

V-TORK®



**V-TORK**

VTM Series Electric Actuator



High Performance and High Reliability

Fully Compliant with the Latest International Standards

Wider Application Specifications and High Cost-Effectiveness

Better Industrial Design, Suitable for Various Application Environments



## Product Introduction

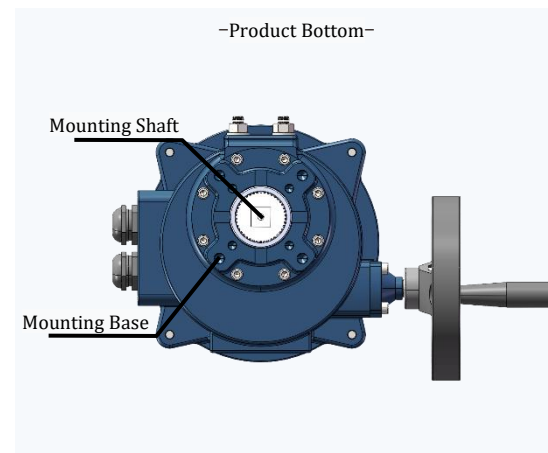
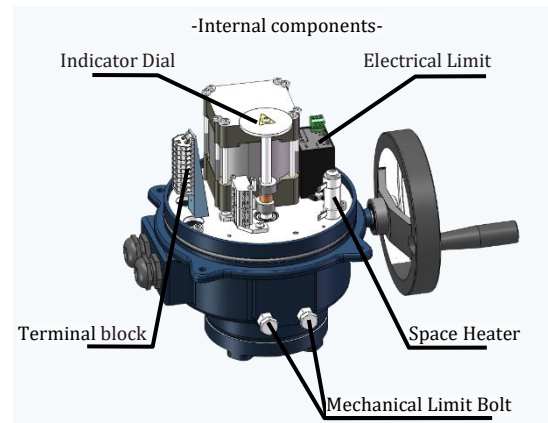
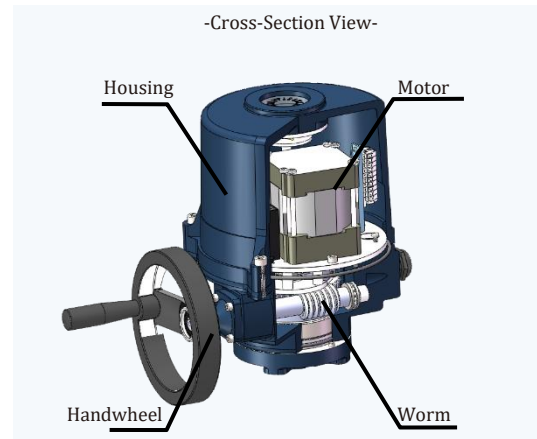
### Product Overview

The VTM Series Electric Actuator is developed based on our years of experience in the valve control field. This series features a compact design, high structural strength, light weight, and high torque (20-5000 N·m). Backed by our strong R&D and service team, we expect this product to provide high-quality solutions and after-sales services for your needs in the valve automation field.

### Product Details



<b>Housing</b>	Anodized & polyester powder-coated aluminum alloy housing: excellent corrosion resistance, for wide working conditions.
<b>Protection Class</b>	Weatherproof IP67 Explosion-Proof Certified Design Exdb IIC T6GB
<b>Motor</b>	Fully enclosed squirrel-cage induction motor with small size, high torque, and low rotational inertia; Class F insulation, and built-in overheat protection.
<b>Handwheel &amp; Worm and Wheel Gear Assembly</b>	The valve can be controlled via the handwheel in case of power failure; Internal worm gear design (no clutch) for easy and labor-saving operation.
<b>Actuator Mounting Base</b>	Designed in accordance with ISO 5211 Standard; The drive shaft adopts a spline shaft design, suitable for matching requirements of various valve stems.
<b>Limit Mode</b>	Mechanical Limiter + Electrical Limiter
<b>Limit Switch</b>	1 for stroke control, 1 for passive feedback (max. 250V 5A)
<b>Valve Position Indicator Dial</b>	Used for valve position indication, rotating synchronously with the valve.
<b>Space Heater</b>	Prevents condensation inside the actuator caused by large temperature differences, ensuring normal operation of internal electrical components(Optional).
<b>Environmental Adaptability</b>	ON/OFF Type: -20°C~+70°C (-4°F~158°F) Regulating Type: -20°C~+55°C (-4°F~131°F)
<b>Relative Humidity</b>	Max. 90% (non-condensing)
<b>Vibration Resistance</b>	XYZ 10g, 0.2~34Hz, 30 minutes



## Product Classification

### 1.VTM Electric Standard Regulating Type

Equipped with IN/OUT interfaces for receiving and feeding back valve threshold analog signals (4mA-20mA); Built-in manual control function, which can be connected by customers according to on-site needs.

The VTM Intelligent Electric Actuator Control Board (hereinafter referred to as "Control Board") is an intelligent control board integrating a multi-function servo amplifier and a position signal transmitter. There are no adjustable components on the control board; On-site debugging, sensitivity setting, manual/automatic switching and other functions are all set via the four buttons on the control board, making on-site installation and debugging fast and simple. The OLED display on the panel shows the current working status of the control board, meeting the needs of different user groups.

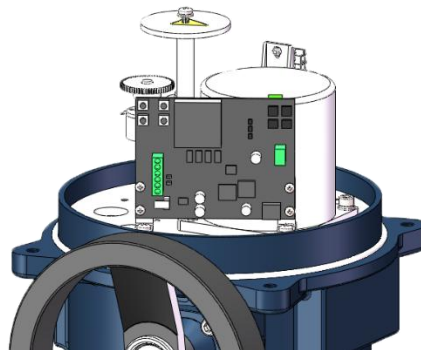
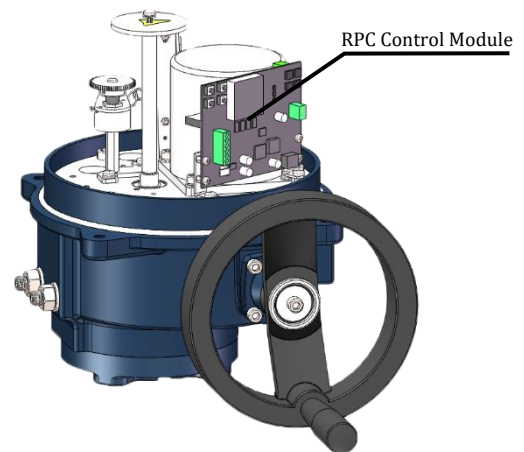
#### 1.1 Remote Position Control(PRC)

The control board is installed inside the electric actuator.

It directly receives standard 4~20mA DC control signals from DCS control systems or other upper-level control systems. The potentiometer signal inside the actuator serves as the valve position signal sensor; the valve position signal and control signal are compared inside the control board chip. When the signal difference after comparison is greater than the sensitivity value of the control board, the control board directly controls the actuator's motor to move in the direction of reducing the signal difference until the signal difference is less than the sensitivity value of the control board.

#### 1.2Main Performance Parameters

- Input Signal: 4~20mA DC, 0~10mA DC
- Input Impedance: 250Ω (4~20mA) or 500Ω (0~10mA)
- Valve Position Feedback Output Signal: 4~20mA DC or 0~10mA DC
- Basic Deviation:  $\leq \pm 0.2\%$
- Motor Stall Protection Duration: 1~25.4S (default 6.4S)
- Power Consumption:  $\leq 3$  VA
- Actuator Operating Sensitivity: 0.1%~12.5%
- Insulation Strength: 1500V AC, 1 minute
- Insulation Resistance:  $\geq 50$ MΩ
- Power Supply Voltage: AC220V/AC110V, 50/60Hz $\pm 10\%$  or DC24V
- Fault Protection Features: Signal loss protection, feedback loss protection, motor stall protection, etc.
- Instant Reverse Protection: When the actuator is in operation, if a reverse action command is received, the control board will first stop the actuator's rotation, delay for a settable period, and then execute the reverse action command to avoid unnecessary damage to the actuator's motor, reducer, valve stem, etc.
- Fault Information Prompt
- One-Key Self-Tuning Function
- Passive Contact Output for Zero Position and Full Stroke Position.



## 2.VTM Electric Intelligent Type

The VTM Series Intelligent Electric Actuator is an intelligent control actuator integrating a multi-function servo amplifier and a position signal transmitter. There are no adjustable components on the control board; On-site debugging, sensitivity setting, manual/automatic switching and other functions are all set via an infrared remote control, making on-site installation and debugging fast and simple. The LCD screen on the panel shows the current working status of the control board, meeting the needs of different user groups.

The control board is installed in an external control box of the electric actuator, and directly receives standard 4~20mA DC control signals or on-off control signals from DCS control systems or other upper-level control systems. The potentiometer signal or absolute encoder signal inside the actuator serves as the valve position signal sensor; the valve position signal and control signal are compared inside the control board chip. When the signal difference after comparison is greater than the sensitivity value of the control board, the control board controls the actuator's motor to move in the direction of reducing the signal difference until the signal difference is less than the sensitivity value of the control board.

### 2.1 Main Performance

- Input Signal Control Mode: Two-position control
  - ① Analog Control Signal: 4~20mA DC (input impedance 150Ω)
  - ② On-off Control Signal: Jog mode
- Valve Position Feedback Output Signal: 4~20mA DC
- Basic Deviation:  $\pm 0.2\%$
- Motor Stall Protection Duration: 1~25.4S (default 6.4S)
- Power Consumption:  $\leq 5$  VA
- Actuator Operating Sensitivity: 0.4%~12.5%
- Insulation Strength: 1500V AC, 1 minute
- Insulation Resistance:  $\geq 50$ MΩ
- Power Supply Voltage (Please Specify Before Ordering):
  - ① AC380V/AC440V、50/60 Hz  $\pm 1$  0%
  - ② AC110V/AC220V、50/60 Hz  $\pm 1$  0%
  - ③ DC24V
- Electronic or Mechanical Over-Torque Protection: After an electronic or mechanical over-torque fault occurs to the valve, retry function, retry times, retry control quantity and other parameters can be set.
- Fault Protection Features: Motor stall protection, motor overheat protection, etc.
- Three-Phase Motor Electric Braking (Specify Before Ordering): Significantly improves the positioning accuracy of the actuator.
- Instant Reverse Protection: When the actuator is in operation, if a reverse action command is received, the control board will first stop the actuator's rotation, delay for a settable period, and then execute the reverse action command to avoid unnecessary damage to the actuator's motor, reducer, valve stem, etc.
- Fault Information Prompt
- Factory Reset Feature
- Relay Contact Alarm Features: Full-open position, full-close position, fault alarm, over-torque alarm, remote status, local status, etc.
- Alarm Functions for Signal Loss and Feedback Loss: After signal loss, it can be set to maintain the current position, full-open position, full-close position, or any other specified position as needed.
- On-site Debugging and Parameter Setting: Can be freely selected via a handheld infrared remote control or two knobs on the housing.
- Three-Phase Automatic Phase Rotation Correction Protection (for AC380V Power Supply): Ensures the actuator always maintains the correct rotation direction.



## 2.2LCD Screen

The actuator control board is equipped with a 128\*64 dot-matrix graphic LCD screen, divided into Area I, Area II, and Area III by layout:Area I (Valve Position Display Area): Real-time displays the current valve position as a percentage of opening.Area II (Control Mode Display Area): Displays the control mode.Area III (Operation Status & Alarm Information Display Area): Displays operation status and alarm information (see subsequent alarm information for details).When entering the working parameter setting menu, the LCD screen will use Area I, Area II, and Area III uniformly.

After the actuator control board is powered on, it first performs a self-test on the command, program area, data area, and A/D conversion function in sequence:

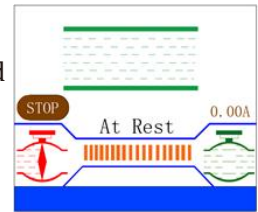
If the self-test is normal: The valve position display area of the LCD shows the current valve position opening percentage, and the alarm area content is cleared.

If any item fails the self-test: The alarm area will continuously display the fault prompt for that item, and the control system will not accept any operations until the fault is handled.

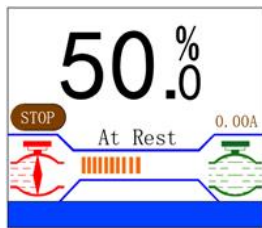
After the power-on initialization of the actuator control board, Area I displays the actual valve opening as a percentage. When the valve is at the full-open or full-close position, it is displayed in a graphical form (see the figure below). In the lower right corner of Area II:For analog control signals: Displays the control signal from the upper-level device as a percentage.

For on-off control mode: Displays the selected on-off control mode (jog, two-position, two-position valve opening, two-position valve closing).

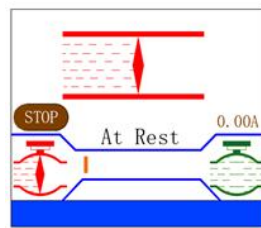
In the lower left corner of Area II: Displays the current working status of the actuator control board (remote, stop, local).



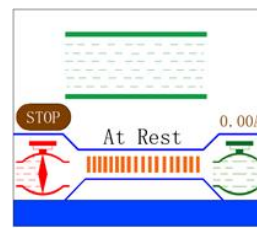
Control Board Display Screen Diagram



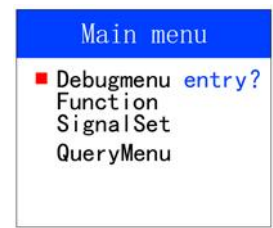
Valve Opening Display



Full-Close Position Display



Full-Open Position Display

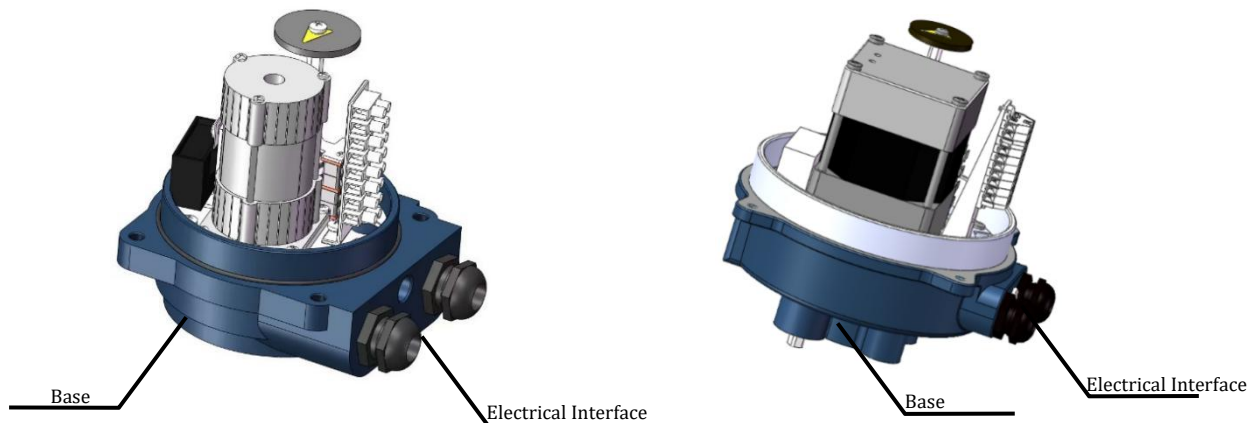


Main Menu Screen Display

## 3. VTM Electric Quick-Opening Type (On-off Type)

Controlled by an external switch; Feeds back electrical signals when the valve is fully open or fully closed.

The VTM Series Electric Quick-Opening Ball Valve is a new generation of automatic control valves independently developed by our company based on market development. This product features fast opening/closing, high reliability, and good stability, suitable for various fluid media. It combines the advantages of solenoid valves and electric valves, with fast and stable action. It is widely used in fire protection, program-controlled ignition systems, heavy oil and crude oil transportation control in the petroleum industry, as well as automatic switching and remote control of viscous media containing particles.



## Technical Parameters

### VTMS Series Technical Parameters

Model	Torque	Operating Time	Motor Power	Insulation Class	Rated Current (A)					Weight	Manual Operation Device
	N·m	sec/90°	W		DC24V	AC110V	AC220V	AC380V	AC440V	Kg	
VTM0S	20	10	8	E	0.2	/	/	/	/	1.2	Wrench
VTM1S	35	12	10	E	1.2	0.4	0.3	/	/	2.8	
VTM2S	100	8	40	F	3	0.65	0.33	0.26	0.21	8	
	200	8	60	F	4.2	0.89	0.45	0.27	0.21	8	
VTM3S	350	8	90	F	6.8	1.7	0.8	0.9	0.7	13	
	500	8	120	F	8.5	2	1.1	0.9	0.7	13	

### VTMS Series Technical Parameters

Model	Torque	Operating Time	Motor Power	Insulation Class	Rated Current (A)					Weight	Manual Operation Device
	N·m	sec/90°	W		DC24V	AC110V	AC220V	AC380V	AC440V	Kg	
VTM1H	50	15	16	F	1.6	0.8	0.4	0.2	/	3.2	Push-in Handwheel
	70	15	18	F	1.6	0.8	0.4	0.2	/	3.2	
VTM2H	100	8	40	F	3.5	0.73	0.33	0.26	0.21	11	
	200	8	60	F	4.2	0.84	0.45	0.27	0.21	11	

### VTMS Series Technical Parameters

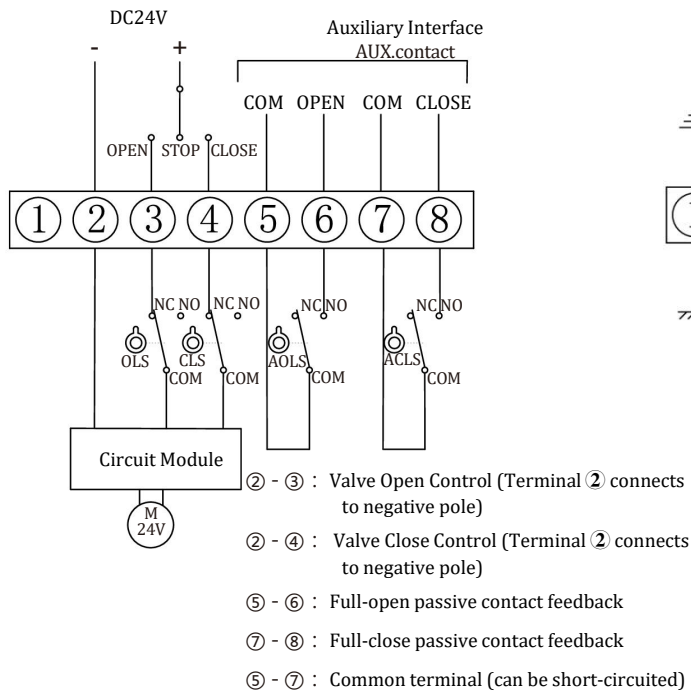
Model	Torque	Operating Time	Motor Power	Insulation Class	Rated Current (A)					Weight	Manual Operation Device
	N·m	sec/90°	W		DC24V	AC110V	AC220V	AC380V	AC440V	Kg	
VTM2	100	30	20	F	2.2	0.8	0.6	0.28	0.26	12	Clutchless Handwheel
	200	30	20	F	2.3	0.8	0.6	0.28	0.26	12	
VTM3	300	20	40	F	3	1.6	0.85	0.3	0.47	14	
	450	30	60	F	3.6	1.9	0.9	0.7	0.47	14	
VTM4	500	40	90	F	8.5	1.8	0.95	0.48	0.54	22	
	800	48	90	F	8.5	1.8	0.95	0.48	0.54	22	
	1000	48	120	F	10.5	2	1.1	0.5	0.55	22	
VTM5	1500	35	200	F	/	4.8	2.8	1.2	1.1	50	
	2300	48	200	F	/	4.8	2.8	1.2	1.1	50	
VTM5+G	4000	81	200	F	/	4.8	2.8	1.2	1.5	81.9	
	5000	94	200	F	/	4.8	2.8	1.2	1.5	81.9	



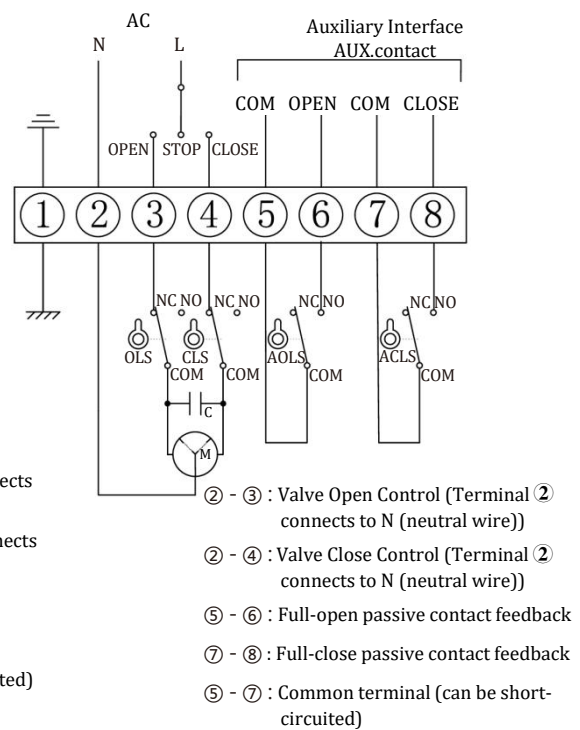
## Wiring Diagrams

### VTM Standard ON-OFF Type Wiring Diagram

Standard On-off Type (DC24V)

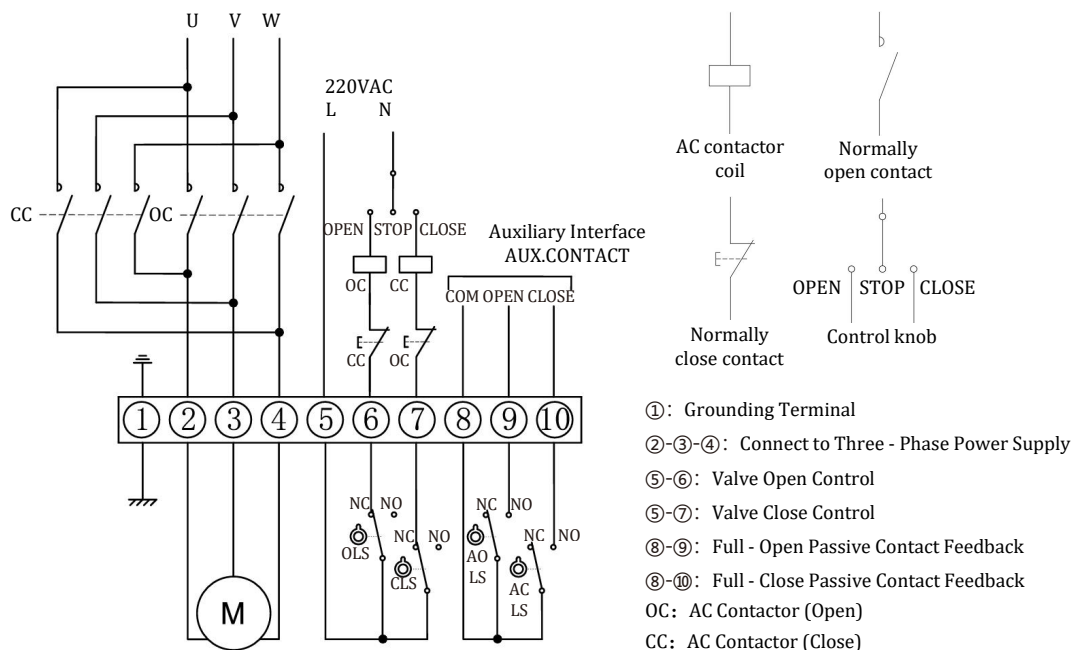


Standard On-off Type AC110V/AC220V

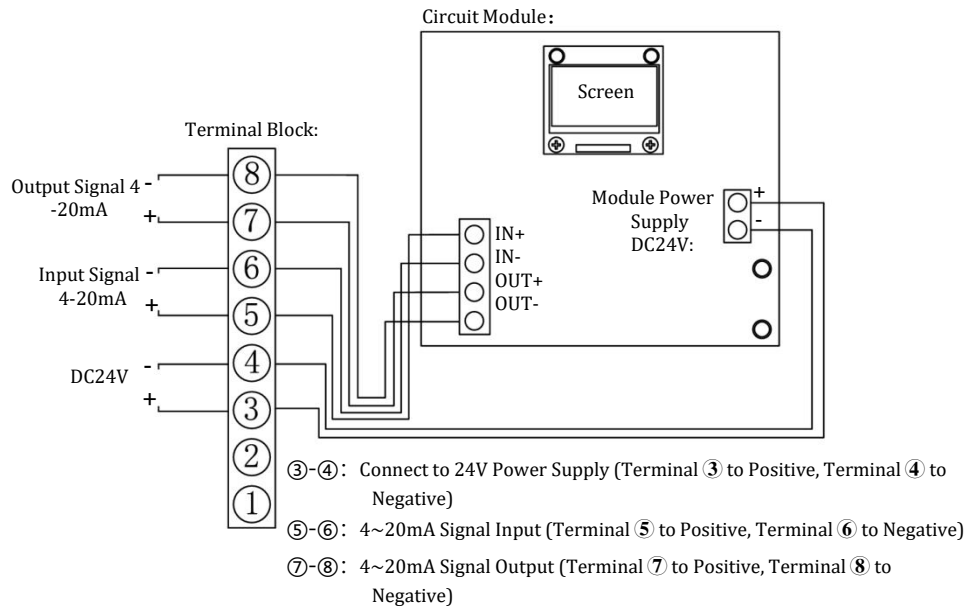


### VTM Three-Phase Standard ON-OFF Type Wiring Diagram

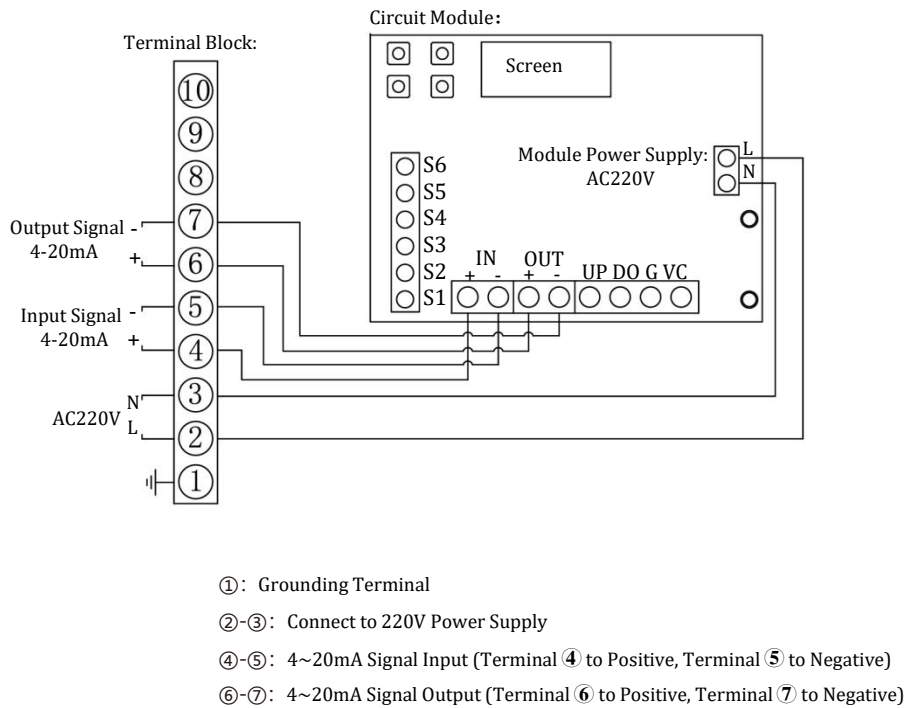
Standard On-off Type AC380V/AC440V



## VTM Series Regulating Type Wiring Diagram (DC24V)

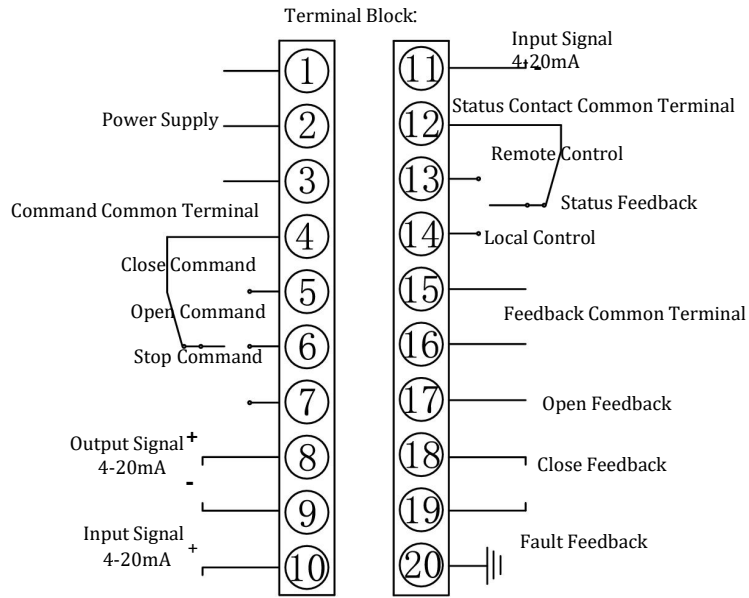


## VTM Series Regulating Type Wiring Diagram (AC220V)



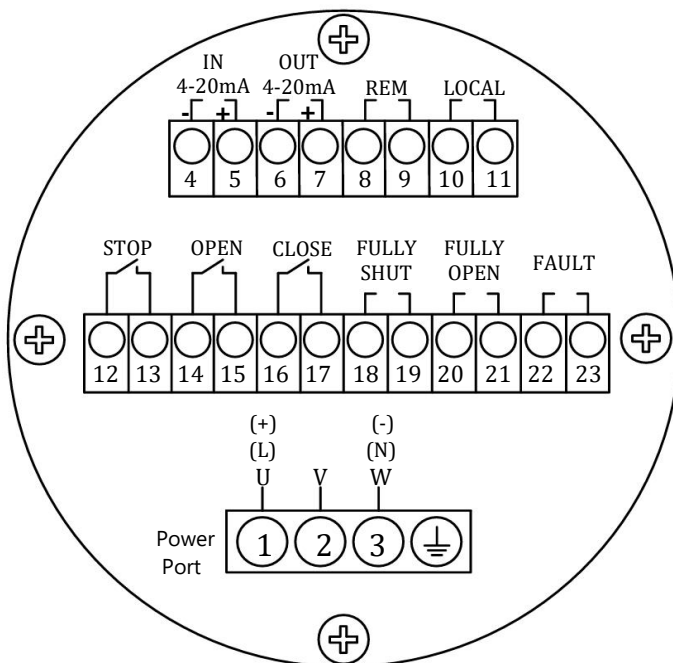


## VTMS/VTMH Series Intelligent Type Wiring Diagram



- ①-②-③: Power Supply  
For input voltage:  
AC380V/AC440V:  
① (A) ; ② (B) ; ③ (C) ;  
For input voltage:  
AC110V/AC220V:  
① (L) ; ② (N) ;  
For input voltage:  
DC24V:  
① (+) ; ② (-) ;  
④-⑤ Valve Close Control  
④-⑥ Valve Open Control  
④-⑦ Valve Stop  
⑧-⑨ 4~20mA Signal Output  
⑧ Output Positive  
⑨ Output Negative  
⑩-⑪ 4~20mA Signal Input  
⑩ Input Positive  
⑪ Input Negative  
⑮-⑯ Full-Open Feedback  
⑮-⑰ Full-Close Feedback  
⑱-⑲ Fault Feedback  
⑳ GND (Ground)

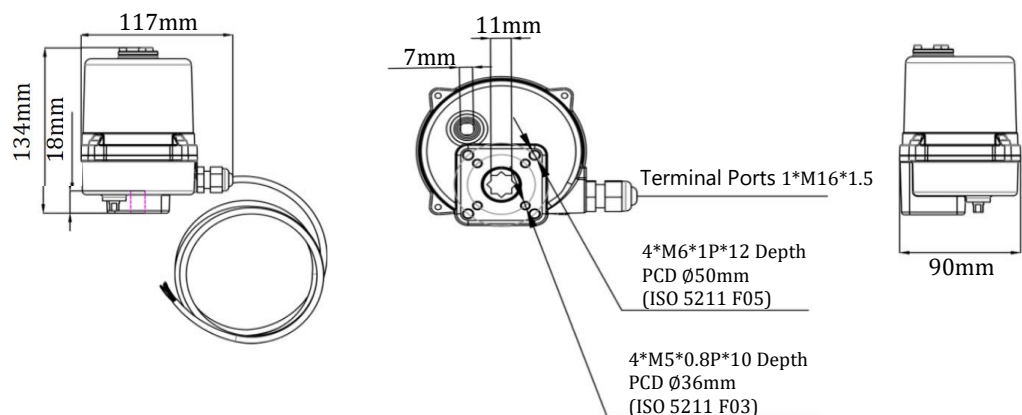
## VTM Series Intelligent Type Wiring Diagram



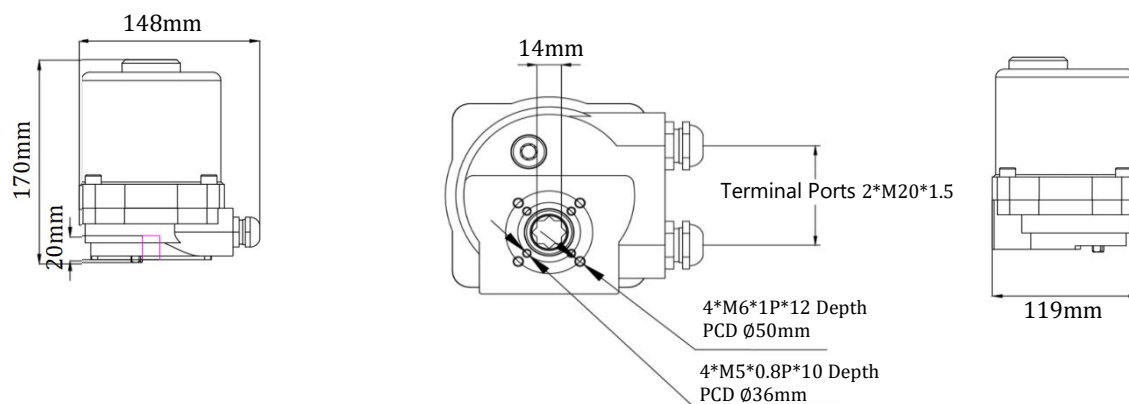
- ①-②-③: Power Supply  
For input voltage:AC380V/AC440V:  
① (A) ; ② (B) ; ③ (C) ;  
For input voltage:AC110V/AC220V:  
① (L) ; ③ (N) ;  
For input voltage:DC24V:  
① (+) ; ③ (-) ;  
④-⑤ 4~20mA Signal Input  
④ Input Negative  
⑤ Input Positive  
⑥-⑦ 4~20mA Signal Output  
⑥ Output Negative  
⑦ Output Positive  
⑫-⑬ Valve Stop  
⑭-⑮ Valve Open Control  
⑯-⑰ Valve Close Control  
⑱-⑲ Full-Close Feedback  
⑳-㉑ Full-Open Signal Feedback  
㉒-㉓ Fault Feedback

## Dimensional Data

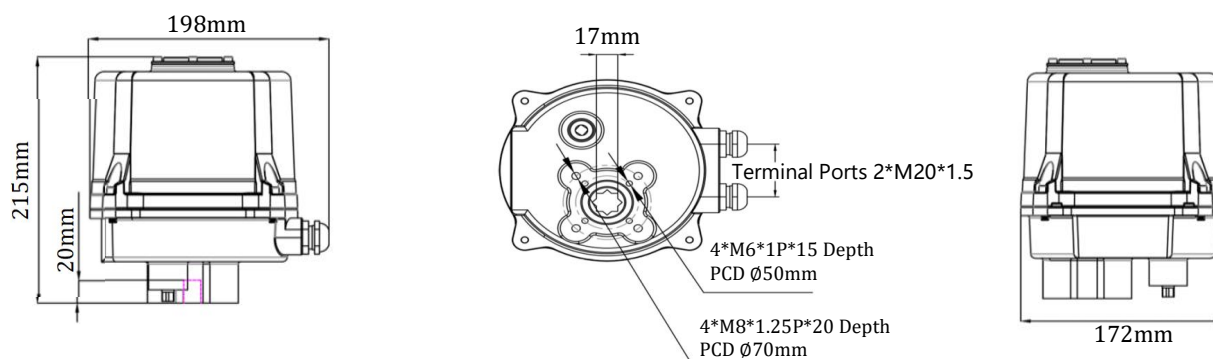
### Dimensional Data of VTM0S (mm)



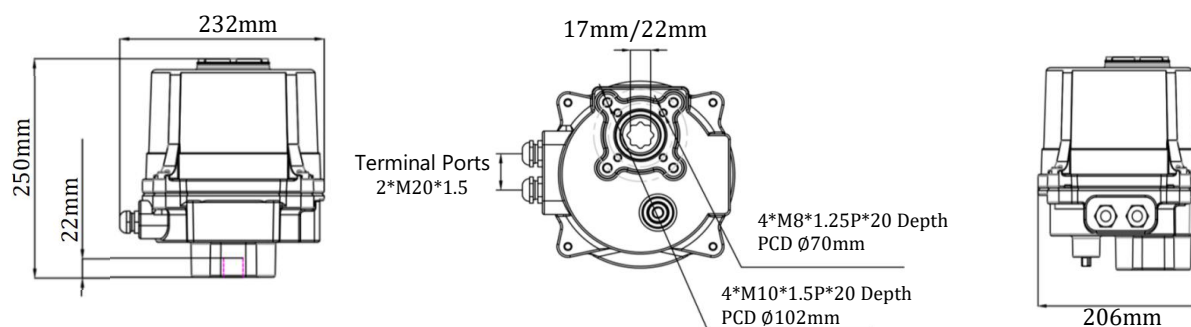
### Dimensional Data of VTM1S (mm)



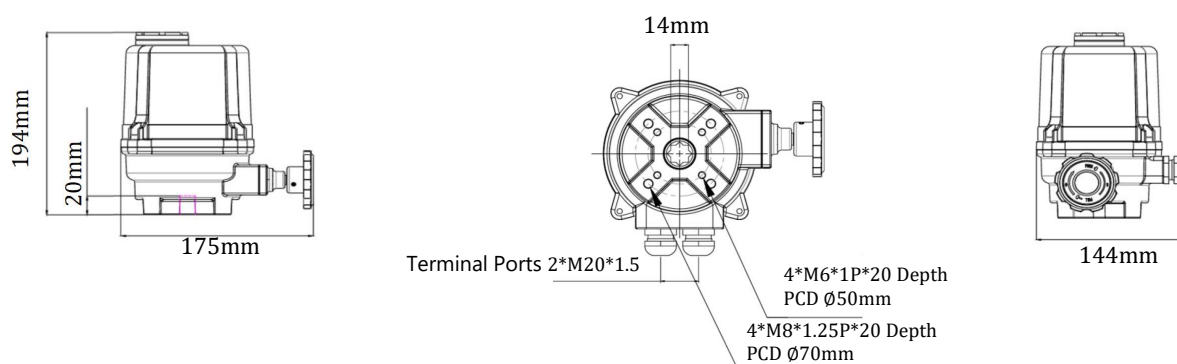
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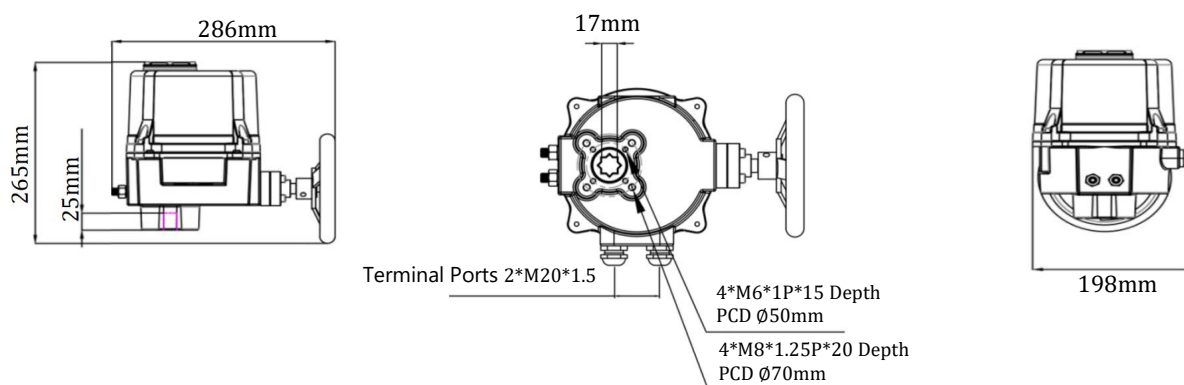
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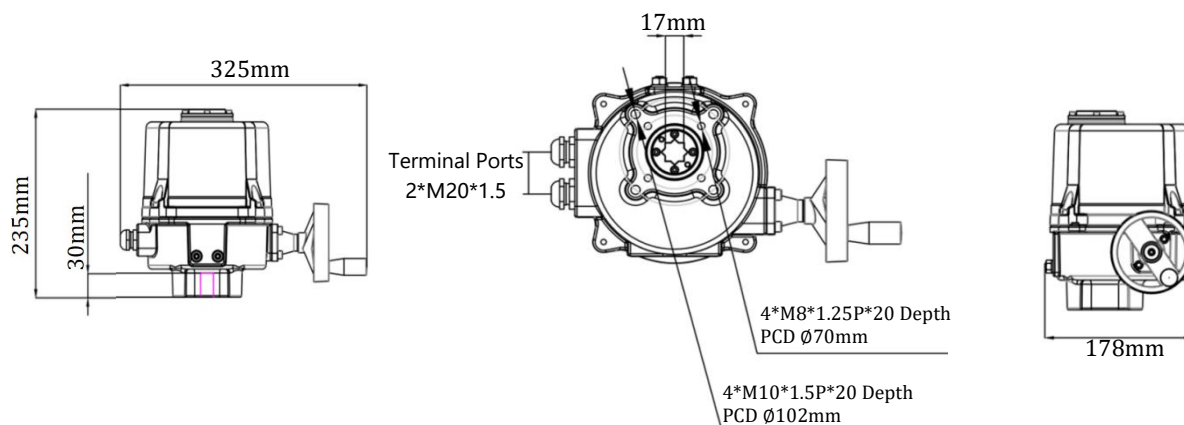
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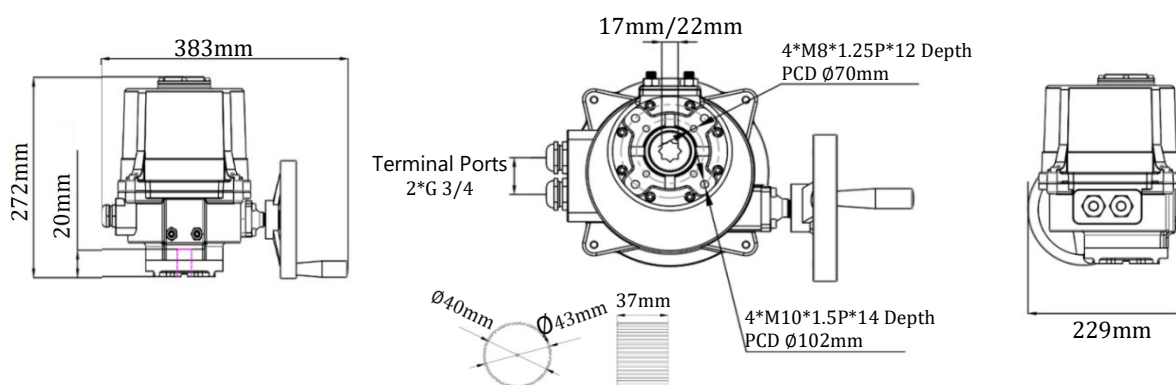
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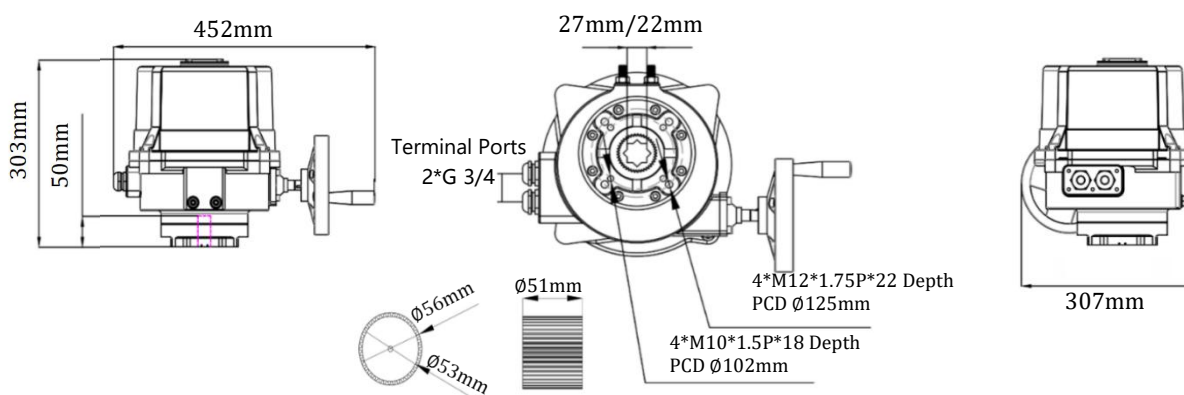
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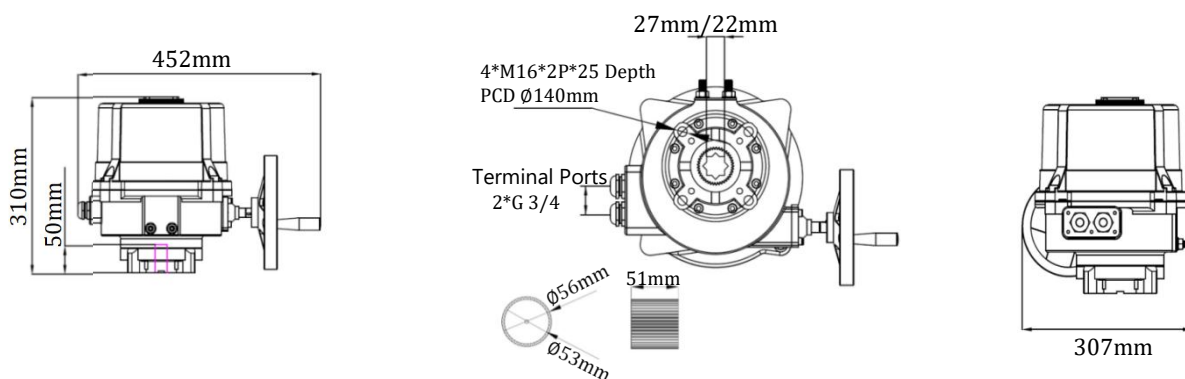
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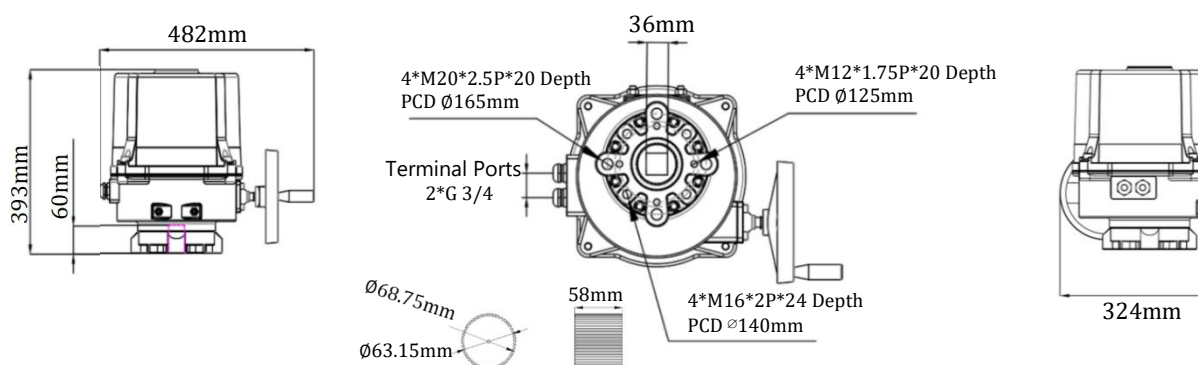
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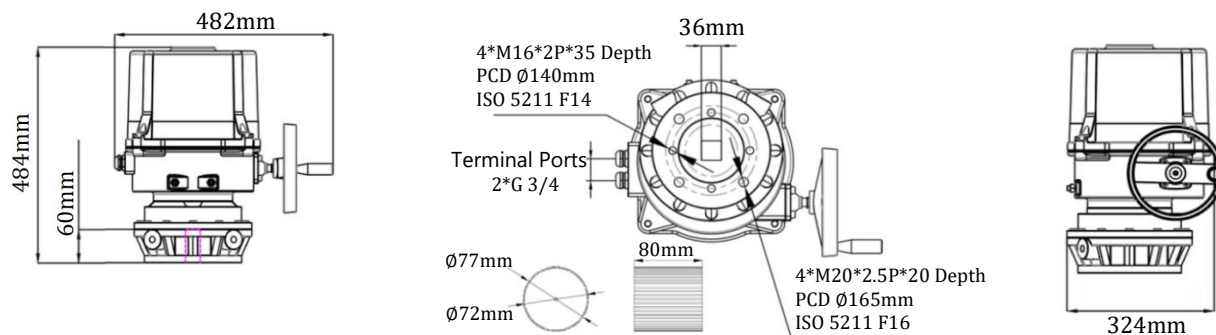
## Dimensional Data of VTM4 (F14) (mm)



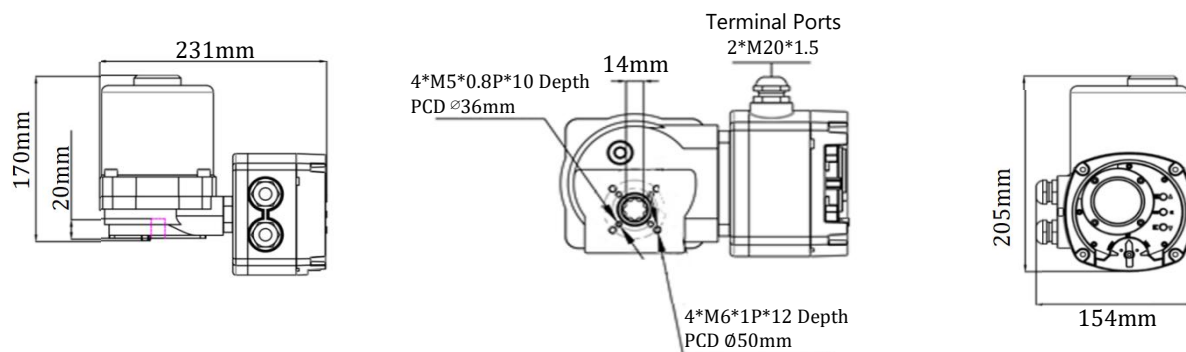
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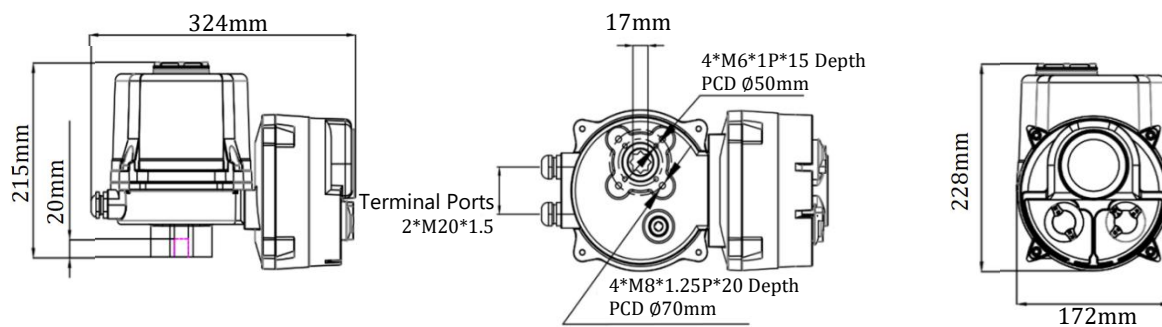
## Dimensional Data of VTM5+G (mm)



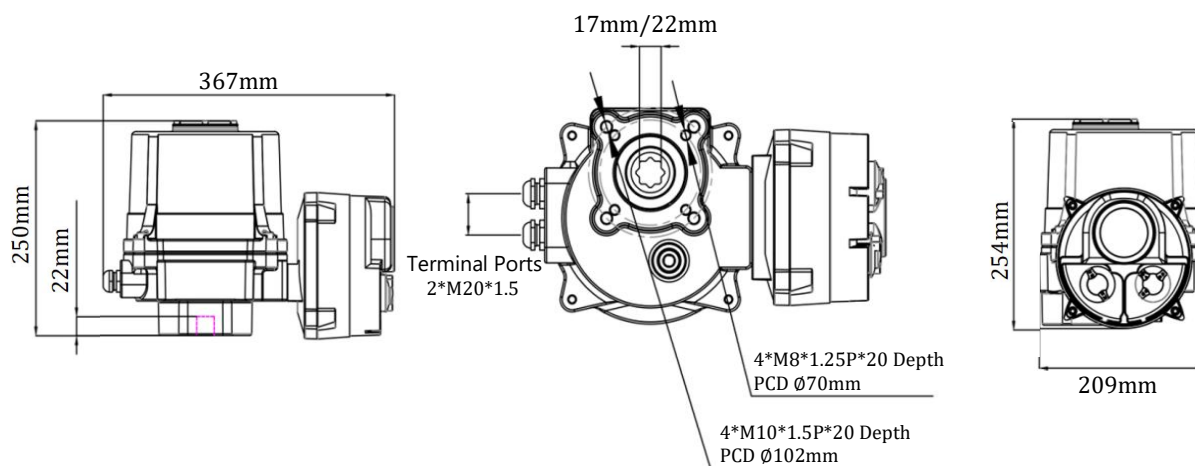
## Dimensional Data of VTM1S (Intelligent Integrated Type) (mm)



## Dimensional Data of VTM2S (Intelligent Integrated Type) (mm)

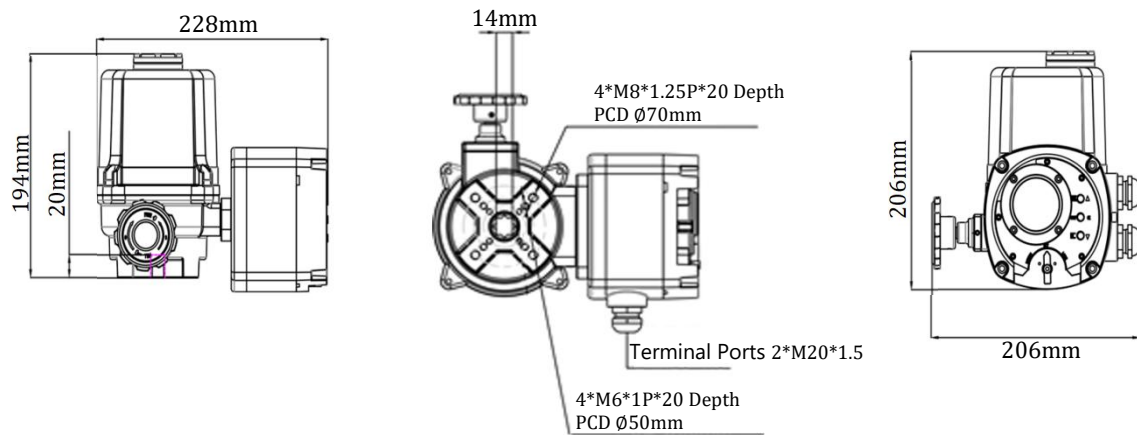


## Dimensional Data of VTM3S (Intelligent Integrated Type) (mm)

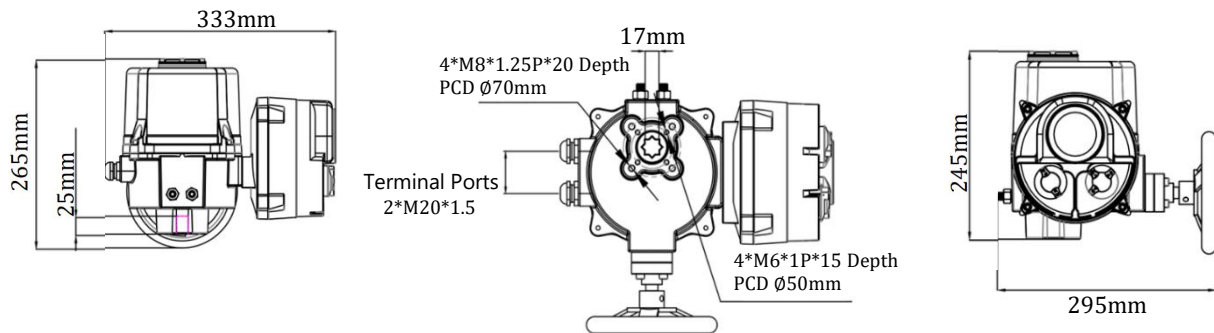




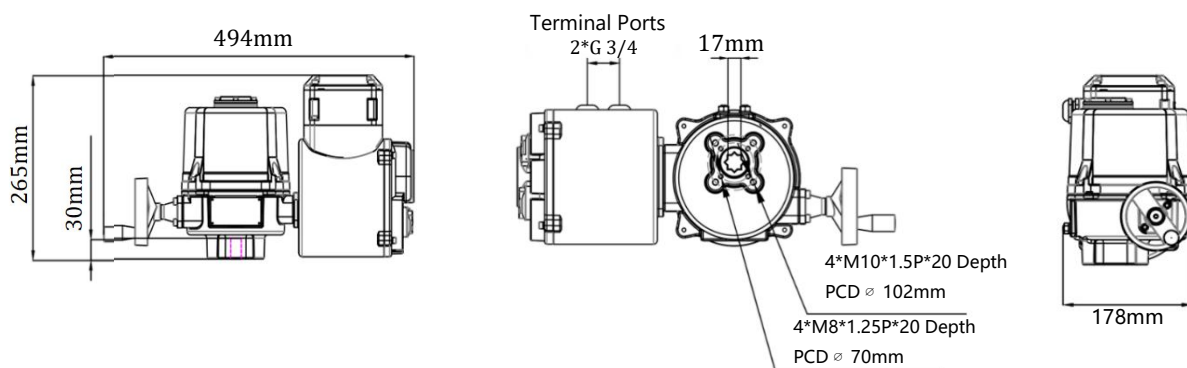
## Dimensional Data of VTM1H (Intelligent Integrated Type) (mm)



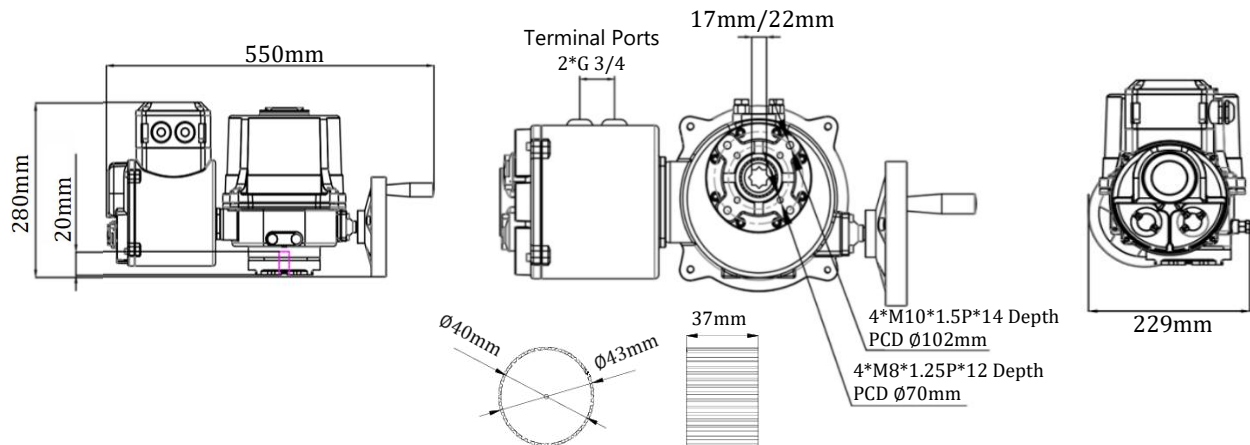
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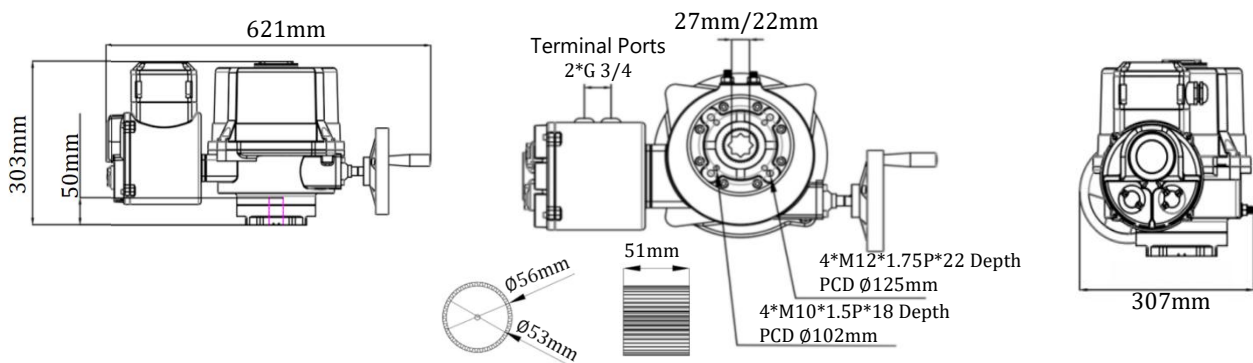
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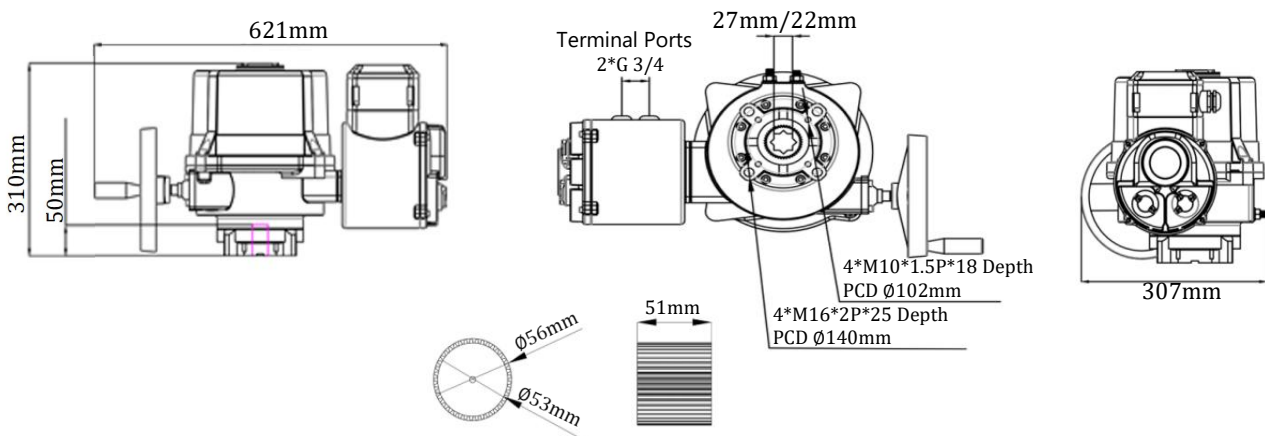
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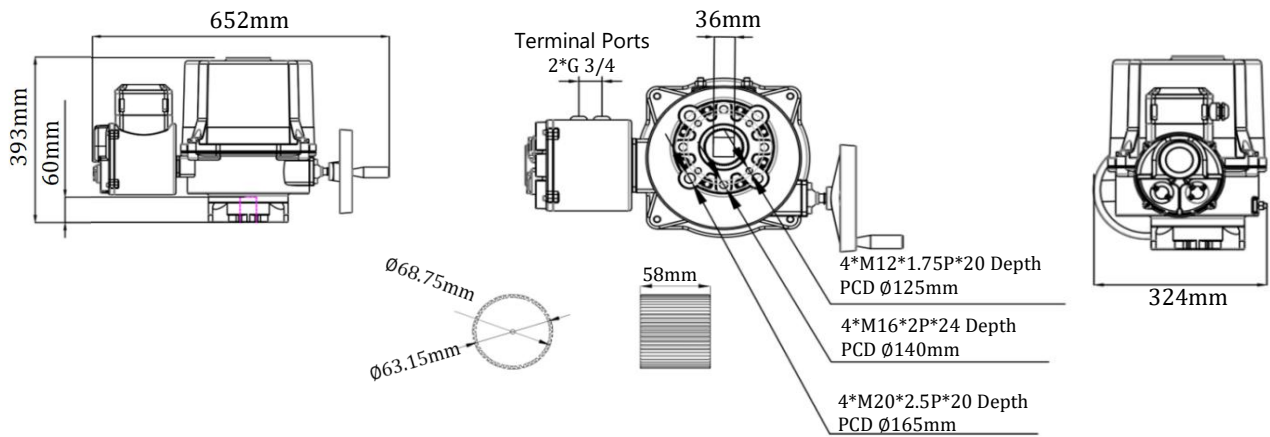
## Dimensional Data of VTM4 (Intelligent Integrated Type, F10-F12) (mm)



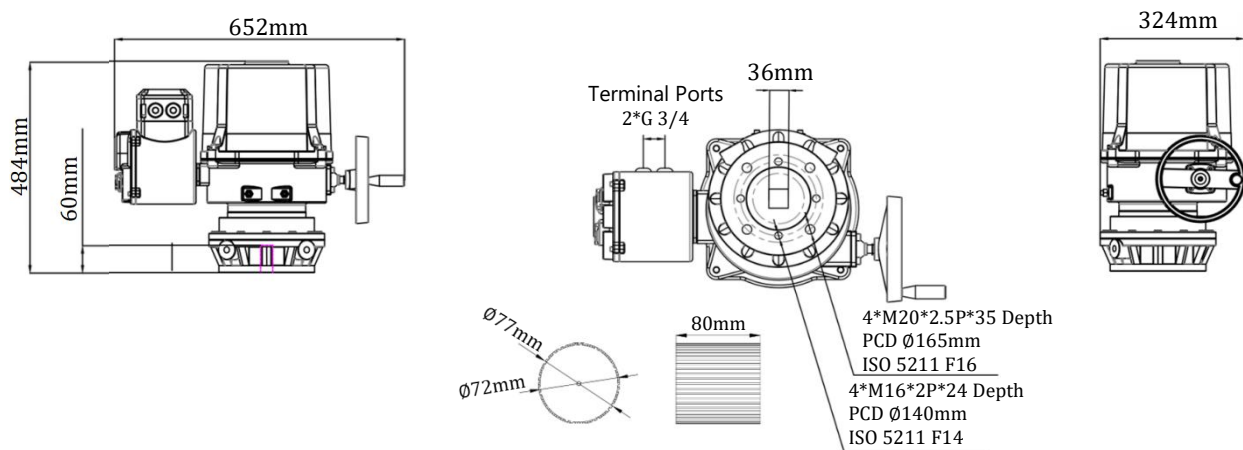
## Dimensional Data of VTM4 (Intelligent Integrated Type, F14) (mm)



## Dimensional Data of VTM5 (Intelligent Integrated Type) (mm)



## Dimensional Data of VTM5+G (Intelligent Integrated Type) (mm)



## Selection Guide

### Actuator Installation

#### 1. Installation Site

##### 1.1 Indoor Precautions

Hazardous Gas Areas: Order explosion-proof actuators.

Flood-Prone or Outdoor Applications: Notify in advance; reserve space for wiring, manual operation & maintenance.

##### 1.2 Outdoor Precautions

Avoid rainwater/direct sunlight: Install Weather Protective Cover or use IP67+ rated actuators.

Reserve space for wiring, manual operation & maintenance.

##### 1.3 Ambient Temperature

Range: -20°C~+70°C.

Below 0°C: Install Anti-condensation Heater.

##### 1.4 Fluid Temperature & Brackets

Heat transfers from fluid to actuator body; high-temperature fluids need special valve brackets:

Standard: ≤+65°C (or bracket-free)

Medium: +100°C~+180°C

High: >+180°C

Note: Users may customize Drive Shaft Bushings (round/square/other shapes); ensure hole-to-Outer circle concentricity during processing.

### Selection Standards and Reference

#### VTM — T — K — V — B

Product Model Torque Control Voltage Optional Features

Control Mode(K) :	Voltage(V):
O: On-off, passive feedback	D: AC 220 V(50/60 hz)
M: Built-in RPC regulation	E: AC 110 V(50/60 hz)
M1: 4-20mA I/O	F: DC 24 V
M2: 0-5V I/O	G: DC 12 V
M3: 2-10V I/O	H: AC 380 V(50/60 hz)
ICM: Integrated Control	I: AC 440 V(50/60 hz)
Optional Features(B):	
X:Space heater (recommended for high humidity/low temp)	
A:0-1K or 0-5K ohm output	
B:Optional 4-20mA signal output for on-off type	

VTM	T(N.M)	K					V						B	
		O	M1	M2	M3	ICM	D	E	F	G	H	I	Optional	
VTM0S	20	•	•	•	•	•	•	•	•	•	•	•	X A B Color Special	
VTM1S	35	•	•	•	•	•	•	•	•	•	•	•		
VTM2S	100	•	•	•	•	•	•	•	•	•	•	•		
	200	•	•	•	•	•	•	•	•	•	•	•		
VTM3S	350	•	•	•	•	•	•	•	•	•	•	•		
	500	•	•	•	•	•	•	•	•	•	•	•		
VTM1H	50	•	•	•	•	•	•	•	•	•	•	•		
	70	•	•	•	•	•	•	•	•	•	•	•		
VTM2H	100	•	•	•	•	•	•	•	•	•	•	•		
	200	•	•	•	•	•	•	•	•	•	•	•		
VTM2	100	•	•	•	•	•	•	•	•	•	•	•		
	200	•	•	•	•	•	•	•	•	•	•	•		
VTM3	300	•	•	•	•	•	•	•	•	•	•	•		
	450	•	•	•	•	•	•	•	•	•	•	•		
VTM4	500	•	•	•	•	•	•	•	•	•	•	•		
	800	•	•	•	•	•	•	•	•	•	•	•		
VTM5	1500	•	•	•	•	•	•	•	•	•	•	•		
	2300	•	•	•	•	•	•	•	•	•	•	•		
VTM5+G	4000	•	•	•	•	•	•	•	•	•	•	•		
	5000	•	•	•	•	•	•	•	•	•	•	•		

\*The above is for reference only. Consult the factory in advance if interested.

#### ▲Notice

Performance Specifications (pressure, rated temperature, etc.) in this catalog is based on national standards, our design, calculations, internal tests and on-site use. Products here are for general use.

For special conditions, contact us in advance or verify performance yourself before use. We are not liable for property damage or personal injury from improper use.

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