IP68 SIL ISO CE

FRY INTELLIGENT ELECTRIC ACTUATOR Engineering Creative Solutions For Fluid Systems

ABOUT US

Reliable operation
Ensure reliability in critical applications and environments. Whether in extremely harsh environments or extremely low temperatures, FRY products can operate reliably.

Customer-first principles and policies, comprehensive services and support
We are committed to solving customer problems and developing new solutions. From product consultation to installation, to after-sales service, we provide professional and dedicated services and support.

Quality-first manufacturing
The products we offer are designed based on years of industry and application knowledge.
Our high-quality products can be used in multiple industries such as petroleum, chemical, paper, building, construction and more.

The product series is used in multiple industries
Mainly used in power, oil and gas, water and wastewater, marine, mining, pulp and paper, food and beverage, pharmaceutical and chemical industries to provide higher efficiency, more reliable safety and environmental protection.

The company has obtained a number of certifications and utility model patents
ISO 9001 quality management system certification, utility model patent certificate, SIL certificate, RoHS certification, IP68 certification, CE certification and ATEX explosion-proof certification. These certifications not only reflect our professional technical level, but also demonstrate our strict compliance and commitment to product quality, safety and environmental protection standards.

A strong technical team
35 senior engineers, 30 professional sales staff, 20 after-sales staff, 13 logistics support staff and 50 production technicians. We implement a two-pronged strategy of software and hardware. We currently have more than 2,000 square meters of standard industrial plants, equipped with very advanced equipment and numerous inspection and testing equipment, which can meet the production needs of various high-end automatic control valves.

FEATURES OF ELECTRIC ACTUATORS

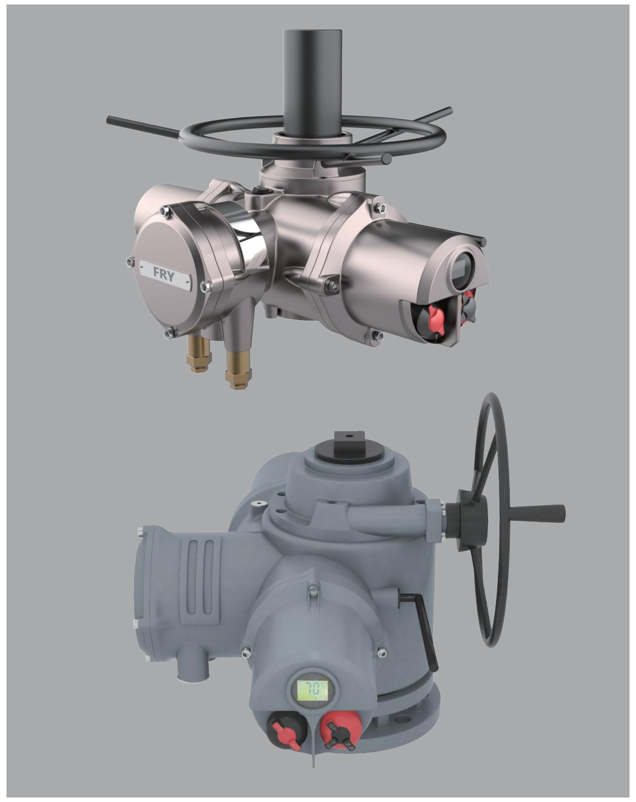
FRYQ Multi-turn Electric Actuator
FRYQ offers a full range of actuators suitable for all multi-turn valve applications that require control and indication flexibility, suitable for gate valves, globe valves, diaphragm valves, etc. It provides end users with a higher standard of performance, quality and value.
The electric actuator is waterproof or explosion-proof, its output torque range is from 40 Nm to 3000 Nm.
With our extensive product range and engineering knowledge, we can provide solutions for the industrial applications.

FRYQ products have a range of excellent functional features:
· Non-invasive design
· Data logger as standard
· Clear, user-friendly controls and indications
· Multi-language text displays for status and settings
· Simplified torque and position control
· Full control and flexibility
· High protection grade IP68

FRYT Quarter-turn Electric Actuator
FRYT offers a full range of actuators suitable for 90-degree rotation valve applications that require control and indication flexibility, suitable for ball valves, butterfly valves, plug valves, etc. It provides end users with a higher standard of performance, quality and value.
The electric actuator is waterproof or explosion-proof, its output torque range is from 250 Nm to 2000 Nm.
It is a direct drive part-turn actuator offering the highest standards of safety and control, with real-time diagnostics and extensive bus compatibility.
With our extensive product range and engineering knowledge, we can provide solutions for the industrial applications.

FRYT products have a range of excellent functional features:
· Non-invasive design
· Data logger as standard
· Clear, user-friendly controls and indications
· Multi-language text displays for status and settings
· Simplified torque and position control
· Full control and flexibility
· High protection grade IP68

TIANJIN FREYA AUTOMATION TECHNOLOGY CO., LTD.



FRYQ18	Max output torque 136Nm Output speed min (50/60Hz) 18/96
FRYQ25	Max output torque 400Nm Output speed min (50/60Hz) 18/96
FRYQ35	Max output torque 610Nm Output speed min (50/60Hz) 18/96
FRYQ40	Max output torque 1020Nm Output speed min (50/60Hz) 18/48
FRYQ70	Max output torque 1490Nm Output speed min (50/60Hz) 18/48
FRYQ90	Max output torque 2030Nm Output speed min (50/60Hz) 18/48
FRYQ95	Max output torque 3000Nm Output speed min (50/60Hz) 18/48

IP55 IP67 IP68

Limit switch | Torque switch | Interlock | Explosion-proof | Bus Profibus Hart Modbus

Transmitter DC4-20mA output | Transmitter DC4-20mA I/O | Manual recovery | Automatic recovery

=Standard specification =Not available =Option

Detal specifications available on request

FRYT250	Max output torque 250Nm Open/Close speed secs 0-90° 20S-30S
FRYT500	Max output torque 500Nm Open/Close speed secs 0-90° 8S-32S
FRYT1000	Max output torque 1000Nm Open/Close speed secs 0-90° 30S-120S
FRYT2000	Max output torque 2000Nm Open/Close speed secs 0-90° 60S-120S

IP55 IP67 IP68

Limit switch | Torque switch | Interlock | Explosion-proof | Bus Profibus Hart Modbus

Transmitter DC4-20mA output | Transmitter DC4-20mA I/O | Manual recovery | Automatic recovery

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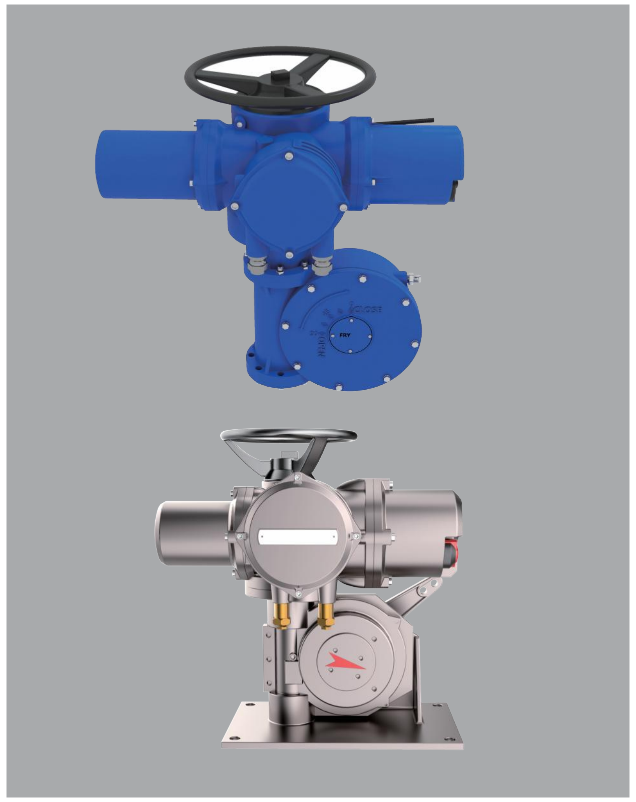


FRYQ18+BW1	Max output torque 1000Nm Open/Close speed secs 0-90°
FRYQ18+BW2	Max output torque 1600Nm Open/Close speed secs 0-90°
FRYQ18+BW3	Max output torque 2500Nm Open/Close speed secs 0-90°
FRYQ18+BW4	Max output torque 4000Nm Open/Close speed secs 0-90°
FRYQ25+BW5	Max output torque 6000Nm Open/Close speed secs 0-90°
FRYQ25+BW6	Max output torque 8000Nm Open/Close speed secs 0-90°
FRYQ35+BW7	Max output torque 10000Nm Open/Close speed secs 0-90°
FRYQ35+BW8	Max output torque 15000Nm Open/Close speed secs 0-90°

IP55 IP67 IP68

Limit switch | Torque switch | Interlock | Explosion-proof | Bus Profibus Hart Modbus

Transmitter DC4-20mA output | Transmitter DC4-20mA I/O | Manual recovery | Automatic recovery

=Standard specification =Not available =Option

Detal specifications available on request

FRYQ18+VE64	Thrust : 6400N	Travel : 10-40mm
FRYQ18+VE100	Thrust : 10000N	Travel : 16-60mm
FRYQ18+VE160	Thrust : 16000N	Travel : 25-100mm
FRYQ18+VE250	Thrust : 25000N	Travel : 40-100mm

IP55 IP67 IP68

Limit switch | Torque switch | Interlock | Explosion-proof | Bus Profibus Hart Modbus

Transmitter DC4-20mA output | Transmitter DC4-20mA I/O | Manual recovery | Automatic recovery

=Standard specification =Not available =Option

Detal specifications available on request

Handwheel

The sturdy handwheel provides reliable emergency manual operation in the event of power failure.

Shell

The high-quality aluminum alloy shell is compact and lightweight. It is coated with a layer of protective material to adapt to extremely harsh environments, and other types of layers are available as needed.

Motor

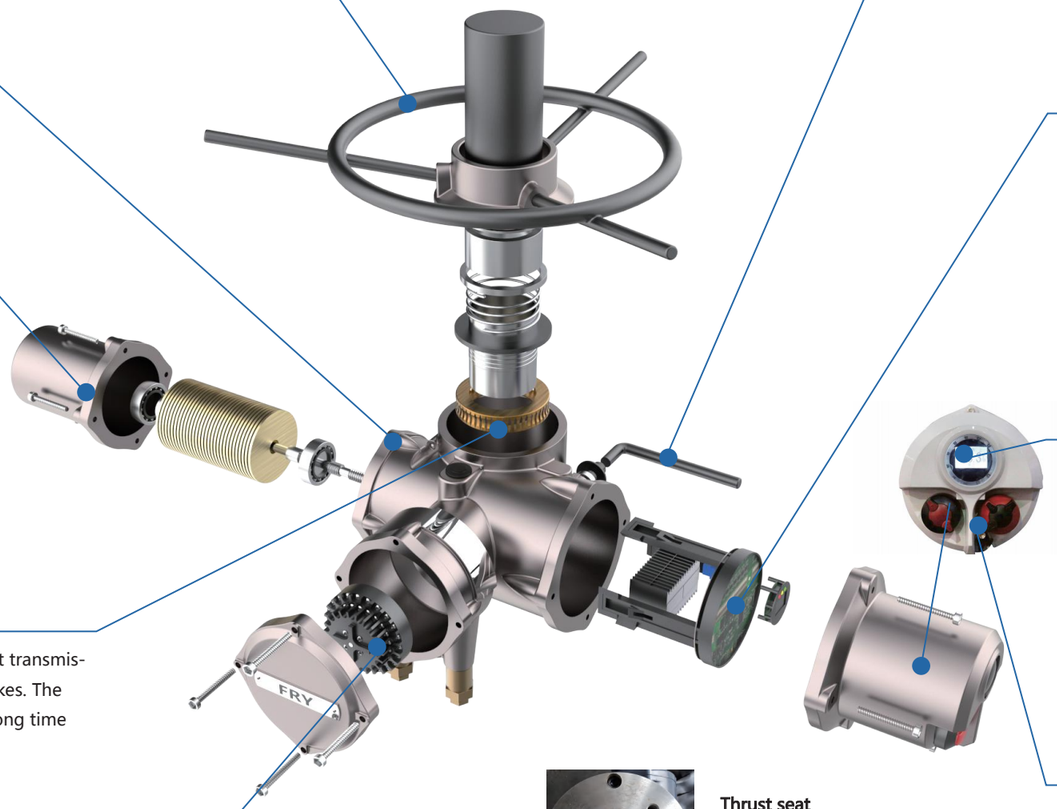
The low inertia and high torque motor allows the motor to quickly reach peak torque after starting, and there is almost no over-limit movement when it is off-excitation. There is a precise temperature switch embedded in the motor coil, which is not affected by the surrounding ambient temperature and keeps the motor in optimal thermal capacity. At the same time, the motor shaft and worm are independent of each other for quick replacement.

Worm gear

The worm gear transmission chain is simple, with exquisite structure and constant transmission efficiency. It has a mechanical self-locking function and does not require brakes. The transmission part is filled with long-lasting lubricating oil and can operate for a long time without maintenance.

Double-sealed design

The double-sealed design provides a sunflower terminal box that is separated from the control room and sealed. Even if the connection box cover is opened on site, it can ensure the isolation of the inside of the actuator from the outside world, so that moisture, dust, and hazardous gases cannot enter the actuator interior in the slightest, and the internal components are fully protected.



Manual/electric switch handle

The manual/electric switch handle can be operated safely at any time. While pressing the handle with appropriate force, slowly turn the handwheel to allow the internal clutch to engage the gear. The clutch will automatically disengage when the motor is energized and in the electrically locked state.

Output torque measurement system

A professionally designed useful power measurement system is used as the output torque measurement system. This system is developed from familiar electric energy measurement technology and can obtain accurate and repeatable torque measurement values that are independent of changes in frequency, voltage and temperature.

Control panel

The control panel LCD can provide instantaneous, up-to-date status and valve position, with Chinese and English languages available, using an intuitive menu structure to provide calibration and diagnostic information, including torque curves, operation and fault records, motor status, local information and hardware data, etc.

Thrust seat

Lubricable thrust seat designed for long life and easy removal, allowing actuator removal without changing valve position. The simple, removable drive bushing can be machined to the stem to facilitate connection to the valve.

Button

The local control "Open"/"Close" buttons and the padlocked "Local"/"Stop"/"Remote" mode buttons all use isolated magnetic transmission Hall effect devices, with no through-shafts and good sealing performance, while eliminating the trouble that can be caused by faulty and fragile reed switches.

Protection is key
Actuators operate reliably in environments ranging from deserts to grasslands, from sea to underground, with humidity, extreme heat or cold, and highly corrosive air. The most important factor in actuator reliability is protection from the environment, in short, the protective shell.

Phase loss protection
To protect the motor from overheating, the actuator electronics constantly monitor the three phases of the power supply. If one or more phases are lost, the control circuit is prevented from energizing the contactor. Local and remote alarms for power phase loss are available as standard.

Motor protection when valve jamming
If the valve is jammed, when the start signal is issued for 5 seconds without any action, the logic circuit can disconnect the corresponding contactor and alarm the corresponding fault information to prevent the motor from overheating.

Overheat protection
Two thermal protection relays are installed in the motor coil to directly detect the temperature of the coil. If the coil overheats, the control circuit of the actuator can be disconnected.

Instantaneous reversal protection
When the actuator receives an instantaneous reversal command, an automatic delay circuit is used to prevent the impact load and unnecessary wear on the valve stem and gearbox. The circuit also limits the inrush current through the contactor.

Thermostatic protection
Two thermostats are built into the motor power module to provide comprehensive protection.

Automatic self-test and diagnosis
Self-tests are automatically performed to ensure correct operation. In the event of a fault being diagnosed, the information is automatically displayed via the display text. At the same time, actuator operation can be inhibited to allow for on-site investigation.

Double seal, double protection
The protection grade of the electric actuator is: IP-3 meters underwater, 48 hours, completely waterproof and dustproof. The double seal system ensures that the internal components are protected because they are isolated from the terminal box. Even during field wiring, the terminal cover is removed, and the terminal module gland is sealed.

Non-invasive design
On-site commissioning of the electric actuator does not require the removal of the electrical box cover. All parameter settings and adjustments are completed using the provided infrared setter. After the electric actuator is assembled in a controlled environment, air convection is eliminated and all internal components are protected for life.

Torque measurement
Electric actuators can reliably and accurately measure the force required to operate a valve, which is the basis for the protection of valves and electric actuators. Electric actuators are a technology that has been tested and verified by industrial practice. As long as the frequency, power supply and temperature vary within the allowed range, accurate and repeatable torque measurements can be obtained.

Valve position measurement
Reliable stroke control depends on accurate positioning of the valve stroke ends. Non-contact valve position measurement systems are the most stable and reliable design for electric actuator control.
A detection circuit with only one moving part converts the rotation of the output shaft into an electrical signal, which is then compared with the limit position stored in a safe, permanent memory.

Actuator display
The electric actuator has a unique display with a large screen that allows the user to easily see valve position, torque and diagnose faults from a distance. The unique display with background lighting system provides high visibility under all lighting conditions. Both green and red LED valve position indicators are provided.

Display support
Electric actuators require local and remote valve position indication at all times, even when the power is off. Therefore, the electric actuator has a built-in battery to maintain and update the valve position indication when the power is off. The power supply also supports data logging during power failure.

Setting
The intrinsically safe infrared setting tool provided is used for setting, adjusting and viewing, which allows the user to conveniently enter the configuration of the electric actuator through the display.

Diagnostic icons on the screen
There are three display areas in the LCD display, which can clearly display the alarm information of the valve, control system and electric actuator.

Valve torque indication
The valve torque corresponding to the valve position can be observed in real time via the display using the setter, so analysis of the valve working conditions becomes a standard function.

Data logging
Data loggers are used to acquire and store data such as valve, actuator and control signal operation and status.

IrDA communication
IDA has compatible communication mode. Data can be exchanged with compatible PDA via IDA interface. PC software on notebook or PC provides communication interface with actuator and built-in data logger.

Conditional control
For applications with high safety integrity, configuration for conditional control is required. In this mode, the operation depends on two independent signals. For example, if a remote valve closing input signal and a valve closing interlock input signal are provided at the same time, the electric actuator will operate and close the valve. If only one signal is provided, or one signal is lost, the electric actuator will be held or stopped to prevent failure. When configured for conditional remote control, local operation does not require an interlock input.

STANDARD SPECIFICATIONS

Protection grade	Standard IP68
Power supply	Three-phase AC380V---690V 50/60Hz Single-phase: AC110V-AC240V 50/60Hz
Torque	Multi-turn: 40-3000Nm Quarter-turn: 40-2000Nm With gearbox: Max. 50000Nm
Thrust	Linear-turn: 6400N-25000N
Motor	Fully sealed non-air-cooled squirrel cage motor (AC)
Insulation grade	F
Control method	On/off type, modulating type/Fieldbus
Stall protection	Build-in overheat protection
Double seal protection	The control part is completely isolated from the conncetion box to protect the electronic components.
Position indicator	Continuous mechanical indicator with arrow
Working cycle(On-off type)	S2 short-time: 15 min
Working cycle(Modulating type)	S5—50%: the maximum number of starts per hour is 1200 times
Cable entries	Standard configuration: 1 M48*2 2 M33*2 ''explosion-proof 1 NPT1.5" 2 NPT 1"
Terminal block	Screw and lever push type (spring loaded)
Ambient temperature	Standard: -30～+70℃ High temp.: -130～+150℃ Low temp.: -50～+70℃
Ambient humidity	90%RH max (Non-condensing)
Shell material	Aluminum casting
Shell anti-corrosion	Pickling and phosphating, surface electrostatic spraying
Explosion-proof grade	ExdIIBT4/CT4 IECEx ATEx customized certification can be provided
Ex degree	IECE × ATEx custom certification available
Position transmitter	Potentiometer output resistance is1kΩ.Two-wire system valve transmitter output 4~20mA DC signal
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, Profidbus DP, Hart
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: Eemote DC4-20mA (modulating) signal. F: Remote DC1-5V, 0-10V (modulating) signals
Feedback signal	A: Open, close, stop signals (passive dry contact). B: Fault signal (passive dry contact). C: Valve position signal (DC4-20mA, DC1-5V, DC0-10V) D: Remote control signal (passive dry contact)

VALVE TYPES

The valve type is defined by the motion required for the actuator to operate - multi-turn, part-turn or linear-turn. The table below provides a guide to available actuators and is determined by valve type, operating torque and work requirements.
Actual selections may vary from those shown below due to factors such as available power, mechanical interface, thrust requirements, etc.

Valve type	Duty	Torque min. Nm	Torque max. Nm	Actuator type	Remarks
Gate valve	On-off/Inching	13	3000	FRYQ	General gate valves, globe, sluice, parallel slide, choke
Part-turn	On-off/Inching	1000	50000	FRYQ+BW	General ball/butterfly /damper
Gate valve	Modulating	13	544	FRYQ	Control valves such as globe, choke
Part-turn	On-off/Inching	50	2000	FRYT	General ball/butterfly /damper
Part-turn	Modulating	40	2000	FRYT	General ball/butterfly /damper

DESIGN SPECIFICATION

DUTY RATING

Classification	Actuator type	Rating
On-off/Inching	FRYQ	Nominal 60 starts per hour 15 minutes rated
On-off/Inching	FRYT	Nominal 60 starts per hour 15 minutes rated
Modulating	FRYQ	Nominal 1200 starts per hour, 50% duty cycle
Modulating	FRYT	Nominal 1200 starts per hour, 50% duty cycle

DESIGN LIFE

Classification	Actuator type	Size	Minimum design life rating
On-off/Inching	FRYQ	10-35	10000 cycles (500000 output turns) 33% rated torque through stroke
		40-95	5000 cycles (250000 output turns) 33%rated torque through stroke
Modulating	FRYQ	12-35	1800000 starts at load of 50% rated torque
On-off/Inching	FRYT	All size	25000 cycles 70% rated torque through stroke
Modulating	FRYT	All size	1800000 starts at load of 70% rated torque

VIBRATION, SHOCK AND NOISE

Standard FRYQ and FRYT actuators are suitable for applications where vibration and shock severity does not exceed the following:

Type	Level
Plant vibration	1g rms total for all vibration within the frequency range of 10 to 1000 Hz
Shock	5g peak acceleration
Earthquake	2g acceleration over a frequency range of 1 to 50 Hz if it is to operate during and after the earthquake
Emitted noise	Independent testing shows noise levels below 61 db(A) at 1 meter

The vibration levels quoted are those at the actuator mounting interface. It should be noted that the effects of vibration are cumulative and therefore actuators subject to greater vibration levels may experience a reduced service life. If excessive vibration is expected in the plant, mounting the actuator away from the valve and driving it via an extended shaft (incorporating a vibration absorbing coupling) may

OPERATING TEMPERATURE

The actuator is suitable for operation within the following ambient temperature ranges. Prior to installation, the actuator should be stored in a dry location within a temperature range not exceeding -60 to +80 ℃

Type	Standard temp.	Low temp.
FRYQ	-30 to +70℃	-50 to +70℃
FRYT	-30 to +70℃	-50 to +70℃

NON-HAZARDOUS AND HAZARDOUS CERTIFIED ENCLOSURES

The electric actuator hazardous and non-hazardous area enclosures are waterproof to IP68/NEMA 4 & 6. The sealed enclosure protects the internal components for life, with non-intrusive commissioning and adjustments using an infrared setting tool without removing the cover. The conncetion box is sealed from other areas by double sealing, maintaining waterproof integrity even during field connections. The actuators are available with the following housing styles and are marked with the ambient operating temperature range. When an optional temperature is stated, some actuator components must be changed so the temperature requirement must be specified.

NON-HAZARDOUS ENCLOSURES

WT: Standard Watertight

Standard	Rating	Standard temp.	Option 1	Option 2
IEC 60529(1989-11)	IP68-7m/72 hrs	-30 to +70°C	-40 to +70°C	-50 to +40°C
BS EN 60529 (1992)	IP68-7m/72 hrs	-30 to +70°C	-40 to +70°C	-50 to +40°C
NEMA	4&6	-22 to +158°F	-40 to +158°F	-58 to +104°F
CSA	4&4X	-22 to +158°F	-40 to +158°F	-58 to +104°F

LOCAL CONTROL, INDICATION, SETUP

The actuator electrical control cover features a non-intrusive selector which also includes a window showing actuator position, status and alarm indication.

Control cover can be rotated 360 degrees to suit actuator orientation/operator access. Setup is via infrared interface using the supplied setup tool.

Operation	Type	Function	Remarks
Control mode	Red, rotary selector	Select “Local” ” Remote” “Stop” control	It can be padlocked in each position (stop remains available) for site operational protection
Local control	Black, rotary selector	Initiate local "Open" and "Close" operation	Spring-return to centre neutral position. Local control may be user configured for inching action
Infrared	Setting tool	Initiate local "Open" and "Close" operation	May be user configured for infrared operation over a nominal distance of 0.5 m(1.5')

REMOTE CONTROL

Actuators can realize remote control and indication of valves, thus realizing centralized control. Actuator control and indication forms can meet the requirements of various field control systems, from manual push button control to complex control systems (DCS) using relay output or digital "bus" network system.

Operation	Type	Range	Remark
Open/Close/Stop	Positive switching 3 x opto-isolated inputs, designed for momentary or sustained contact	20-60 VAC/DC,120 VAC, 5 mA per input (12 mA at 120 VAC)	Actuator -24 VDC(120 VAC available as an option) or externally supplied from the control system
ESD Open interlock Close Interlock	Positive switching 3 x opto-isolated inputs, designed for sustained contact	20-60 VAC/DC,120 VAC, 5 mA per input (12 mA at 120 VAC)	The ESD is user configurable to open, maintain, or close from either NO or NC contacts. The ESD takes precedence over all other local or remote control signals. The interlock provides hardwired “permit” protection and is active for both local and remote, or can be configured for remote signals only

FIELDBUS CONTROL SYSTEM

Integration of plant control using network connectivity has been a feature of FRY actuators for many years. All FRY actuators are compatible with a variety of communication and process control systems, simply by adding the appropriate option card during the actuator manufacturing process. The actuator reports status feedback to the entire plant control system (DCS or PLC) via the fieldbus and executes valve control commands.

Our fieldbus systems complement the open systems of Foundation Fieldbus, Profibus, Modbus and DeviceNet. Innovative technology combined with expert bus system knowledge ensures that electric actuators always offer the ideal solution for control systems.

A comprehensive control solution

Whether you need to remotely control a few electric valves or fully automate your plant, you can save a lot of time and cost.
The bus system allows actuators and valves to be remotely controlled via a simple single twisted pair data highway, eliminating the need for heavy multi-core cables. It also includes automatic built-in redundancy of the field network to ensure that control is maintained even in the event of a device or cable failure.
It can be used as a single station or hot standby master station, using secure field communications, capable of controlling up to 240 actuators and other field devices. The field data highway cable length can reach up to 20 kilometers, so even valves that are far away can be easily included in the network without the need for repeaters.

Master Station

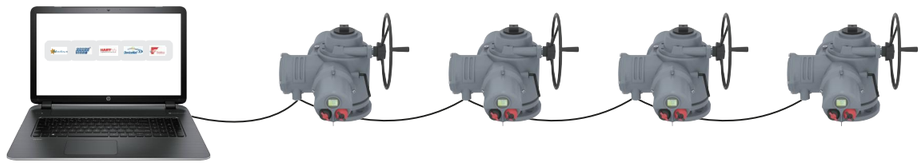
A simple but intelligent control center capable of operating up to 240 actuators in a single loop, with an easy-to-use touchscreen interface. The Master Station and its field network are designed for all industries and applications requiring powerful and reliable plant control and monitoring. The Master Station provides a high integrity link from the Distributed Control System (DCS) to the field devices.
It features a large touchscreen interface that gives operators and engineers an accurate view of the system and field device operation at all times. The Master Station continues to provide system availability in the event of component failure. The host port allows simultaneous connection to multiple host systems and provides redundant communication links when necessary.

PROFIBUS

The electric actuator supports Profibus Dp and has the following features:

- Support Profibus Dp-V0.Dp-V1.Dp-V2 functional level
- High-speed data exchange (up to 1.5Mbit/s - corresponding to approx. 0.3ms/actuator)
- Cable length is about 10Km (the length between two actuators is about 1200m)
- About 126 devices can be attached
- Redundant linear topology as an option

For Profibus Dp, the basic topology is through RS485 segment tree structure, as shown in the figure:



MODBUS

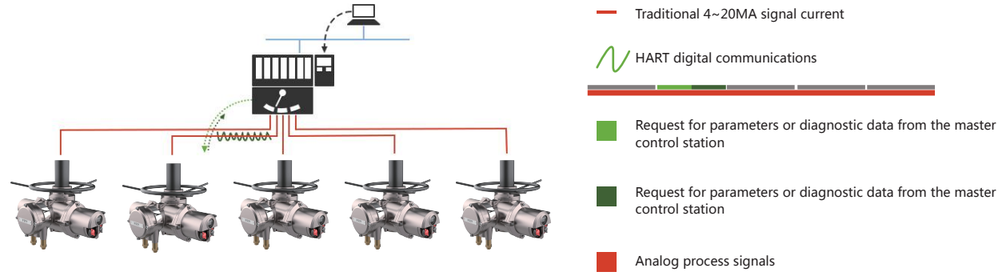
The electric actuator supports Modbus RTU and has the following features:

- Fast data exchange (up to 115Kbit/s - corresponding to approx. 30ms/actuator)
- Cable length reaches approximately 10km (1200m without intermediate relay between two actuators)
- About 247 devices can be attached
- Redundant linear topology as an option

*For Modbus RTU, the basic topology is through RS485 segment tree structure, the same as Profibus Dp.

HART

The HART communication protocol adopts the frequency shift keying (FREQUENCY SHIFT KEYING, FSK) principle, which is based on the BELL 202 communication standard. Digital signals are represented by two frequencies: 1200HZ represents logic "1", and 2200HZ represents logic "0". Since the average component of the frequency signal is zero during communication, it will not affect the transmission of analog signals. Therefore, the sine waves of these two frequencies can be superimposed on the DC4~20MA analog signal and transmitted simultaneously. In this way, not only the DC4-20MA analog signal can be used, but also the same cable can be used to realize two-way multi-information transmission with digital signals, thus having functions such as modifying the range, damping time, PID parameters, etc., which can improve the operation quality and management efficiency of the system.



APP CONTROL

Chinese version mobile phone control

Through the Chinese version of mobile phone control software, it can realize the functions of long-distance wireless debugging, operation and monitoring, actuator diagnosis, downloading all information, saving all information and uploading information of the actuator, etc. It greatly facilitates user operation, debugging and diagnosis.

- Visualization
- Easy to debug
- Operation and monitoring functions
- Actuator diagnostic function
- All information of the actuator can be downloaded, saved and uploaded.

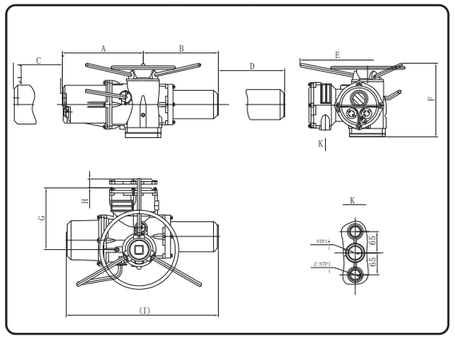
FRYQ single-phase actuator performance parameters (220V 50Hz)

Model	Output speed (RPM)	Output torque (NM)	Motor power (KW)	Rated current (A)
FRYQ18	18	55	0.2	3.3
	24	50	0.2	3.3
	36	40	0.2	3.3
	48	35	0.2	3.3
FRYQ25	18	210	0.9	9
	24	210	0.9	9
	36	170	0.9	9
	48	130	0.9	9
FRYQ35	18	300	1.1	14
	24	300	1.1	14
	36	220	1.1	14
	48	160	1.1	14

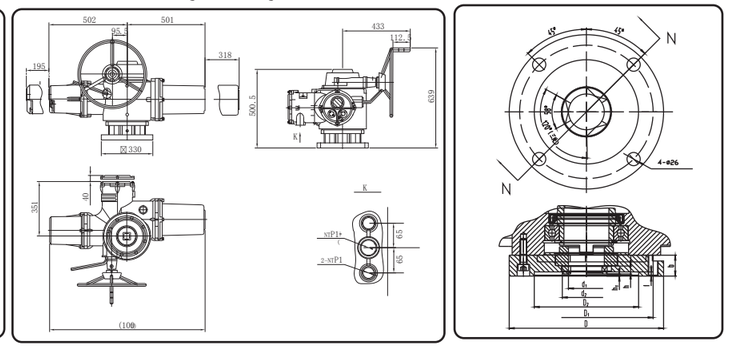
FRYQ three-phase actuator performance parameters (380V 50Hz)

Model	Rotating speed (RPM)	Torque (NM)	Motor power (KW)	Rated current (A)	Rated thrust (KN)	Rising and non rising stem diameter (MM)	Flange code	Weight (KG)
FRYQ18	18	136	0.37	1.6	44	32/26	F10	27
	24	108						
	36	72						
	48	54						
FRYQ25	18	400	1.1	3.4	100	38/32	F14	46
	24	400						
	36	298						
	48	244						
FRYQ35	18	610	1.5	4.5	150	54/45	F16	69
	24	610						
	36	542						
	48	474						
FRYQ40	18	1020	2.2	6.5	220	64/51	F25	190
	24	1020						
	36	845						
	48	680						
FRYQ70	18	1490	3	9	220	70/57	F25	190
	24	1490						
	36	1290						
	48	1020						
FRYQ90	18	2030	5.5	14	334	70/57	F25 or F30	200
	24	2030						
	36	1700						
	48	1355						
FRYQ95	24	3000	7.5	19	445	-	F30	200

FRYQ18-FRYQ40



FRYQ70-FRYQ95



FRYQ18-FRYQ40 dimensions

Model	A	B	C	D	E	F	G	H	(I)
FRYQ18	299	258.5	150	170	φ300	302	257	40	557.5
FRYQ25	328	357	150	248	φ642	333	278.5	40	685
FRYQ35	342	356	150	220	φ780	374	300	40	698.5
FRYQ40	502	479	195	290	φ812.5	515	351	40	979

FRYQ flange dimensions

Model	D	D1	D2	d1	d2	d Well distributed	h	h1	f	b
FRYQ18	φ145	φ120	φ90	φ30.5	φ45	4-M10	11	2	5	23.5
FRYQ25	φ185	φ160	φ125	φ43	φ58	4-M12	9.5	2.5	5	25
FRYQ35	φ225	φ195	φ150	φ51.5	φ72	4-M16	12	2	5	24
FRYQ40	φ275	φ235	φ180	φ62	φ83	4-M22	14	2	5	21
FRYQ70-95	φ330	φ285	φ220	φ72	φ98	4-M26	16	2	6	30

FRYT QUARTER-TURN ELECTRIC ACTUATOR

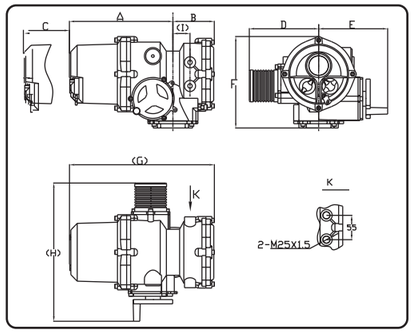
FRYT actuator performance parameters (three-phase 380V 50HZ)

Model	Rotating speed (RPM)	Torque (NM)	Motor power (KW)	Rated current (A)	90°rotation time (S)	Flange code	Maximum stem diameter (MM)	Weight (KG)
FRYT250	1	250	0.06	0.65	15	F07、F10	28	23
FRYT500	0.5	500	0.09	0.72	30	F10	42	23
FRYT1000	0.5	1000	0.12	0.85	30	F12、F14	42~60	37
FRYT2000	0.25	2000	0.12	0.85	60	F14	42~60	37

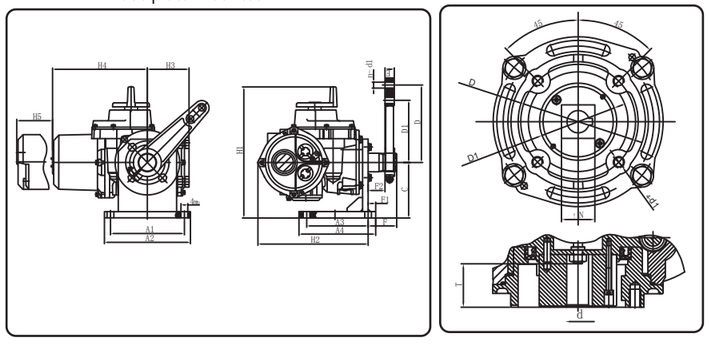
FRYT actuator performance parameters (single-phase 220V 50HZ)

Model	Rotating speed (RPM)	Torque (NM)	Motor power (KW)	Rated currrent (A)	90°rotation time (S)	Flange code	Maximum stem diameter (mm)	Weight (KG)
FRYT250	1	250	0.06	0.95	15	F07、F10	28	23
FRYT500	0.5	500	0.09	1.2	30	F10	42	23
FRYT1000	0.5	1000	0.18	2.2	30	F12、F14	42~60	37
FRYT2000	0.25	2000	0.18	2.2	60	F14	42~60	37

FRYT direct mounted



FRYT foot-plate mounted



FRYT dimensions (direct mounted)

Model	Spec.	A	B	C	D	E	F	(G)	(H)	(I)
FRYT1	FRYT250	306	124	160	135.5	202.5	277	430	338	54
	FRYT500									
FRYT2	FRYT1000	308	121.5	160	123.5	245	340	428.5	368.5	52
	FRYT2000									

FRYT dimensions (foot-plate mounted)

Model	A1	A2	A3	A4	C	D1	D	E	F	F1	F2	H1	H2	H3	H4	H5	n-Φd1	4-Φd2
FRYT1	240	280	180	220	180	100	100	22	68.5	20	17.5	382	288	124	306	160	18	17.5
FRYT2	240	280	200	250	180	200	250	30	93	25	55	425	356	136	308	160	2-Φ20	22

FRYT flange dimensions

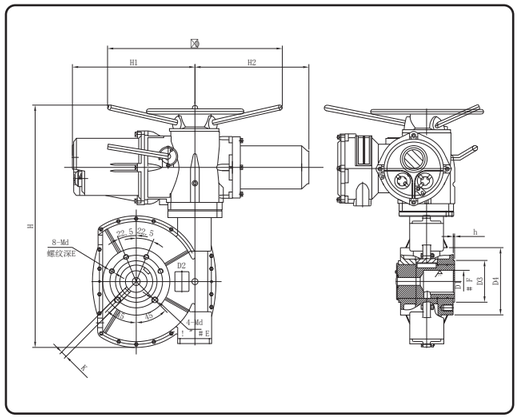
Model	Flange code	D	D1	N(Max)	D(Max)	T	D1 (well distributed)
FRYT1	F05	φ50	φ38	20	φ25	38	M6
	F07	φ70	φ55	30	φ35	38	M8
FRYT2	F10	φ102	φ69	30	φ42	38	M10
	F12	φ125	φ98	50	φ65	68	M12
	F14	φ140	φ98	50	φ65	68	M16

FRYQ+BW QUARTER-TURN ELECTRIC ACTUATOR

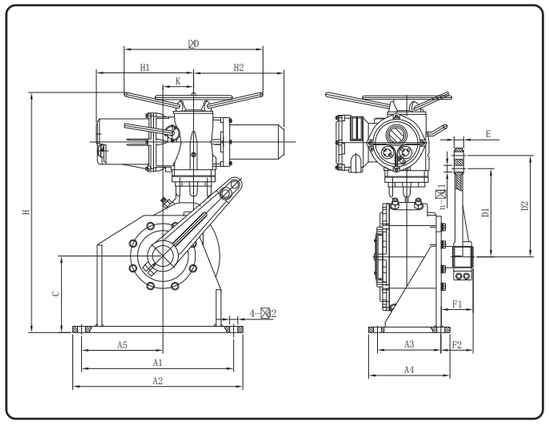
FRYQ+BW actuator performance parameters

Model	Output torque (NM)	Output speed (r/min)	Motor power (KW)	Rated curent (A)	Jam current (A)	90°rotation time (S)	Weight (KG)
FRYQ18+BW1	1000	0.68	0.21	1.70	4.65	22	95
	1700	0.34	0.21	1.75	6.00	44	
FRYQ18+BW2	3000	0.68	0.64	3.70	12.00	22	140
	3000	0.34	0.78	5.90	16.50	44	
FRYQ18+BW3	4000	0.68	0.64	3.70	12.00	22	185
	5000	0.34	0.75	5.90	16.50	44	
FRYQ18+BW4	7800	0.68	1.50	9.30	37.00	22	200
	7800	0.34	1.19	5.90	26.50	44	
FRYQ25+BW5	8500	0.8	1.50	9.30	37.00	19	240
	10000	0.4	1.19	5.90	26.50	38	
FRYQ25+BW6	12000	0.8	2.14	15.00	70.00	19	370
	17500	0.4	1.91	11.00	40.00	38	
FRYQ35+BW7	13000	0.74	2.14	15.00	70.00	20	450
	20000	0.37	1.91	11.00	40.00	40	
FRYQ35+BW8	32000	0.73	4.29	24.00	135.00	21	500
	63500	0.36	5.81	35.00	80.00	41	

FRYQ+BW direct mounted



FRYQ+BW foot-plate mounted



FRYQ+BW dimensions (direct mounted)

Model	D	D1	D2	D3	D4	E	F	K	H	H1	H2	n-Md	h	Output torque
FRYQ18+BW1	φ328	φ45	φ125	/	φ162	20	94	14	558	295	258.5	4-M12	/	1000
FRYQ18+BW2	φ328	φ60	φ140	/	φ178	25	87	18	603	295	258.5	4-M16	/	1600
FRYQ18+BW3	φ328	φ70	φ165	/	φ210	25	95.5	20	685	295	258.5	4-M20	/	2500
FRYQ18+BW4	φ328	φ70	φ165	/	φ210	30	92	20	739	295	258.5	4-M20	/	4000
FRYQ25+BW5	φ642	φ70	φ165	/	φ218	25	103	2-20	900	324	357	4-M20	/	6000
FRYQ25+BW6	φ642	φ75	φ254	φ200	/	25	165	2-20	877	324	357	8-M16	5.5	8000
FRYQ35+BW7	φ780	/	φ254	φ200	/	25	165	2-20	1102	338	357	8-M16	5.5	10000
FRYQ35+BW8	φ780	/	φ254	φ200	/	25	165	2-20	1102	338	357	8-M16	5.5	15000

FRYQ+BW dimensions

Model	A1	A2	A3	A4	A5	C	D1	D2	n-φd1	Output torque
FRYQ18+BW1	240	280	150	190	120	170	200	250	2-φ20	1000
FRYQ18+BW2	375	435	175	235	195	170	200	250	2-φ20	1600
FRYQ18+BW3	500	560	180	240	210	230	200	250	2-φ30	2500
FRYQ18+BW4	500	560	180	240	210	230	200	250	2-φ30	4000
FRYQ25+BW5	480	540	260	320	200	267	350	/	φ36	6000
FRYQ25+BW6	600	670	250	320	320	300	400	/	φ40	8000
FRYQ35+BW7	600	670	250	320	320	300	400	/	φ40	10000
FRYQ35+BW8	600	670	250	320	320	300	400	/	φ40	15000

Model	4-φd2	D	E	F1	F2	H	H1	H2	K
FRYQ18+BW1	4-φ17	φ328	30	74	74	604	295	258.5	92
FRYQ18+BW2	4-φ22	φ328	30	95	95	630	295	258.5	116.5
FRYQ18+BW3	4-φ22	φ328	30	85	85	754.5	295	258.5	150.5
FRYQ18+BW4	4-φ22	φ328	38	81	81	779	295	258.5	183
FRYQ25+BW5	4-φ22	φ642	38	108	108	921	324	357	120
FRYQ25+BW6	4-φ32	φ642	40	126	126	945	324	357	120
FRYQ35+BW7	4-φ32	φ780	40	126	126	1170	338	357	120
FRYQ35+BW8	4-φ32	φ780	40	126	126	1170	338	357	120

FRYQ+VE LINEAR-TURN ELECTRIC ACTUATOR

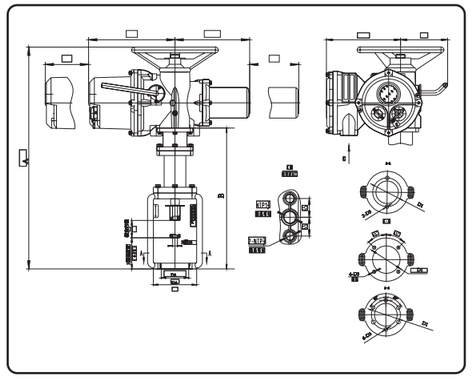
FRYQ+VE linear-turn electric actuator (single-phase)

Model	Rated load (N)	Rotating speed (RPM)	Linear speed (MM/S)	Rated travel (MM)	Power supply (V)	Number of power phases (Ph)	Frequecy (Hz)	Motor power (KW)	Rated current (A)	Duty cycle
FRYQ18+VE64/0610KNP	6400	18	0.6	10	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/0810KNP	6400	24	0.8	10	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1210KNP	6400	18	1.2	10	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1610KNP	6400	24	1.6	10	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/0616KNP	6400	18	0.6	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/0816KNP	6400	24	0.8	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1216KNP	6400	18	1.2	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1616KNP	6400	24	1.6	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1225KNP	6400	18	1.2	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1625KNP	6400	24	1.6	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1240KNP	6400	18	1.2	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE64/1640KNP	6400	24	1.6	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1216KNP	10000	18	1.2	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1616KNP	10000	24	1.6	16	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1225KNP	10000	18	1.2	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1625KNP	10000	24	1.6	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1240KNP	10000	18	1.2	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1640KNP	10000	24	1.6	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1260KNP	10000	18	1.2	60	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE100/1660KNP	10000	24	1.6	60	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1225KNP	16000	18	1.2	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1625KNP	16000	24	1.6	25	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1240KNP	16000	18	1.2	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1640KNP	16000	24	1.6	40	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1260KNP	16000	18	1.2	60	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1660KNP	16000	24	1.6	60	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1200KNP	16000	18	1.2	100	220	1	50	0.2	2.6	S4(30%)
FRYQ18+VE160/1600KNP	16000	24	1.6	100	220	1	50	0.2	2.6	S4(30%)
FRYQ25+VE250/1640KNP	25000	24	1.6	40	220	1	50	0.9	9	S4(30%)
FRYQ25+VE250/1660KNP	25000	24	1.6	60	220	1	50	0.9	9	S4(30%)
FRYQ25+VE250/1600KNP	25000	24	1.6	100	220	1	50	0.9	9	S4(30%)
FRYT+VE/1310KNP	6400	4	0.13	10	220	1	50	0.04	1.14	S4(30%)
FRYT+VE/2710KNP	6400	4	0.27	10	220	1	50	0.04	1.14	S4(30%)
FRYT+VE/1316KNP	6400	4	0.13	16	220	1	50	0.04	1.14	S4(30%)
FRYT+VE/2716KNP	6400	4	0.27	16	220	1	50	0.04	1.14	S4(30%)

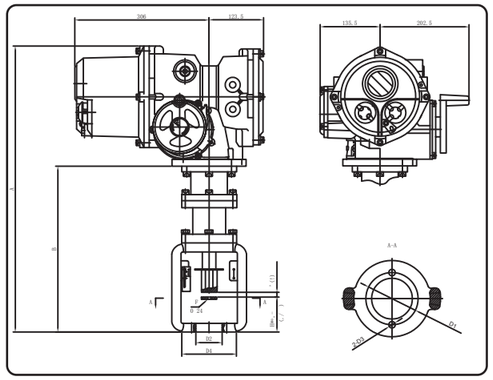
FRYQ+VE linear-turn electric actuator (three-phase)

Model	Rated load (N)	Rotating speed (RPM)	Linear speed (MM/S)	Rated travel (MM)	Power supply (V)	Number of power phases (Ph)	Frequecy (Hz)	Motor power (KW)	Rated current (A)	Duty cycle
FRYQ18+VE64/0610FNP	6400	18	0.6	10	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/0810FNP	6400	24	0.8	10	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1210FNP	6400	18	1.2	10	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1610FNP	6400	24	1.6	10	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/0616FNP	6400	18	0.6	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/0816FNP	6400	24	0.8	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1216FNP	6400	18	1.2	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1616FNP	6400	24	1.6	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1225FNP	6400	18	1.2	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1625FNP	6400	24	1.6	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1240FNP	6400	18	1.2	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE64/1640FNP	6400	24	1.6	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1216FNP	10000	18	1.2	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1616FNP	10000	24	1.6	16	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1225FNP	10000	18	1.2	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1625FNP	10000	24	1.6	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1240FNP	10000	18	1.2	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1640FNP	10000	24	1.6	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1260FNP	10000	18	1.2	60	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE100/1660FNP	10000	24	1.6	60	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1225FNP	16000	18	1.2	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1625FNP	16000	24	1.6	25	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1240FNP	16000	18	1.2	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1640FNP	16000	24	1.6	40	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1260FNP	16000	18	1.2	60	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1660FNP	16000	24	1.6	60	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1200FNP	16000	18	1.2	100	380	3	50	0.37	3.3	S4(30%)
FRYQ18+VE160/1600FNP	16000	24	1.6	100	380	3	50	0.37	3.3	S4(30%)
FRYQ25+VE250/1640FNP	25000	24	1.6	40	380	3	50	1.1	5.8	S4(30%)
FRYQ25+VE250/1660FNP	25000	24	1.6	60	380	3	50	1.1	5.8	S4(30%)
FRYQ25+VE250/1600FNP	25000	24	1.6	100	380	3	50	1.1	5.8	S4(30%)
FRYT+VE/1310FNP	6400	4	0.13	10	380	3	50	0.04	0.57	S4(30%)
FRYT+VE/2710FNP	6400	4	0.27	10	380	3	50	0.04	0.57	S4(30%)
FRYT+VE/1316FNP	6400	4	0.13	16	380	3	50	0.04	0.57	S4(30%)
FRYT+VE/2716FNP	6400	4	0.27	16	380	3	50	0.04	0.57	S4(30%)

FRYQ+VE

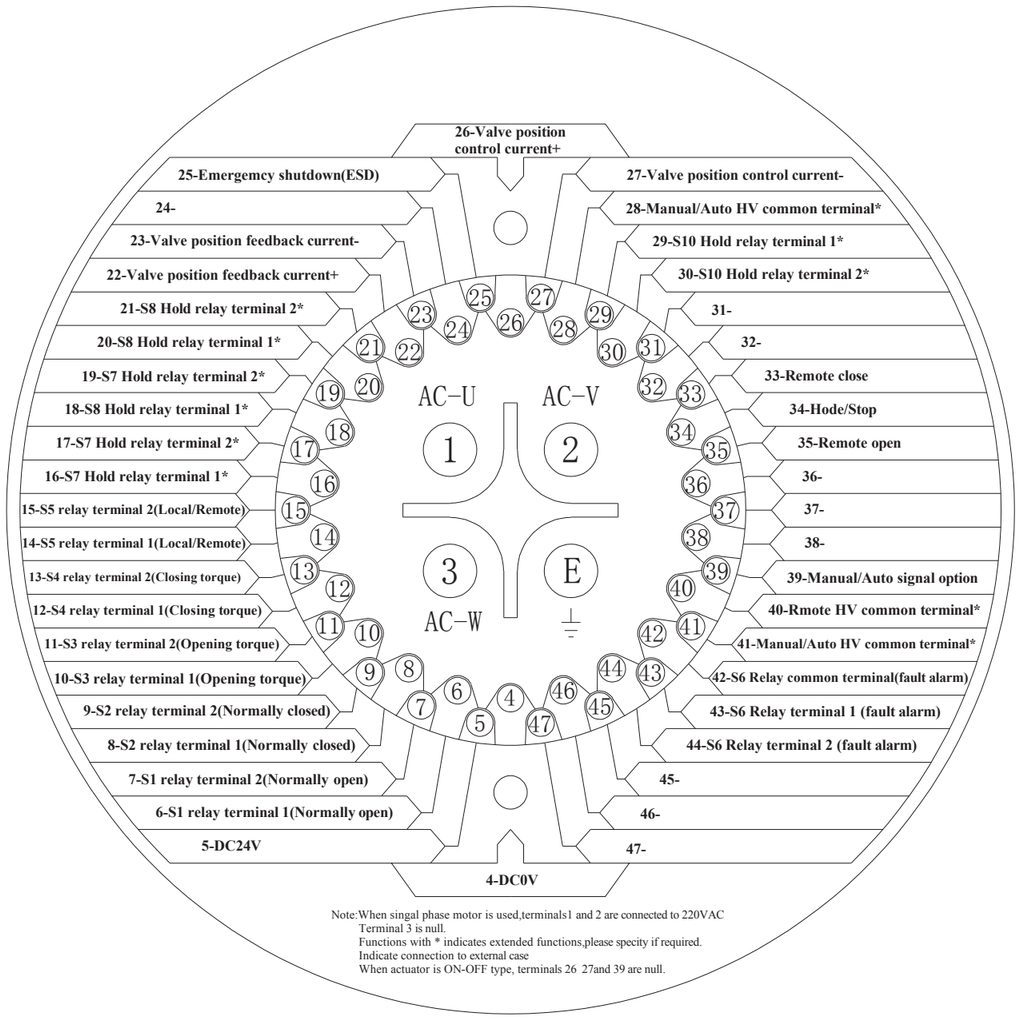


FRYT+VE



FRYQ+VE actuator performance parameters (three-phase 380V 50HZ)

Model	Rated load	Rated travel	Rated speed	Valve stem con. hole	Flange con.	Flange inner hole	Flange hole	Con. valve flange			
	N	mm	mm/s	F	D1	D2	D3	D4	A	B	H
FRYQ18+VE64/1610K (F) NP	6400	10	16	M8x1.25	φ80	φ60D11	2-φ11	φ125	629	376	81
FRYQ18+VE64/1616K (F) NP		16	16								75
FRYQ18+VE64/1625K (F) NP		25	16	M12x1.25	φ105	φ80D11	4-φ11	φ140	726.5	446	121
FRYQ18+VE64/1640K (F) NP		40	16								106
FRYQ18+VE64/1660K (F) NP		60	16	M16x1.25	φ118	φ95D11	4-φ11	φ150	768.5	488	108
FRYQ18+VE100/1625K (F) NP	10000	25	16	M16x1.25	φ118	φ95D11	4-φ11	φ150	768.5	488	134
FRYQ18+VE100/1640K (F) NP		40	16								128
FRYQ18+VE100/1660K (F) NP		60	16								108
FRYQ18+VE160/1625K (F) NP	16000	25	16	M20x15	φ135	φ100D11	6-φ11	φ165	845.5	565	209
FRYQ18+VE160/1640K (F) NP		40	16								194
FRYQ18+VE160/1660K (F) NP		60	16								174
FRYQ18+VE160/1600K (F) NP		100	16	M20x15	φ135	φ100D11	6-φ11	φ165	886.5	606	134
FRYQ25+VE250/1640K (F) NP	25000	40	1.6	M27*2	φ135	φ100D11	6-φ18	φ165	913	446	195.5
FRYQ25+VE250/1660K (F) NP		60	1.6								175.5
FRYQ25+VE250/1600K (F) NP		100	1.6								135.5
FRYT+VE/2710K (F) NP	6400	10	0.27	M8x1.25	φ80	φ60D11	2-φ11	φ125	649	377	81
FRYT+VE/2710K (F) NP		16	0.27								75



Note:When singal phase motor is used,terminals1 and 2 are connected to 220VAC
Terminal 3 is null.
Functions with * indicates extended functions,please specity if required.
Indicate connection to external case
When actuator is ON-OFF type, terminals 26 27and 39 are null.

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