V-TORK®

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VSM Series Electric Actuator

Incorporates advanced technology
Safety and reliability as core design principles
Supports a variety of redundant control methods
Supports an array of communication protocols including PROFIBUS,FF (Foundation Fieldbus), and MODBUS

Product Introduction

Product Overview

As a new-generation core fluid control device, it follows a safety-first, reliability-based design core. Its performance meets industrial needs: supporting Class C frequent modulation (throttle valves, etc.) and Class A/B intermittent control (gate valves, etc.), with Class 1 positioning accuracy and wear-free torque detection for long-term stability.
Integrating cutting-edge actuator tech, it innovatively uses dual structures (integrated for compact spaces, split for long-distance/special layouts) for complex domestic industrial scenarios.
Widely used in domestic key industries (power plants, petrochemicals, etc.), offering efficient, safe fluid control solutions.

Product Features

Circuit module	Uses large-scale digital integrated chips, powerful and high-precision.
Communication protocols	Supports PROFIBUS, FF, MODBUS, HART and other fieldbus protocols, plus multiple redundant control methods.
Torque monitoring	Continuously measures output torque via current, voltage, flux detection, with mathematical models and advanced algorithms.
Displacement sensor	Uses absolute encoder (no battery memory required), basic valve positioning error meets Class 1 precision.
On-site operation	Function setting, parameter configuration, commissioning and electric operation via handheld remote or knob.
Wiring ports	Plug-in or sunflower-disc wiring for easy and quick maintenance.
Display screen	Full English & character display, menu-driven, easy to operate.
Protection class	Enclosure IP68, explosion-proof class dIICT4.
Electrical sealing	Wiring part adopts double-sealing structure to block moisture ingress.
Valve position indication	LED indicates fully open/closed valve positions, visible from a distance.
Handwheel	Newly designed manual mechanism with double seals, solves common lubricating oil leakage at handwheel in electric actuators.

Product Features

1.Standard enclosure protection class: IP68.

2.Wiring section adopts double-sealing structure to effectively block moisture ingress.

3. Terminal cover port is rotatable every 90°, allowing the electric actuator's installation direction to be unrestricted by cable orientation, and ensuring the cable inlet always faces downward to prevent rain and snow ingress.

4. Terminal cover connects to the cabinet via captive bolts, with a nylon lanyard between cover and cabinet for easy on-site wiring operation.

5. Newly designed manual operation mechanism with double seals, solving the common lubricating oil leakage issue at thehandwheel of electric actuators.

6.Adopts advanced magnetoelectric absolute encoder: the output shaft drives the encoder to rotate, and the generated coding signal is sent to the main control chip to calculate the current valve position. The absolute encoder is unaffected bypower failure or interference, ensuring accurate valve position at all times.

7. Graphic dot-matrix LCD screen: displays actuator torque, valve position, limit settings and other operating status/alarms in Chinese, numbers, graphics, etc., supporting multiple languages including Chinese and English.

8. Remote/local mode selection knob; local valve open/close knobs.

9. LED indicators show fully open/closed valve positions, visible from a distance.

10.Backup battery enables valve position display when main power is off.

11.Adopts more stable, higher-grade three-phase three-control circuit design, while being backward compatible with three-phase two-control circuits.

12.Torque detection: Continuously measures output torque by detecting current, voltage, flux, establishing a mathematical model and using advanced algorithmsTorque protection value adjustment can be easily done via the programmer. Compared with mechanical torque or other detection methods, it eliminates mechanical wear for long-term reliability.

13.Non-intrusive setting:
a) Local/remote selection knob and local operation knob use magnets to control Hall sensors inside the electrical enclosure, eliminating traditional through-shafts.
b) No need to open the actuator enclosure when setting, checking or querying via a wireless programmer.
c) Enclosure remains closed, preventing dust, harmful gases and moisture in the environment from eroding the actuator; easy commissioning in rain or flammable gas environments; convenient query of various actuator statuses.

14.Protection functions:
a) Torque protection b) Valve position limit protection c) Automatic phase sequence adjustment d) Instant reverse protection e) Power phase loss protection f) Optional follow-up action for valve jamming g) Overheating protection h)Electrical protection

15.Configurable alarms:
a) Fully open/closed valve position feedback b) Over-torque alarm c) ESD trigger alarm d) Motor temperature alarm e)Power phase loss alarm f) Remote signal loss alarm g) Operation knob status h) PST success signal

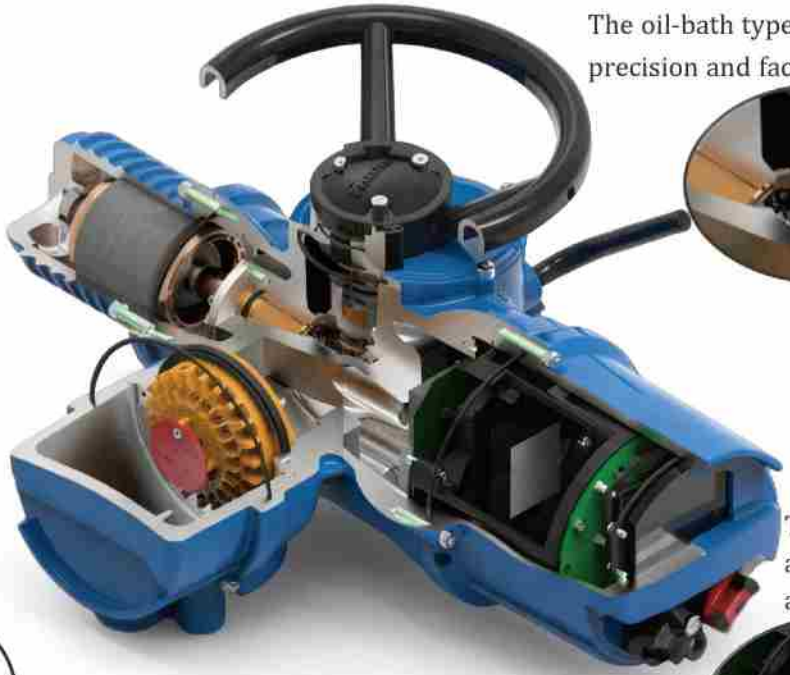
16.Other functions:
a) Intermittent timed operation (multi-speed control) b) Fieldbus control: ST-Ring (proprietary protocol), Profibus, Modbus, Foundation Fieldbus, Hart c) Electronic latching function d) Advanced real-time clock e) Intelligent diagnostic function

Product Features

Simple and reliable structure, optimized drive train parameter design, high transmission efficiency ratio, and the worm adopts angular contact bearings, which enhances the axial load-carrying capacity.

Output flanges conforming to ISO 5210 and other international standards; special flanges can be customized.

The motor mounting structure adopts a brand-new design, featuring easy disassembly and high reliability.



The oil-bath type worm gear improves precision and facilitates heat dissipation.

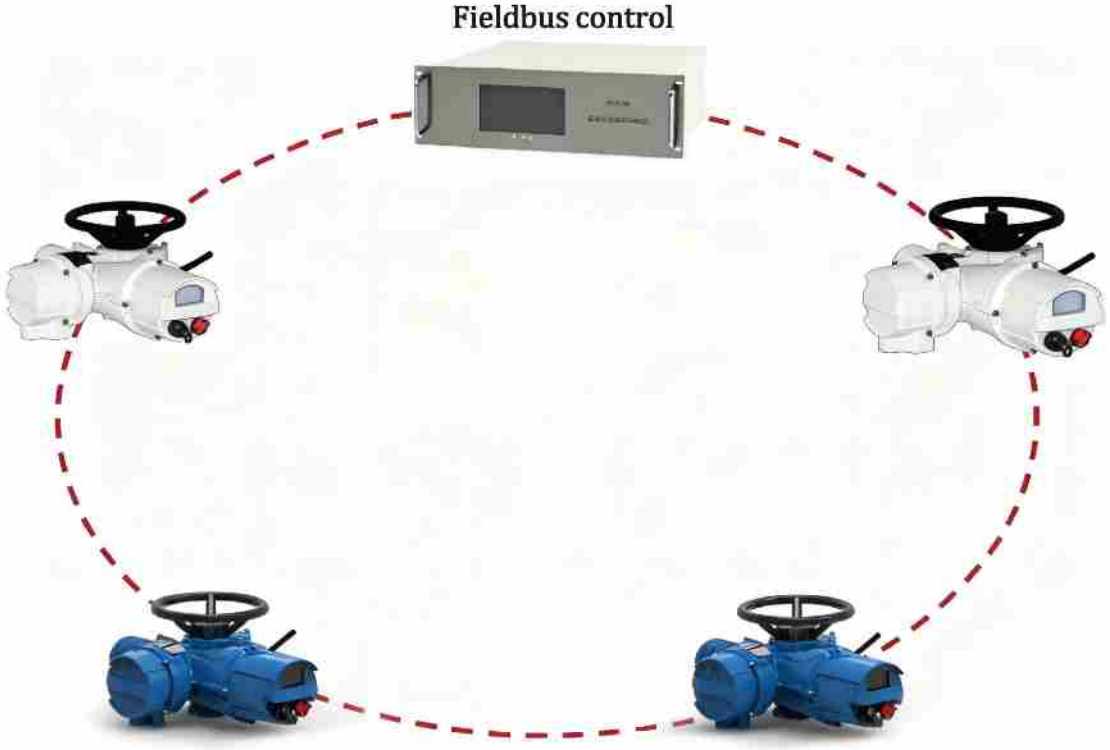
The cable entry part adopts a double-sealed structure, which effectively blocks the ingress of moisture.

The electrical part adopts a suspended anti-vibration structure.

The cable entry port can be customized.

Knob anti-collision design.

Product Features



In addition to supporting conventional control methods, the VSM series actuators of V-TORK also support seamless connection with a variety of fieldbus control systems that comply with international standards, such as PROFIBUS, F F (Foundation Fieldbus), MODBUS, HART, etc. They support device descriptions of EDDL and FDT/DTM, and suppor t multiple bus redundancy methods.

V-TORK's advanced ST-RING controller supports forming a ring network with up to 250 actuators, and can independ ently implement remote control and diagnosis of actuators without the need for DCS/PLC.

- Two-wire fieldbus system
- Intelligent terminal
- Supports multiple actuator devices
- Maximum supported devices: 250 units per host
- Maximum loop distance: 20Km (without repeater)
- Compatible with SMART PLUS detector
- Response delay: 50ms

Split-type electric actuator (optional)

•Designed for harsh working conditions
•Separates the electrical part from the mechanical part to protect electrical components from harsh conditions such as high temperature and vibration
•Split-type arrangement
•Modular design with highly universal components
•Does not affect original functions and applications
•Maximum distance for split layout can reach
•200m, IP68 waterproof standard
•IEC ATEX DIIICT4 explosion-proof standard
•Please state in the purchase remarks: Split-type electric actuator is required

SMART PLUS detector (optional)

•Infrared addressing for quick binding to actuators
•Bluetooth effective distance: 30m
•Ergonomic design
•3-inch LCD display, what you see is what you get, displaying the actuator screen content in real time
•Wireless charging
•Supports HART protocol
•Intrinsically safe type
•Offline parameter setting
•No need to set one by one for each unit
•Suitable for setting in small spaces, high altitudes, and underground
•Can download actuator historical data (Data log) for analysis and comparison on the PLUS setter or computer
* VSM SMART PLUS detector is an additional purchase; the actuator comes with an ordinary wireless setter

Overview of VSM Series Selection

Drive Forms

Thrust Type (Type A Bushing)

Mainly used in applications with large axial forces; different drive sleeves are selected based on the valve stem shaft diameter.

Non-thrust Type (Type B Bushing)

Mainly used in occasions without axial for ce, and different drive bushings are select ed according to the stem shaft diameter a nd mode.

Internet of Things (IoT) Module (Optional)

- V-TORK SMART-IiOT Industrial IoT Module (Optional)
- An essential product for actuator products to enter the Industry 4.0 era
- Data monitoring in the wireless era
- Wireless 4G\5G ① connection adaptation
- Factory safety application

Gearbox Adaptation

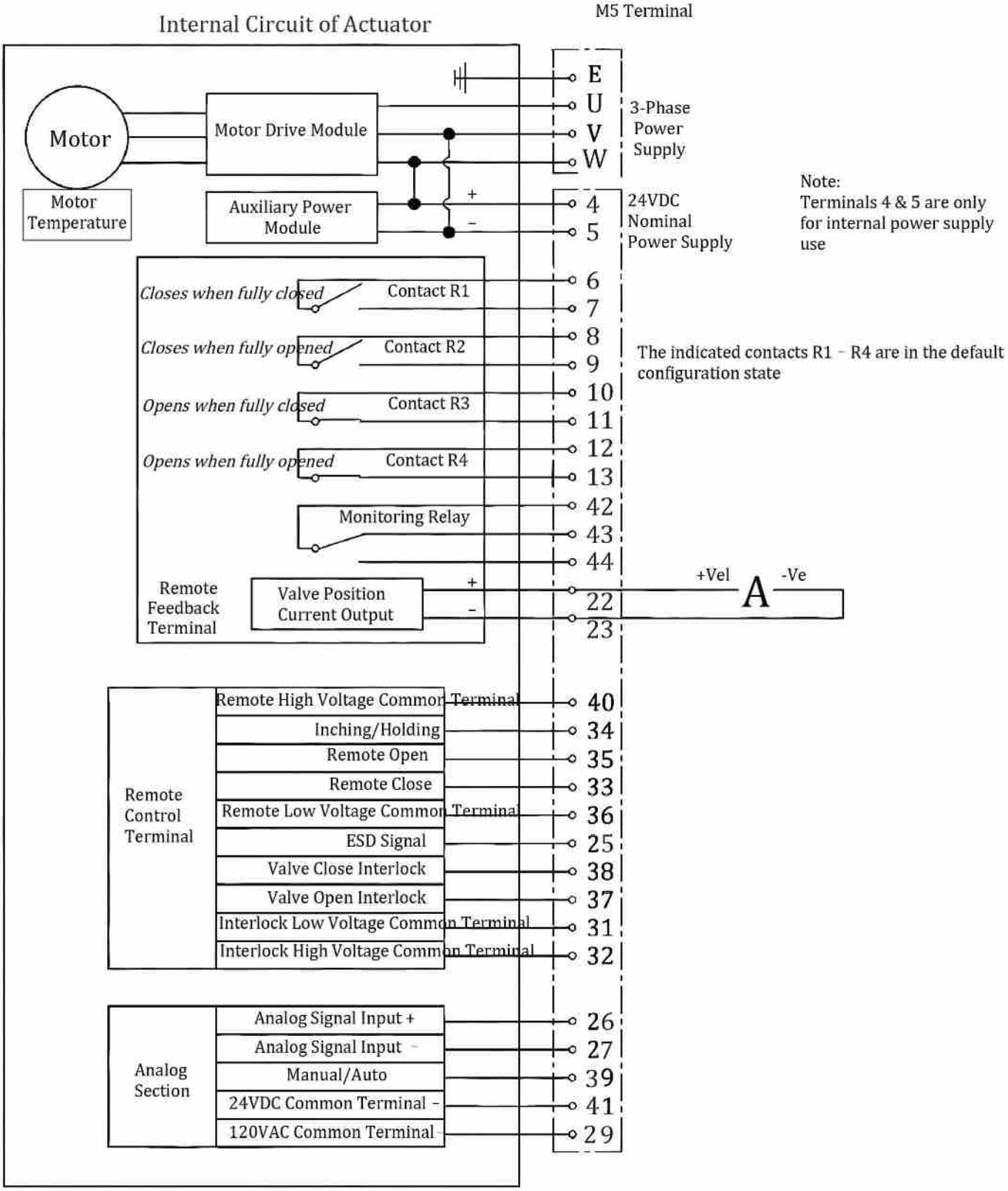
Worm gear
Rotary stroke gearbox

Bevel/Spur Gear
Multi-turn Gearbox

Linear Stroke
Linear Thrust Unit

Multiple paint specifications and colors are available

VSM Wiring Diagram



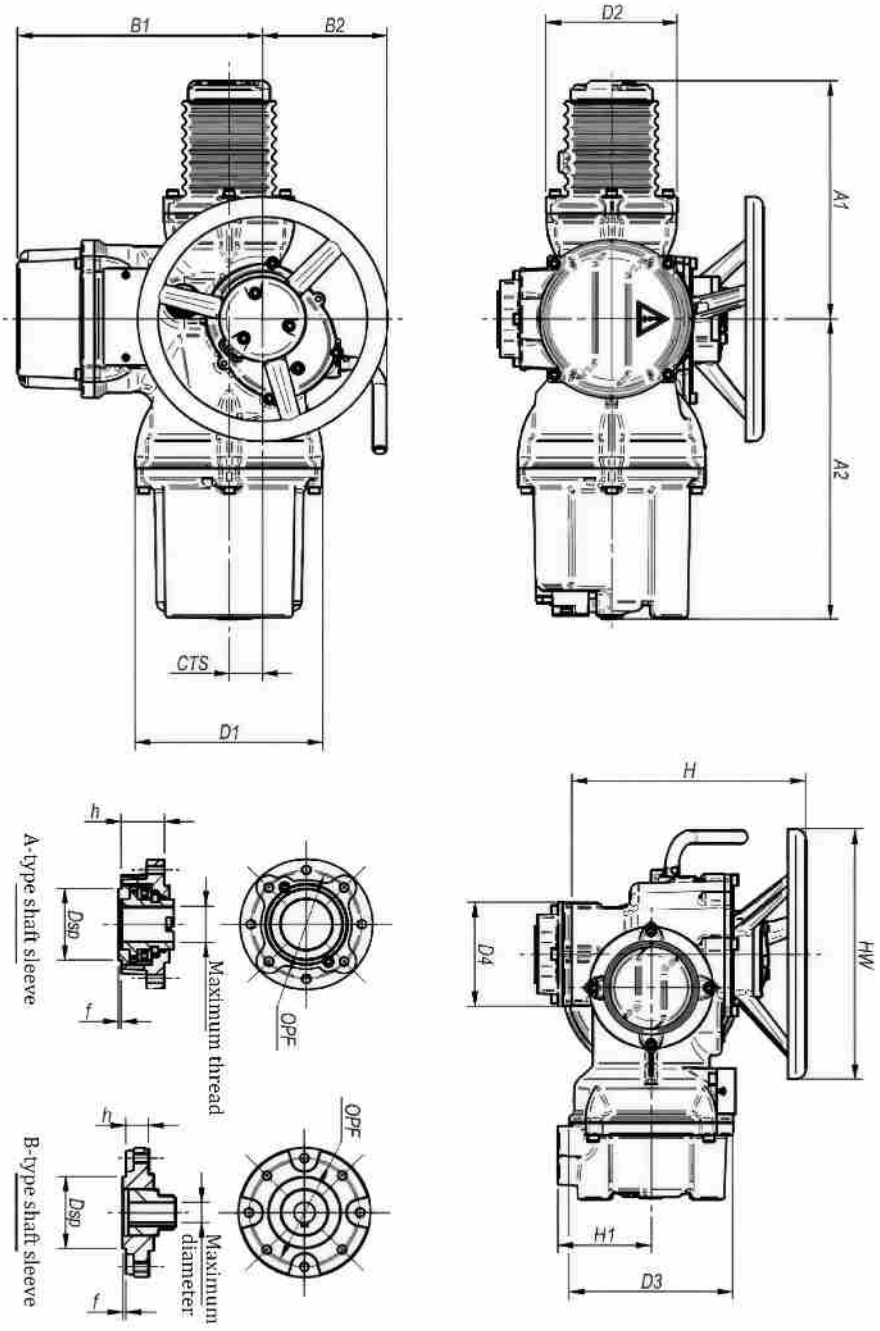
The circuit shown is in a power-off state and the actuator is in the middle position of the stroke.

VSM Series Model Specifications and Main Performance Parameters

VSM Series Multi-turn Electric Actuators

Model	Output Speed	Output Torque	Motor Power	AC380V 50Hz		AC400V 50Hz		AC440V 50Hz		Reference Weight
				Rated Current	Locked-Rotor Current	Rated Current	Locked-Rotor Current	Rated Current	Locked-Rotor Current	
	RPM	N.m	KW	A	A	A	A	A	A	Kg
VSM1	18	80	0.55	1.3	3.1	1.0	2.8	0.9	2.3	37
	24	80	0.55	1.3	3.1	1.2	3.4	1.1	3.1	
	36	70	0.55	1.7	4.1	1.5	4.4	1.4	4.0	
	48	60	0.55	1.7	4.1	1.4	3.6	1.3	3.8	
	72	50	0.55	1.8	4.5	1.4	3.5	1.6	4.3	
	96	40	0.55	1.8	4.4	1.6	4.4	1.6	4.3	
	18	110	0.65	1.9	4.6	1.3	3.6	1.4	3.8	
	24	110	0.65	1.9	4.6	1.6	4.5	1.5	3.8	
	36	80	0.65	2.0	4.9	1.5	4.8	1.4	4.0	
	48	70	0.65	2.0	5.0	1.8	4.8	1.3	3.8	
	72	60	0.65	2.0	4.9	2.1	6.9	1.9	5.2	
	96	50	0.65	2.2	5.4	2.3	6.9	1.9	5.2	
VSM2	18	200	1.50	4.8	12	2.1	7.4	2.4	7.8	62
	24	200	1.50	4.8	12	2.1	7.5	2.0	5.9	
	36	200	1.50	4.6	11.5	2.8	9.9	2.6	8.4	
	48	200	1.50	5.0	12.3	3.4	11.0	3.1	11.3	
	72	180	1.50	5.1	12.3	4.2	15.0	3.6	11.1	
	96	150	2.20	6.3	15.6	4.4	12.8	4.0	11.1	
	144	105	2.20	6.1	15.3	4.7	16.7	4.2	10.9	
	18	400	3.00	5.9	14.6	4.0	14.9	3.7	15.0	
	24	400	3.00	5.9	14.6	4.4	14.8	3.5	10.2	
	36	300	3.00	6.0	14.9	4.3	15.3	3.5	11.0	
	48	250	3.00	5.6	13.8	4.0	12.9	3.8	11.1	
	72	250	3.00	6.0	15.0	5.7	21.2	5.0	17.0	
	96	230	2.20	6.3	15.6	6.6	21.5	5.9	24.0	
	144	150	2.20	6.1	15.3	6.2	21.2	6.1	21.5	
VSM3	18	600	3.00	5.2	25.8	4.8	20.2	4.3	17.7	75
	24	600	3.00	6.0	25.8	5.8	20.1	4.9	17.2	
	36	540	3.00	7.3	25.9	6.8	25.7	6.2	21.3	
	48	470	3.00	9.4	32.5	8.4	35.4	7.3	32.0	
	72	470	2.20	12.3	45.4	11.6	48.2	11.5	31.4	
	96	360	2.20	12.0	45.5	12.0	35.6	10.9	33.0	
	144	250	2.20	13.3	36.7	11.5	36.0	11.1	31.7	
VSM4	18	1000	2.70	9.6	34.7	8.8	37.1	10.1	43.5	175
	24	1000	2.70	11.8	42.6	10.5	43.7	10.1	43.5	
	36	850	2.70	11.9	48.8	11.5	33.8	9.4	36.7	
	48	680	3.50	14.1	44.1	12.3	46.4	15.2	70.6	
	72	680	4.30	16.2	56.5	16.6	46.7	15.4	71.1	
	96	550	4.30	17.0	56.6	15.6	55.2	16.5	65.7	
	144	410	5.40	17.9	57.0	16.3	58.5	16.5	65.7	
	18	1500	3.50	17.0	72.9	12.8	42.0	9.9	46.2	
	24	1500	3.50	16.5	57.3	17.2	43.9	14.3	48.0	
	36	1300	5.40	22.3	59.7	22.1	61.1	14.3	65.5	
	48	1000	5.40	19.7	55.6	18.3	61.4	22.6	75.4	
	72	1000	6.50	24	84.5	22.6	88.6	22.6	75.4	
	96	750	6.50	23.0	71.0	22.6	68.9	18.1	100.0	
	144	650	6.50	25.5	107.1	25.0	89.4	21.9	100.0	
	18	2000	5.40	17.0	72.9	18.1	77.4	17.5	82.9	
	24	2000	5.40	22.3	74.4	20.3	77.4	17.5	60.4	
	36	1700	5.40	24.0	80.7	22.3	78.3	23.8	59.8	
	48	1360	7.00	24.3	94.6	25.1	96.5	22.3	70.4	
	72	1360	7.60	36.2	90.8	29.5	96.4	27.8	106.9	
	96	1000	7.60	30.9	91.0	27.9	98.2	27.8	106.9	
	144	870	7.60	37.3	107.1	32.6	114.0	28.1	127.8	
	24	3000	7.00	33	97.4	30.8	94.5	29.1	87.6	

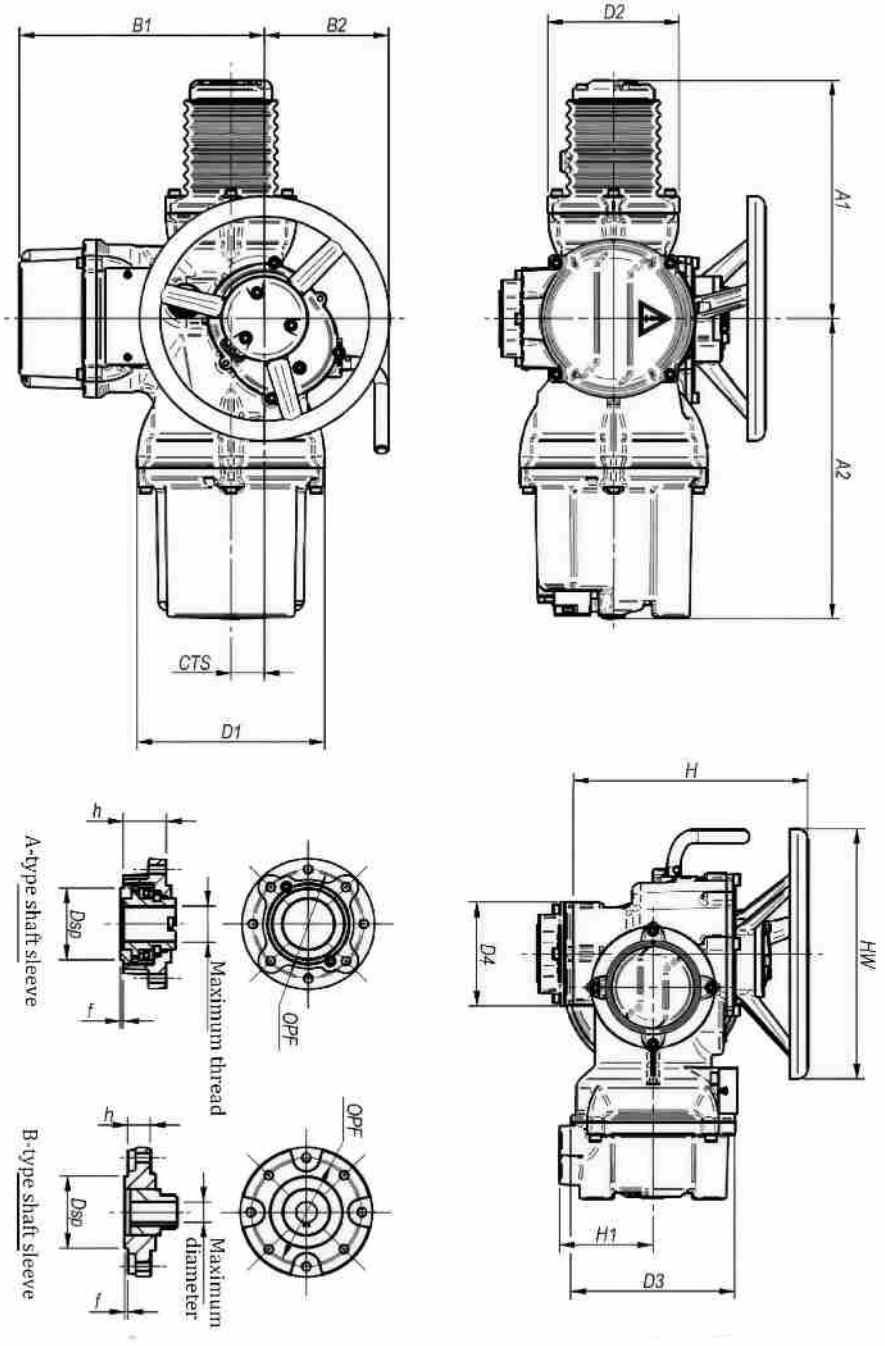
VSM Series Multi-turn Intelligent Electric Actuator Dimension Drawing



Actuator Model	A1	A2	B1	B2	H	H1 (Excluding dust cover)	D1	D2	D3	CTS	Handwheel HW
VSM1	297	374	299	151	280	112	229	160	196	41	305
VSM2	353.5	409	321	145	292	112	229	191	196	60	450
VSM3	421	439	366	230	326	112	229	230	196	91	400
VSM4 18RPM 1000N.m To 144RPM 650N.m	488	469	366	314	360	112	229	269	196	91	400
VSM4 18RPM 2000N.m To 24RPM 3000N.m	561	469	366	314	360	112	229	269	196	91	400

*This dimension table must be used in conjunction with the content on the previous page

VSM Series Multi-turn Intelligent Electric Actuators



Actuator Model	OPF	Dsp	Cable Entry Hole		Type A Bushing			Type B Bushing		
			1	2	h	f	Maximum Thread	h	f	Maximum Valve Stem
VSM1	F10/FA10	70/58.7	M40x2	2xM25x1.5	41	3	32	22	3	20
VSM2	F14/FA14	100/95.25	M40x2	2xM25x1.5	69	4	51	25	4	32
VSM3	F16/FA16	130/127	M40x2	2xM25x1.5	98	5	73	45	5	60
VSM4 18RPM 1000 N.m To 144RPM 650 N.m	F16/FA16	130/127	M40x2	2xM25x1.5	98	5	73	45	5	60
VSM4 18RPM 2000 N.m To 144RPM 870 N.m	F25/FA25	200/152.4	M40x2	2xM25x1.5	98	5	73	45	5	60
VSM4 24RPM 3000 N.m	F30/FA30	230/177.8	M40x2	2xM25x1.5	122	5	83	45	5	60

Selection Standards and References

VSM	RPM	T	K	V	IP	E	B
Product Model	Work speed	Torque	Control method	Voltage	Protective performance	Explosion proof performance	Remarks

Product Model	Speed (RPM)	Torque (T)	Control method (K)	Voltage (V)	Protective performance (IP) / Explosion proof performance (E) / Note (B)
Example: VSM1 VSM2 VSM3 VSM4	Example: 24 : 24RPM 36 : 36RPM 72 : 72RPM .... 144 : 144RPM	Example: 70 : 70 N.m 80 : 80 N.m 150 : 150 N.m 230 : 230 N.m 400 : 400 N.m .... 3000 : 3000 N.m	MO: Switching quantity M1: 4-20 mA input/output PB: PROFIBUS communication protocol FF: FF Communication Protocol MB: MODBUS communication protocol HT: HART communication protocol	H: Three phase AC 380 V(50 / 60 hz) I: Three phase AC 440 V(50 / 60 hz) J: Three phase AC 400 V(50hz)	**Protective performance (IP)** IP67: IP67 version IP68: IP68 version **Explosion proof performance (E)** EX: Explosion proof version N: Regular Edition **Note (B)** Note: The following are optional items. If necessary, choose one of the two. LT40: -40 ℃ environmental model LT60: -60 ℃ environmental model

* Naming demonstration:

VSM1-18-80-M1-I-IP67-N
(VSM1 series, 18rpm, 80 N.m, 4-20 mA input/output, three-phase AC 440 V (50/60 Hz), IP67 version, regular version)

VSM3-36-540-FF-H-IP68-N-LT60
(VSM3 series, 36rpm, 540 N.m, FF communication protocol, three-phase AC 380 V (50/60 Hz), IP68 version, regular version, -60 ℃ environment version)

⚠ Notice

The performance data of products such as pressure and rated temperature recorded on this sample are based on national standard specifications and summarized by our company based on design, calculation, internal testing, and actual use of on-site products. The products introduced on this sample are mainly provided to customers who use them under general conditions. If you need to use these products under special conditions, please contact our company in advance, or the customer can conduct research and evaluation on the performance of these products before using them. Our company is not responsible for any damage or personal injury caused by careless use. In addition, although our company has made every effort to prepare samples, we cannot be held responsible for any errors, inadequacies, or inadequacies. The content described on this sample can be corrected at any time as deemed necessary by our company: discontinuation of product production, design changes, and product introductions.

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