V-TORK USA

VTMR Series Spring Return Electric Actuator

- Reliable Mechanical Fail-Safe Spring Return Actuator
- Compact Design to Meet Space Requirements
- Wide Range of Sizes and Torque Outputs (20-300 NM)
- On-Off or Modulating Control

V-TORK®

Design and Construction

Design

The VTMR series spring return electric actuator is designed for mechanical fail-safe positioning of valves or dampers upon loss of supply power. The VTMR is for used in environments where reliable automatic closing or opening is required upon loss of power. When powered, the VTMR operates like a normal quarter-turn electric on-off or modulating actuator. Under normal powered conditions, the actuator and spring are held stationary through an electromechanical brake system. When power is lost, the spring is activated and returns the actuator to a predetermined fail-safe position.

The optional manual override ensures that operators can manually rotate the valve or damper to a precise position and maintain a set position. Manual release is not required during the electric control operation.

Structure

1. Product Construction
Compact design to reduce space requirements.

2. Low Maintenance
Rugged design with mechanical springs reduces maintenance.

3. SIL Certification
Spring return electric actuator complies with SIL2.

4. Adaptive Mounting
Actuator flange and drive sleeves comply with ISO5211 standards. Versatile design provides flexible mounting options.

5. Position Indication
Position signal available in several outputs including 4-20ma and 0-10V.

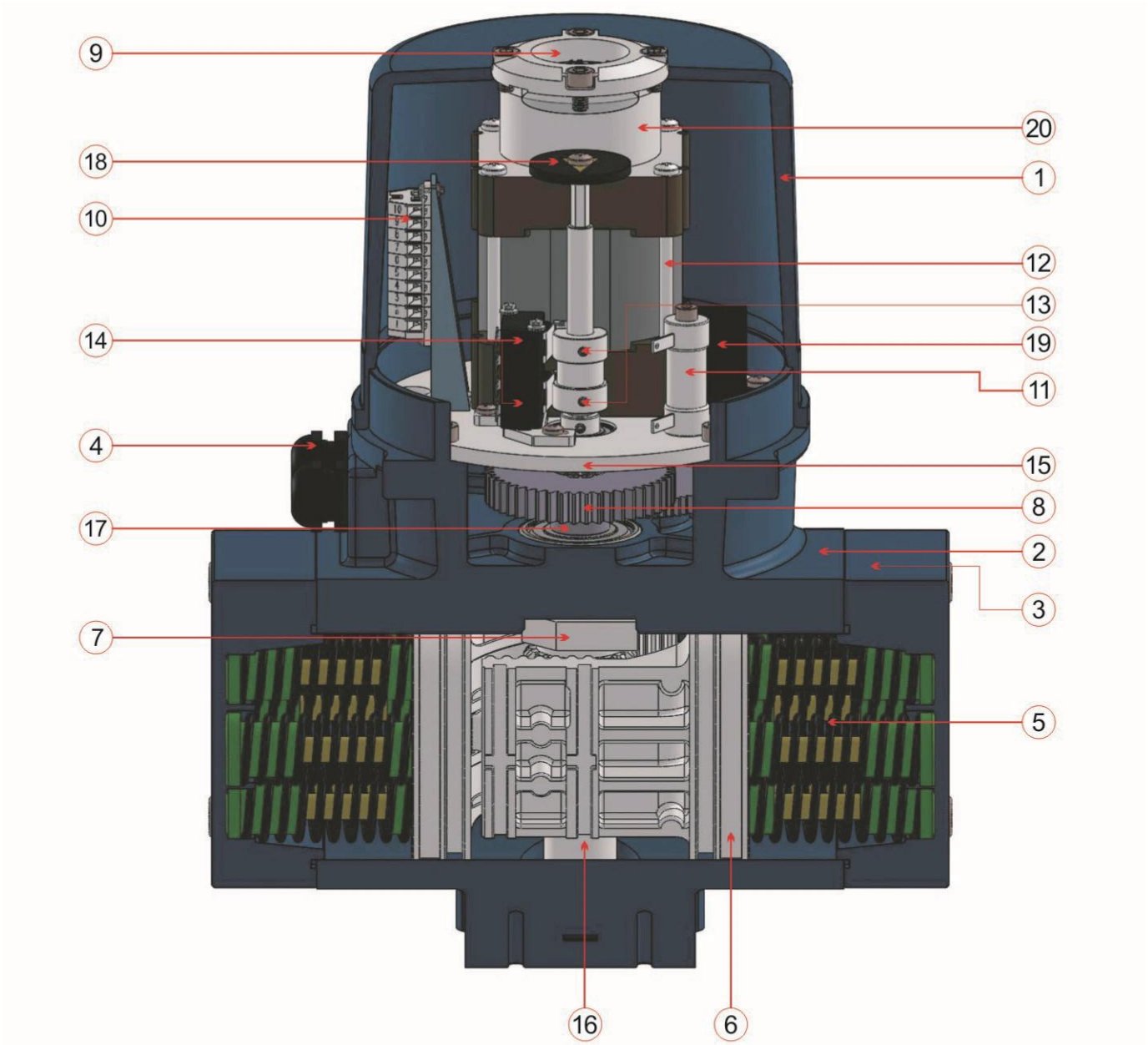
6. Reliable

The VTMR provides a fail-safe mechanical solution for critical applications requiring the most reliable method assuring fail-condition in case of power loss.

Quality Management

- VTMR series spring return electric actuator manufacturing process is compliant with ISO9001.
- 100% of all actuators are factory tested and externally marked with unique serial numbers.
- 100% of all units are individually boxed and appropriately labeled.

Part and Material



Serial No.	Part Name	Material	Serial No.	Part Name	Material
1	Upper Cap	ADC12	11	Space Heater	Ceramic
2	Body	AL104	12	Electrical Motor	Integrated Set
3	Side Cap	ADC12	13	Adjustment Cam	ADC12
4	Connection Lock	Nylon	14	Micro switch	Integrated Assembly
5	Safety Spring	Spring Steel	15	Mounting Retaining Plate	Q235
6	Piston	ADC12	16	output Shaft	45# Steel
7	Spacing Block	45# Steel	17	Locating Bearing	Bearing Steel
8	Driving Gear	40CR	18	Position Indicator	Nylon
9	Display Window	Tempered Glass	19	Capacitor	Composite Material
10	Wiring Terminal	Flame-retarded Nylon	20	Brake	Integrated Set

Product Information

1. Body
Material: aluminum alloy coated with polyester powder, ISO12944-6 C3 corrosion-resistant grade, available in NEMA 4 or NEMA 4X.

2. Position Indicator
Continuous mechanical position indicator for convenient indication of actuator position

3. Lubrication
Gear sets are factory lubricated and additional lubrication is not required.

4. Starting Frequency
50% starting frequency (as per IEC standard)

5. Certifications
CE/RoHS/REACH

6. Operating Conditions
Temperature: -20°F to 140°F
Humidity (@77°F):95%

7. Safety Integrity Grade
SIL2

8. Conduit Entry
Standard: 2 x 3/4"NPT, 2 x 1/2"NPT,
Optional: 2xM20*1.5

9. Heater
The internal heater maintains temperature at a proper level to avoid freezing of lubrication and reduce internal enclosure humidity.

10. Temperature Control Switch
Temperature control switch for the heater will control the internal enclosure temperature to 77°F +/- 9°F.

11. Limit Switches
Equipped with two standard full open/ full close limit switches (LS1 & LS2) and additional two limit switches (LS3 & LS4).

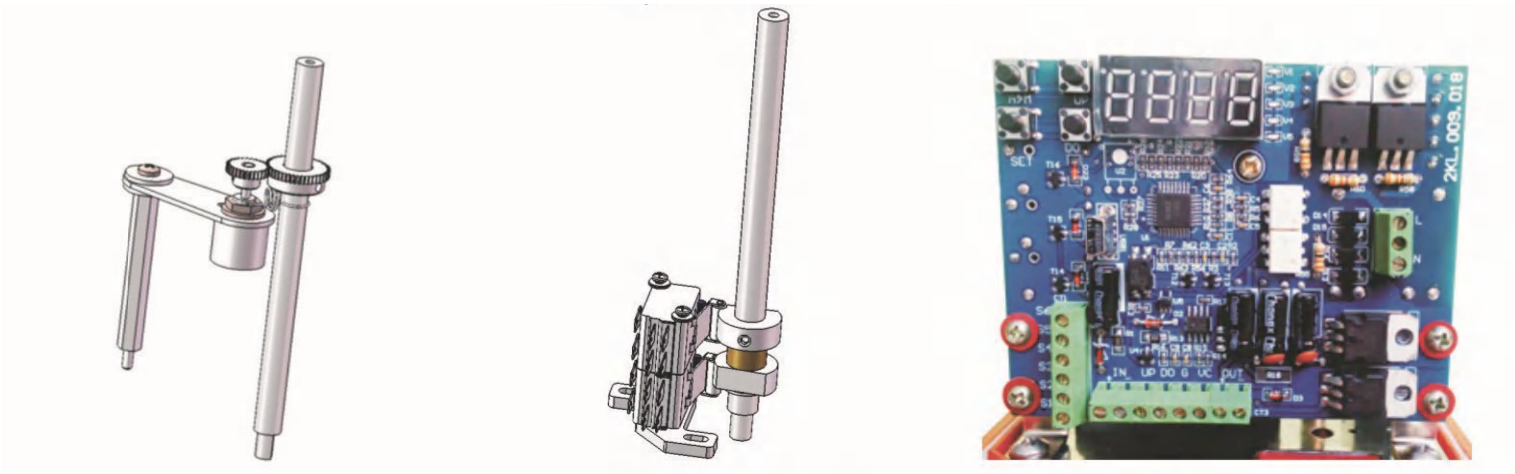
12. Analog Input
Optional analog input module fits within standard enclosure and does not require additional enclosure. Available inputs: 4-20ma, 0-5V, or 2-10V

13. Position Output Signal
Selectable 1K ohm or 5K ohm resistance position signal output.

14. Analog Signal Output
Analog Position indication with selectable 0-20ma, 4-20ma, 0-5V, 0-10V, 1-5V, or 2-10V

15. Partial Stroke Setting
The actuator can be controlled to open, close, or stop at intermediate positions between 0 and 90 degrees via external signal. In case of a power outage during partial stroke, the actuator will operate to fail position.

16. Operating Rotation Direction
The actuator rotation direction is not field adjustable. Standard power failure direction is clockwise. Optional power failure direction is counterclockwise.



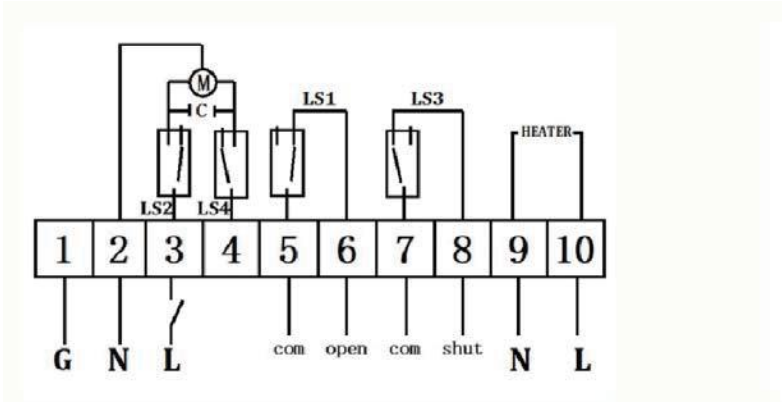
Potentiometer 1K
Resistance Output

On/Off Type Passive Contact

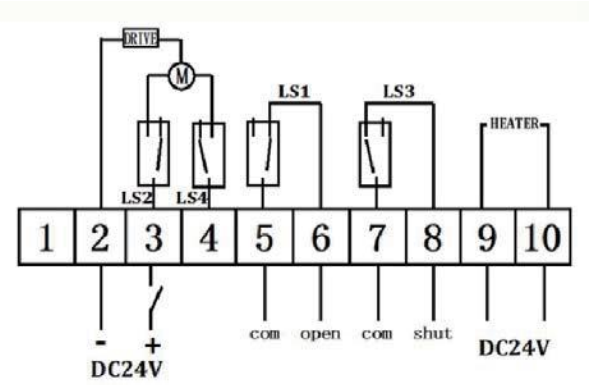
Electrical Information

Model	Torque		Current Draw (amps)	
	NM	In-lbs	24VDC	110VAC
VTRM-1	20	177	1.8	0.9
VTRM-2	38	336	2.5	1.2
VTRM-3	55	487	3.5	1.6
VTRM-3	70	320	5.0	1.8
VTRM-4	140	1239	8.5	4.2
VTRM-4	210	1859	9.5	4.5
VTRM-5	300	2655	21.0	5.5

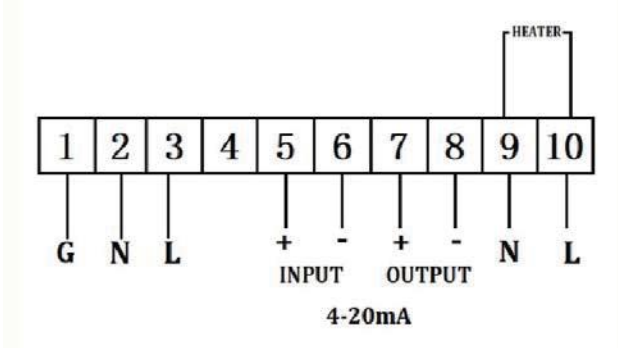
Electrical Information



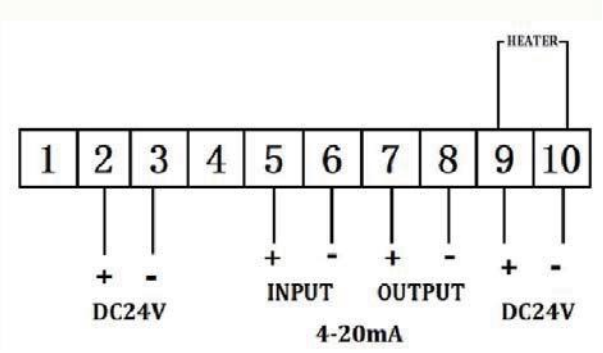
Single-phase AC120V/AC220V On/Off Type



DC24V On/Off Type

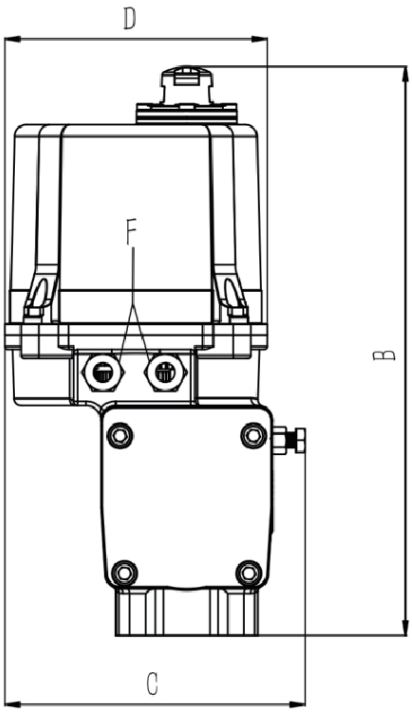


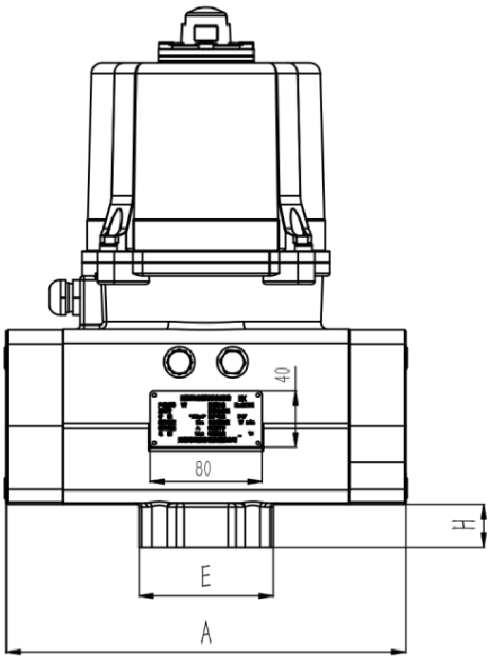
Single-phase AC120V/AC220V Modulating Type

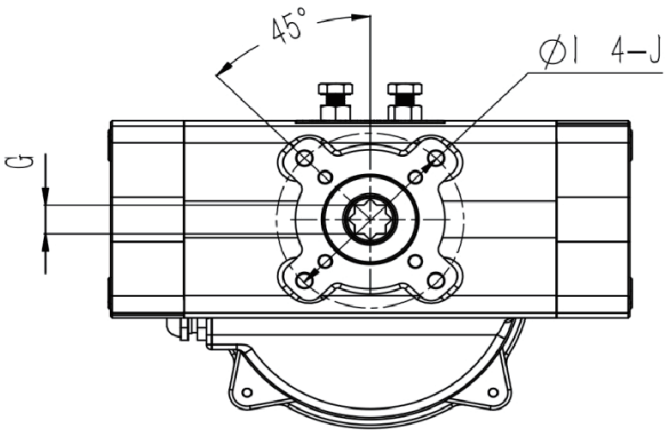


DC24V Modulating Type

Dimensions







Model	Unit	A	B	C	D	E	F	G	H	ΦI	J
VTMR-1	inches	7.44	9.06	4.92	4.65	2.95	1/2" NPT	0.55	0.63	F03	#10-24UNCx0.39
VTMR-2		9.02	11.93	6.38	5.71	2.95	1/2" NPT	0.55	0.67	F05/F07	1/4-20UNCx0.59
											5/16-18UNCx0.59
VTMR-3		10.47	14.96	7.83	6.97	3.78	1/2" NPT	0.67	0.75	F07/F10	5/16-18UNCx0.59
											3/8-16UNCx0.79
VTMR-4		14.84	17.17	9.45	8.11	4.72	1/2" NPT	0.87	0.98	F10	3/8-16UNCx0.79
VTMR-5		15.98	21.06	11.02	10.24	4.72	1/2" NPT	1.06	1.18	F10/F12	3/8-16UNCx0.79
											1/2-13UNCx0.79

Technical Data

Model	VTMR-1	VTMR-2	VTMR-3		VTMR-4		VTMR-5
Torque	177in.Lbs	336in.Lbs	487in.Lbs	620in.Lbs	1239in.Lbs	1859in.Lbs	2655in.Lbs
	20Nm	38Nm	55Nm	70Nm	140Nm	210Nm	300Nm
Power(W)	10W	18W	40W	60W	90W	120W	200W
Voltage (DC/AC)	120VAC/220VAC, 24VDC						
Frequency (Hz)	50/60						
Operation Mode	S2-20Min						
Start Time(S)	12	8	8	8	10	12	12
Spring Return Time(S)	5	3	3	3	5	5	5
Spring Circle Life (Cycles)	100000	100000	100000	100000	100000	100000	100000
Ambient Temperature	-13F to 149F						
Ambient Humidity (77℉)	95%						
Protection Class	NEMA 4X & IP67						
Manual Override	Optional with open						
Manual Override Method	Operation under power off (system power supply interrupted)						
Power Loss Return Direction	Close (or open)						
Half Stop	Electromagnetic brake control						
Cable Entry	2*1/2" NPT						
Lubrication	Grease						
Limit Method	Electronic control: electronic limit						
	Spring return at power failure: mechanical limit						
On-Off Type Signal	Passive feedback,two-wire/three-wire						
Mechanical Stop	Full close/open mechanical stop						

Product Model Numbering

VTMR	Size-	T-	C-	V-	E-	O
	Enclosure Size	Output Torque (NM)	Control Method	Power Supply	Enclosure Type	Options
	1	20	O: open/close	D: 220VAC	W: NEMA 4	CCW: ccw fail position
	2	38	M1: 4-20mA input/output	E: 110VAC	EX: NEMA 4X	
	3	55				
	3	70				
	4	140	M2: 0-5V input/output	F: 24VDC		
	4	210	M3: 2-10V input/output	G: 12VDC		
	5	300				

Example: VTMR3-70-M1-F-EX would represent a VTMR with 70NM ouput torque,4-20ma input modulating operation with 24 volt dc power supply in NEMA 4X enclosure.

Notice

Pressure class and other performance data published in this catalog have been developed from our design calculation, in-house testing, and/or published official standards or specifications. They are to be used as a general guideline to users of VTORK products. For specific application information, contact factory for technical support. Failure to follow this request could result in property damage and/ or personal injury, for which we shall not be liable. While this catalog has been compiled with the utmost care, we assume no responsibility for errors. Any information provided in this catalog is subject to change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that VTORK considers necessary. This edition cancels all previous issues.

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