DATASHEET

Intelligent Valve Positioner APV400

- Adaptive predictive control algorithm for faster response and more precise control.
- Automatic detection of valve lower and upper limits, optimizing valve control parameters to enhance accuracy.
- Dot matrix LCD display with multi-language support, rotatable by 180° for easy observation. Equipped with four configuration buttons for local valve control and settings adjustments.
- Supporting parameter configuration for split range, characteristic curves, stroke range and direction, tight closure, dead zone, control parameters, digital input, alarm and fault outputs, and more.
- Diagnostic capabilities include leakage detection, partial stroke testing, upper and lower limit monitoring, pressure and temperature diagnostics, stroke accumulation, directional change counts, and piezoelectric operation monitoring.
- IDM software allows setup and calibration of valve accessories, with status monitoring and alarm tracking.
- Compatible with HART 5 and HART 7 communication protocols.
- Including one isolated digital input and two dry contact inputs.
- Digital output with electric isolation provides alarm or fault notifications.
- Electrically isolated position feedback block outputs 4 to 20mA position feedback.
- Optional “fail last” function ensures operational stability during power, gas, or signal failure.
- Equipped with surge protection for enhanced reliability.

Intelligence For Excellence

HollySys

Contents

Specifications and Parameters

Input Signal

- Type: piezoelectric
- Actuation Type: Single acting, double acting, linear stroke, rotary stroke
- Stroke Range: Linear stroke 10 to 130 mm, rotary stroke 30° to 100°
- Input Signal: Two-wire system 4 to 20 mA DC
- Load Impedance: 455Ω (without HART), 495Ω (with HART)
- Flow Characteristic: Linear/equal percentage/inverse percentage/user-defined
- Communication: HART (optional)

Pneumatic Parameters

- Air Supply: 1.5 to 8.0 bar, compressed air quality according to ISO 8573-1, required filter level 4, oil content level 4, dew point level 4 (at least 10K lower than ambient temperature). The air shouldn't include obvious corrosive gases, vapors, or oils.
- Output Pressure: Minimum 0 bar, the maximum is air supply pressure.
- Rated Flow Rate: Input ≥ 130 L/min (@ 25 °C) 6 to 5 bar, exhaust ≥ 240 L/min (@ 25 °C) 6 to 5 bar
- Chamber Leakage: ≤ 0.05 L/min (@ 25 °C) 6 to 0 bar
- Air Consumption in Stabilization: ≤ 0.4 l / min (@ 25 °C)

Accuracy

- Dead Zone: Automatic, 0.1 to 10.0% FS adjustable
- Intrinsic Error: 0.5% FS
- Hysteresis: 0.5% FS
- Repeatability: 0.2% FS
- Response Time: 20 ms

Display and Interface

- LCD Display: Matrix LCD display with Chinese and English language options, rotatable up to 180° for easy viewing
- Display Contents: Shows valve opening, input current, set value, operation mode, and diagnostic status, with four selectable display themes
- Pressure Gauge: Available with 2 or 3 pressure gauges to display inlet and outlet pressures
- Automatic Initialization: Automatically sets valve lower and upper limits, minimum control pulses, and optimizes control parameters

- Diagnostic: Provides leakage detection, partial stroke test, upper and lower limit monitoring, pressure and temperature monitoring, stroke accumulation, directional change count, and piezoelectric operation count
- Local Operation: 4 local configuration buttons for easy valve control and configuration adjustments

Environmental Parameters

- Ambient Temperature: T4: -30°C to +80°C, T5: -30°C to +65°C, T6: -30°C to +50°C (low temperature -40°C for option)
- Ambient Humidity: 5% to 95%
- Vibration Effect: The APV400 valve positioner is tested to the following specifications with no effect on performance

Frequency	Vibration
10 to 60 Hz	0.15 mm displacement
60 to 500 Hz	20 m/s 2 peak acceleration

Explosion-proof

- Protection Grade: IP66
- Explosion-proof: Ex ia II C T4.. . T6 Ga, Ex db II C T4 · · · T6 Gb

Connection

- Air Connection: 1/4 NPT F
- Electrical Connection: 2 × M20 × 1.5 F, 1/2 NPT F

Digital Input 1

- Functionality: Configuration lock, configuration and manual lock, partial stroke test, controlling the valve to the start of stroke adjustment, controlling the valve to the end of stroke adjustment, and prohibiting the valve from moving
- Electrical Parameters: Only applicable to floating contacts, contact load 3 VDC 10 μA

  Status 0: Disconnected

  Status 1: Short circuit

Digital Input 2

- Functionality: Partial stroke test, controlling the valve to the start of stroke adjustment, controlling the valve to the end of stroke adjustment and prohibiting the valve from moving
- Electrical Parameters:

  Terminal X202 (23+, 24-) electrical isolation, input voltage range < 25V DC

  Status 0: Input voltage ≤ 4.5 V or open-circuit

  Status 1: Input voltage ≥ 13V

  Terminal X203 (25+, 26-) for floating contacts only, contact load 3 VDC 10μA

  Status 0: Disconnected

  Status 1: Short Circuit

Alarm Output

- Functionality: alarm threshold 1 and alarm threshold 2 are settable, low alarm “MIN MAX”, “MIN MIN” or “MAX MAX” are optional; High alarm “-MIN-MAX”, “-MIN-MIN” or “-MAX-MAX” or turn off alarm and other alarm output modes.
- Electrical Parameters: 2 alarm outputs, electrical isolation, input voltage≤10.5 V DC

  Signal Status: low, ≤ 1.2 mA

  Signal Status: High, ≥ 2.1 mA

  Auxiliary Power Supply: The switching threshold of the power supply meets requirements of EN 60947-5-6, UAux = 8.2 V, R ii = 1 kΩ

Fault Output

- Functionality: Low fault parameters “Fault” “FNA” and “FNAB”, high fault parameters “-Fault”, “FNA” and “FNAB” output are optional
- Electrical Parameters: 1 way fault output, electrical isolation, input voltage ≤ 10.5 VDC

  Signal Status: low, ≤ 1.2 mA

  Signal Status: high, ≥ 2.1 mA

  Auxiliary power supply: The switching threshold of the power supply meets requirements of EN 60947-5-6,UAux = 8.2 V,Ri = 1 kΩ

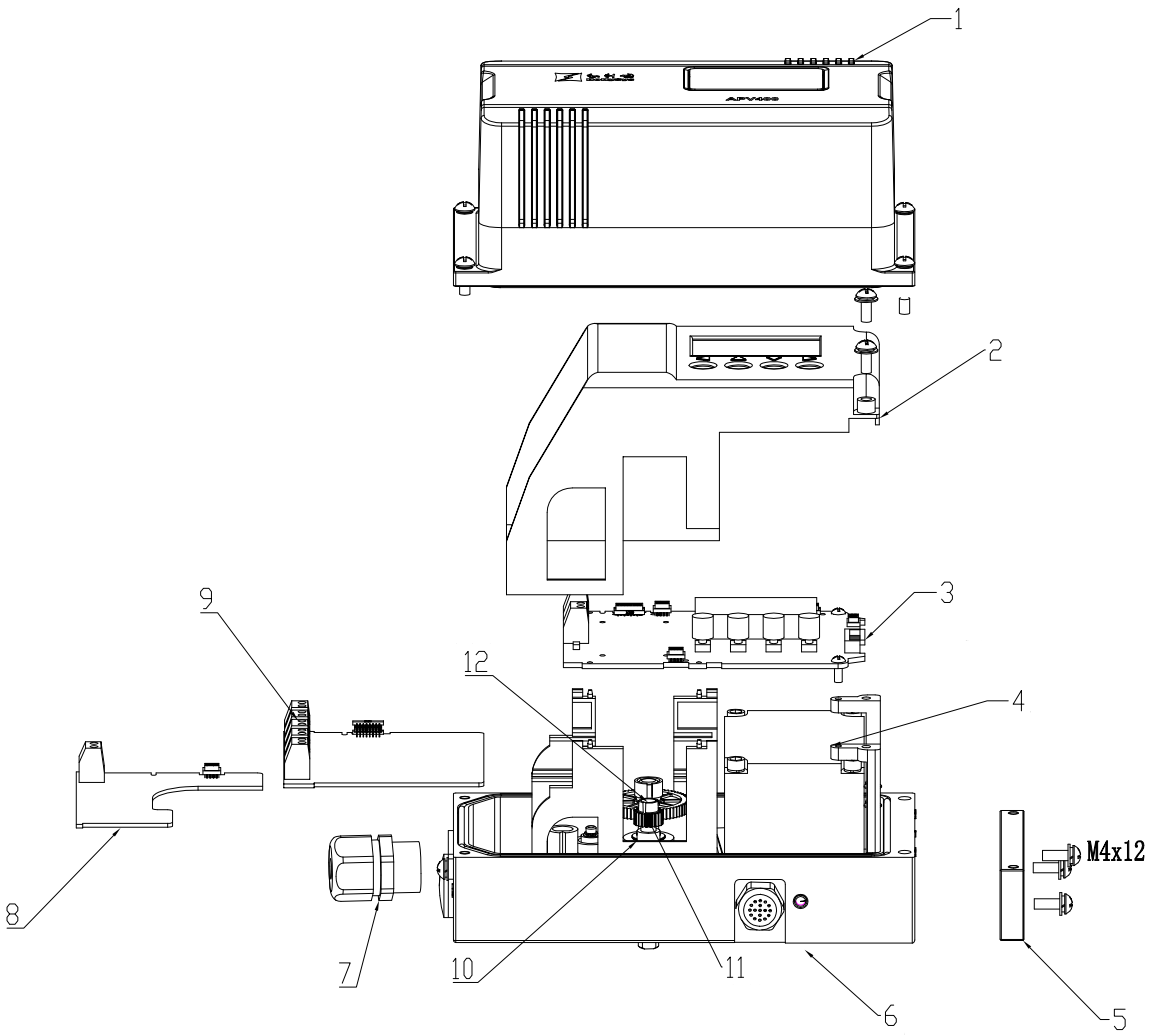
Position Feedback (Optional)

- Power Supply : Auxiliary power supply UAux : 13.5 to 28V DC with reverse protection
- Output: 4 to 20mA
- Load Resistance Ω: ≤ (UAux [V]-13.5 V)/I [mA] × 1,000
- Resolution: ≤ 0.1%
- Transmission Error: ≤ 0. 3%
- Temperature Effect: ≤ 0. 1%/10℃

Pressure Measurement Module (optional)

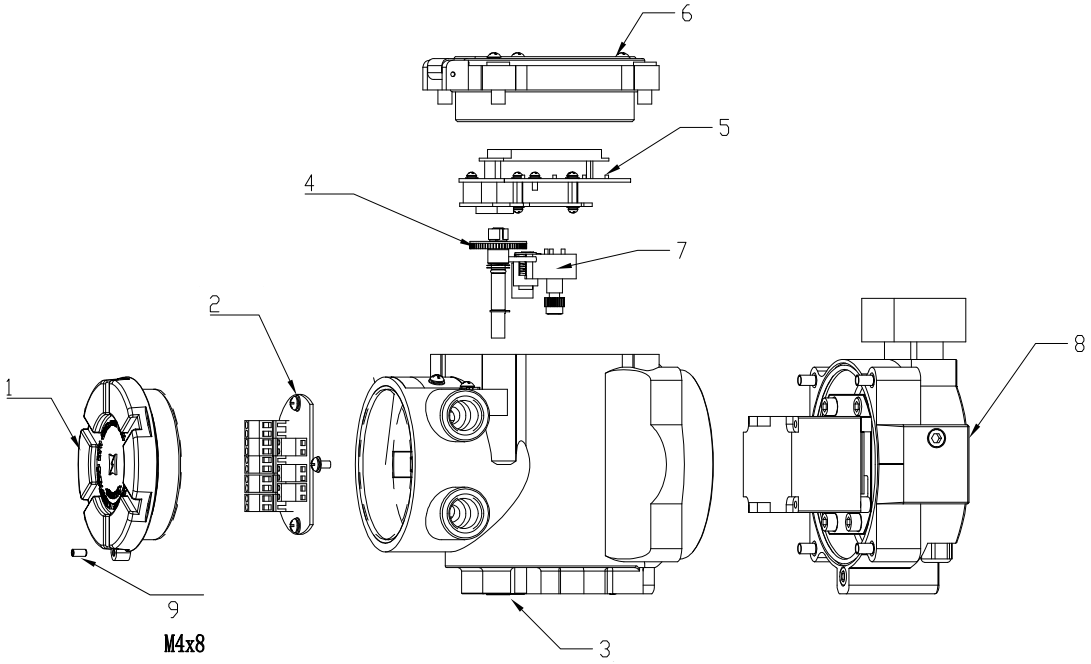
Using for measurement and diagnostic of air source pressure and driving pressure.

Assembly Drawing



Die-cast aluminum type A housing positioner internal structure

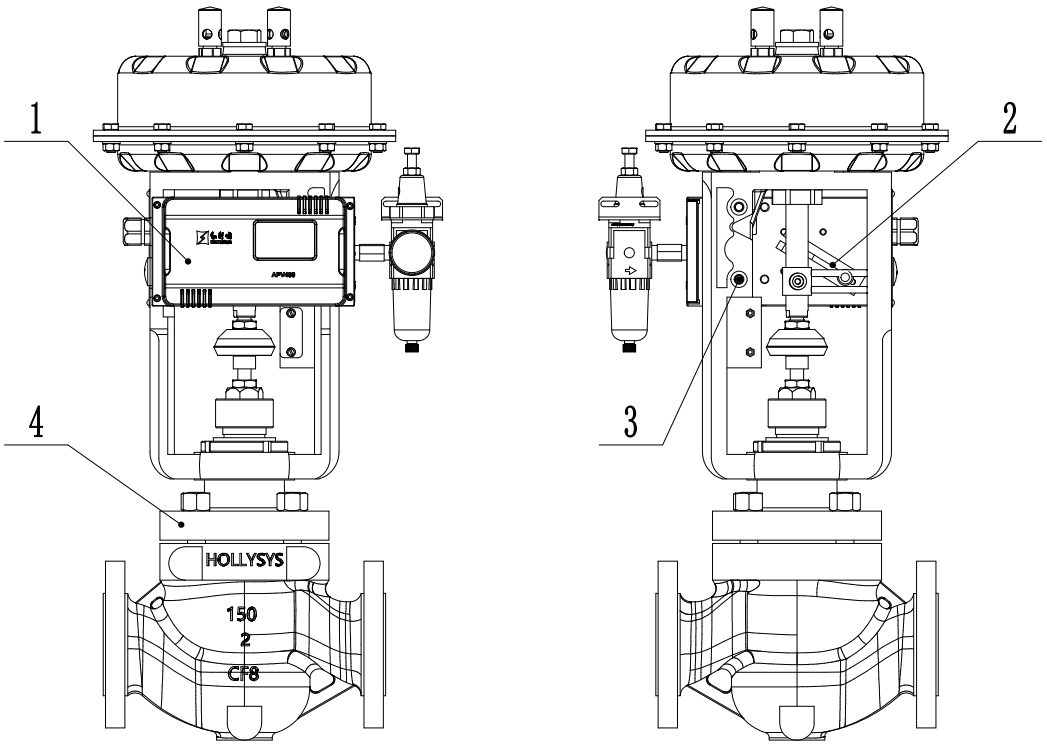
1. Positioner upper cover	2. Circuit board cover	3. Main board
4. Piezo valve	5. Air supply extension plate	6. Positioner bottom cover
7. Cable connector	8. Feedback board	9. DI/DO control board
10. Position sensor	11. Gear	12. Circlip



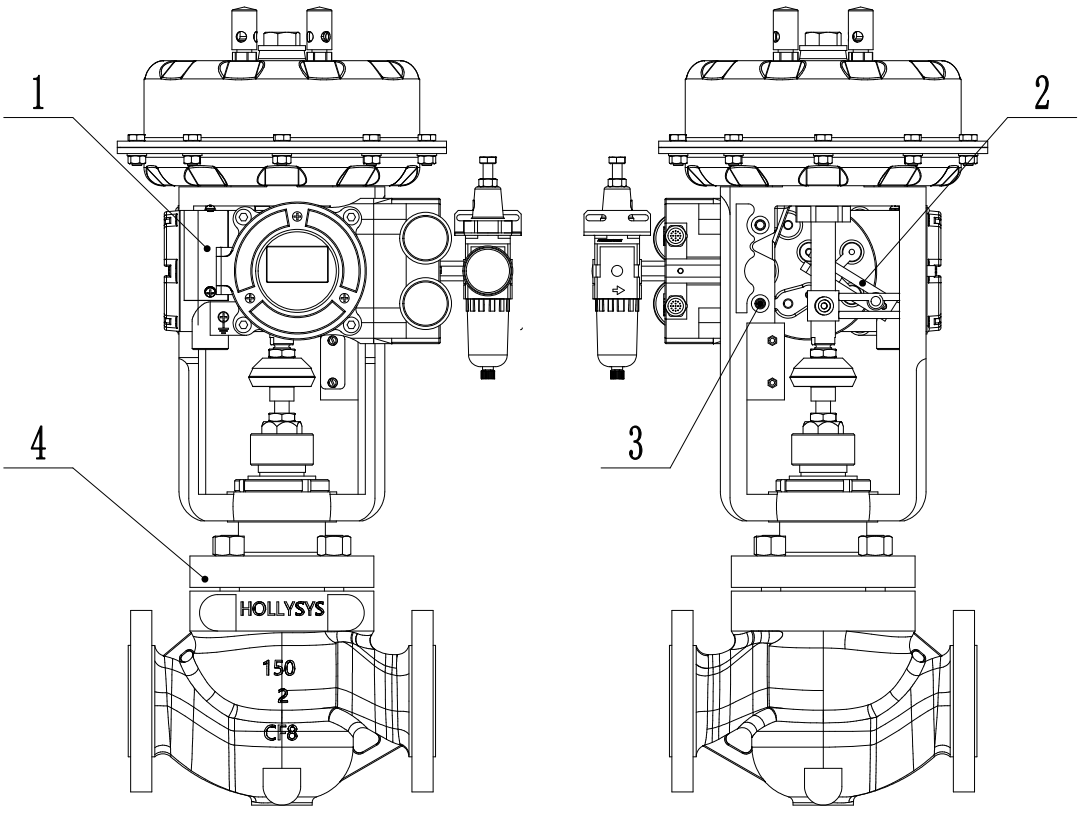
Die-cast aluminum type B housing positioner internal structure

1. Terminal cover	2. Terminal board	3. Positioner cover
4. Coupling gear	5. Main board	6. Window cover
7. Position feedback module	8. Air supply cover	9. Top screw

Installation Components



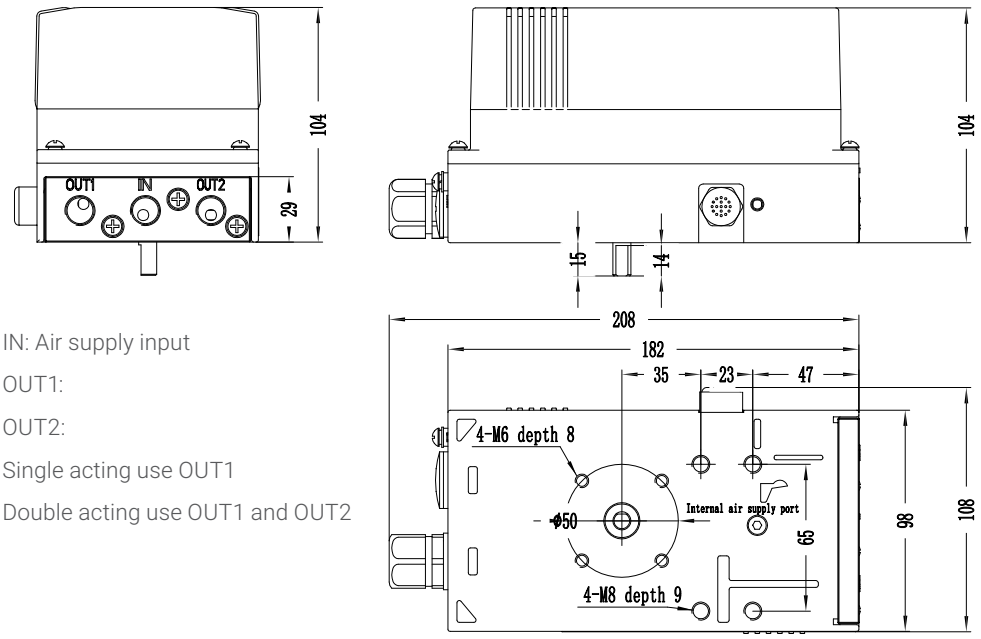
Intrinsically Safe



Flameproof

1. Positioner 2. Feedback rod 3. Screw M8 4. Inner air supply actuator (with U-shaped rod)

Dimensional Drawing



IN: Air supply input

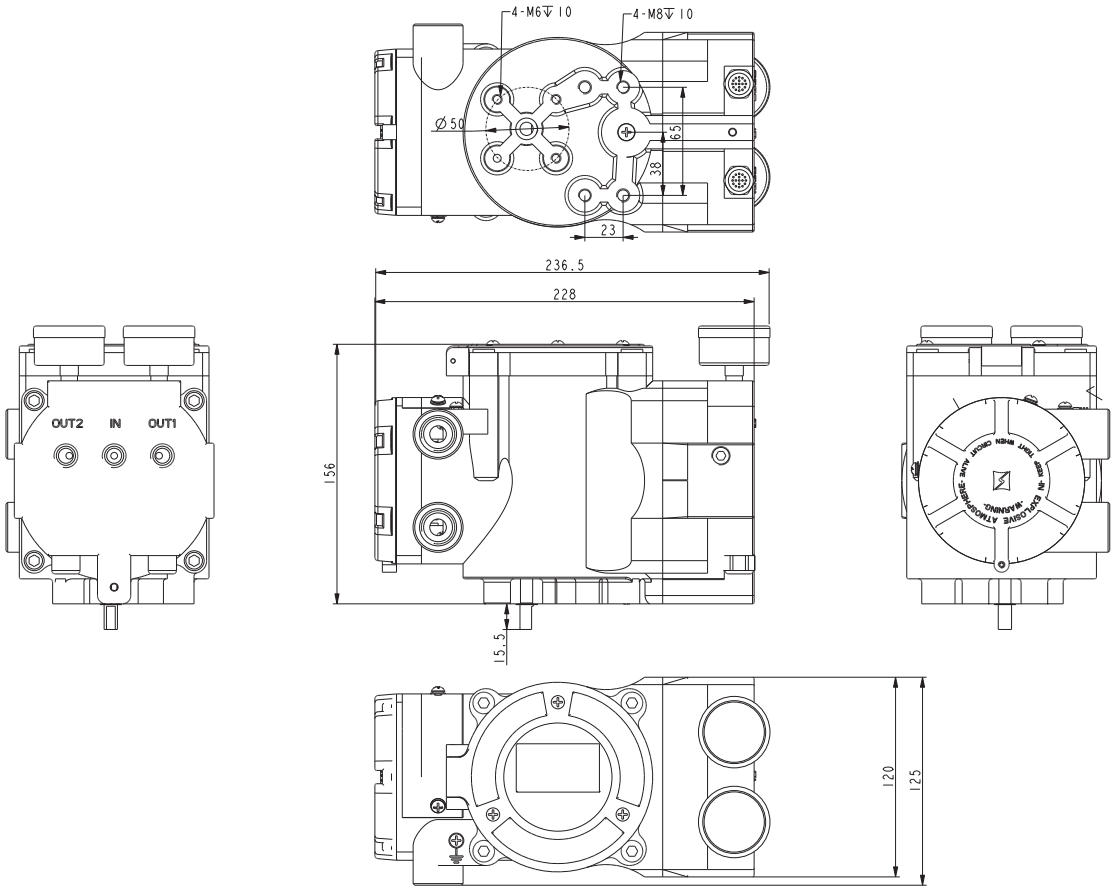
OUT1:

OUT2:

Single acting use OUT1

Double acting use OUT1 and OUT2

Die-cast aluminum A shell installation dimensions, weight 2.0 (Kg)



Die-cast aluminum B shell installation dimensions, weight 5.0 (Kg)

Certification

NEPSI	NEPSI intrinsically safe Ex ia IIC T4 … T6 Ga Applicable standard: GB/T 3836.1-2021, GB/T 3836.4-2021
	NEPSI explosive-proof Ex db IIC T4 … T6 Gb Applicable standard: GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.31-2021
	NEPSI dust explosion prevention Ex tb IIIC T85℃ … T135℃ Db Applicable standard: GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.31-2021
CCC	China Compulsory Product Certification, NEPSI Ex ia IIC T4 … T6 Ga/Ex db IIC T4…T6 Gb/ Ex tb IIIC T85℃ … T135℃ Db
Others	Industrial automation instrument intelligent evaluation certificate Applicable standard: T/SHIIA000001-2020

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