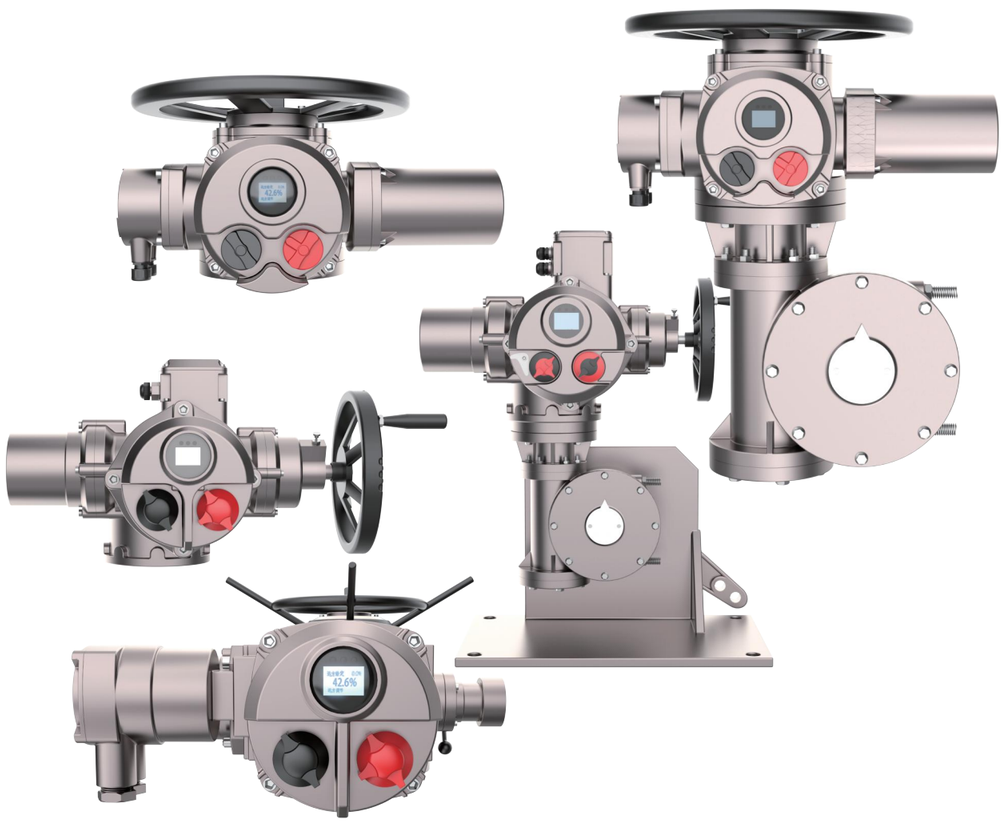
TIANJIN FREYA AUTOMATION TECHNOLOGY CO., LTD.

ELECTRIC VALVE ACTUATOR



ENGINEERING CREATIVE SOLUTIONS FOR FLUID SYSTEMS

INTRODUCTION

• Multi-turn electric valve actuators are suitable for gate valves, globe valves, diaphragm valves etc, which are required to turn 360°. These actuators are featured by compact structure, small volume, beautiful appearance, stable performance, high efficiency, high reliability, high protection capability and so on. Both operation at site and remote controlling can be carried out. So they have been applied in petroleum and chemical industries, power plant, water treatment and paper-making industries.

• Freya controls designs, produces and provides high-quality actuators and services related to valve automation.

• With our many years of experience in the field of automation, we have launched the series of electric actuators, which are compact, rugged, reliable and can be fully integrated into complex control systems.

• We are always ready to provide you with our electric actuators and accessories as well as quality services.

This series electric valve actuator has the following features:
• Compact and robust construction, lightweight.
• Wide range of torque variation (Multi-turn: 100-3500Nm Quarter-turn: 100-165000Nm).
• Hard anodized aluminum housing inside and outside with external high temperature paint coating for use against severe industrial environment.
• Enclosure uses radial seals & O-rings that provide protection to waterproof IP67 and optional watertight IP68.
• ISO5211 standard.
• It automatically identifies and corrects phases. Automatic phase failure protection protects equipment safety.
• Reliable mechanical torque sensing system providing safe operation in overload condition.
• Large size window and indicator provides better position indication from a distance.
• Number of local position control options to provide easy commissioning and field operation.

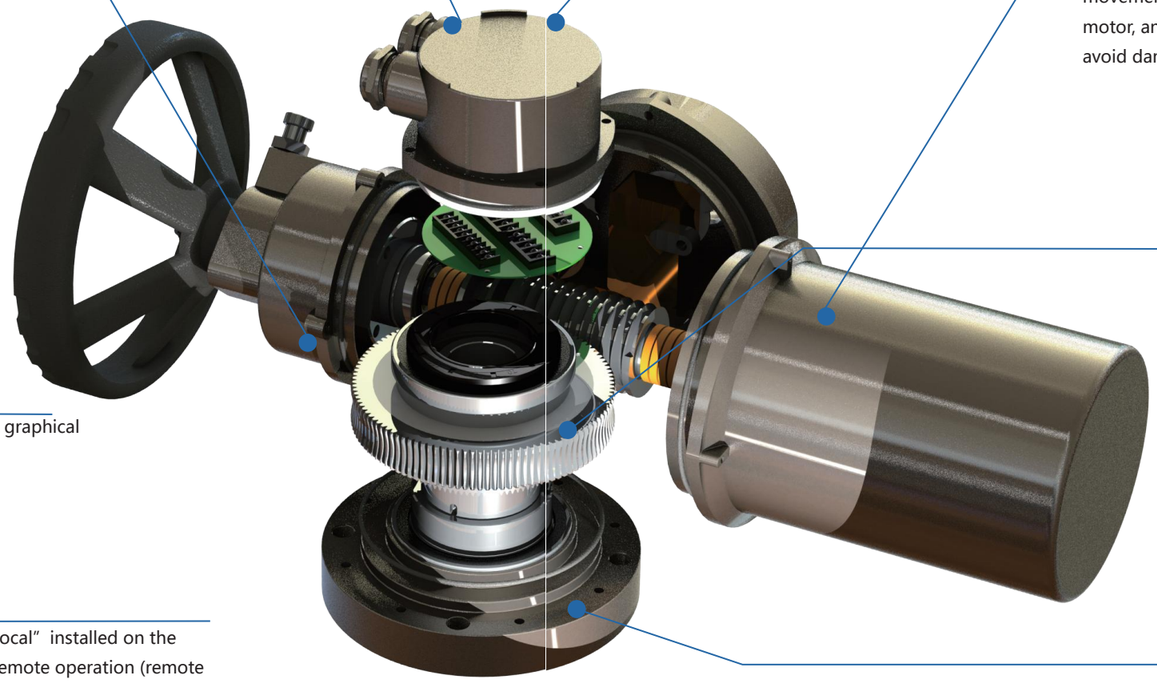
PRODUCT STRUCTURE

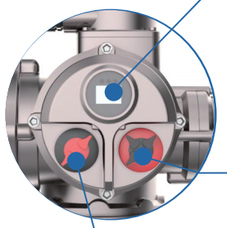
Terminal box

The independent sealed terminal box ensures the sealing integrity of the electrical part of the electric actuator when performing on-site wiring, and meets the product explosion-proof requirements.

Sealed structure

The actuator adopts a double-sealed design structure to ensure that the actuator is completely waterproof and dustproof; the standard product protection grade is IP67, and the highest grade can reach IP68.





LCD interface

The LCD interface can display text information, graphical elements and actuator characteristics.

Selection of control mode

The selective switch "Remote" -" Stop" -" Local" installed on the local operating device can be used to set up remote operation (remote control) or local operation (local control) or stop mode.

Local electric operation

The operating switch "Open" - "Close" installed on the local operating device can be used to open or close actuator locally.

Shell anti-corrosion

The outer surface of the actuator is painted with a special aluminum alloy paint with a tough paint film and strong adhesion. It has strong UV resistance, corrosion resistance and high fullness, which can comprehensively improve the service life and self-cleaning properties of the coating and is suitable for various harsh production environments.

Motor

The motor adopts low inertia and high torque motor, which can quickly reach the peak torque after the motor starts, and there is almost no over-limit movement when not excited; there is a precise temperature sensor in the motor, and the over-temperature limit is set through the control system to avoid damage caused by overheating of the motor.

Power transmission

Power transmission

The power transmission of the actuator uses a precision reduction mechanism consisting of a bronze alloy worm gear and an alloy steel worm. The worm gear and worm run separately in grease, which is suitable for the maximum ambient temperature difference and maximizes the service life.

Output interface

The actuator flange complies with ISO5210/5211 (GB12222/12223) standards, and also provides flange interfaces that comply with JB2920 standards, and it can be specially customized according to customer requirements.

STANDARD SPECIFICATION

Protection grade	Standard IP67 Special IP68
Power supply	Three-phase AC380V---460V 50/60Hz Single-phase: AC110V-AC220V DC24V AC24V 50/60Hz
Duty cycle(on-off)	S2-15 minutes
Duty cycle(modulating)	S4, 25%
Control methods	Local control/DCS/FCS(Fieldbus Control System)
Motor protection	Overheating/Overload and short circuit/Instantaneous reverse/Electronic brake protection
Torque protection	Mechanical torque/Electronic torque protection
Jam protection	Build-in overheat protection
Travel angle	360°
Repeatability error	≤±1%
Basic error limit	≤1%
Dead zone setting	0.1%-9.9% adjustable
Ambient temperature	Standard: -20～+60℃ Optional: -40～+70℃
Ambient humidity	95%RH max (Non-condensing)
External coating	High temperature paint
Explosion-proof grade	ExdI, ExdIb II BT4, ExdIb II CT4 (IECEx/ATEx)
Functions	LCD Chinese / English display window and local operation function Self phase sequence identifying and phase disconnection protection Infrared setting and control Fault self-diagnosis technology Modbus RTU, Profidbus DP, Hart, FF, DeviceNe(optional)
Signal	A: Remote passive dry contact, signal short pulse (Inching) B: Remote passive dry contact, signal long pulse (hold) C: Active DC24V signal D: Active AC220V signal E: Remote DC4-20mA signal
Feedback signal	A: Open, close, stop signals B: Fault signal C: Valve position signal (DC4-20mA, DC1-5V, DC0-10V) D: Remote control signal

OPTIONS AVAILABLE

Mechanical

Symbol	Description	Remark
EX	Explosion proof (Ex d II B T4)	Approved by ATEX
WT	Watertight (IP67), temporary submersible	
ALS	Auxiliary limit switches	
ATS	Auxiliary torque switches	
EXT	Extended travel angle	
SV	Variation in torque and operating speed	Please consult before ordering

Remote monitoring and control

PK	Potentiometer kit (output signal: 0 – 1 KΩ) High resolution potentiometer and precisely machined gearing are directly engaged with drive shaft to feedback Continuous position of valve
CT	Current transmitter (output signal: 4-20mA)
Signal Confguration	Remote position controller (input and output signal) Input: 4-20mA, 0-10VDC, 2-10VDC, 1-5VDC, 0-5VDC Output: 4-20mA Option: 0-10VDC, 2-10VDC, 1-5VDC, 0-5VDC Auto-calibration Reverse operating direction

MODEL COMPILATION METHOD

1 2 - 3 4 (5)

Drive type :
FRYZ------Multi-turn
DQ(FRYZ+RS)------ Combined quarter turn
FRYZ+VE------- Linear-turn

Rated torque: (Unit: kgf.m)
Or thrust: (Unit: N)

Rated speed: (Unit: r/min)

Control type:
Basic type without letters
Z ---Integral on-off type
T----Integral modulating type
NZ--Intelligent on-off type (non-intrusive)
NT--Intelligent modulating type (non-intrusive)
B---Explosion-proof type

Working voltage:
110V/220V/440V/660V (380V is not indicated)

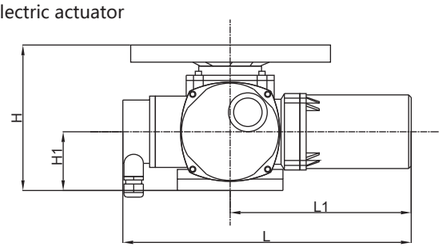
TECHNICAL PARAMETERS

FRYZ multi-turn electric actuator

Model	Torque (Nm)	Rotating speed (rpm)	Motor power (KW)	Rated current (A)	Manual ratio (I)	Maximum stem diameter (mm)	Weight (KG)
FRYZ10	100	18	0.25	1.6	1:80	28	25
		24	0.25	1.9	1:60		
		36	0.37	2.2	1:40		
		48	0.55	2.8	1:30		
		72	0.75	4.1	1:40		
		96	1.1	6.5	1:30		
FRYZ15	150	18	0.37	2.2	1:80	28	28
		24	0.37	2.5	1:60		
		36	0.55	2.8	1:40		
		48	0.55	3.1	1:30		
		72	1.1	6.5	1:40		
		96	1.5	7.9	1:30		
FRYZ20	200	18	0.55	2.8	1:80	40	30
		24	0.55	3.1	1:60		
		36	0.75	4.1	1:40		
		48	0.75	4.7	1:30		
		72	1.5	7.9	1:40		
		96	2.2	12.6	1:30		
FRYZ30	300	18	0.55	2.8	1:80	40	31
		24	0.75	4.1	1:60		
		36	1.1	6.5	1:40		
		48	1.1	7.2	1:30		
		72	2.2	12.6	1:40		
FRYZ45	450	24	1.1	6.5	1:60	48	47
		36	1.5	7.9	1:40		
		48	2.2	12.6	1:30		
		72	3	13.5	1:40		
FRYZ60	600	24	1.5	7.9	1:60	48	50
		36	2.2	12.6	1:40		
		48	2.2	13.1	1:30		
		72	4.0	15.2	1:40		
FRYZ90	900	24	2.2	12.6	1:60	60	65
		40	3.0	13.5	1:36		
		48	4.0	15.2	1:30		
FRYZ120	1200	24	3.0	13.5	1:60	60	69
		40	4.0	15.2	1:36		
FRYZ180	1800	18	4.0	15.2	1:80	70	150
		36	5.5	17.1	1:40		
FRYZ250	2500	18	5.5	17.1	1:80	70	162
		36	7.5	19.6	1:40		
FRYZ350	3500	18	7.5	19.6	1:80	80	171

DIMENSIONS

FRYZ multi-turn electric actuator



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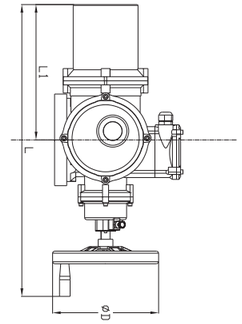

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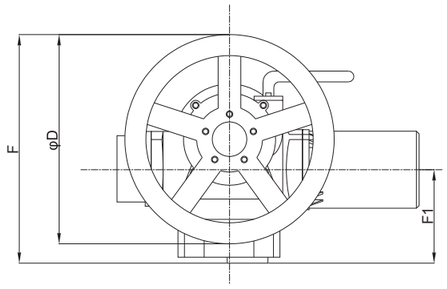
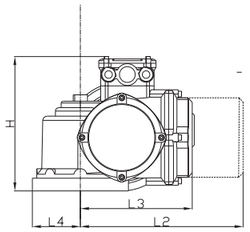


(Z10-Z30)



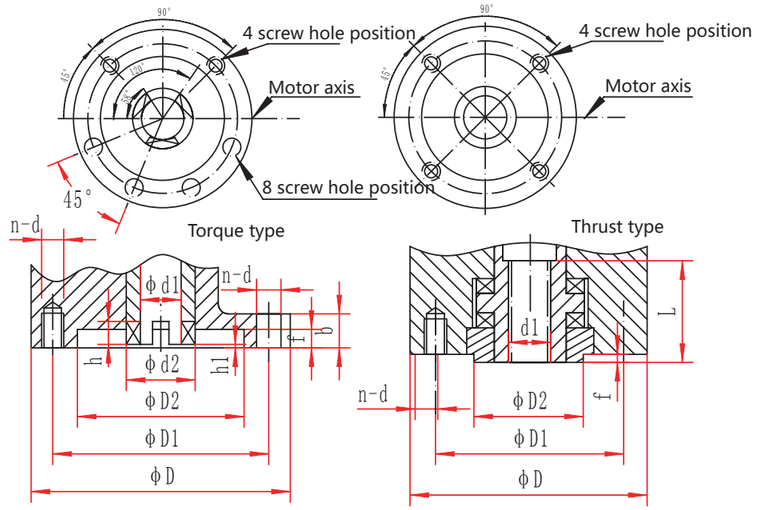
(Z45-Z350)

Model	L	L1	H	H1	d2	F1 Ordinary type	F2 Intelligent type	φD
FRYZ10-15	382	228	233	87	45	150	203	300
FRYZ20-30	435	278	248	90	39	157	210	350

Model	H	L	L1	L2	L3	L4	φD
FRYZ45-60	338	708	335	401	305	115	250
FRYZ90-120	347	795	390	423	312	135	250
FRYZ180-250	408	825	445	462	347	165	350
FRYZ350	408	905	530	462	347	165	350

CONNECTION DIMENSIONS

FRYZ multi-turn electric actuator

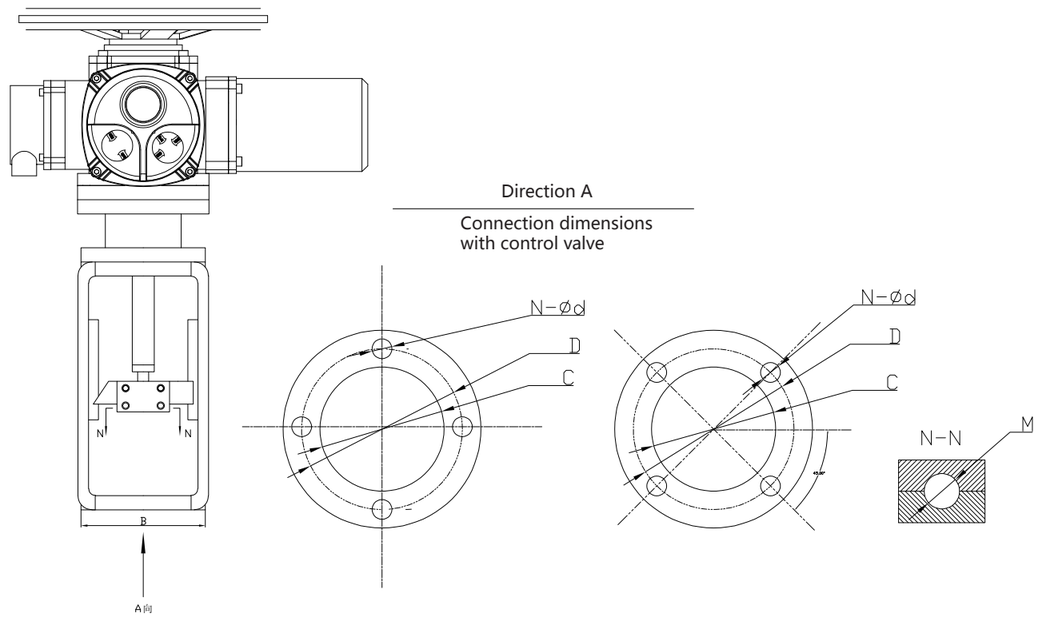


Model	Torque type(JB2920)										
Parameters	Flange code	D	D1	D2	d2	d1	h	h1	f	b	n-d
FRYZ5-15	2	145	120	90	45	30	8	2	5	12	4-M10
	2(I)	115	95	75	39	26	6	2	5	10	4-M8
FRYZ20-30	3	185	160	125	58	42	10	2	5	15	4-M12
	3(I)	145	120	90	45	30	8	2	5	12	4-M10
FRYZ45-60	4	225	195	150	72	50	12	2	5	20	4-M16
FRYZ90-120	5	275	235	180	82	62	14	2	5	25	4-M20
	5(I)	230	195	150	72	50	12	2	5	20	4-M16
FRYZ180-250	7	330	285	220	98	72	16	3	6	30	4-φ27
FRYZ350-500	8	380	340	280	118	82	20	3	6	35	8-φ22

Model	Thrust type GB12222							
	Flange code	D	D1	D2	d1 (Max.)	n-d	L	f
FRYZ5-15	F10	125	102	70	T28	4-M10	40	3
FRYZ20-30	F14	175	140	100	T40	4-M16	55	4
FRYZ45-60	F16	210	165	130	T48	4-M20	70	5
FRYZ90-120	F25	300	254	200	T60	8-M16	90	5
FRYZ180-250	F30	350	298	230	T70	8-M20	130	5
FRYZ350-500	F35	415	356	260	T80	8-M30	130	5

DIMENSIONS

FRYZ+VE linear-turn electric actuator



Model	A	B	C	D	n-φd	M
FRYZ+VE4000	175	155	60	80	4-φ10	M10
FRYZ+VE6300	310	155	80	105	4-φ12	M12×1.25
FRYZ+VE10000	310	155	95	118	4-φ14	M16×1.5
FRYZ+VE16000	310	155	95	118	4-φ14	M16×1.5
FRYZ+VE25000	310	155	100	130	4-φ18	M20×1.5
FRYZ+VE40000	310	155	100	130	4-φ18	M24×1.5
FRYZ+VE50000	310	155	100	130	4-φ18	M24×1.5

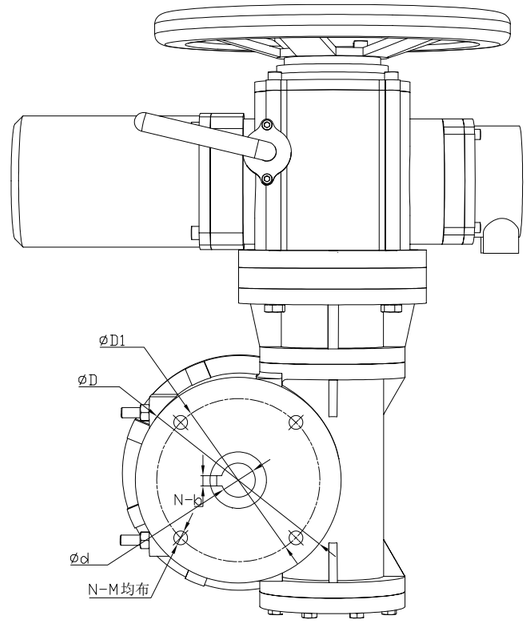
TECHNICAL PARAMETERS

FRYDQ quarter-turn electric actuator

Model parameters	Output torque (Nm)	Output speed (r/min)	90° travel time (S)	Maximum stem diameter (mm)	Selection of FRYZ Actuator Model	Motor power (KW)	Rated current (A)
FRYDQ10	100	1	15	28	FRYZ5	0.12	0.57
FRYDQ20	200	1	15	28	FRYZ5	0.12	0.57
FRYDQ30	300	1	15	28	FRYZ5	0.12	0.57
FRYDQ60	600	1	15	42	FRYZ5	0.12	0.57
FRYDQ90	900	0.75	20	42	FRYZ10	0.25	1.03
FRYDQ120	1200	0.75	20	42	FRYZ10	0.25	1.03
FRYDQ200	2000	0.5	30	60	FRYZ15	0.37	1.38
FRYDQ250	2500	0.5	30	60	FRYZ15	0.37	1.38
FRYDQ300	3000	0.5	30	60	FRYZ20	0.55	2.2
FRYDQ400	4000	0.5	30	60	FRYZ20	0.55	2.2
FRYDQ500	5000	0.5	30	70	FRYZ30	0.75	2.62
FRYDQ600	6000	0.5	30	80	FRYZ30	0.75	2.62
FRYDQ800	8000	0.45	35	100	FRYZ45	1.1	4
FRYDQ1000	10000	0.45	35	100	FRYZ60	1.5	4.12
FRYDQ1200	12000	0.45	35	100	FRYZ60	1.5	4.12
FRYDQ1600	16000	0.4	38	120	FRYZ90	2.2	5.25
FRYDQ2000	20000	0.4	38	120	FRYZ90	2.2	5.25
FRYDQ3200	32000	0.3	50	160	FRYZ120	3	7.9
FRYDQ4000	40000	0.3	50	160	FRYZ180	4	8.87
FRYDQ5000	50000	0.26	58	160	FRYZ250	5.5	12.05
FRYDQ6300	63000	0.26	58	180	FRYZ350	7.5	15.6
FRYDQ8000	80000	0.26	58	180	FRYZ500	10	20.5
FRYDQ12000	120000	0.24	63	220	FRYZ500	10	20.5
FRYDQ16500	165000	0.187	80	240	FRYZ650	11	24

DIMENSIONS

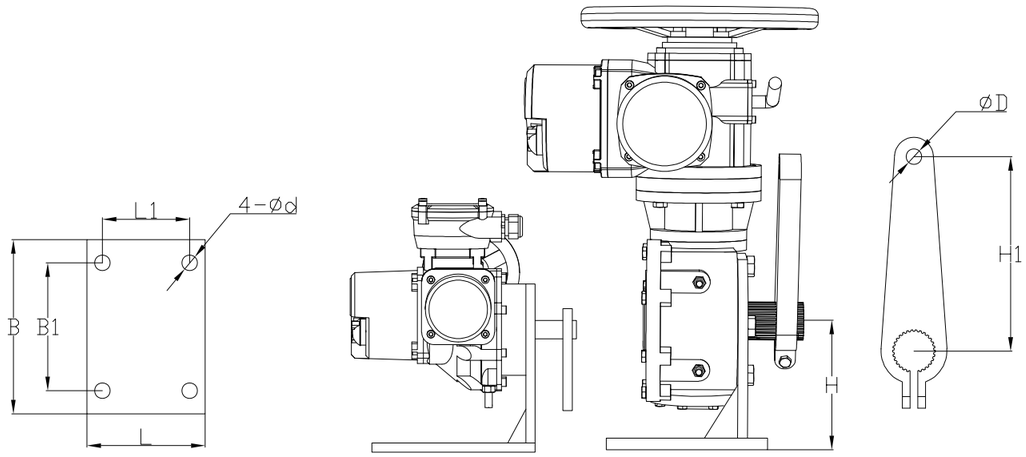
FRYDQ quarter-turn electric actuator



Model	D	D1	N-M	d	N-b	Primary transmission mechanism	Wormgear box ratio	0-90° time
FRYDQ200	175	140	4-M16	40	1-10	Z15-18	56:1/4#	46
FRYDQ300	210	165	4-M20	45	2-12	Z20-18	49:1/5#	40
FRYDQ400	210	165	4-M20	45	2-12	Z30-18	49:1/5#	40
FRYDQ600	235	185	4-M20	55	2-14	Z45-24	55:1/6#	34
FRYDQ800	235	185	4-M20	55	2-14	Z60-24	55:1/6#	34
FRYDQ1000	300	254	8-M16	70	2-18	Z60-24	67:1/8#	42
FRYDQ1600	300	254	8-M16	70	2-18	Z90-24	67:1/8#	42
FRYDQ2400	350	298	8-M20	90	2-20	Z120-24	81:1/9#	51
FRYDQ3200	415	356	12-M20	105	2-22	Z180-24	78:1/10#	49
FRYDQ4000	475	406	12-M20	130	2-28	Z180-24	82:1/11#	51
FRYDQ6300	560	483	12-M22	160	2-28	Z250-24	95:1/12#	59
FRYDQ8000	650	590	12-M27	170	2-32	Z350-18	100:1/13#	83

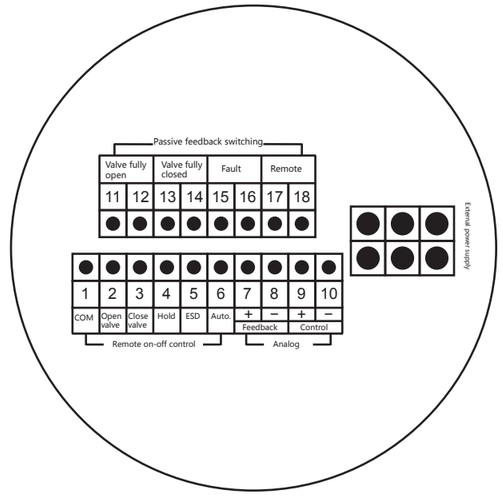
DIMENSIONS

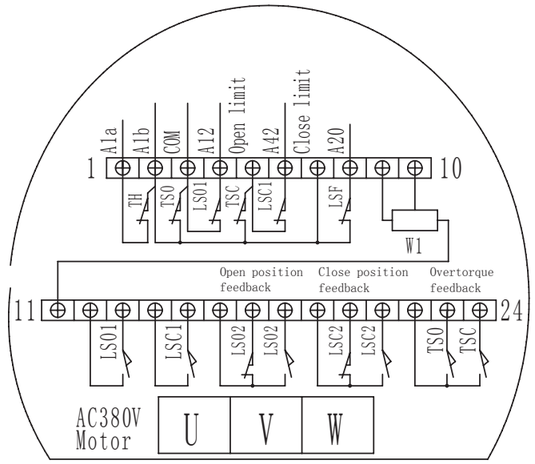
FRYDQ foot-plate mounted quarter-turn electric actuator

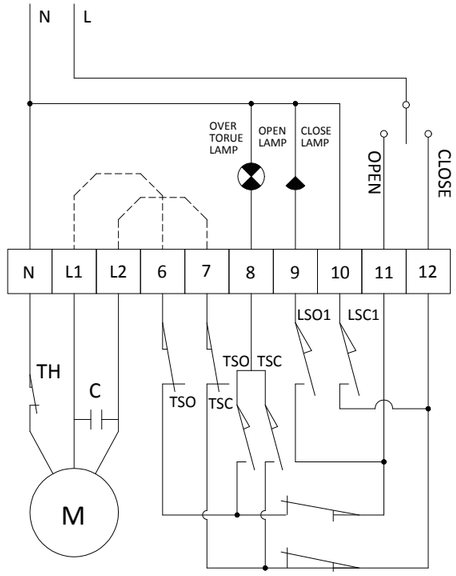


Model	B	B1	L	L1	d	H	H1	H2	D
FRYDQ10-40	250	214	160	100	18	150	150	/	18
FRYDQ60-180	300	264	180	120	18	200	200	/	18
FRTDQ200	400	360	250	210	20	200	200	219	20
FRYDQ300	500	440	260	215	22	280	250	237	30
FRYDQ400	500	440	260	215	22	280	250	237	30
FRYDQ600	500	440	260	215	22	280	250	296	30
FRYDQ800	500	440	260	215	22	280	250	296	30
FRYDQ1000	600	540	315	265	26	315	300	346	34
FRYDQ1600	600	540	315	265	26	315	300	430	34
FRYDQ2400	600	540	315	265	26	315	350	455	34
FRYDQ3200	600	540	315	265	26	315	350	520	34

WIRING TERMINAL







INSTALLATION, DISASSEMBLY AND PRECAUTIONS

1) There is no principle requirement for the installation form of this electric device, but the recommended installation form is that the motor is in a horizontal state and the electrical box cover is in a horizontal or vertical upward state, which is conducive to lubrication, debugging, maintenance and manual operation;
2) During installation, the space required for maintenance and inspection personnel to disassemble each component should be ensured;
3) The bolts connected to the valve shall not be lower than grade 8.8;
4) When disassembly is required, the manual handwheel should be rotated several times first, with the valve slightly open;
5) During installation, disassembly and commissioning, the sealing surface, seals and explosion-proof surface of explosion-proof electrical equipment must not be damaged, and anti-rust oil should be applied to the explosion-proof surface. The electrical cover should be tightly closed to prevent rain or moisture from entering;
6) The window must not collide with the hard objects.
7) This electric device is a short-time working cycle and the continuous working time shall not exceed the nameplate calibration time;
8) When the valve is not used frequently, it should be inspected, maintained and operated regularly. It is recommended to run it at least once a month and the running time shall not exceed 10 minutes. .

ELECTRIC VALVE ACTUATOR ORDERING INFORMATION

Electric Actuator

Series	Actuator size	Power	Voltage	Phase	Name
XX	XX	XX	XX	X	X
FRYZ Eletric	10 10	024 24	VAC AC	1 Single Phase	EX Exp. Proof
	15 15	048 48	VDC DC	3 Three Phase	WT IP67
	20 20	220 220			
	30 30	380 380			
	45 45	460 460			
	60 90				
	120 120				
	180 180				
	250 250				
	350 350				

Electric Actuator Ordering Examples
Example Part #: FRYZ-10-220VAC (Standard)
Example Part #: FRYZ-10-380VAC-EX (Explosion Proof)
Example Part #: FRYZ-10-460VAC-3 (460 volt 3 phase unit)

Standard Product
Special Order Product

TIANJIN FREYA AUTOMATION TECHNOLOGY CO., LTD.

Tell: 022-27901003
Mail: tjfreya@tj-bnd.com
Web: www.tj-bnd.com
Add: Industrial Park, Zhongbei Town, Xiqing District, Tianjin