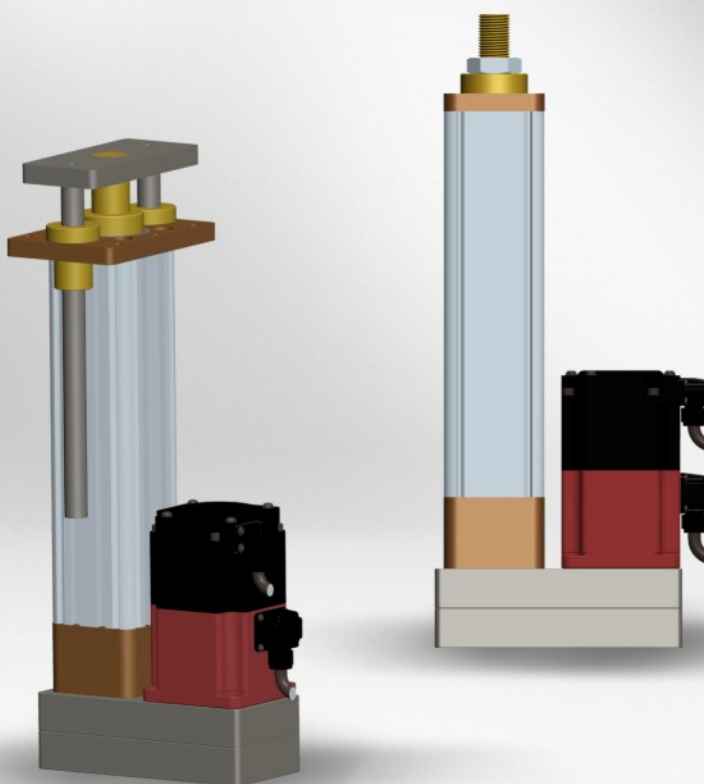


# KGV-C

Powerful. Compact. Reliable

▶ Servo Electric Cylinders



## Product introduction

### Working Principle

A servo electric cylinder is a modular product that integrates a servo motor with a ball screw or planetary roller screw. It converts the rotational motion of the servo motor into linear motion, while transforming the motor's advantages—precise speed control, precise rotation control, and precise torque control—into precise speed control, precise position control, and precise force control. This represents a revolutionary product for high-precision linear motion.

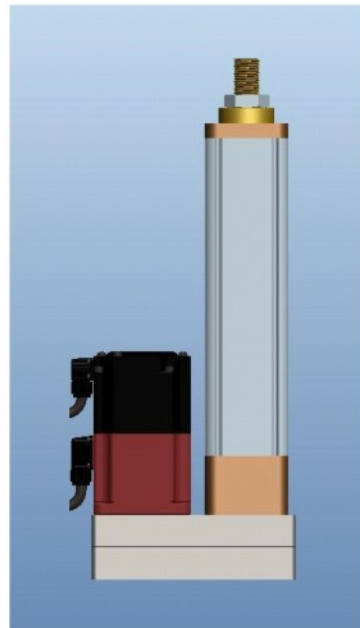
### Types of Servo Electric Cylinders

#### 1. Direct Drive Electric Cylinder

The direct drive electric cylinder integrates servo motors, servo drives, high-precision ball screws, and modular design technologies, offering advantages such as compact structure, low inertia, fast response, low noise, and long lifetime. The servo motor is directly connected to the driving screw of the electric cylinder, reducing inertia and gaps, thus enhancing control and precision. The overall connection facilitates easier installation, with stable performance and low failure rates.

#### 2. Retractable Electric Cylinder

The retractable electric cylinder is suitable for installations with space constraints due to its short overall length. The selected gearbox and reducer are high-precision and high-lifetime products, giving the entire electric cylinder high control and precision.



### Applications of Servo Electric Cylinders

Servo electric cylinders are widely used in material handling and high-precision mechanical processing fields: aerospace testing equipment, six-degree-of-freedom simulators, lifting platforms, robotics, injection molding machines, press-fitting machines, mold control, valve control, precision machine tools, and automotive manufacturing equipment.

## Features

Electric cylinders can operate faultlessly for long periods in harsh environments, achieving high strength, high speed, and high precision with smooth motion and low noise. Their unique anti-rotation feature ensures high-precision position control and safety.

### ● High Transmission Efficiency

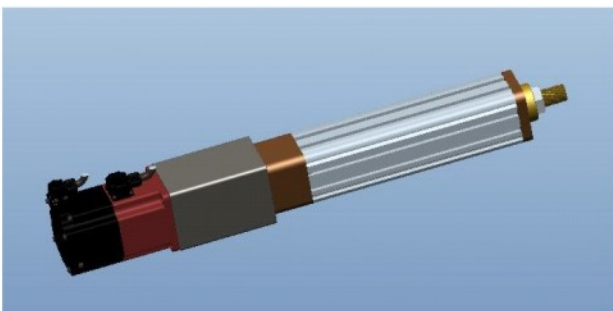
Electric cylinders using precision ball screws or planetary roller screws eliminate many complex mechanical structures, significantly improving transmission efficiency, which can exceed 90%.

### ● High Positioning Accuracy

Servo electric cylinders with ball screws can achieve precise positioning of about 0.01 mm through servo control, making them suitable for high-precision applications. They can attain significant accuracy in semi-closed loop systems, unlike hydraulic or pneumatic cylinders, which require full closed-loop systems to achieve similar precision.

### ● Simple Structure, Compact Size, Easy Maintenance

The servo electric cylinder mainly consists of a motor and nut-screw structure, making it compact and occupying minimal workspace. Its simplicity allows for easy troubleshooting and convenient maintenance.



### ● Stable Operation

Using ball screws or planetary roller screws significantly reduces friction in the drive mechanism, decreasing material wear, enhancing operational stability, and extending lifetime.

### ● Precise Control

Equipped with encoders, rotary transformers, or potentiometers, and controlled by inverters, servo controllers, or PLCs, it achieves closed-loop precise positioning.

### ● Well Synchronization

When multiple drives need to operate in sync, achieving high precision with hydraulic or pneumatic cylinders is challenging. In contrast, synchronizing multiple electric cylinders is easier due to the electrical system's frequency characteristics.

### ● Overload Protection

Can be equipped with safety clutches to prevent overload, as well as overload pressure sensors for alarm functions.

### ● High Load Capacity and Long Stroke

Pull/push force ranges from 15 kg to 30 tons, with strokes up to 1 meter.

### ● High Speed

## Lifetime Calculation

The lifetime of electric cylinder products is primarily determined by the lifetime of components like screws. We mainly verify the lifetime of the screw, as other components may also experience wear but typically have a longer lifetime than the screw.

The expected lifetime L10 of the screw is the running distance that 90% of screws can achieve or exceed before material fatigue failure occurs. The unit is in millions of millimeters. L10 is not a warranty commitment; the expected lifetime assumes proper maintenance, no contaminants, and correct lubrication.

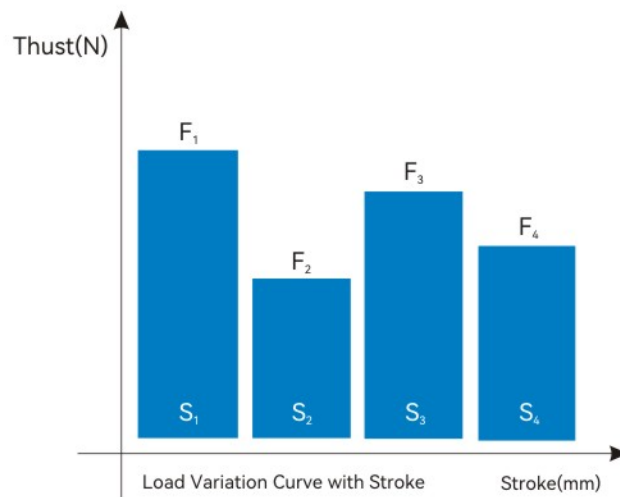
If the desired expected lifetime is greater than 90%, multiply the expected lifetime by the following coefficients:

95%: L10 x 62%    96%: L10 x 53%    97%: L10 x 44%  
 98%: L10 x 33%    99%: L10 x 21%

lifetime Calculation Formula:  $L10 = (C/F_m)^3 \times P$

Where:

- L10: Theoretical lifetime in kilometers (km)
- C: Rated dynamic load (N)
- P: Lead of the screw (mm)
- $F_m$ : Average load (N)

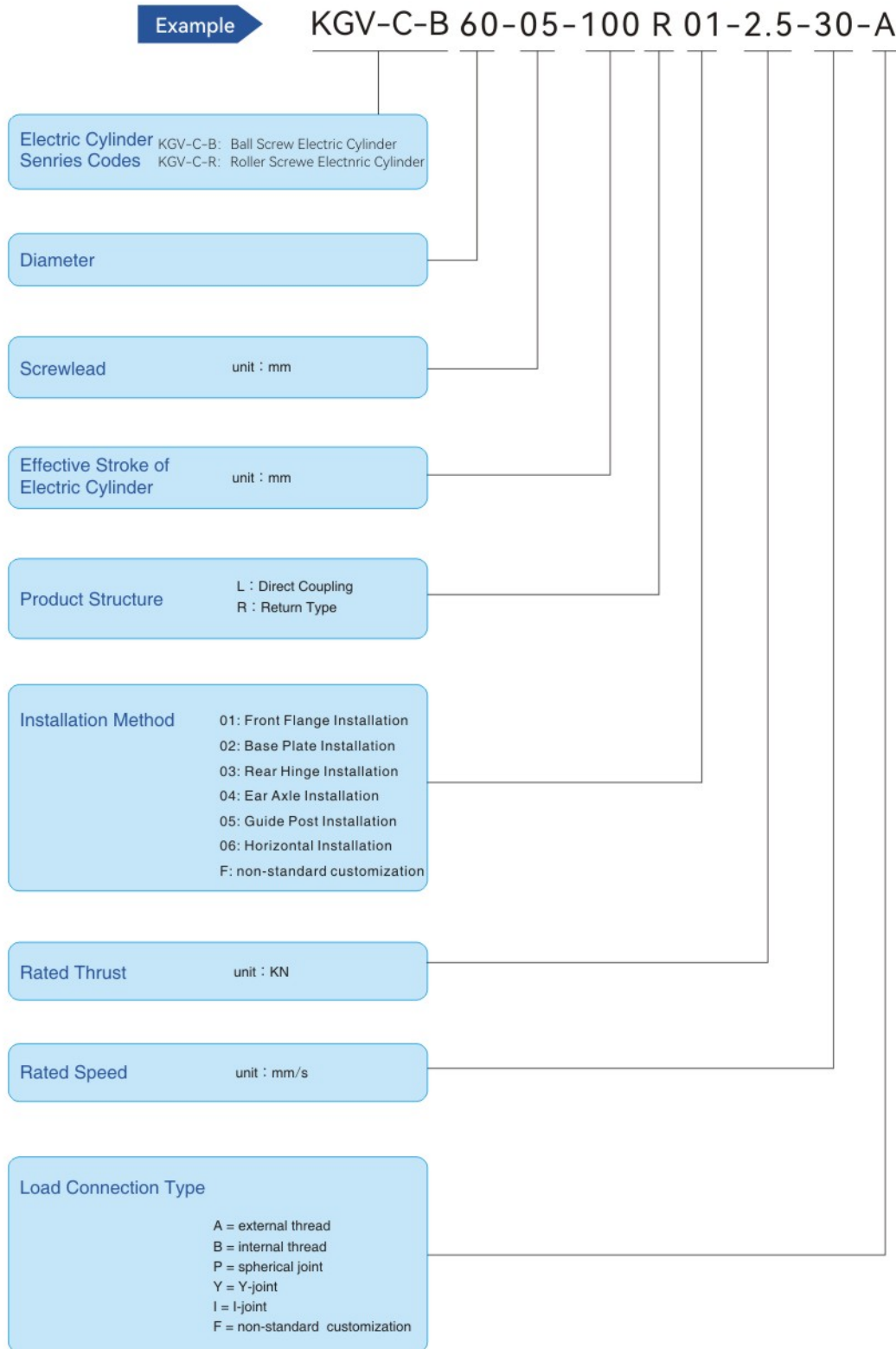


To accurately calculate the lifetime of the ball screw, we first determine the average load, as shown in the Load Variation Curve with Stroke.

The average load  $F_m$  can be calculated using the following formula:

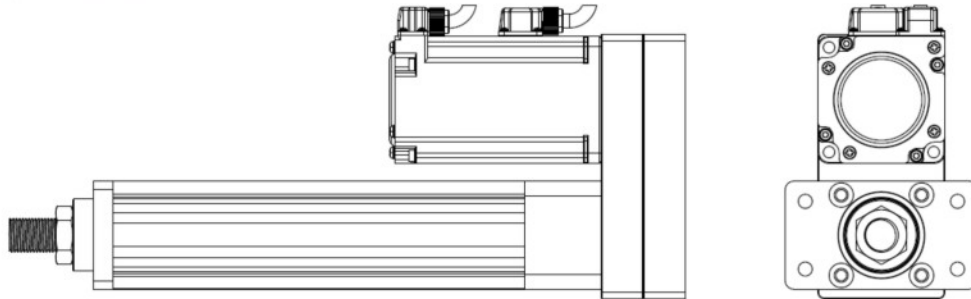
$$F_m = \sqrt{\frac{F_1^3 S_1 + F_2^3 S_2 + F_3^3 S_3 + F_4^3 S_4}{S_1 + S_2 + S_3 + S_4}}$$

## Order instructions

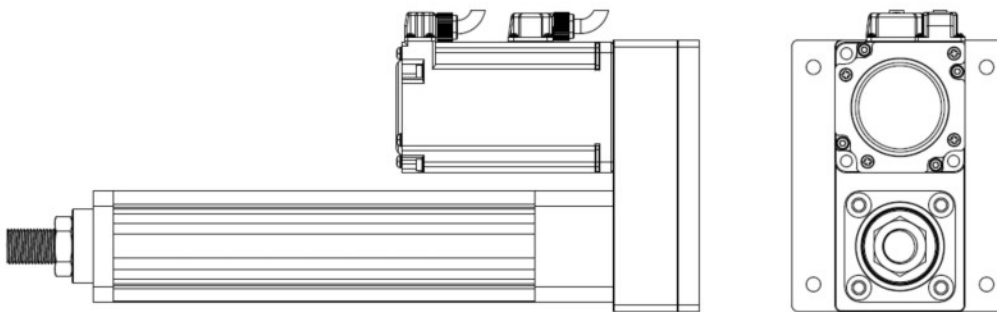


## Installation Methods

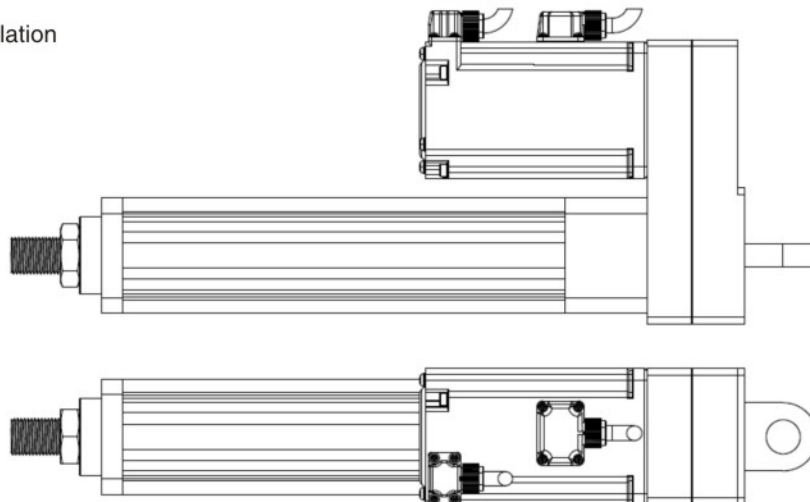
Front Flange Installation



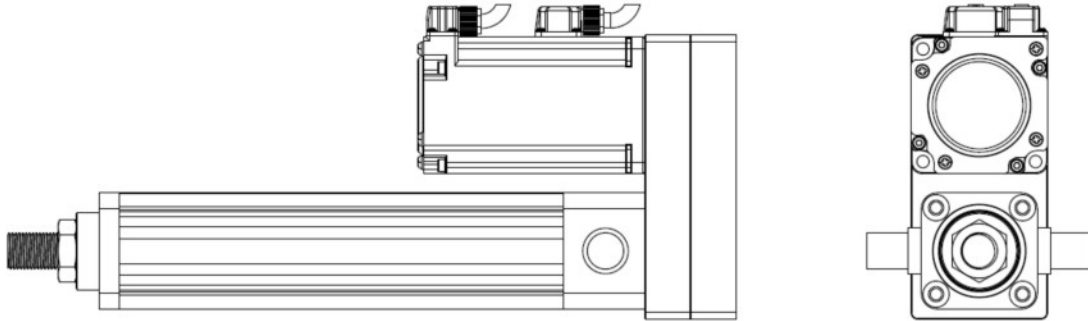
Base Plate Installation



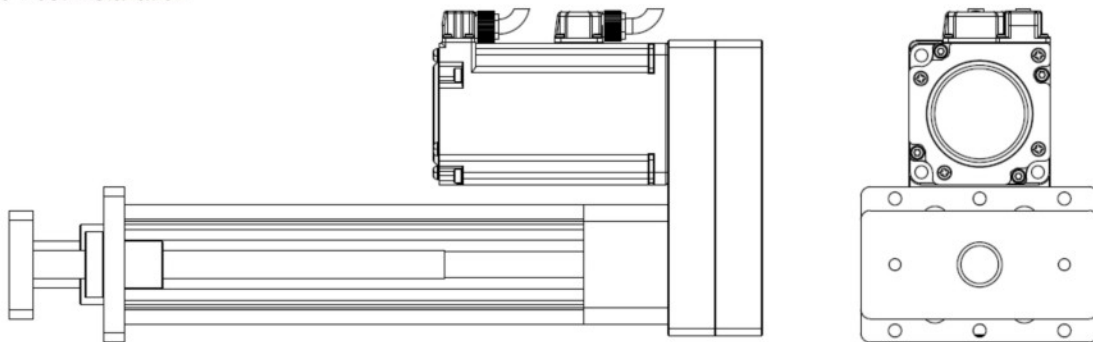
Rear Hinge Installation



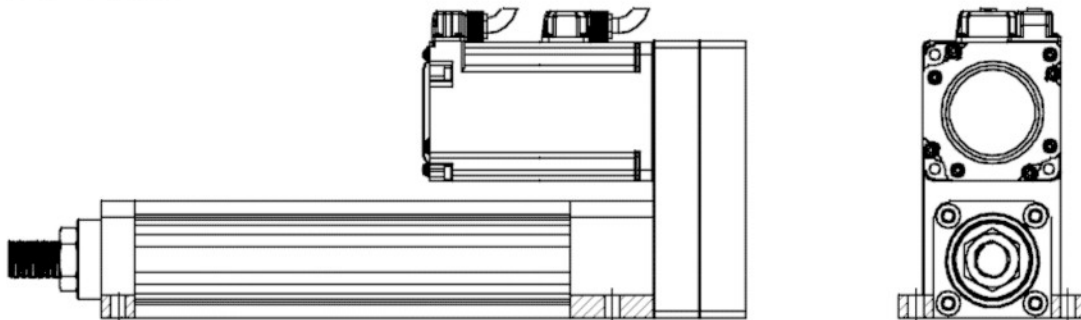
Ear Axle Installation



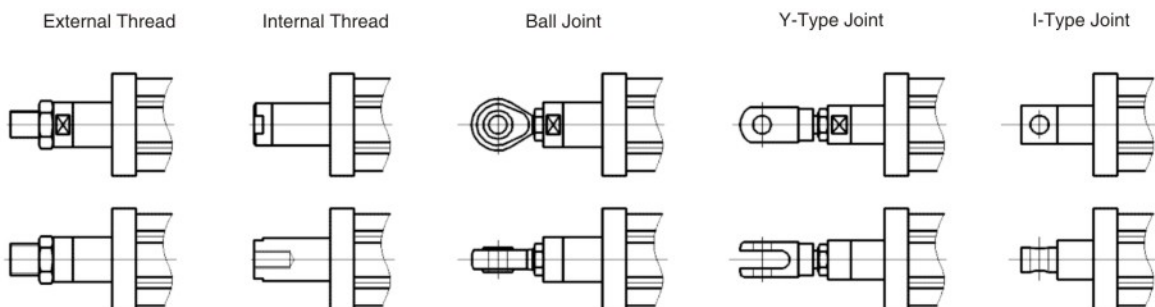
Guide Post Installation



Horizontal Installation



Load Connection Types



## KGV-C-B Technical Specifications

Series	Screw Lead	Max Thrust	Max Speed	Screw Input Torque under Max Thrust	Screw rated dynamic load	Maximum Stroke	Weight per 100 mm Stroke	Maximum Rotation Angle of Power Tube	Axial Clearance	300 mm Lead Error	Reproducibility
	mm	KN	mm/s	Nm	KN	mm	Kg	°	mm	mm	mm
KGV-C-B50	2	1.5	100	0.72	1.85	200	2.1	±0.3	0.02-0.04	0.02	0.01
	3	3	150	2.5	3.4						
	4	3	200	3	3.8						
KGV-C-B60	4	6	100	5.8	7.6	300	3.5	±0.3	0.02-0.04	0.02	0.02
	5	7.5	250	9.2	9.8						
KGV-C-B70	5	8.5	250	10.5	11	400	4.8	±0.3	0.02-0.04	0.02	0.02
	6	11	300	16.2	13.8						
KGV-C-B80	5	10	250	12.4	12.5	400	7.1	±0.3	0.03-0.05	0.025	0.02
	6	13	300	19.1	16.3						
KGV-C-B100	5	14	250	17.2	17.6	600	15	±0.3	0.03-0.05	0.03	0.02
	6	15	300	22.1	19.2						
	8	18	400	35.3	23.3						
	10	26	500	64	33.4						
KGV-C-B120	5	17	250	21	22.3	600	18	±0.3	0.03-0.05	0.03	0.02
	6	24	300	35.5	30.2						
	8	30	400	59	38.5						
	10	30	500	74	38.5						

Notes:

- 1.The recommended operating speed for the KGV-C-B series servo electric cylinder is no more than 500 mm/s. By selecting special ball screws or planetary roller screws, speeds can reach up to 1 m/s.
- 2.The power listed in the table refers to the output power of the servo motor at a rated speed of 3000 rpm.
- 3.For data requirements beyond this range, please consult with an engineer.



## Selection Table

### KGV-C-B50

Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm(mm/s)	Actual Load of Servo Electric Cylinder(N)									
				3000		2000		1500		1000		500	
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)
KGV-C-B50	2	1: 1	100							0.15	0.48	0.08	0.25
		1: 2	50					0.12	0.38	0.08	0.25	0.04	0.13
		1: 3	33.3					0.08	0.25	0.05	0.16	0.03	0.10
		1: 5	20					0.05	0.16	0.03	0.10	0.02	0.06
		1: 10	10					0.03	0.10	0.02	0.06	0.01	0.03
	3	1: 1	150	0.57	1.81	0.48	1.53	0.34	1.08	0.23	0.73	0.12	0.38
		1: 2	75	0.28	0.89	0.23	0.73	0.17	0.54	0.12	0.38	0.06	0.19
		1: 3	50	0.19	0.60	1.50	4.78	0.12	0.38	0.08	0.25	0.04	0.13
		1: 5	30	1.40	4.46	0.94	2.99	0.07	0.22	0.05	0.16	0.06	0.19
		1: 10	15	0.70	2.23	0.47	1.50	0.04	0.13	0.03	0.10	0.02	0.06
	4	1: 1	200	0.80	2.55	0.60	1.91	0.45	1.43	0.30	0.96	0.15	0.48
		1: 2	100	0.40	1.27	0.32	1.02	0.23	0.73	0.15	0.48	0.08	0.25
		1: 3	66.7	0.30	0.96	0.20	0.64	0.15	0.48	0.10	0.32	0.05	0.16
		1: 5	40	0.20	0.64	1.25	3.98	0.09	0.29	0.06	0.19	0.03	0.10
		1: 10	20	0.90	2.87	0.63	2.01	0.05	0.16	0.03	0.10	0.02	0.06

### KGV-C-B60

Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm(mm/s)	Actual Load of Servo Electric Cylinder(N)									
				7500		6000		4000		2000		1000	
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)
KGV-C-B60	4	1: 1	200			1.80	5.73	1.20	3.82	0.60	1.91	0.30	0.96
		1: 3	100			0.60	1.91	0.40	1.27	0.20	0.64	0.10	0.32
		1: 5	66.7			0.36	1.15	0.24	0.76	0.12	0.38	0.06	0.19
		1: 10	40			0.18	0.57	0.12	0.38	0.06	0.19	0.03	0.10
		1: 20	20			0.09	0.29	0.06	0.19	0.03	0.10	0.02	0.06
	5	1: 1	250	2.85	9.07	2.28	7.26	1.52	4.84	0.76	2.42	0.38	1.21
		1: 5	50	0.57	1.81	0.46	1.46	0.31	0.99	0.16	0.51	0.08	0.25
		1: 10	25	0.29	0.92	0.23	0.73	0.16	0.51	0.08	0.25	0.04	0.13
		1: 20	12.5	0.15	0.48	0.12	0.38	0.08	0.25	0.04	0.13	0.02	0.06
		1: 25	10	0.12	0.38	0.09	0.29	0.06	0.19	0.03	0.10	0.02	0.06

## Selection Table

### KGV-C-B70

Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm/(mm/s)	Actual Load of Servo Electric Cylinder(N)									
				11000		9000		7000		5000		3000	
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)
KGV-C-B70	5	1: 3	83.3			1.14	3.63	0.89	2.83	0.64	2.04	0.38	1.21
		1: 5	50			0.69	2.20	0.54	1.72	0.38	1.21	0.23	0.73
		1: 10	25			0.34	1.08	0.27	0.86	0.19	0.60	0.12	0.38
		1: 20	12.5			0.17	0.54	0.14	0.45	0.10	0.32	0.06	0.19
		1: 30	8.3			0.12	0.38	0.90	2.87	0.07	0.22	0.04	0.13
	6	1: 3	100	1.68	5.35	1.37	4.36	1.07	3.41	0.76	2.42	0.46	1.46
		1: 5	60	1.01	3.22	0.82	2.61	0.64	2.04	0.46	1.46	0.28	0.89
		1: 10	30	0.51	1.62	0.41	1.31	0.32	1.02	0.23	0.73	0.14	0.45
		1: 20	15	0.25	0.80	0.21	0.67	0.16	0.51	0.12	0.38	0.07	0.22
		1: 30	10	0.17	0.54	0.14	0.45	0.11	0.35	0.08	0.25	0.05	0.16

### KGV-C-B80

Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm/(mm/s)	Actual Load of Servo Electric Cylinder(N)									
				13000		10000		8000		5000		3000	
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)
KGV-C-B80	5	1: 3	83.3			1.27	4.04	0.10	0.32	0.64	2.04	0.38	1.21
		1: 5	50			0.76	2.42	0.61	1.94	0.38	1.21	0.23	0.73
		1: 10	25			0.38	1.21	0.31	0.99	0.19	0.60	0.12	0.38
		1: 20	12.5			0.19	0.60	0.15	0.48	0.10	0.32	0.06	0.19
		1: 30	8.3			0.13	0.41	0.10	0.32	0.07	0.22	0.04	0.13
	6	1: 3	100	1.98	6.30	1.52	4.84	1.22	3.88	0.76	2.42	0.46	1.46
		1: 5	60	1.19	3.79	0.92	2.93	0.73	2.32	0.46	1.46	0.28	0.89
		1: 10	30	0.60	1.91	0.46	1.46	0.37	1.18	0.23	0.73	0.14	0.45
		1: 20	15	0.30	0.96	0.23	0.73	0.19	0.60	0.12	0.38	0.07	0.22
		1: 30	10	0.20	0.64	0.15	0.48	0.13	0.41	0.08	0.25	0.05	0.16

## Selection Table

### KGV-C-B100

Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm(mm/s)	Actual Load of Servo Electric Cylinder(N)									
				26000		22000		16000		12000		8000	
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)
KGV-C-B100	5	1: 5	50					1.22	3.88	0.92	2.93	0.61	1.94
		1: 10	25					0.61	1.94	0.46	1.46	0.31	0.99
		1: 20	12.5					0.31	0.99	0.23	0.73	0.15	0.48
		1: 30	8.3					0.21	0.67	0.15	0.48	0.10	0.32
		1: 50	5					1.23	3.92	0.09	0.29	0.06	0.19
	6	1: 5	60					1.46	4.65	1.10	3.50	0.73	2.32
		1: 10	30					0.73	2.32	0.55	1.75	0.37	1.18
		1: 20	15					0.37	1.18	0.28	0.89	0.19	0.60
		1: 30	10					0.25	0.80	0.18	0.57	0.13	0.41
		1: 50	6					0.15	0.48	0.11	0.35	0.08	0.25
	8	1: 5	80			2.68	8.53	1.95	6.21	0.46	1.46	0.98	3.12
		1: 10	40			1.34	4.27	0.98	3.12	0.73	2.32	0.49	1.56
		1: 20	20			0.67	2.13	0.49	1.56	0.37	1.18	0.25	0.80
		1: 30	13.3			0.45	1.43	0.33	1.05	0.25	0.80	0.17	0.54
		1: 50	8			0.27	0.86	0.20	0.64	0.15	0.48	0.10	0.32
	10	1: 5	100	4.94	15.73	4.18	13.31	3.04	9.68	2.28	7.26	1.52	4.84
		1: 10	50	2.47	7.86	2.09	6.65	1.52	4.84	1.14	3.63	0.76	2.42
		1: 20	25	1.24	3.95	1.05	3.34	0.76	2.42	0.57	1.81	0.38	1.21
		1: 30	16.7	0.83	2.64	0.70	2.23	0.51	1.62	0.38	1.21	0.26	0.83
		1: 50	10	0.50	1.59	0.42	1.34	0.31	0.99	0.23	0.73	0.16	0.51

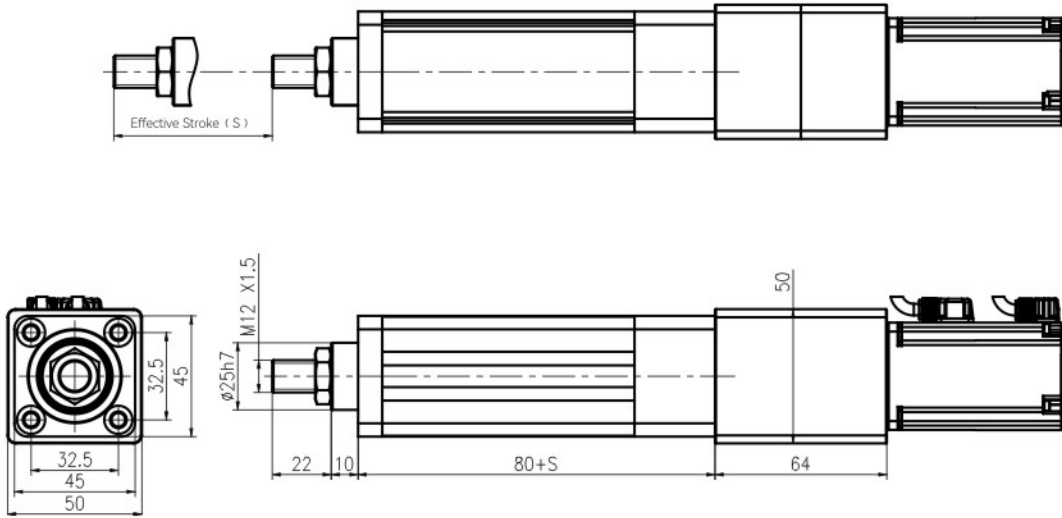
## Selection Table

### KGV-C-B120

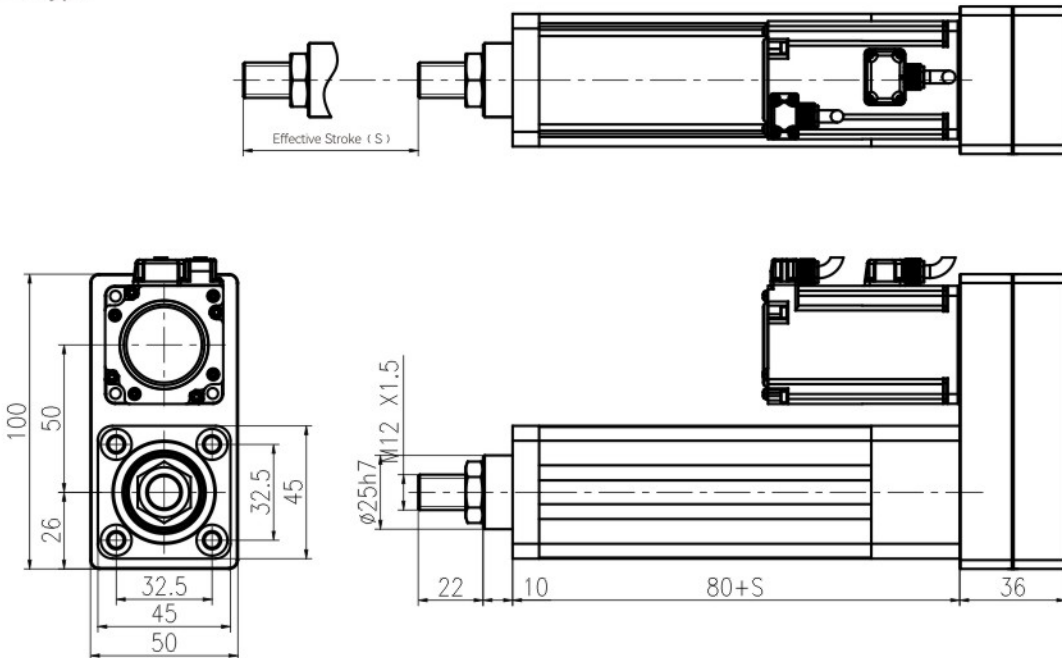
Series	Lead	Ratio	Retracting Speed at Rated Speed of Servo Motor 3000 rpm(mm/s)	Actual Load of Servo Electric Cylinder(N)										
				30000		24000		20000		16000		12000		
				Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	Servo Motor Power (KW)	Twisting Torque(Nm)	
KGV-C-B120	5	1: 5	50							1.23	3.92	0.92	2.93	
		1: 10	25							0.62	1.97	0.46	1.46	
		1: 20	12.5								0.31	0.99	0.23	0.73
		1: 30	8.3								0.21	0.67	0.16	0.51
		1: 50	5								0.13	0.41	0.10	0.32
	6	1: 5	60			2.20	7.00	1.84	5.86	1.47	4.68	1.10	3.50	
		1: 10	30			1.10	3.50	0.92	2.93	0.74	2.36	0.55	1.75	
		1: 20	15			0.55	1.75	0.46	1.46	0.37	1.18	0.28	0.89	
		1: 30	10			0.37	1.18	0.31	0.99	0.25	0.80	0.19	0.60	
		1: 50	6			0.22	0.70	0.19	0.60	0.15	0.48	0.11	0.35	
	8	1: 8	50	3.65	11.62	2.92	9.30	2.44	7.77	1.95	6.21	1.46	4.65	
		1: 10	40	1.83	5.83	1.46	4.65	1.22	3.88	0.98	3.12	0.73	2.32	
		1: 20	20	0.92	2.93	0.73	2.32	0.61	1.94	0.49	1.56	0.37	1.18	
		1: 30	13.3	0.61	1.94	0.49	1.56	0.41	1.31	0.33	1.05	0.25	0.80	
		1: 50	8	0.37	1.18	0.30	0.96	0.25	0.80	0.20	0.64	0.15	0.48	
	10	1: 8	62.5	4.58	14.58	3.66	11.65	3.05	9.71	2.44	7.77	1.83	5.83	
		1: 10	50	2.29	7.29	1.83	5.83	1.53	4.87	1.22	3.88	0.92	2.93	
		1: 20	25	0.15	0.48	0.92	2.93	0.77	2.45	0.61	1.94	0.46	1.46	
		1: 30	16.7	0.77	2.45	0.61	1.94	0.51	1.62	0.41	1.31	0.31	0.99	
		1: 50	10	0.46	1.46	0.37	1.18	0.31	0.99	0.25	0.80	0.19	0.60	

## KGV-C-B50 Servo Electric Cylinder Figuration

### Direct Coupling Type

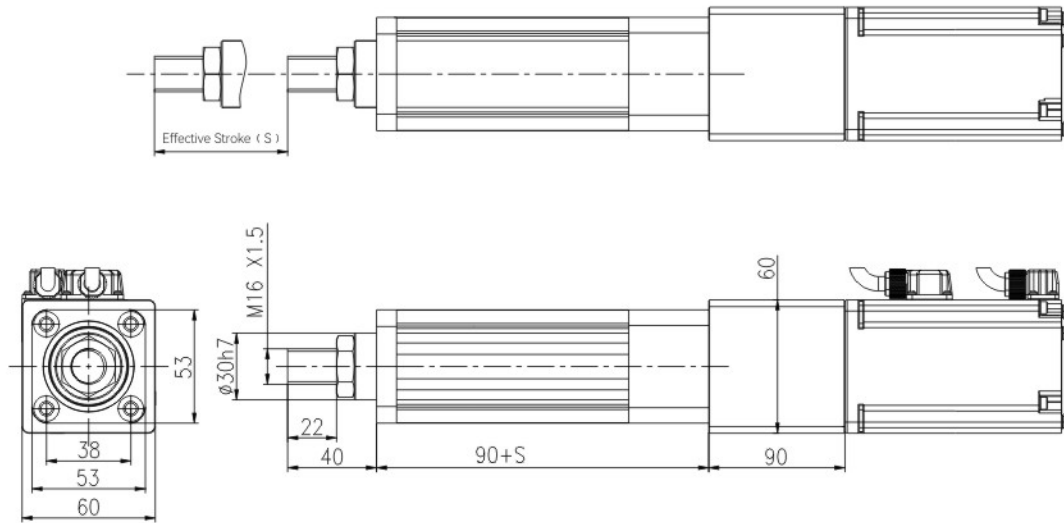


### Return Type

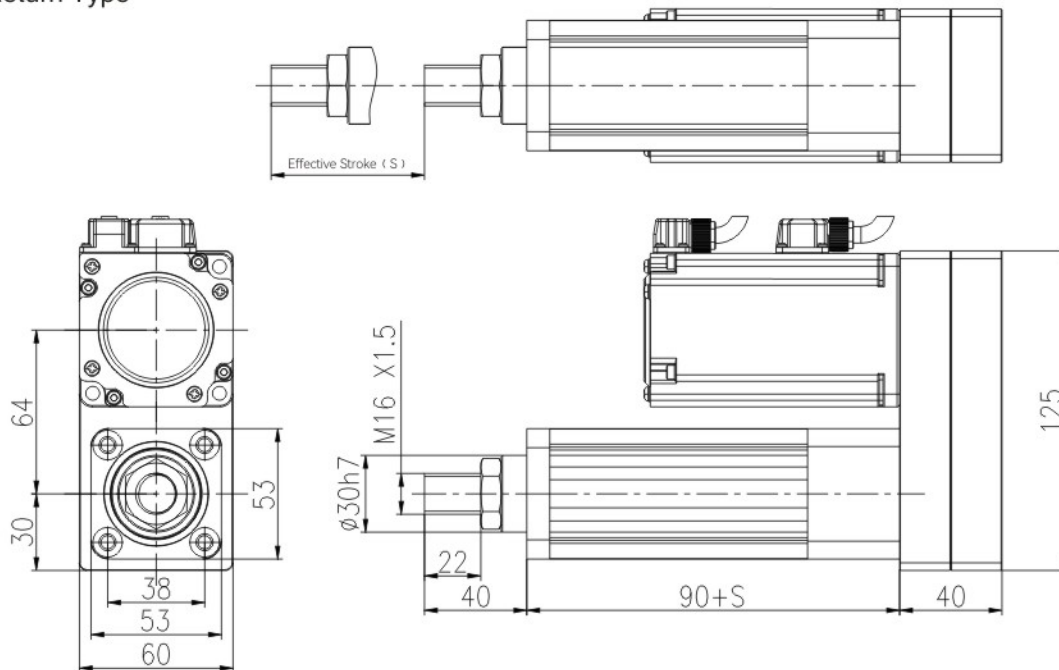


## KGV-C-B60 Servo Electric Cylinder Figuration

### Direct Coupling Type

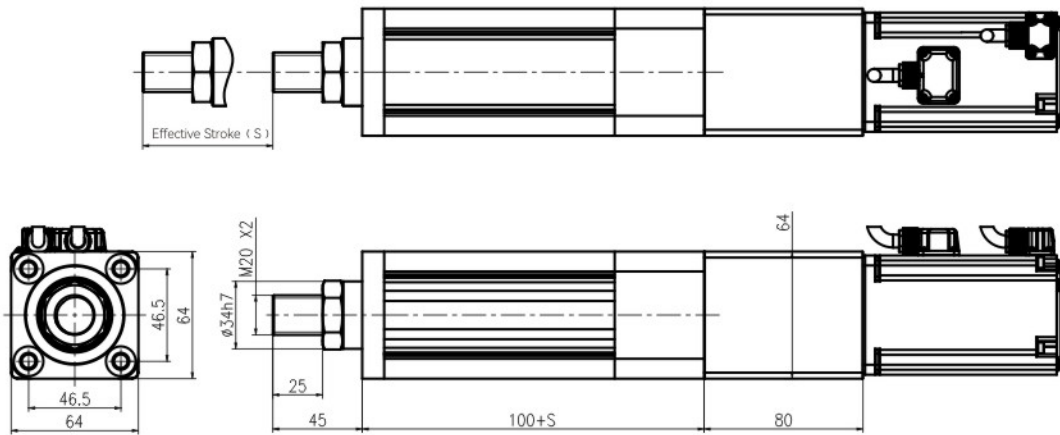


### Return Type

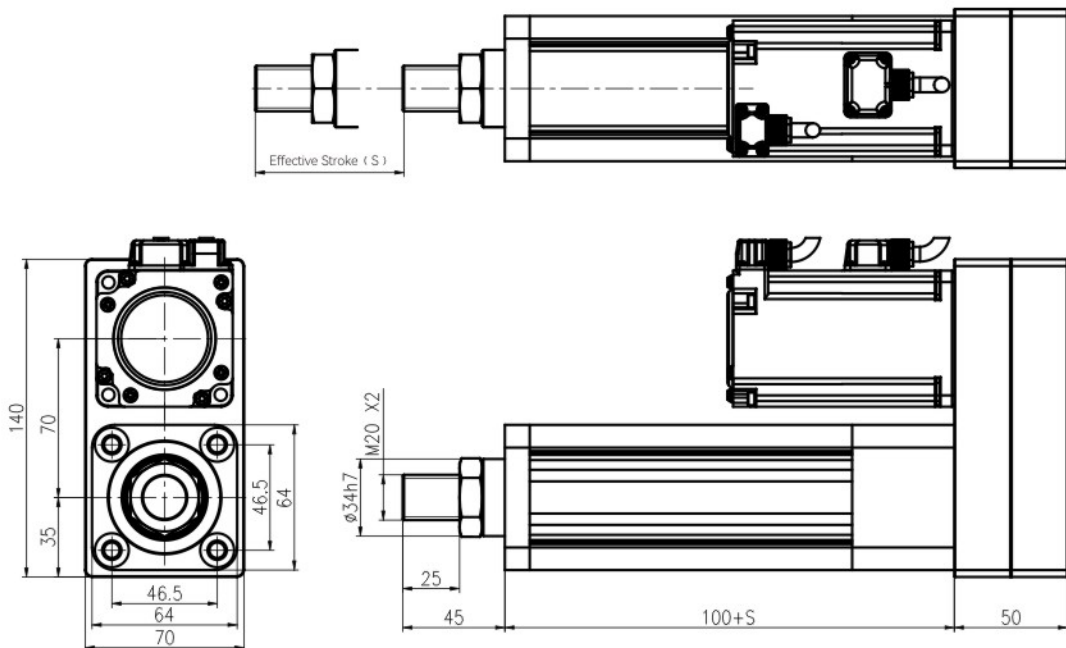


## KGV-C-B70 Servo Electric Cylinder Figuration

### Direct Coupling Type

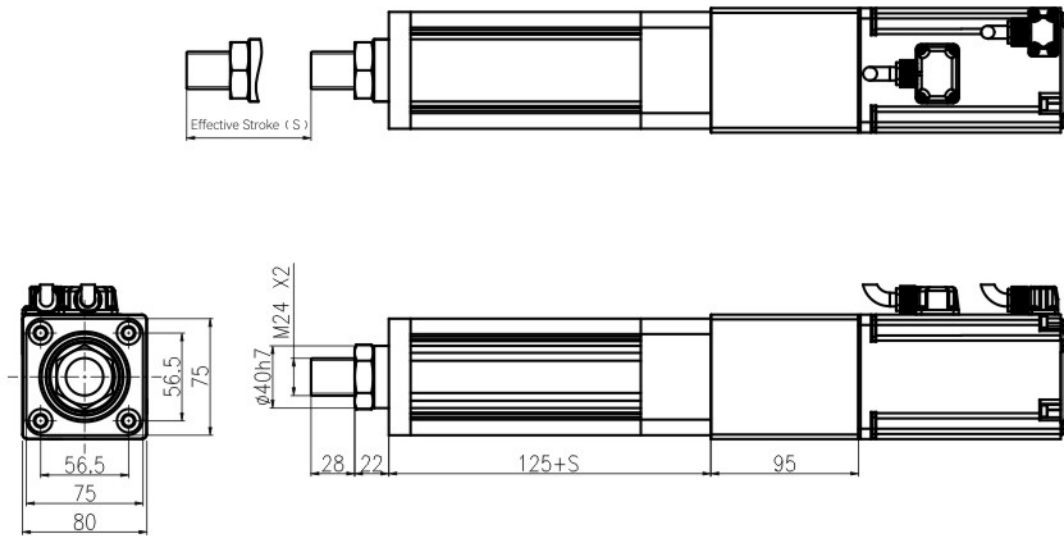


### Return Type

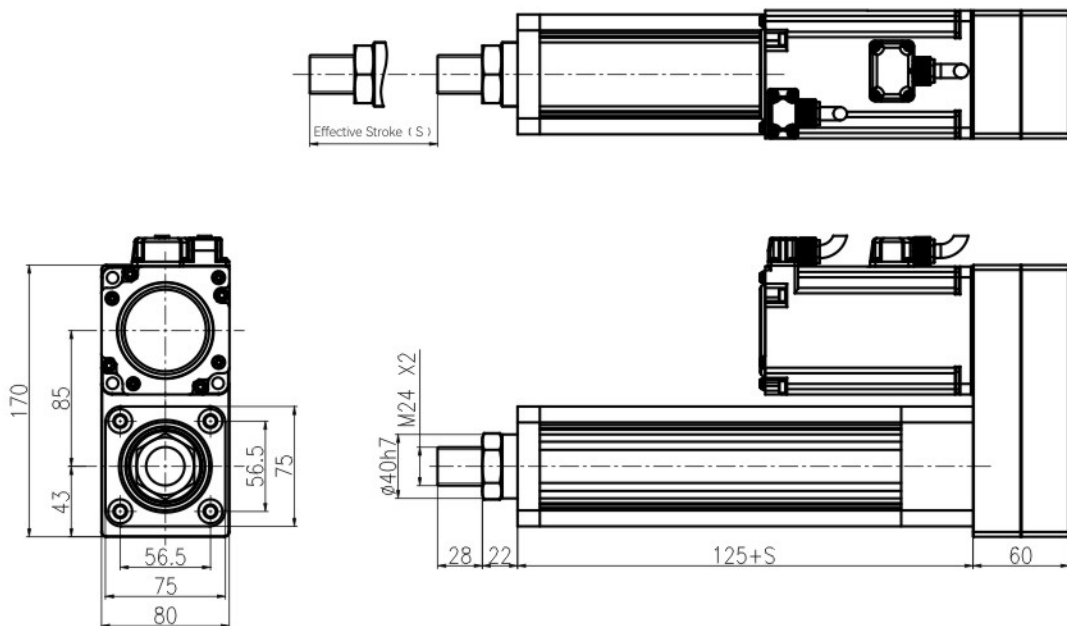


## KGV-C-B80 Servo Electric Cylinder Figuration

### Direct Coupling Type



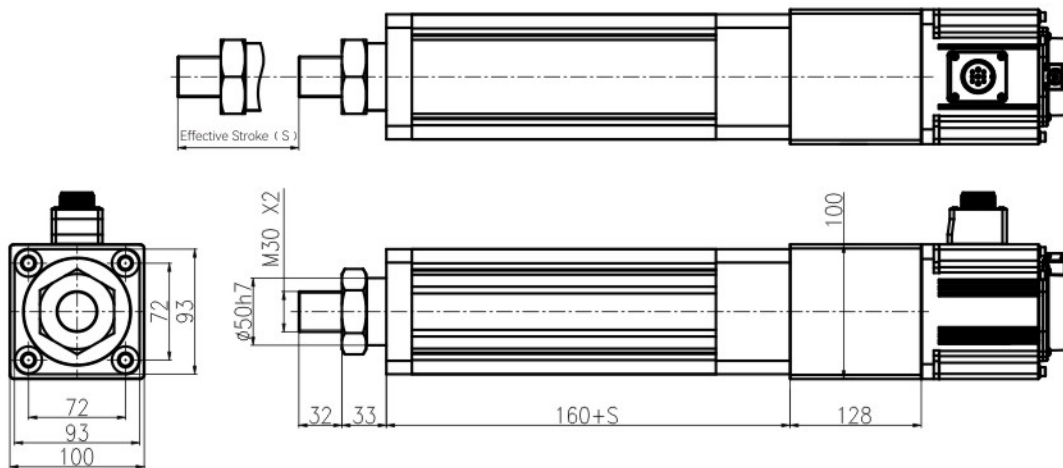
### Return Type



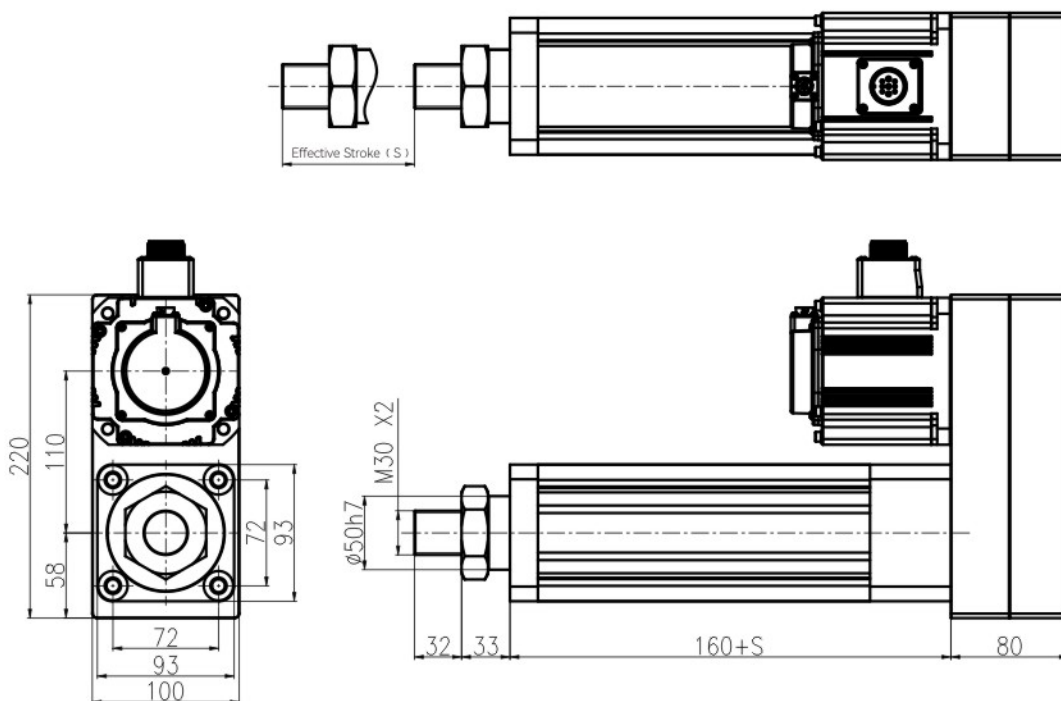


## KGV-C-B100 Servo Electric Cylinder Figuration

### Direct Coupling Type

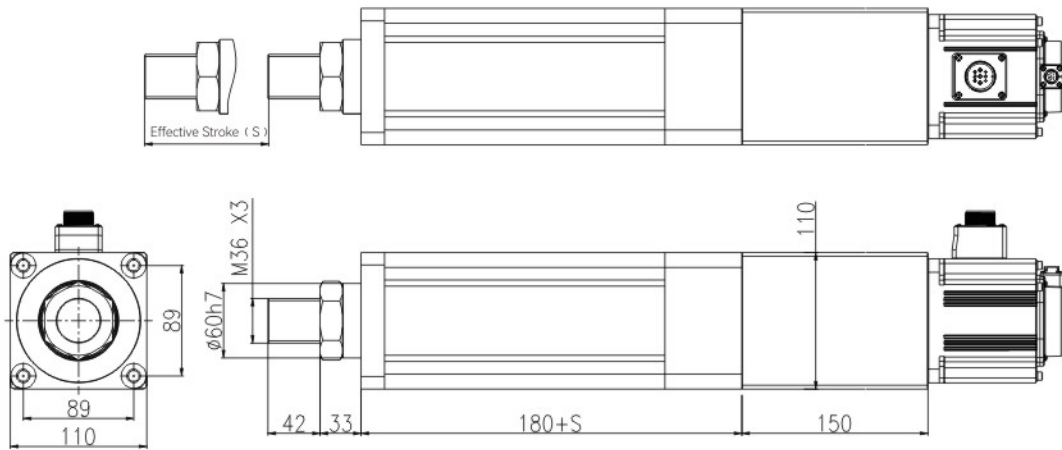


### Return Type

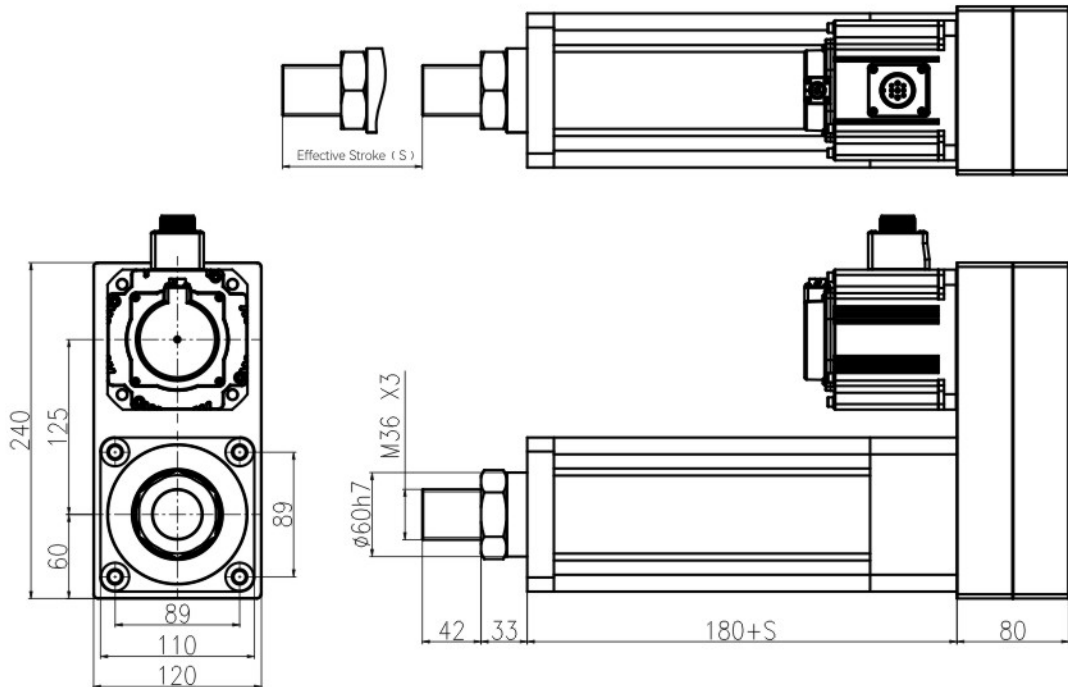


## KGV-C-B120 Servo Electric Cylinder Figuration

### Direct Coupling Type



### Return Type



Technical Memo

