
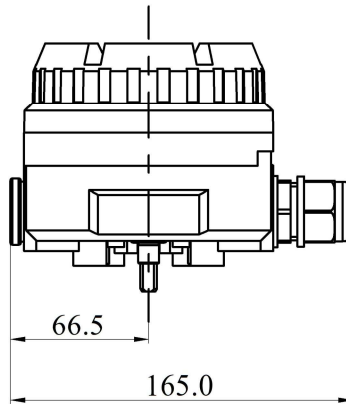
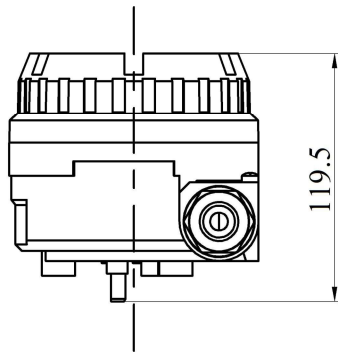
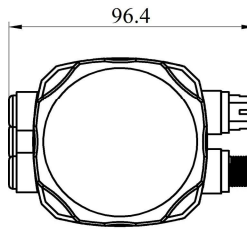
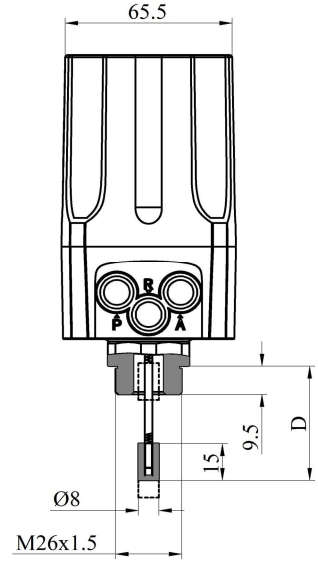
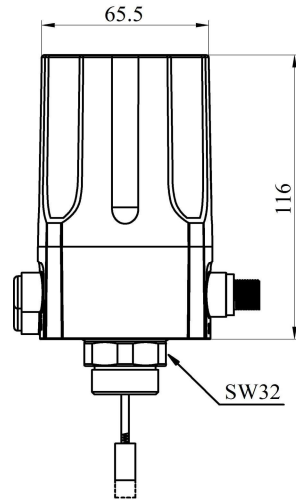


Rotary mounting bracket (Form 1)



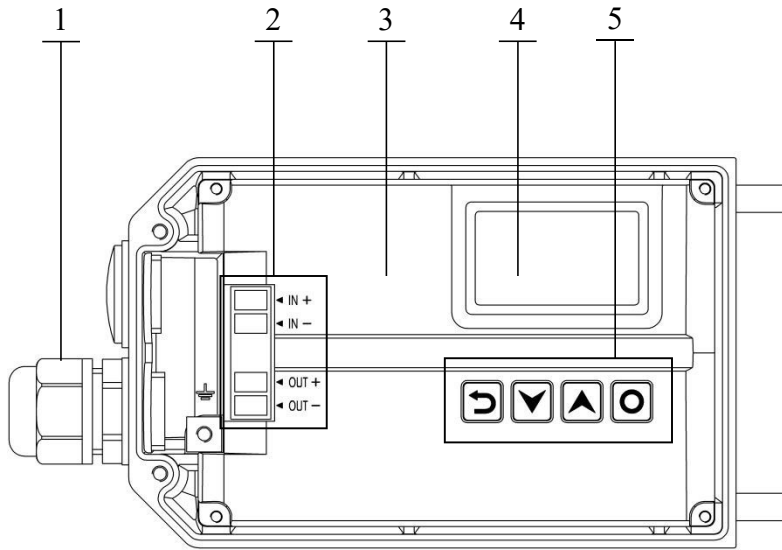
Rotary mounting bracket (Form 2)

Dimensions of separate type sensor



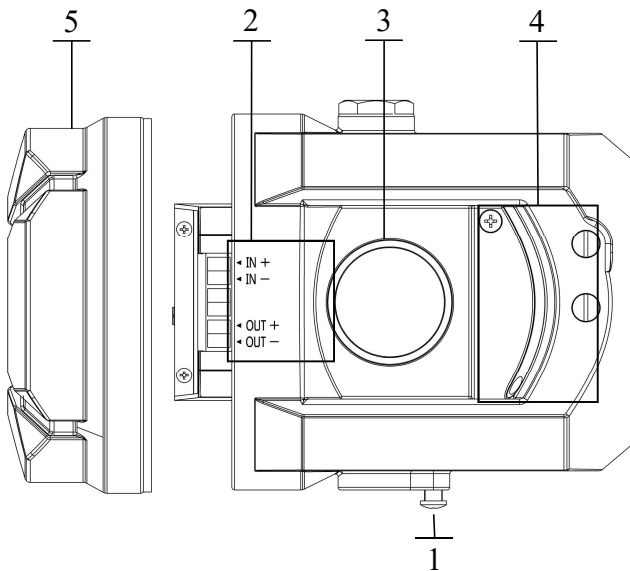
Dimensions of remote type sensor

4 Structure



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

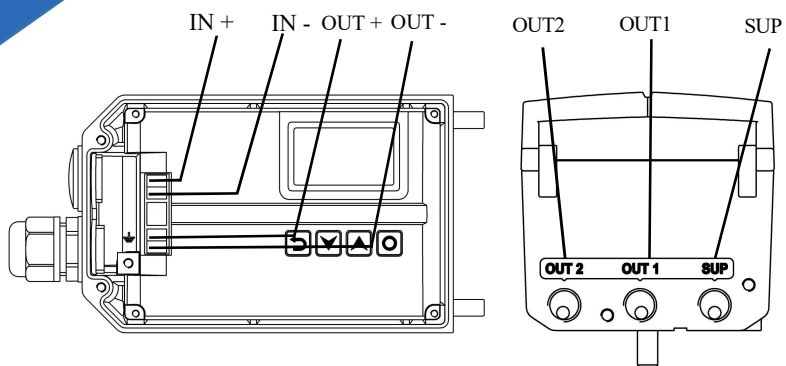
Ex ia positioner structure



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

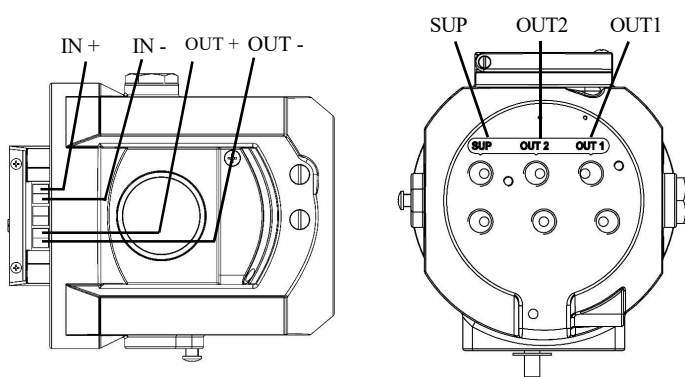
Ex d positioner structure

5 Electrical & pneumatic connections, wiring diagram



Ex ia type

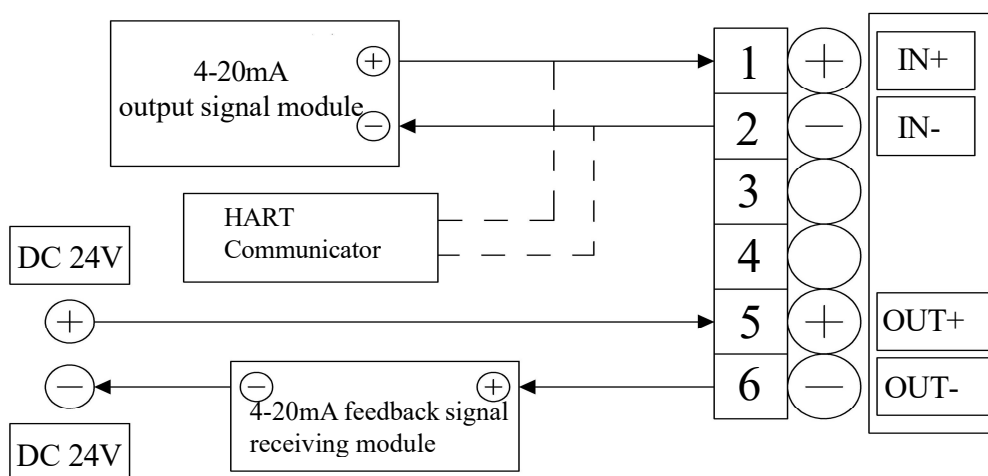
Pneumatical	Description
SUP	Air supply input
OUT1	Pilot air outlet 1
OUT2	Pilot air outlet 2

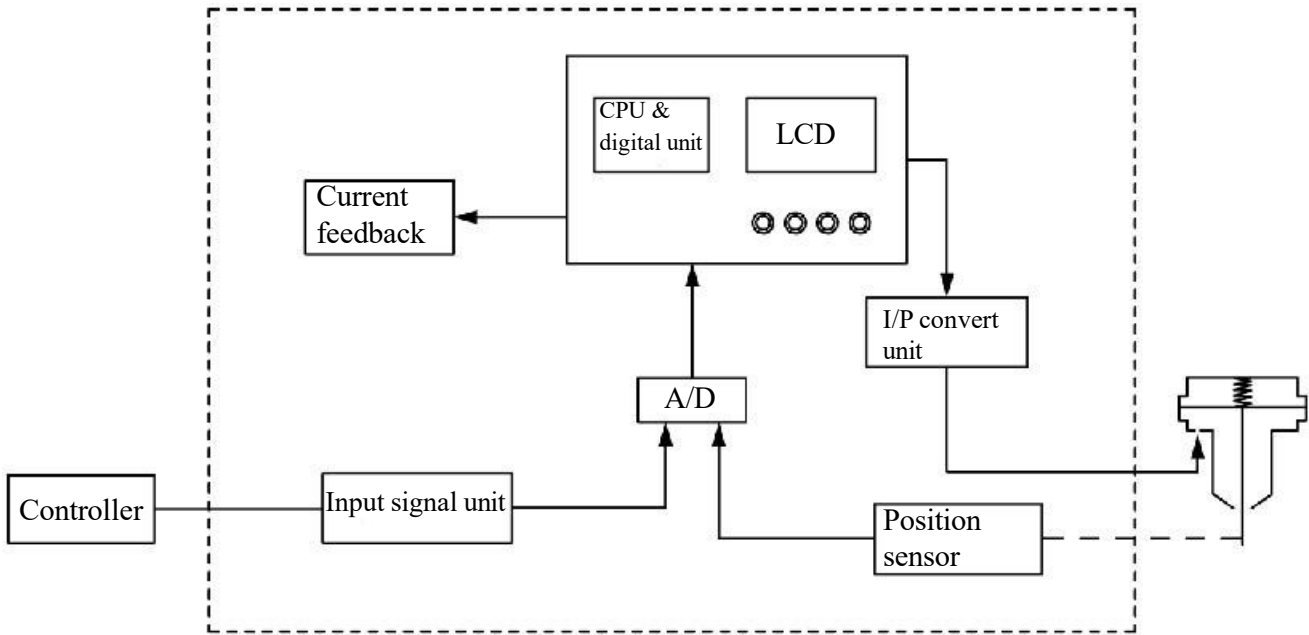


Ex d type

Electrical	Description
IN+	4-20 mA input signal +
IN-	4-20 mA input signal -
OUT+	Feedback signal module 18-30 V DC +
OUT-	Feedback signal module 4-20mA output

Wiring diagram





Additional Software Functions

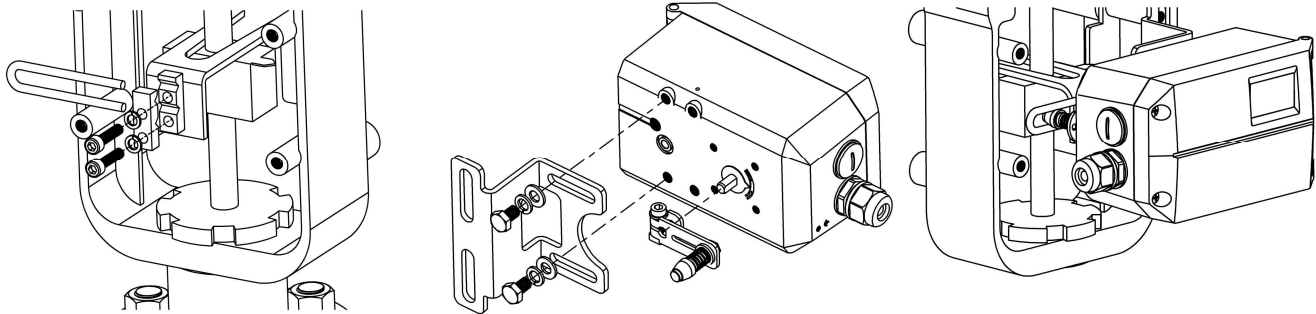
- Calibrating the input signal.
- Setting and selection of characteristic curves
- Calibrating the set-point signal.
- Selection of signal direction.
- Tight closing function
- Selection of stroke direction.
- Stroke limit function
- Reset function

Advantages

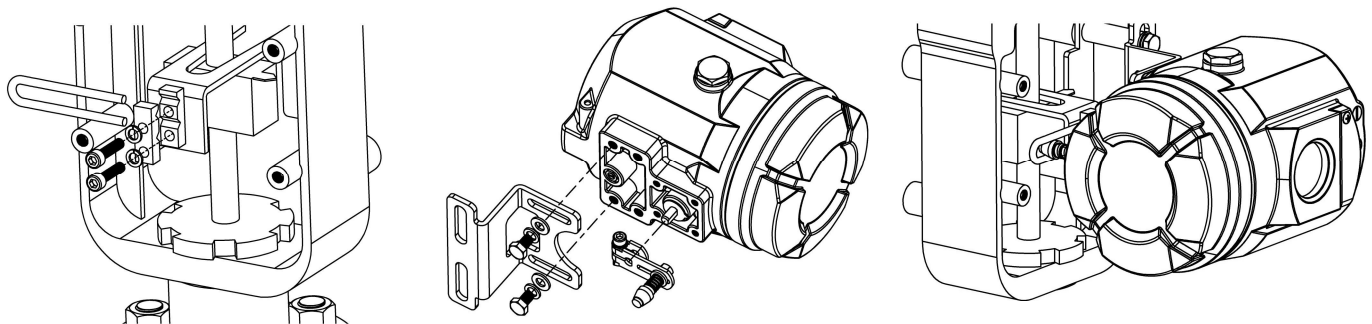
The IP6000 series intelligent valve positioner uses a microprocessor and a new type of piezo valve to replace the nozzle and baffle pressure regulating system in the traditional positioner to realize the regulation and control of the output pressure. The control of the input signal of the valve opening and the feedback signal of the valve position is realized by CPU calculation processing. 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.

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 mounting bracket*1
8. M8 hexagon head bolt*2
9. M8 spring washer*2
10. M8 flat washer*2



Ex ia linear type

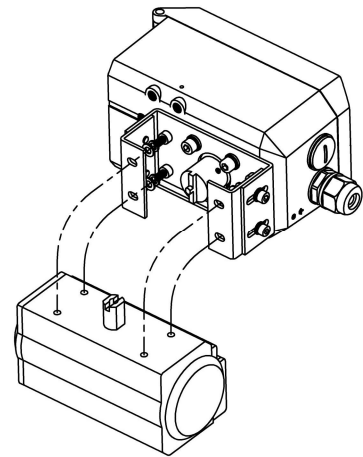
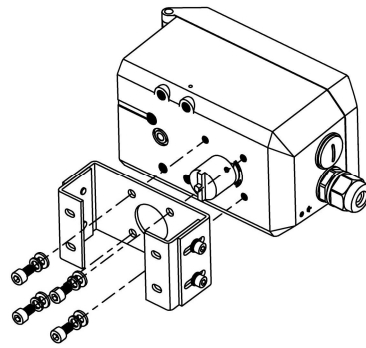
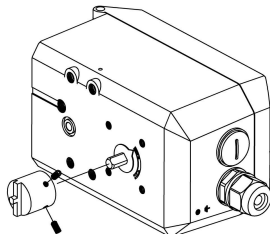


Ex d linear type

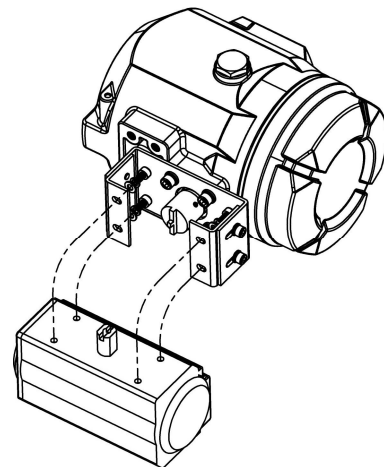
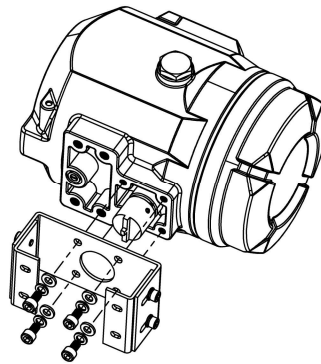
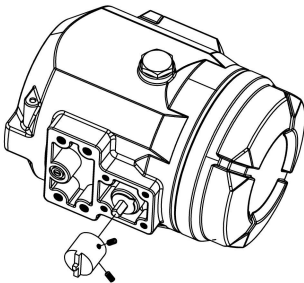
7 Mounting components

Linear actuator mounting components:

1. Adapter*1
2. Hexagon socket set screw*4
3. Rotary 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

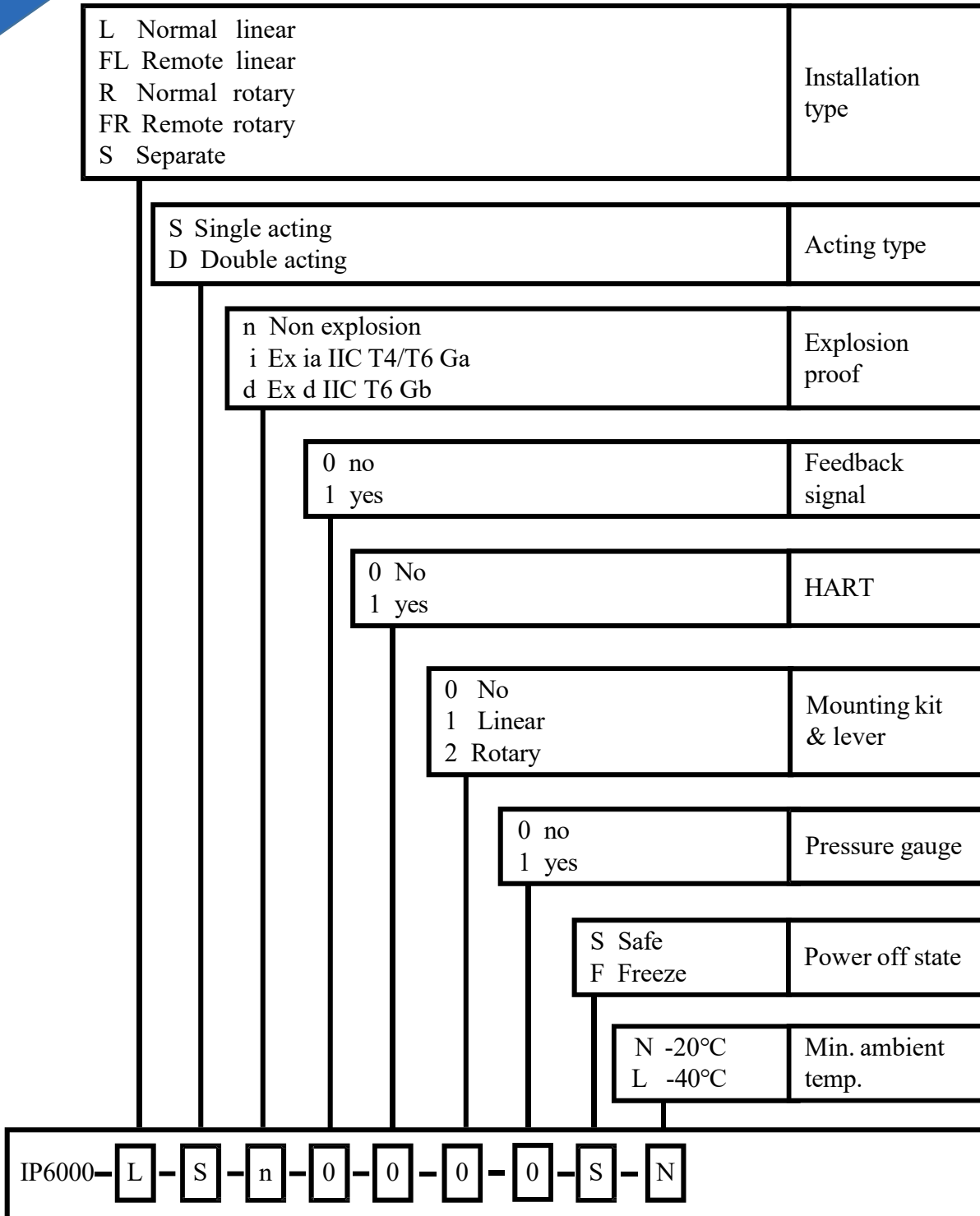


Ex ia rotary type



Ex d rotary type

8 Selection and Ordering



Remarks: In the installation type options, the options marked with * (FL, FR and S) do NOT support explosion proof option d (Ex d IIC T6 Gb). * marked option S (separate type) does NOT support the Min. ambient temperature option L (-40°C).