V-TORK®

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VTM Series Electric Actuator

Quarter-Turn Electric Actuator
Compact design to meet space requirements
Wide range of sizes and torque outputs(35-2300NM)
For On-Off or Modulating Control

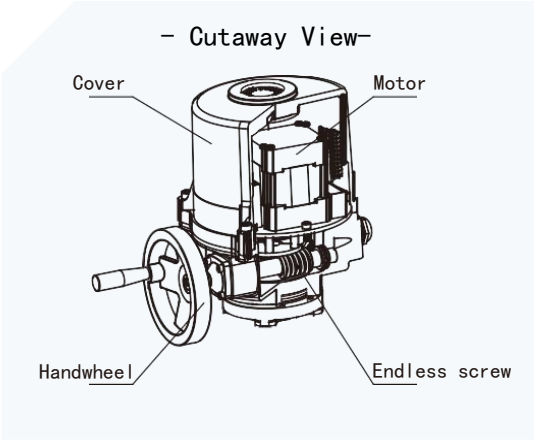
MD 2006/42/EC

ATEX 94/9/EC

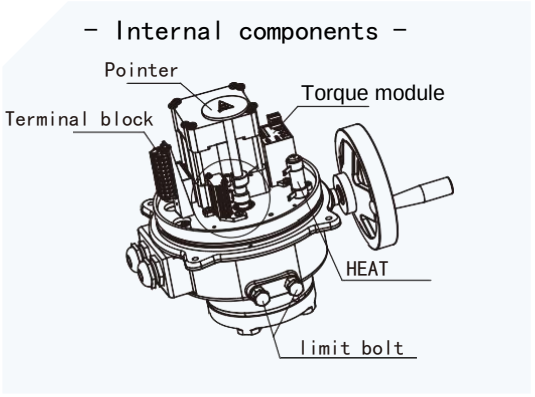
Inteoduction

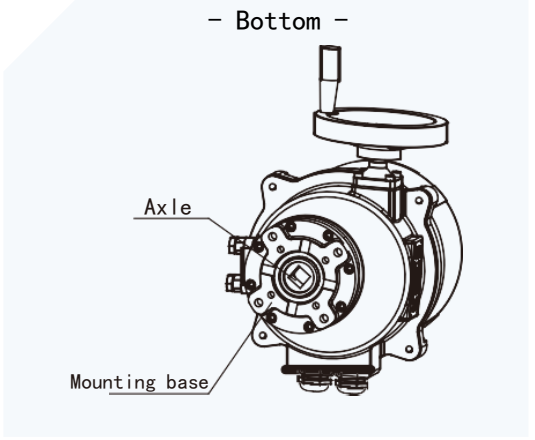
The V-Tork VTM Series is a rugged,compact electric quarter-turn actuator for on-off and modulating control of valves and dampers.The VTM offers a high quality,reliable solution for valve automation that is also cost-effective

Product details



Shell	The shell is made of aluminum alloy, anodized and coated with polyester powder .
Protection Grade	IP 67、Exd IIC T6Gb(TBD)、Ex tb IIIC T80℃ Db(TBD)
Motor	Totally enclosed cage induction motor，Low rotational inertia ，insulation class F， Built in overheat protection.
Hand wheel& endless screw	After power failure，Hand wheel can be used for manual control，Internal endless screw design，no clutch. light and easy to control
Mounting base	ISO 5211 Design,high versatility，The transmission shaft adopts spline shaft design.,
Limit Configuration	Mechanical Limiter + Electrical Limiter
Limiter	Power cut-off + passive feedback （Vmax 250V，Imax5A）
Pointer dial	For valve position indication, it will rotate with the valve
Heater	Used to balance temperature difference and prevent condensation. Ensure that the internal electrical components work normally(Optional)
Temperature resistance	ON/OFF Types：-20℃~+70℃（-4°F~158°F） Modulating Types：-20℃~+55℃（-4°F~131°F）
Humidity resistance	Maximum relative humidity 90% (non condensing)
Seismic capacity	XYZ10g.0.2～34Hz，30mins





1.VTM Modulating Type

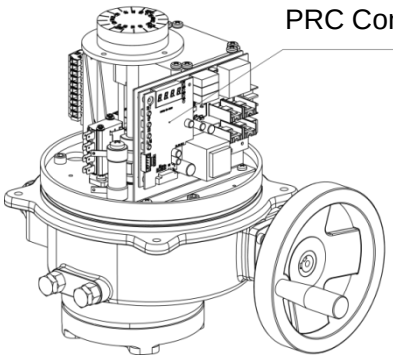
VTM Modulating electric actuators integrate a multi-functional servo amplifier and a position signal transmitter into the standard actuator to provide modulating control.All operations such as calibration,sensitivity setting and automatic/manual switching are controlled by four buttons on the PRC Control Module making it quick and easy to install and set up.LEDs on the panel indicate actuator status.

1.1 RPC Control Module

The PRC Control Module is installed in the actuator enclosure and receives the 4~20mA control signal from the control system or other control device.An integral potentiometer acts as the electronic valve positioner input to the PRC Control Module.

1.2 Specifications

- Input Signal:4~20mA.DC
- Input Impedance:250Ω(4~20mA)
- Valve Position Sensor:Single-turn absolute value encoder
- Valve Transmitting Output Sinal:4~20mA.DC
- Intrinsic Error:≤+0.2%
- Motor Blocking Protection Time:1~25.4S(default 6.4S)
- Consumptin Power:≤3VA
- Actuator Operating Sensitivity:0.1%~12.5%
- Insulation Strength:power frequency 1500V、1min
- Insulation Resistance:above 50MΩ
- Power Voltage: 220VAC/120VAC,50/60Hz±10% or 24VDC…
- Signal loss,feedback loss,motor stalling failure protection function,
- Instantaneous Reverse Rotation Protection Function with adjustable time delay.
- Failure code warning function
- One-key calibration function
- Passive feedback output function for full close position and full open position



2. The VTM Series Intelligent Electric Actuator

The VTM Series Intelligent Electric Actuator is an intelligently controlled actuator，It combines a multi-function server amplifier and a position signal transmitter.

It is not equipped with adjustable parts,All settings can be set by the infrared remote control, such as on-site debugging, sensitivity settings, manual automatic switching and other functions.The LCD display control panel will show the current working status of the product.

A control box is installed on the product，It will receive standard 4-20 m A current control or on-off control signals from DCS control system or other upper computer control system and convert them into valve action parameters.

2.1 Main parameter

- Input Signal：two types
  ①Analog quantity control signal：4～20mADC（ Input impedance 150Ω）
  ②ON/OFF control signal： Point control
- Valve Transmitting Output Signal： 4～20mA.DC
- Basic deviation：≤± 0.2％
- Motor Stall Protection Trigger Time：1～25.4S(default 6.4S)
- Power consumption：≤ 5 VA
- Actuator action sensitivity：0.4％～12.5％
- Insulation strength： power frequency 1500V、1min
- insulation resistance： above 50 MΩ
- Power supply (please specify in advance before ordering)：
  ①440VAC/3Ø、50/60Hz± 10％
  ②380VAC&400VAC/3Ø、50/60Hz± 10％
  ③120VAC/220VAC、50/60Hz± 10％
  ③24VDC
- Our production has an electronic or mechanical overtorque protection function. When the working torque of the product exceeds the setting, the protection function will disconnects the power supply to protect the equipment.
- Three-phase motor braking function, it can significantly improve the operating accuracy of the executing mechanism (Please mark this requirement before ordering);
- sudden reverse rotation protection function： When our product is operating, if the action command in the opposite direction is received, the control board will first stop the rotation of the motor in the product and delay a certain time (the delay time can be set as required) before executing the reverse action command. This function can protect the electric actuator motor, reducer, valve rod and other devices;
- With fault code prompt function；
- It has the function of restoring factory settings；
- Signal alarm / feedback functions such as full opening, full closing, fault alarm, excessive torque alarm, remote control, local control status, etc;；
- It has the function of off signal and off feedback alarm. At the same time, after the signal is off, it can be set to maintain the current position, full open position, full close position, or any other specified position as required;
- The on-site debugging and function setting of the control board can be set through the infrared remote control or two knobs on the shell
- When the power supply is AC 380V, it has three-phase automatic protection function and automatically adjusts the phase line sequence to ensure that the electric actuator is in the correct rotation direction.

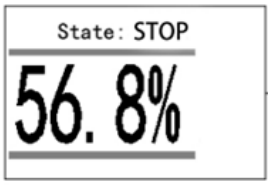
2.2 LCD

There is a 128*6 LCD on the actuator control panel. It is divided into Area I, Area II and Area III according to its layout. Area I is the valve position display area, which displays the current valve position in real time in the form of percentage; Area II will display the current control mode; Zone III is the operation status and alarm information (see the following alarm information for the specific display content); When entering the setting mode menu, the LCD will uniformly use zone I, zone II and zone III.

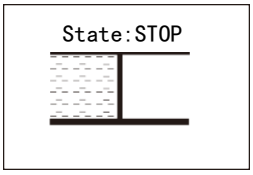
After the actuator control board is powered on, it will first perform self-test on the command, program area, data area and a/d conversion function. If the self-test is normal, the LCD will work normally and the contents of the alarm area will be cleared. If the self inspection finds any abnormality, the alarm area will always display the fault information of this item, and the control system will not accept any operation and wait for fault treatment.

After the actuator control board is powered on, Area I displays the current valve position as a percentage. When the valve is in the fully open or fully closed position, it will be displayed graphically (see the following figure). When the analog control signal is displayed in the lower right corner of area II, the LCD will display the control signal sent by the upper computer in the form of percentage; Similarly, when the switching value control mode is used, the LCD will display the control mode of the selected switching value (inching, two position, two position open valve, two position close valve). The current working state of the actuator control board will be displayed in the lower left corner of area II(remote, stop, on-site).

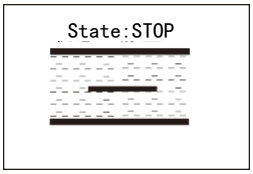
LCD



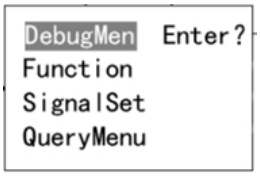
Valve position



Fully closed



Fully opened

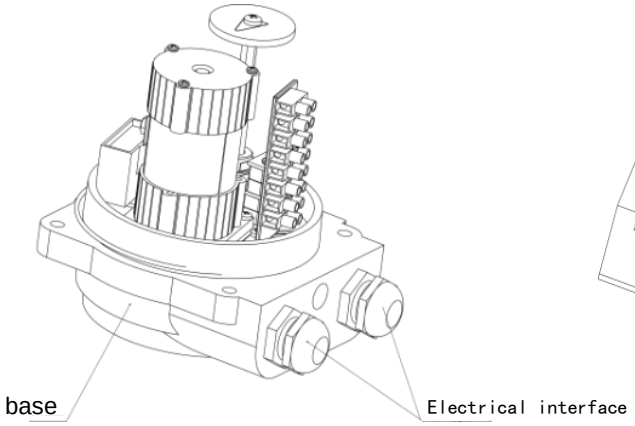


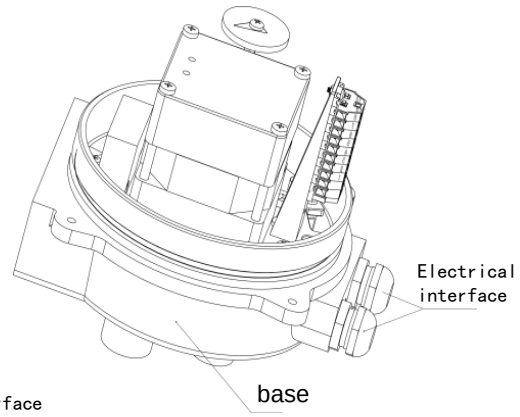
Main menu screen display

3. VTM electric actuator On/Off type

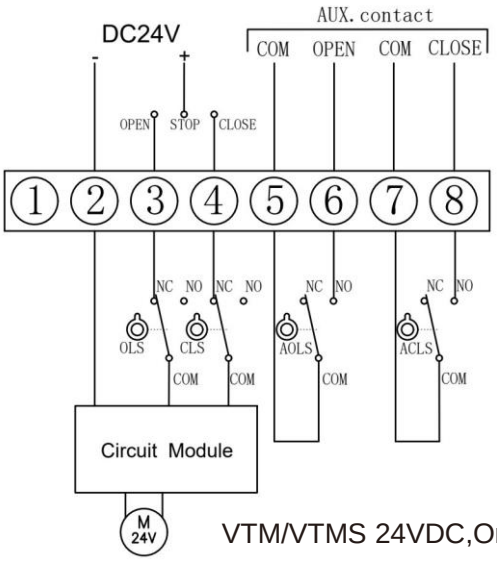
With external switch control, when the valve is fully open or closed, there will be port feedback electrical signal.

This product is fast, reliable and stable,can be widely used in fire control, program-controlled ignition system, heavy oil and crude oil transportation control in the petroleum industry, viscous media containing particles



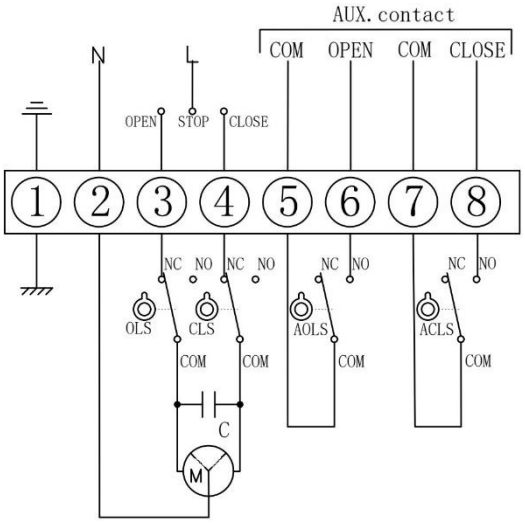


VTM On/Off Type Wiring Diagram



VTM/VTMS 24VDC,On/Off

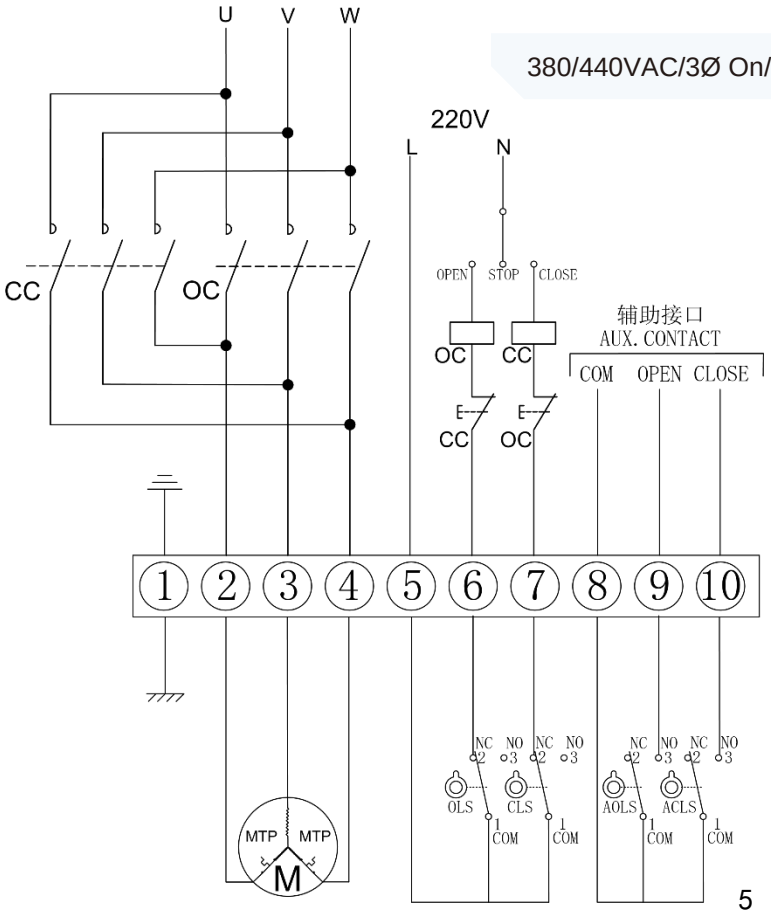
② - ③: Open control
② - ④: close control
⑤ - ⑥: full-open switch output
⑦ - ⑧: full-close switch output



VTM/VTMS 120VAC/220VAC,On/Off

①: GND
② - ③: open control
② - ④: close control
⑤ - ⑥: full-open switch output
⑦ - ⑧: full-close switch output

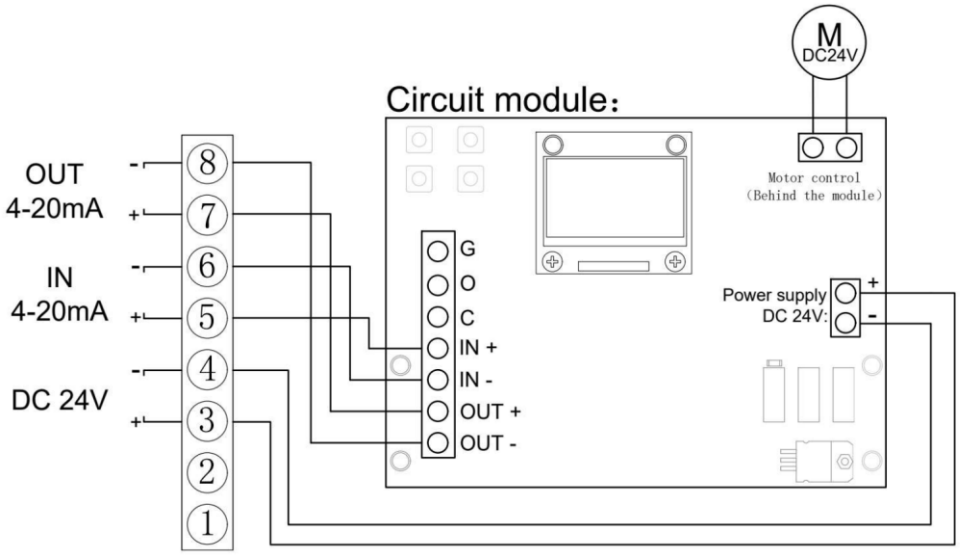
VTM three phase power supply Wiring Diagram



①: GND
② - ③ - ④: power supply for 440VAC/3Ø
⑤ - ⑥: open control(220VAC)
⑤ - ⑦: close control(220VAC)
⑧ - ⑨: full-open switch output
⑧ - ⑩: full-close switch output

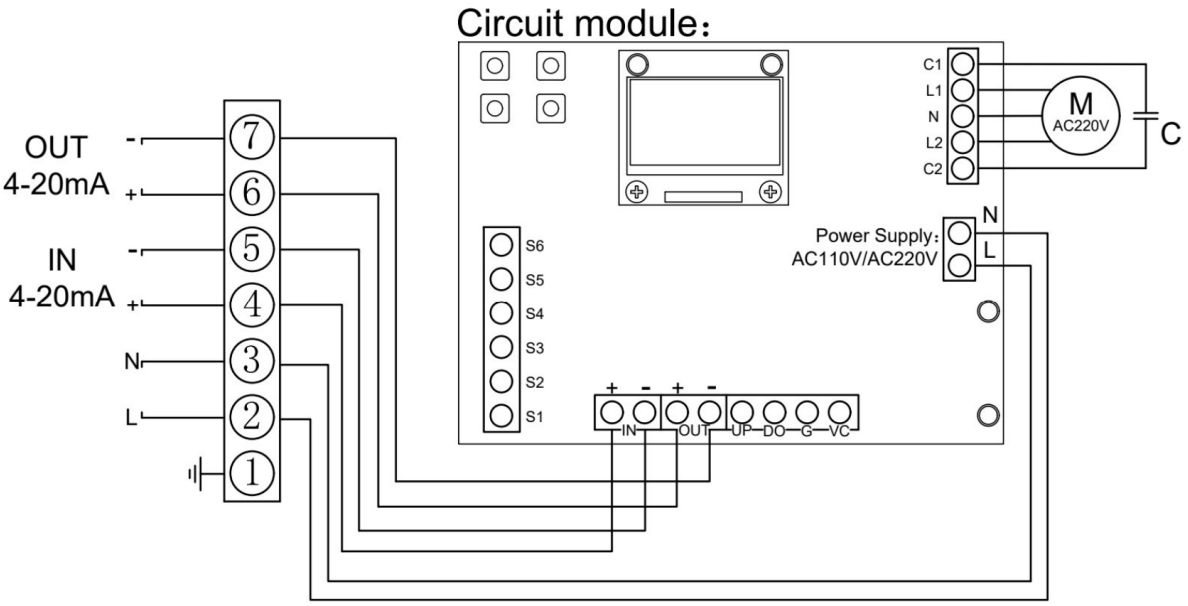
OC: contactor（open）
CC: contactor（close）

VTM Modulating Wiring Diagran（24VDC）



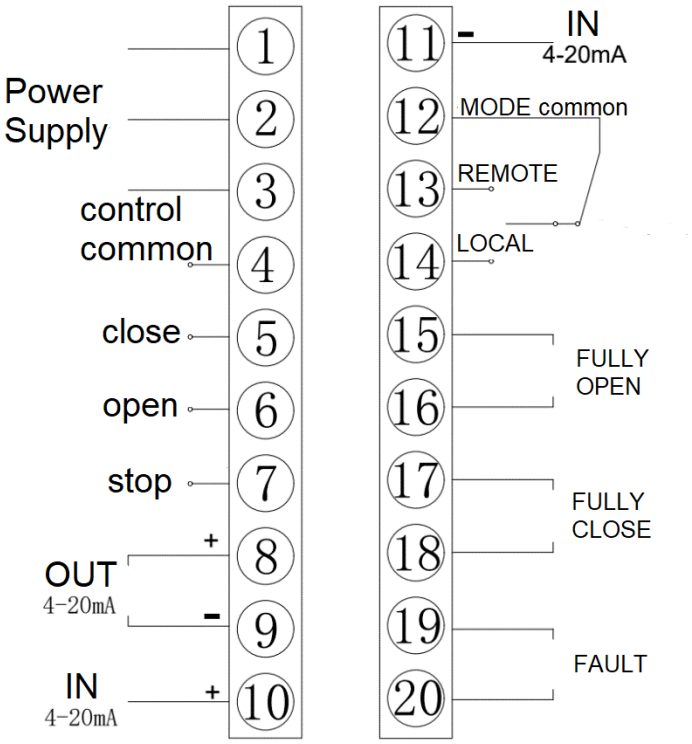
③ - ④：power supply（24VDC）
⑤ - ⑥：4~20mA input signal
⑦ - ⑧：4~20mA output signal

VTM Modulating Wiring Diagran（110VAC/220VAC）



①：GND
② - ③：power supply（220VAC）
④ - ⑤：4~20mA input signal
⑥ - ⑦：4~20mA output signal

VTMS/VTMH Intelligent types wiring dlagram



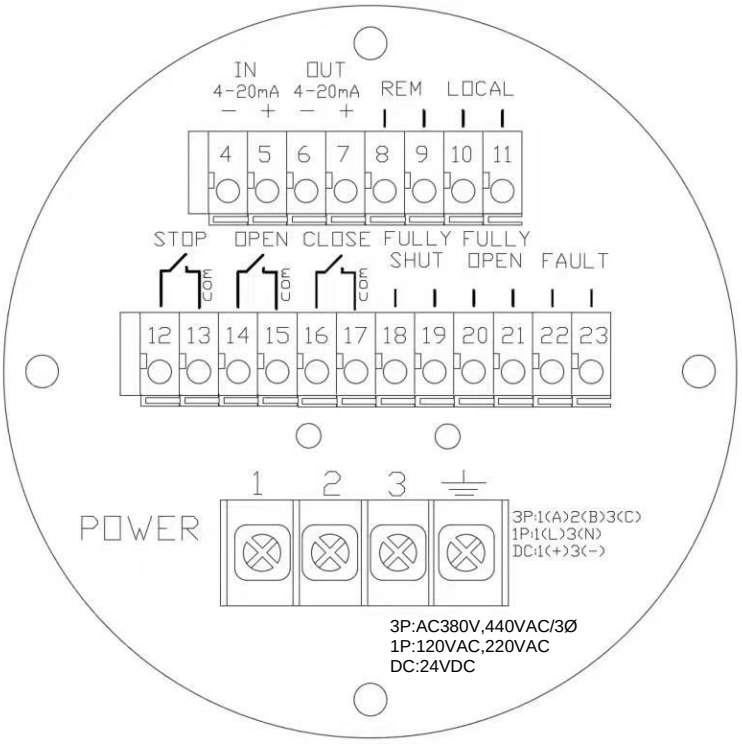
①-②-③： Power supply

Control power 440VAC/3Ø：

①（A）；②（B）；③（C）；
Control power 120VAC/220VAC：
①（L）；②（N）；
Control power 24VDC：
①（+）；②（-）；

④-⑤close control
④-⑥open control
④-⑦stop
⑧positive（+）of output signal
⑨negative（-）of output signal
⑩positive（+）of input signal
⑪negative（-）of input signal
⑮-⑯full open switch output
⑰-⑱full close switch output
⑲-⑳fault switch output

VTM Intelligent types wiring dlagram



①-②-③： Power supply

Control power 440VAC/3Ø：

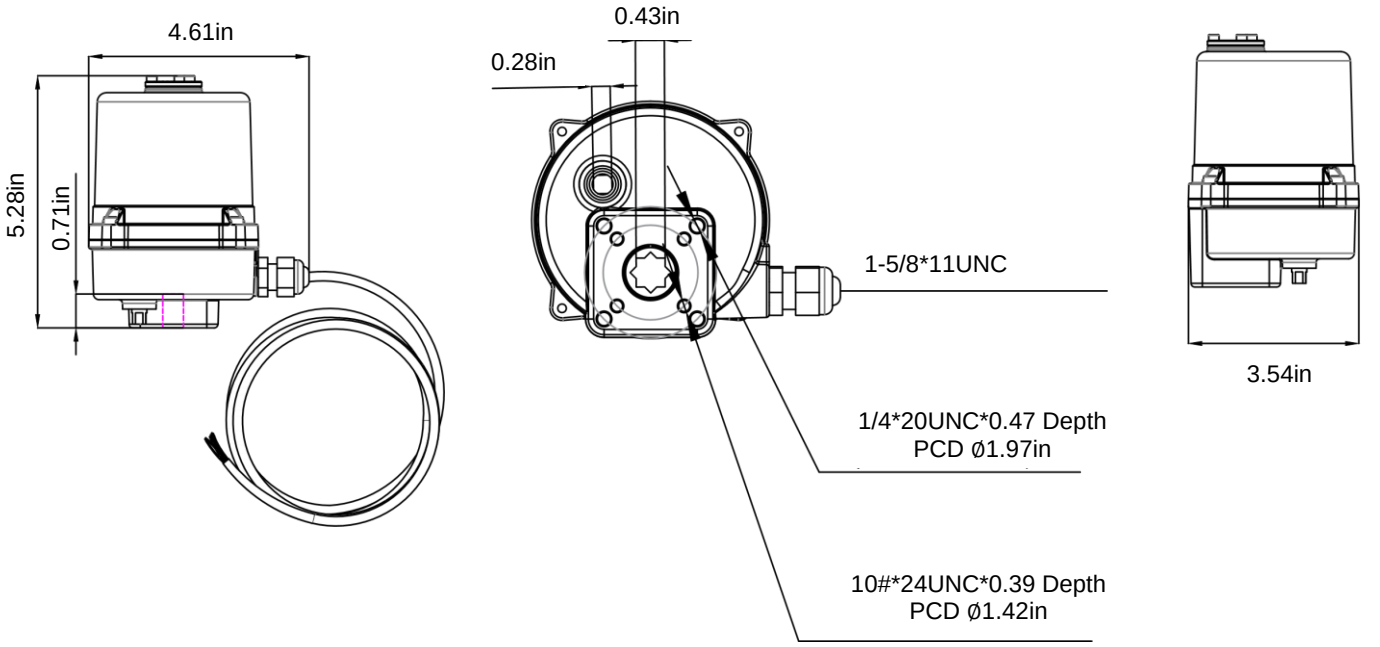
①（A）；②（B）；③（C）；
Control power 120VAC/220VAC：
①（L）；②（N）；
Control power 24VDC：
①（+）；②（-）；

④negative（-）of input signal
⑤positive（+）of input signal
⑥negative（-）of output signal
⑦positive（+）of output signal
⑫-⑬stop
⑭-⑮open control
⑯-⑰close control
⑱-⑲full close switch output
⑳-㉑full open switch output
㉒-㉓fault switch output

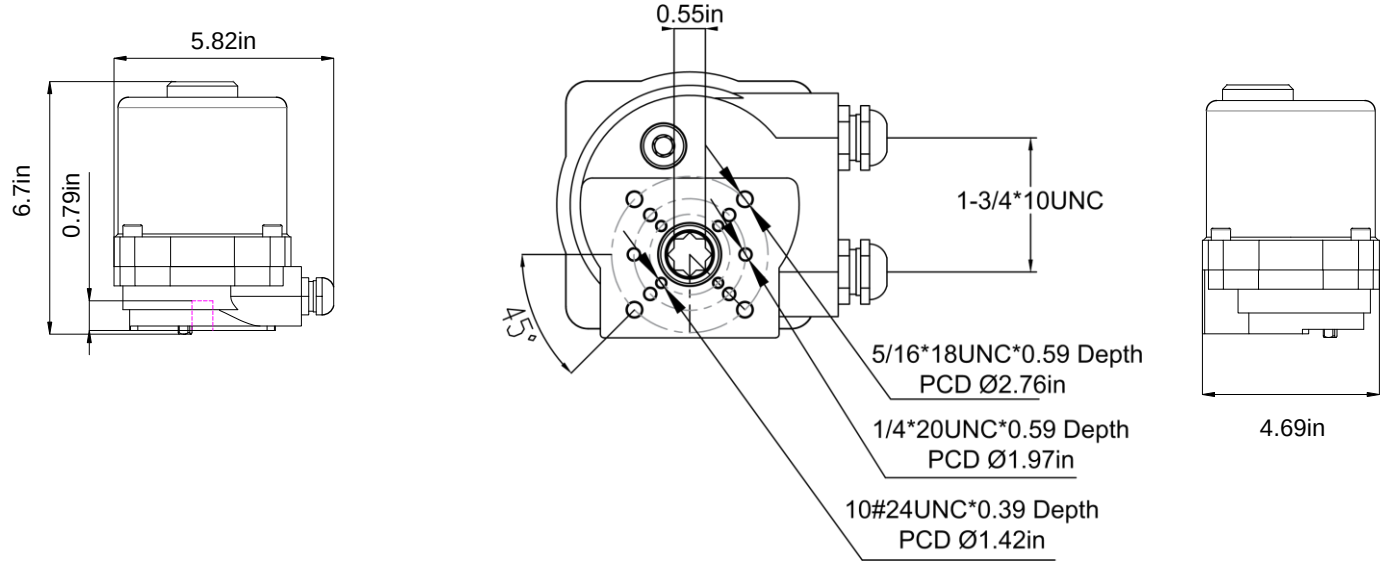
VTMS Type Specifications

Model No	Torque		Switch Time	Motor Power	ISO Mounting Base	Rated current(A)				Weight	Manual Device
	N.m	In.ibs	Sec/90°	W		24VDC	120VAC	220VAC	440VAC/3Ø	lb	
VTM0S	20	177	10	8	F03-F05	0.2	/	/	/	2.7	Spanner
VTM1S	35	310	12	10	F03-F05-F07	1.2	0.4	0.3	/	6.2	
VTM1H	50	443	10	18	F03-F05-F07	1.6	0.8	0.4	/	7.05	Push hand Wheel Operation
	70	620	15	18	F03-F05-F07	1.6	0.8	0.4	/	7.05	
VTM2H	100	885	8	40	F05-F07	3.5	0.73	0.33	0.21	24.25	
	200	1770	8	60	F05-F07	4.2	0.84	0.45	0.21	24.25	
VTM2	100	885	20	20	F05-F07	2.2	0.8	0.6	0.26	26.46	Clutch less Hand Wheel
	200	1770	30	20	F05-F07	2.3	0.8	0.6	0.26	26.46	
VTM3	300	2655	20	40	F07-F10	3	1.6	0.85	0.47	30.86	
	450	3983	30	60	F07-F10	3.6	1.9	0.9	0.47	30.86	
VTM4	500	4425	40	90	F10-F12/F14	8.5	1.8	0.95	0.54	48.50	
	800	7080	48	90	F10-F12/F14	8.5	1.8	0.95	0.54	48.50	
	1000	8850	48	120	F10-F12/F14	10.5	2	1.1	0.55	48.50	
VTM5	1500	13275	60	200	F12-F14-F16	10.5	4.8	2.8	1.1	94.79	
	2300	20355	82	200	F12-F14-F16	10.5	4.8	2.8	1.1	94.79	
VTM5+G	4000	35400	138	200	F14-F16	10.5	4.8	2.8	1.5	180.56	
	5000	44250	160	200	F14-F16	10.5	4.8	2.8	1.5	180.56	

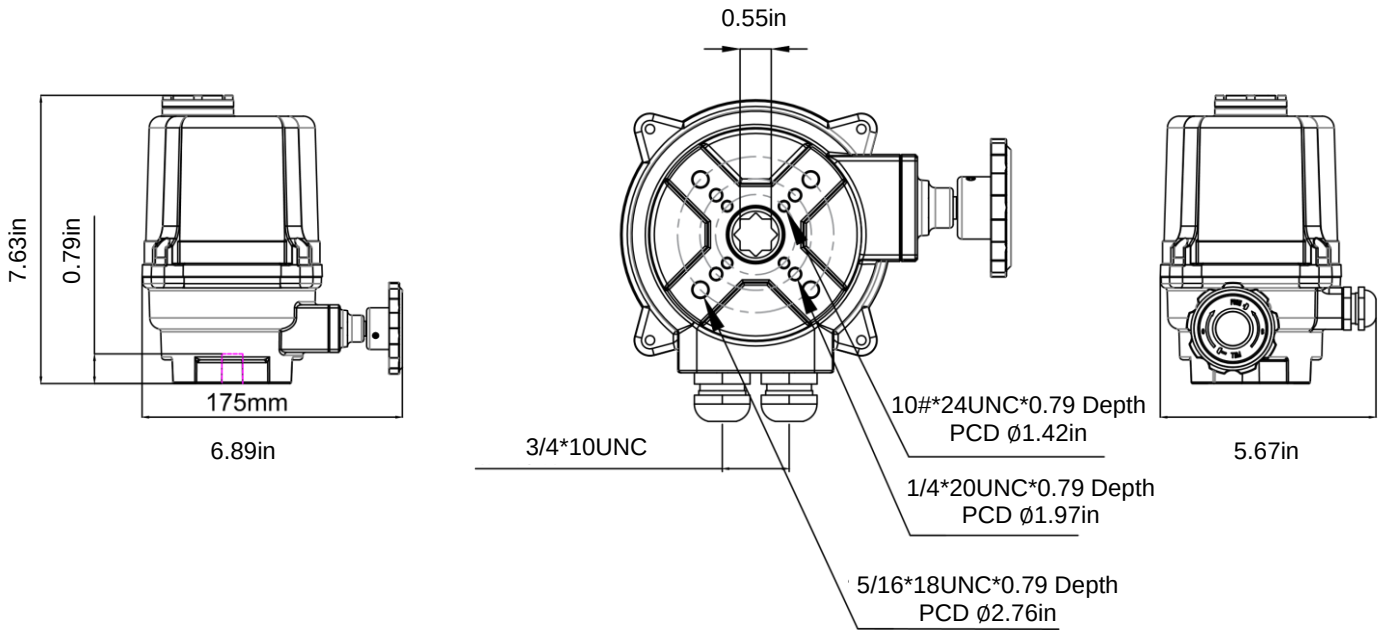
VTM0S Dimensions（inch）



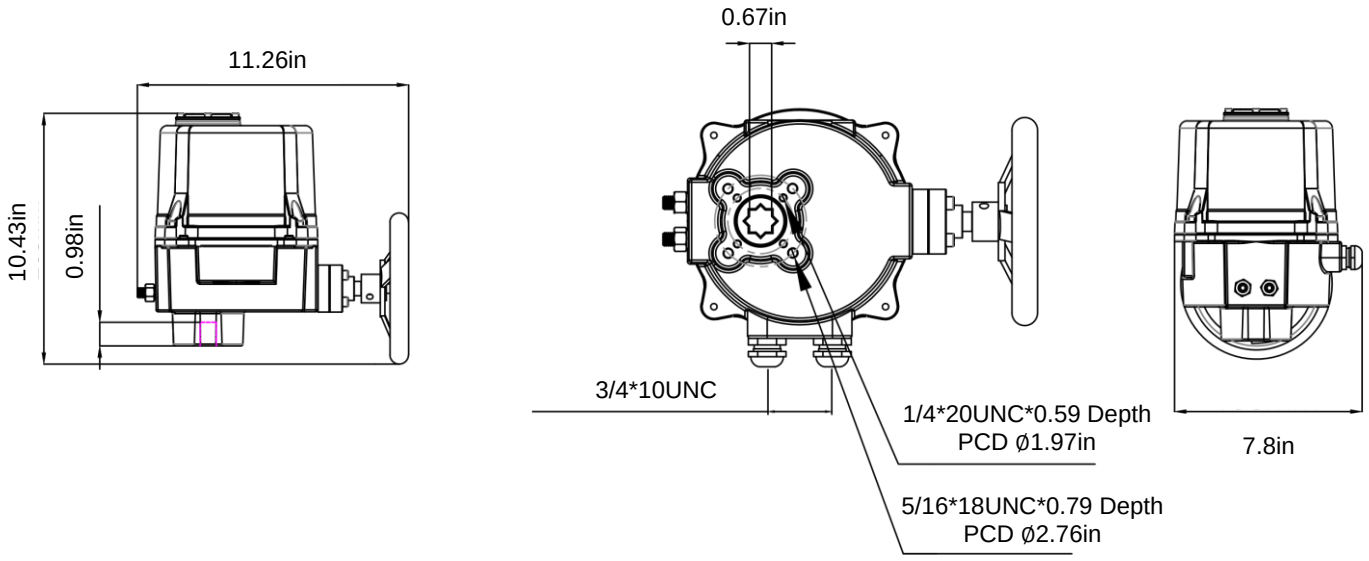
VTM1S Dimensions（inch）



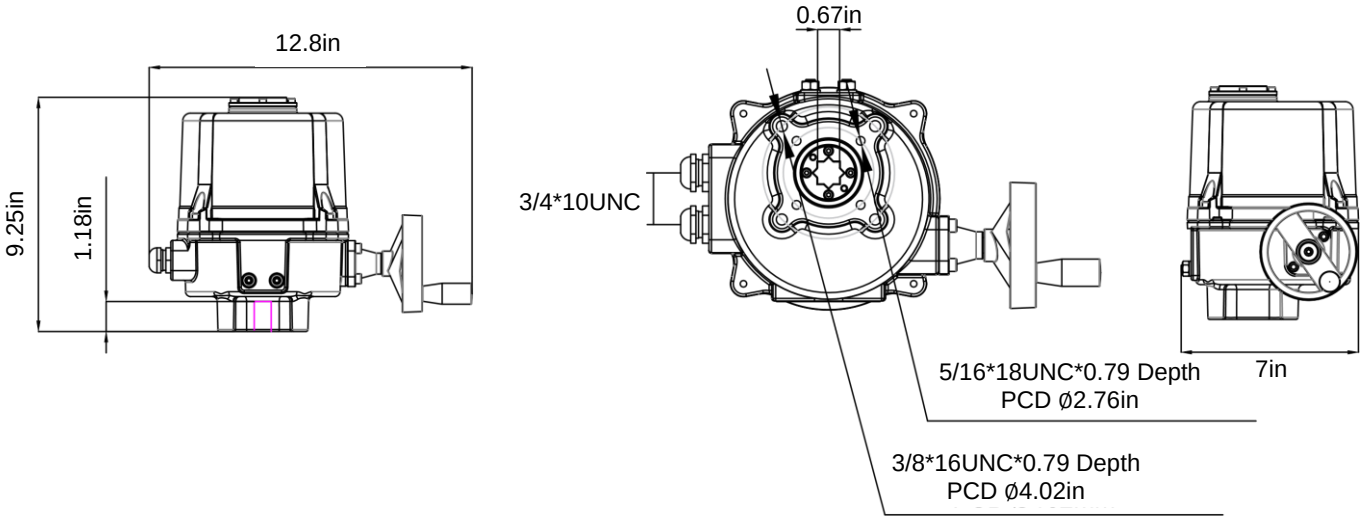
VTM1H Series Electric Actuator dimensions



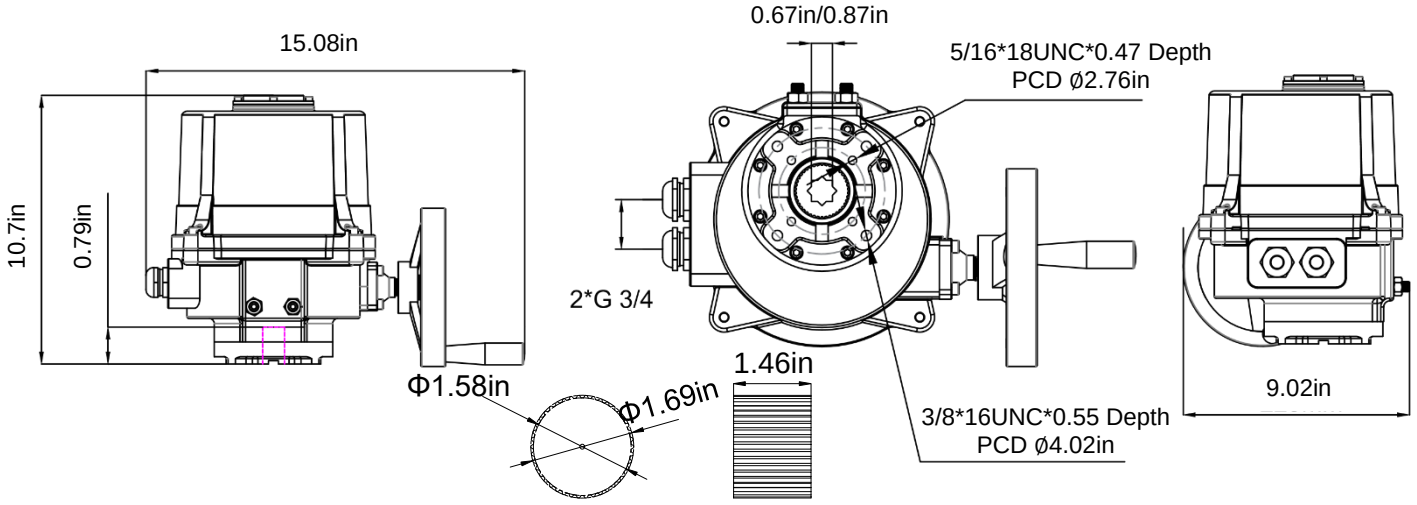
VTM2H Series Electric Actuator dimensions



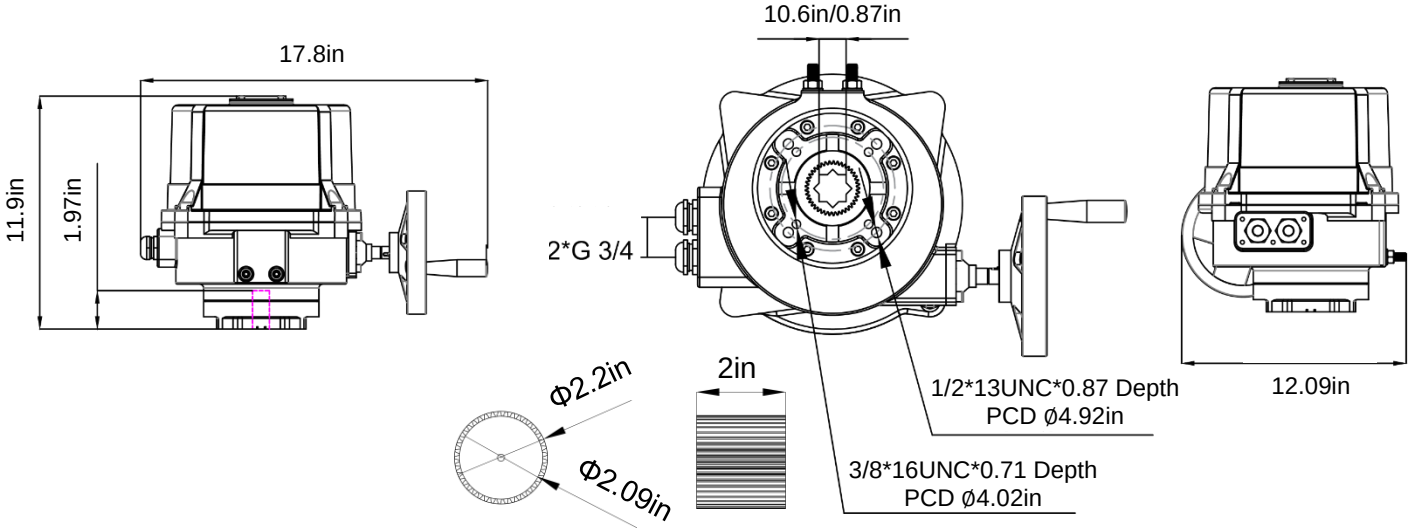
VTM2 Series Electric Actuator dimensions



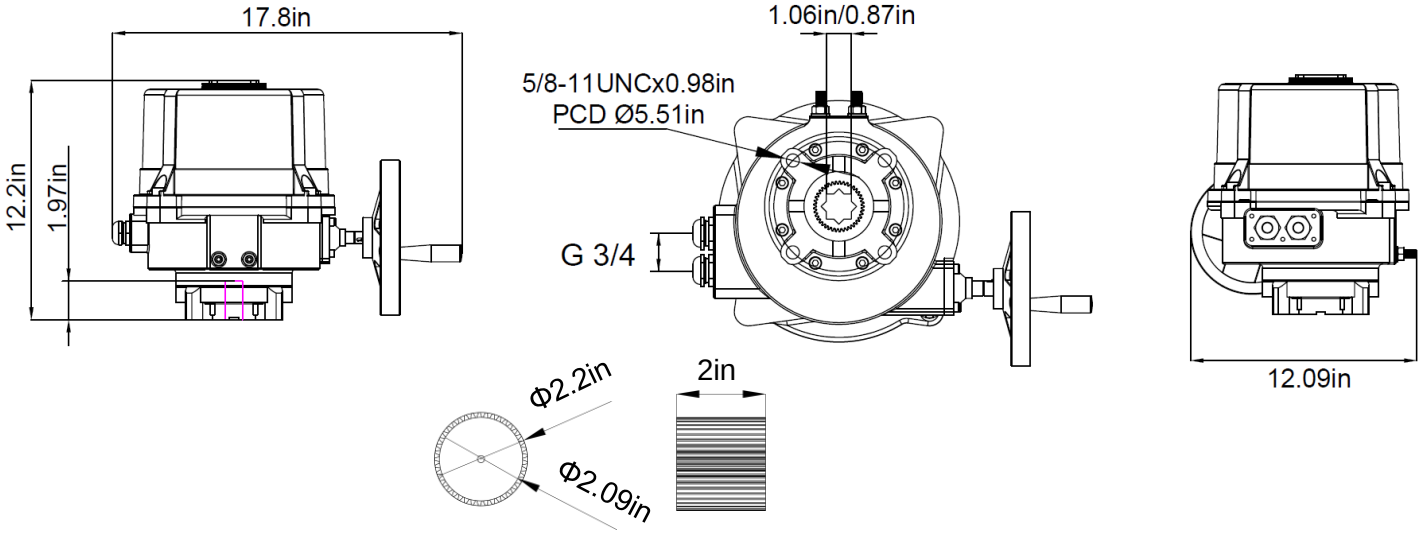
VTM3 Series Electric Actuator dimensions



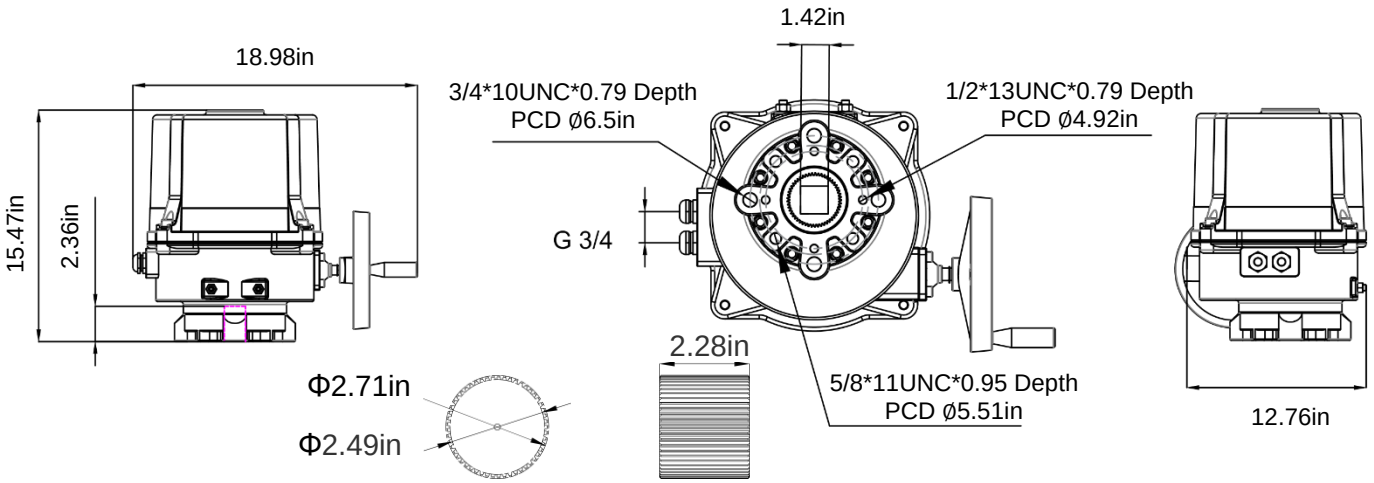
VTM4 Series Electric Actuator dimensions F10-F12



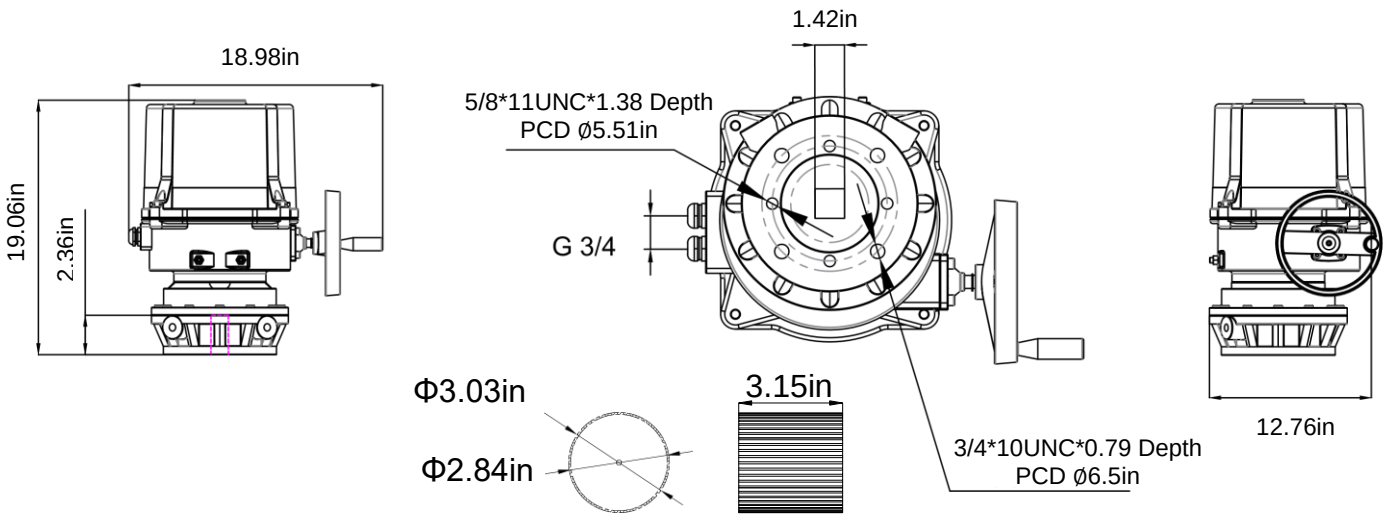
VTM4 Series Electric Actuator dimensions F14



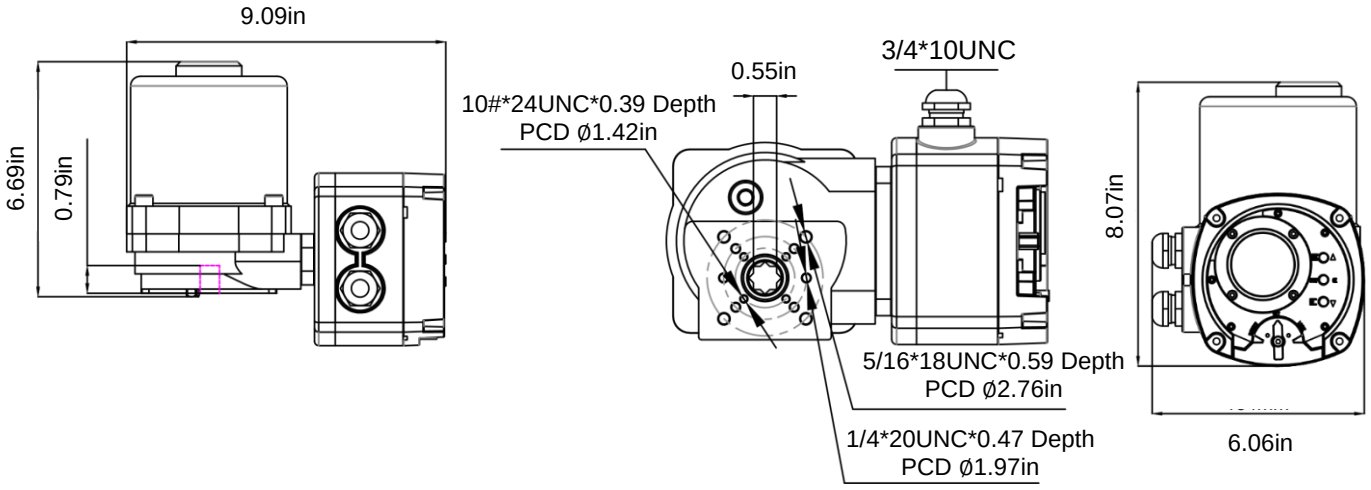
VTM5 Series Electric Actuator dimensions



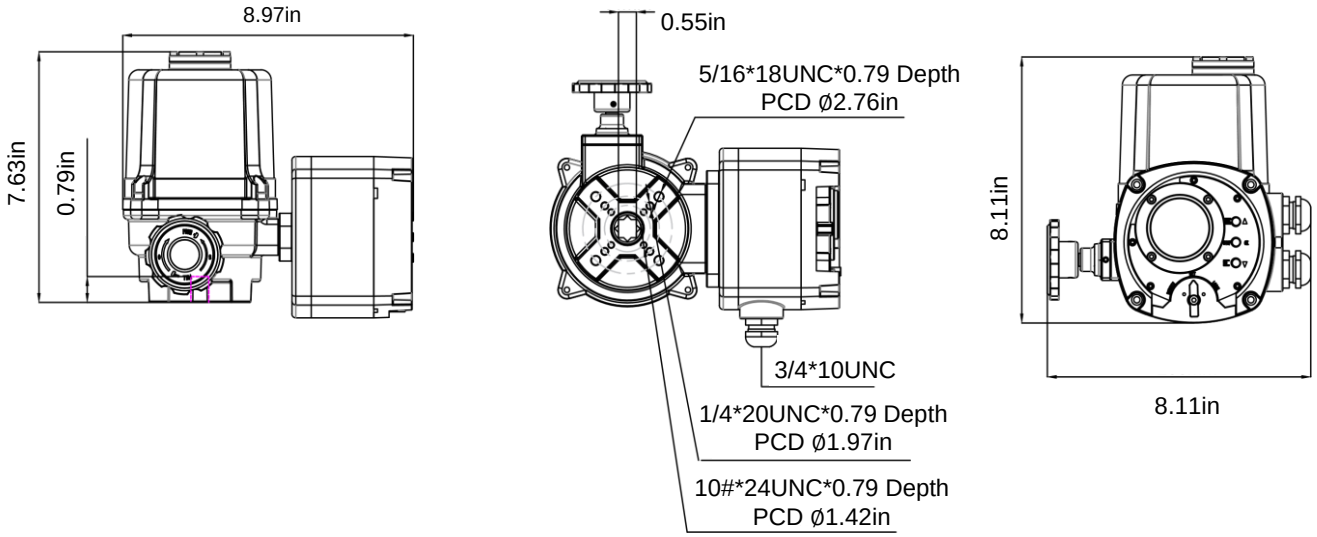
VTM5+G Series Electric Actuator dimensions



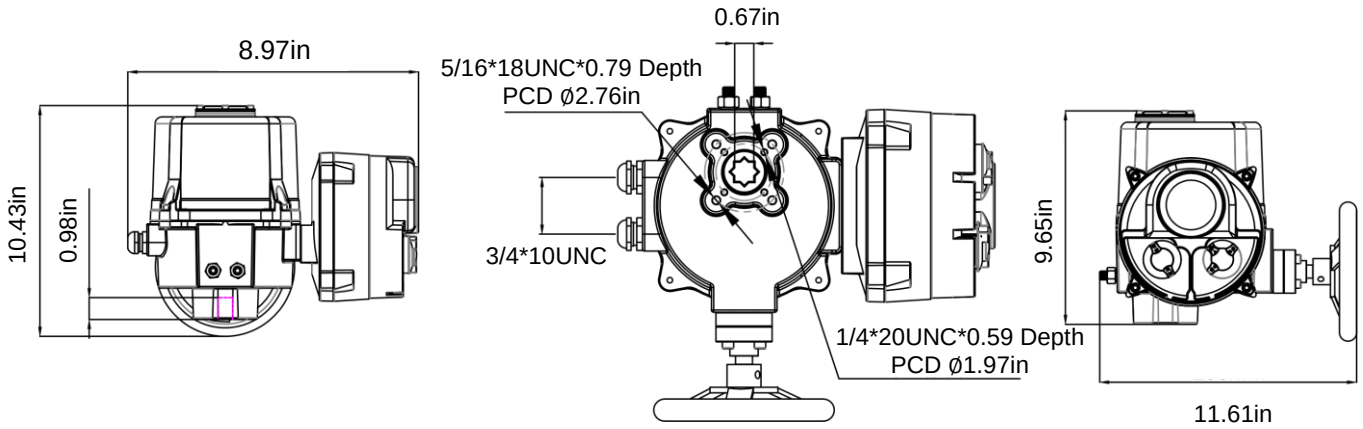
VTM1S intelligent interation dimensions



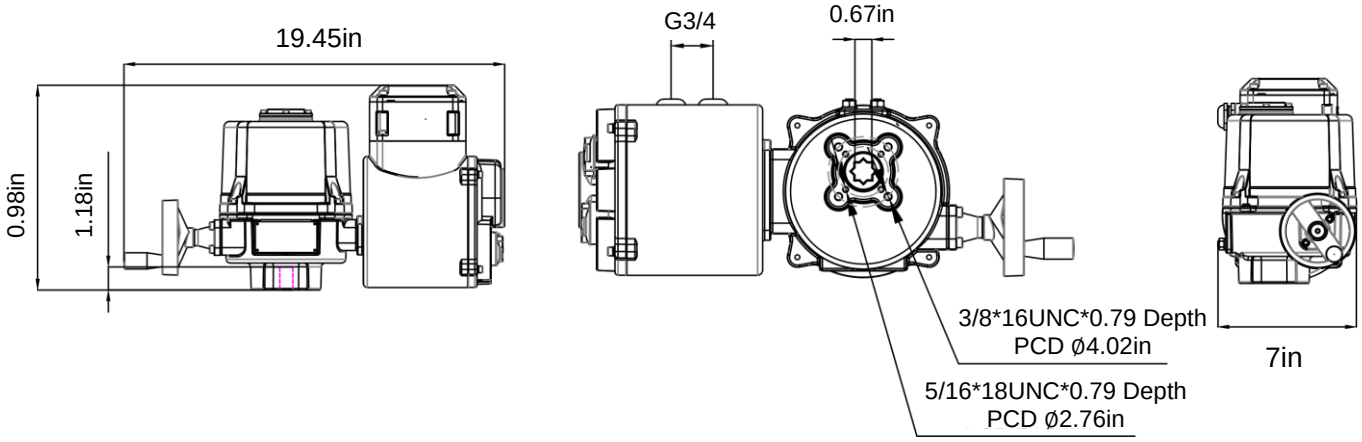
VTM1H intelligent interation dimensions



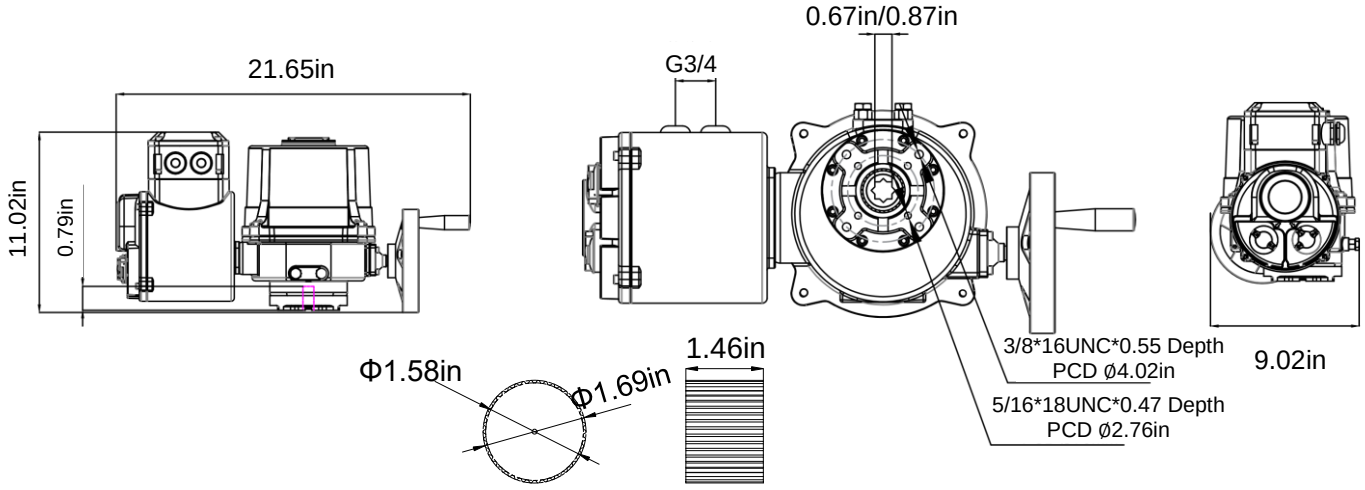
VTM2H intelligent interation dimensions



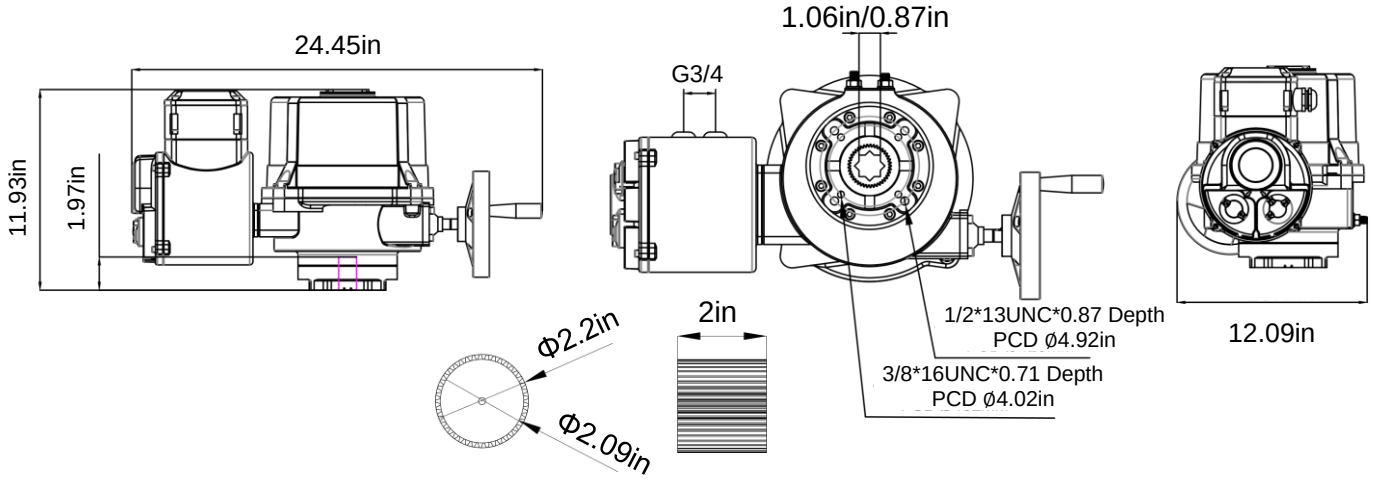
VTM2 intelligent interation dimensions



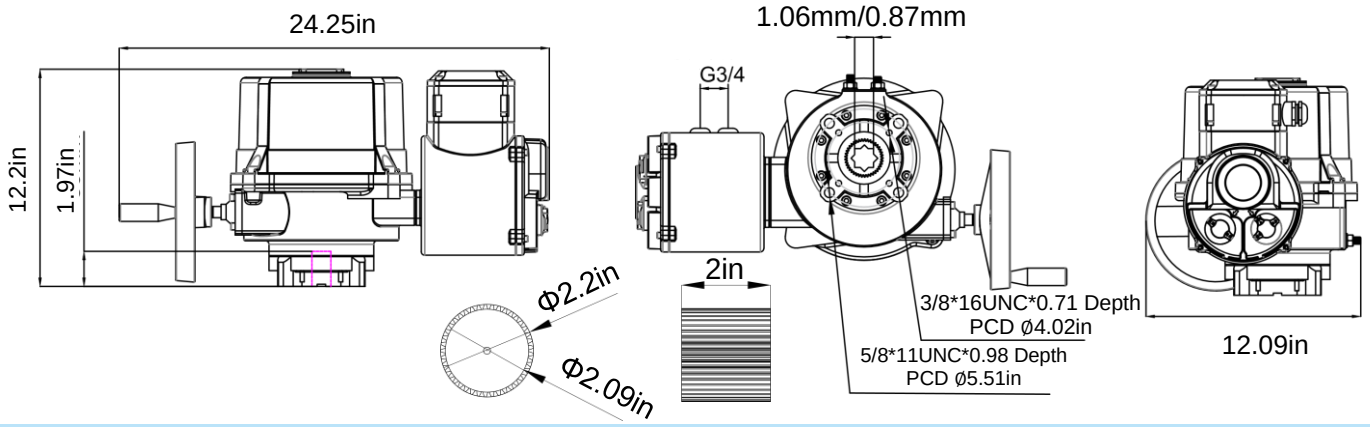
VTM3 intelligent interation dimensions



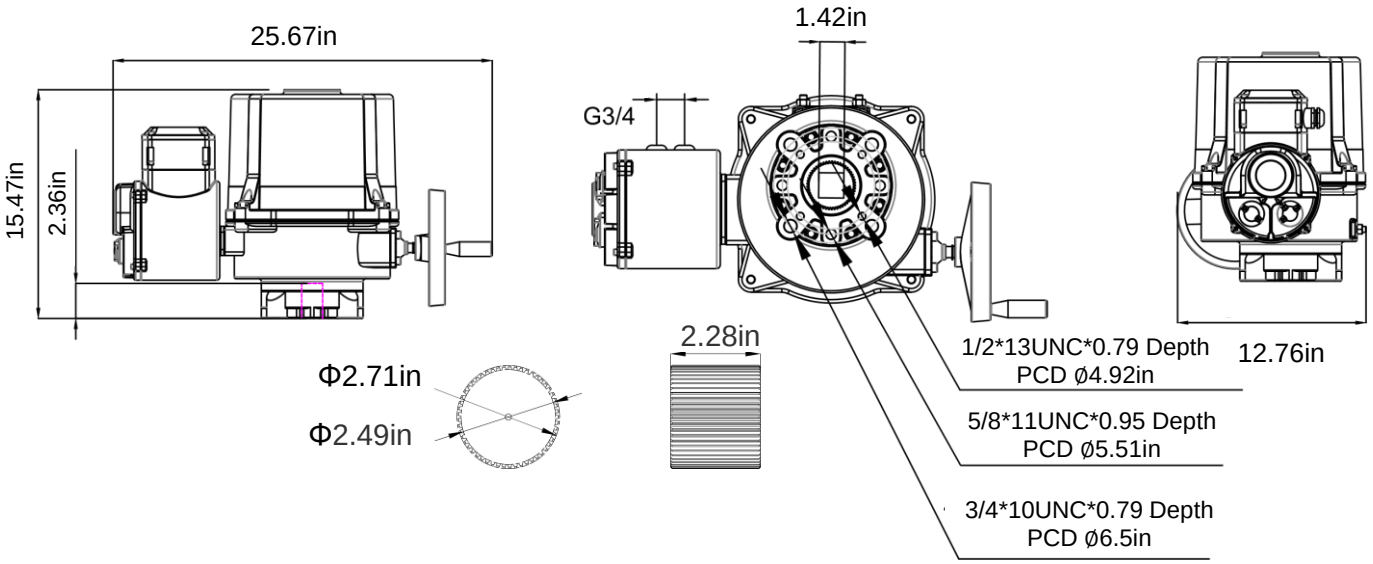
VTM4 intelligent interation dimensions F10-F12



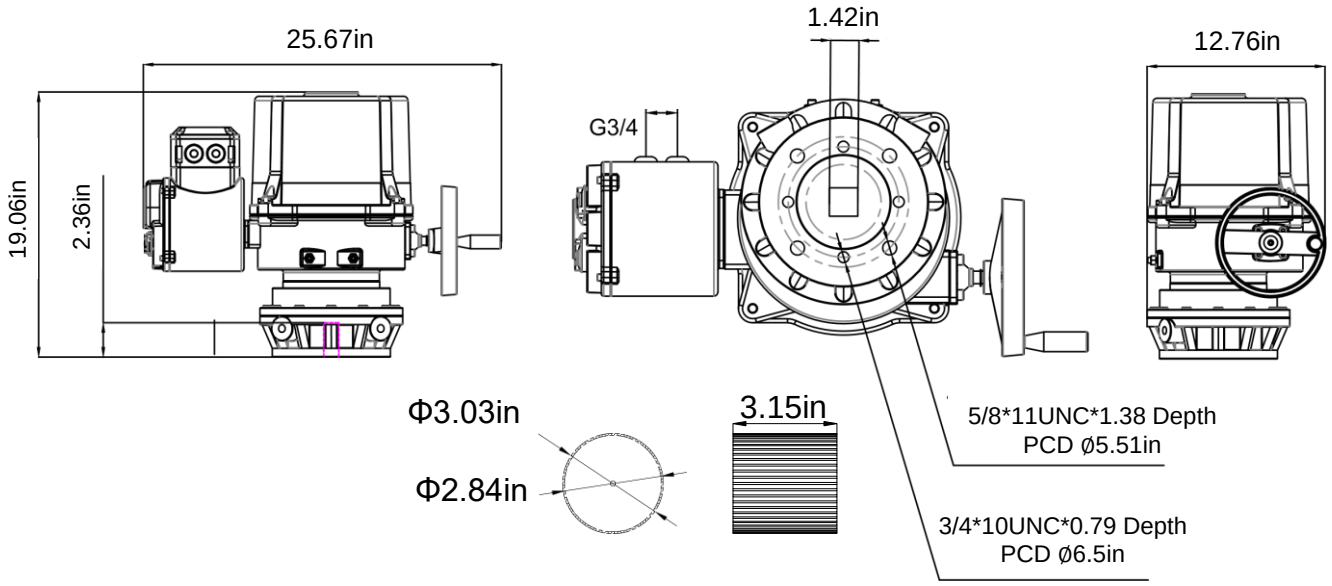
VTM4 intelligent interation dimensions F14



VTM5 intelligent interation dimensions



VTM5+G intelligent interation dimensions



Installation suggestions

1、Installation site：

Precautions for indoor installation:

If it is installed in an environment with explosive gas, it is necessary to order explosion-proof actuator;Please explain in advance if it is installed in a flooded environment or outdoors;Please reserve space for wiring, manual operation and maintenance during installation;

2、Precautions for outdoor installation:

In order to avoid rain, direct sunlight and other problems, it is necessary to install a protective cover, or choose a configuration with a protection grade of IP67 or above; Please reserve space for wiring, manual operation and other maintenance;

3、 Ambient temperature:

The acceptable working temperature is within the range of -20 ℃ ~ + 70 ℃(ON/OFF Control Type)&-20 ℃ ~ + 60 ℃（Modulating control）;When the ambient temperature is below 0 ℃, install dehumidification heater in the machine;

4、Fluid temperature conditions:

When used in conjunction with valves, the heat of fluid will be transferred to the body, causing the body temperature to rise; When the fluid is in a high temperature condition, special treatment is required for the supports connected to the valves.

1：Standard supports: suitable for fluids below +65 C or without optional;

2：Medium temperature support: suitable for fluid temperature + above 100 C, + below 180 C;

3：High-temperature support: suitable for fluid temperature + over 180 C;

Note: Users can design and manufacture brackets separately according to the functional requirements of drive bushing. The brackets can be designed as circular shaft, square shaft or other forms of shaped shaft output.

(Processing must ensure that holes are concentric with the outer circle)

Selection Criteria and Configuration Reference

VTM — T — K — V — B

Model No / torque / Control method / Power Supply / Opitions

Control method（K）：

O :Open/Close

M1 : 4 - 20 mA input/output

M2 : 0 - 5V mA input/output

M3 : 2 – 10 V input/output

ICM:Intelligent integrated control

Power Supply（V）：

D: 220 VAC(50 / 60 hz)

E: 120 VAC(50 / 60 hz)

F: 24 VDC

I: 440 VAC/3Ø (50 / 60 hz)

J:400 VAC/3Ø (50 / 60 hz)

Opitions（B）：

X: Heater（Recommended for high humidity and low temperature working environment）

A: 0-1K or 0-5KΩ resistance output

B: 4-20mA Output for O Control method

VTM	T		K					V				B
	N.m	In.ibs	O	M1	M2	M3	ICM	D	E	F	I&J	Opitions
VTM0S	20	78	•	•	•	•	—	—	—	•	—	X A B And Special requirements such as color customization
VTM1S	35	310	•	•	•	•	•	•	•	•	—	
VTM1H	50	443	•	•	•	•	•	•	•	•	—	
	70	620	•	•	•	•	•	•	•	•	—	
VTM2H	100	885	•	•	•	•	•	•	•	•	•	
	200	1770	•	•	•	•	•	•	•	•	•	
VTM2	100	885	•	•	•	•	•	•	•	•	•	
	200	1770	•	•	•	•	•	•	•	•	•	
VTM3	300	2655	•	•	•	•	•	•	•	•	•	
	450	3983	•	•	•	•	•	•	•	•	•	
VTM4	500	4425	•	•	•	•	•	•	•	•	•	
	800	7080	•	•	•	•	•	•	•	•	•	
	1000	8850	•	•	•	•	•	•	•	•	•	
VTM5	1500	13275	•	•	•	•	•	•	•	•	•	
	2300	20355	•	•	•	•	•	•	•	•	•	
VTM5+G	4000	35400	•	•	•	•	•	•	•	•	•	
	5000	44250	•	•	•	•	•	•	•	•	•	

*These information is for reference only, please consult our customer service for details.

⚠ Notice

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