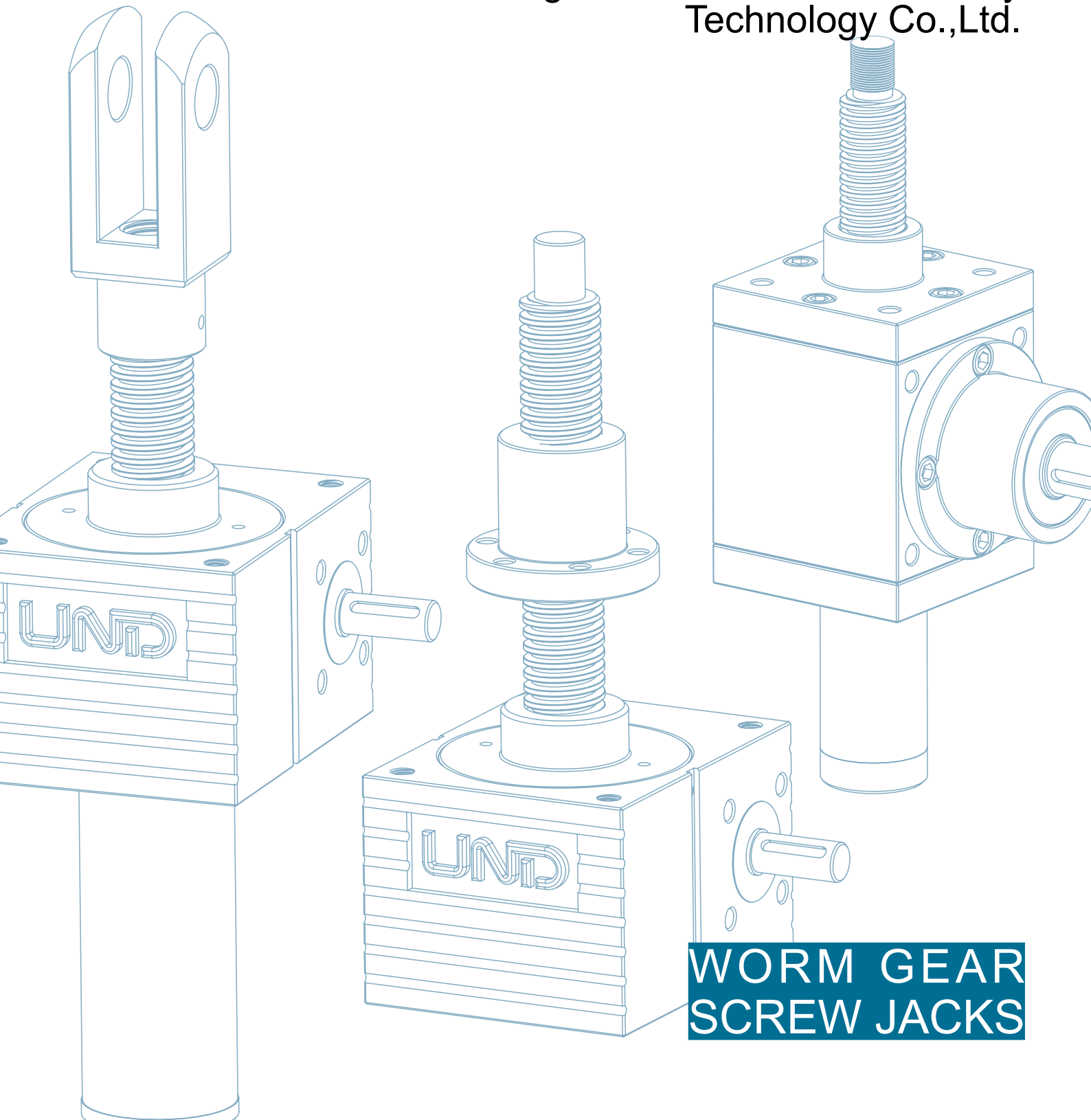# UNiD

NanJing UNID Precision Machinery Technology Co.,Ltd.

WORM GEAR
SCREW JACKS

Nanjing UNID precision machinery technology Co.,Ltd.,is a specialized company that produces worm gear screw jacks, gearboxes, linear motion units, precision CNC worktables，precision ball screws, T-screws and other transmission parts. The company is located in Nanjing Yuhua Economic Development Zone, No. 8 Longzang Avenue, UNID International Industrial Park, near the Nanjing Yangtze River Third Bridge and the city highway, the transportation is very convenient.

UNID Precision is the only authorized agent of NEFF Gmbh in China. Mr. Karl NEFF and his technical team have been working for the company for a long time for technical guidance and technical support.

Mr. Karl Neffis a senior expert in Germany who studies transmission components such as ball screws, screw jacks, and linear motion units,NEFF brand screw jacks are also the most influential brand screw jacks in Europe.The company has introduced first-class German brands while also introducing first-class German technology and modern management.Our products are produced using German production process, management system and manufacturing standards, and have now passed the ISO9001:2008 quality system certification.The company is well-equipped, and the main equipments are imported from Germany, Austria, Switzerland and England.

To provide users with system solutions is the purpose of the enterprise's services, "exquisite, effective, innovative" is the core concept of the enterprise. All the staff of the company sincerely look forward to serving you!
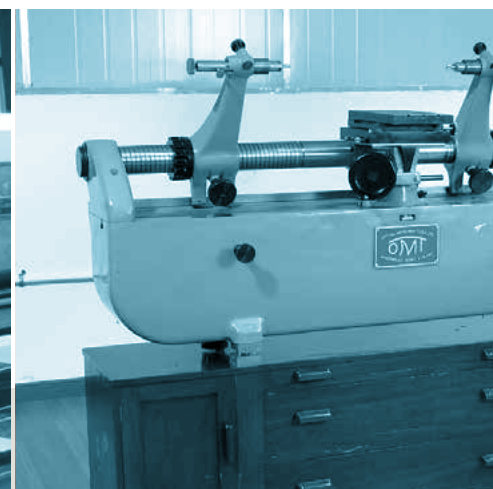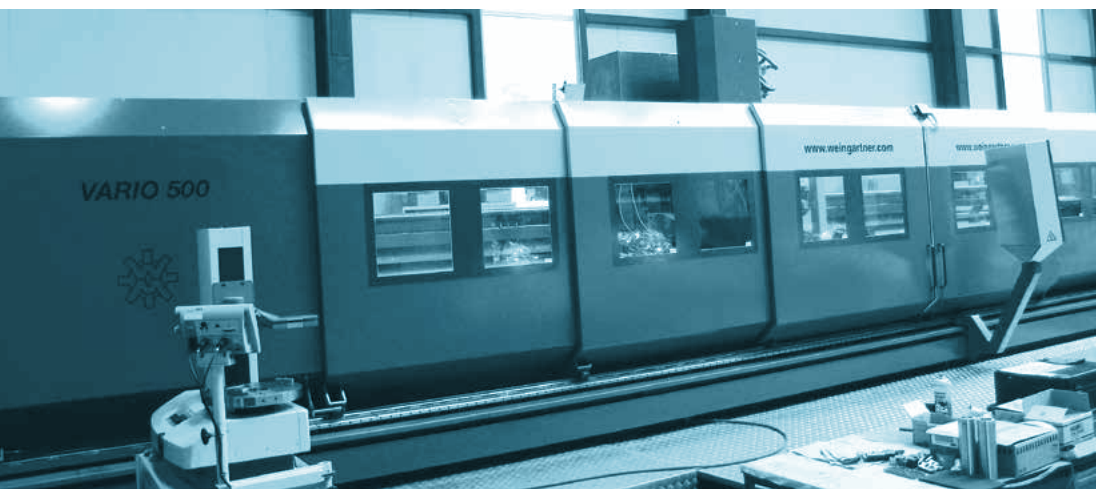
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Austrian 8-meter 5-axis CNC screw hard cyclone milling machine /1

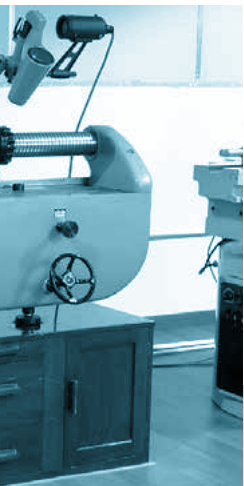Maximum processing diameter of the screw 160 mm, maximum processing length 12 m

British OMT Horizontal Comparator /2

Galvanizing furnace lifting device

UNiD

Contents list

1\ Product description

Worm gear screw jacks are mechatronic motion execution units that skillfully combine motors, reduction systems, and screws. It can be used independently or in combination with multiple units. Similar to building blocks, it can be connected together through components such as right-angle gearboxes, couplings, and transmission shafts. It can accurately control the lifting, reciprocating, flipping motions of the mechanism according to a certain program. Therefore, it can replace traditional hydraulic and pneumatic transmissions in various applications. This type of motion unit centered around the worm screw jacks provides engineers entering the digital age with broad design possibilities for developing products.

Application scope

■ Elevating, shifting, clamping, and flipping actuating devices in production assembly lines.
■ Rolling mill motion device and clamping, lifting, and flipping device in metallurgical equipment.
■ The automotive manufacturing industry includes lifting equipment, flexible fixtures, and welding robots.
■ Elevating devices for monocrystalline silicon and polycrystalline silicon ingot furnaces in the photovoltaic industry, as well as solar power tracking systems.
■ Remote control execution devices for aerospace, defense, military, and astronomical telescopes.
■ The lifting device of elevating and lowering stage.
■ Various executive mechanisms for industries such as shipbuilding, water conservancy, papermaking, food and warehousing, and casting, as well as medical equipment, woodworking machinery, and food machinery.
■ The lifting devices on vertical lathes and gantry machines.

Advantages

■ The unique external structure of the square screw jacks for precision machining features precise positioning on all six sides and can be freely assembled and combined. This square external structure has obtained our company's "design patent".
■ Good rigidity, precise positioning capability, and generally able to self-lock even after power failure.
■ The system architecture is simple and compact, eliminating the need for various complex pumps, valves, oil tanks, gas sources, and piping systems.
■ Being noiseless, free from fluid leakage, and causing minimal environmental pollution, it is considered an ideal green and environmentally friendly product.
■ Due to the presence of a reduction mechanism, the system is able to achieve a "small horse pulling a large cart" effect, where a smaller motor can transmit a significant amount of torque.
■ It can form a closed-loop servo control system to achieve automation control.

2\Application examples

Screw jacks in large sheet metal production line applications: Lifting 54 tons Select 4 x CS250 Jacks + 2 x bevel gearboxes with Tr8010 screws

Application of screw jacks on large-scale water conservancy test benches: 50 meter long variable slope water tank, using screw jacks to achieve precise slope adjustment.

Screw Jacks application in large glass production line.

Vertical lifting box-Typical application of screw jacks on machine tools: Equipped with TR8010 screw, capable of lifting 250KN weight, used in pairs with strict synchronization requirements.

Application of screw jacks in metallurgical equipment

Screw jacks are utilized in solar power tracking systems for both altitude and azimuth tracking.

Example of combined application of screw jacks and reducer - Military equipment application
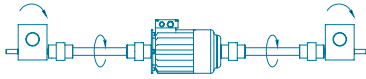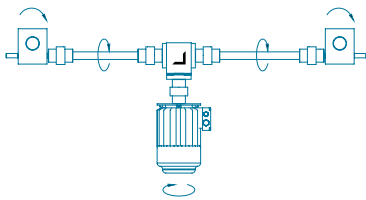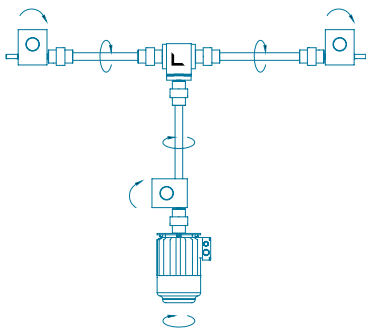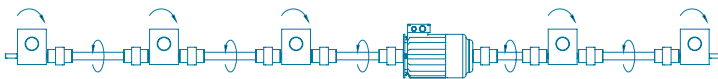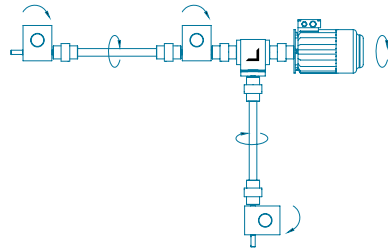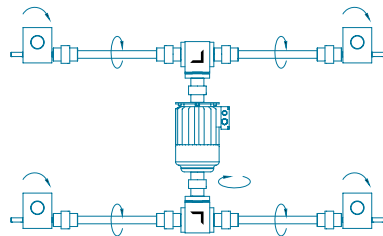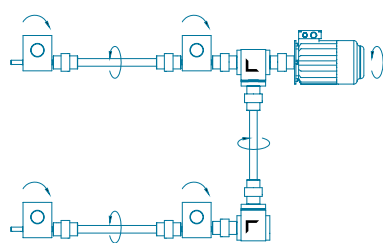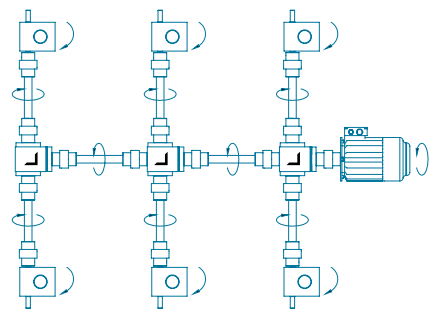
UNID Precision Machinery Technology Co.,Ltd.

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Type A - Screw axial motion type

Type B - Nut Axial Motion: The screw rotates and is fixed axially, while the nut moves in an axial motion.

U-type - upward movement of the screw assembly

D-type - downward movement of the screw assembly

U type - Nut up assembly

D type - Nut down assembly

1\Motion Characteristics and Assembly Methods

Explanation: In A-type transmission, the nut rotates and the screw only moves axially without rotating, the stopping of the screw is limited by an external load; if the external load cannot reliably limit the rotation of the screw, it is necessary to use an anti-rotation device with a P-type.

2\Body specifications CS series (square type)Screw Jacks lifting force for 2.5KN ~ 500KN, a total of 9 specifications.

(Non-standard specifications can be designed according to user requirements)
The general shell of square lift 2.5KN-25KN is aluminum alloy box, 50KN-500KN is ductile iron box;

3\Lifting speed screw jacks can be divided into normal speed ratio N and slow speed ratio L according to the number of teeth of the worm wheel and worm gear.

For CS-Series jacks, N-type worm screw jacks equipped with standard trapezoidal screws have a travel distance of 1mm per turn of the worm shaft. Hence, a travel speed of 1500mm/min can be attained at an input shaft speed of 1500 rpm. The speed range of a ball screw mounted worm gear screw jacks depends on the screw's size and lead.
For L-type worm screw jacks that come with standard trapezoidal screws, the screw travels 0.25mm every turn of the worm shaft. This yields linear speeds of up to 375 mm/min when the input shaft speed is 1500 rpm. The speed range of worm screw jacks mounted on ball screws depends on the size and lead of the screw. greater speeds can be attained by using larger lead screws or multiple screws.

4\Screw Joint Type

The screw head of Type A comprises five types: Type 1 (cylinder), Type 2 (flange), Type 3 (thread), Type 4 (flat head), and Type 5 (opening) (refer to Table CS8-1).
The screw head of Type B is categorized into two types: Type 1 (cylinder) and Type 2 (thread).

5\Additional requirements (Optional accessories)

There are three types of additional requirements for the A-type structure: with anti-rotation device (P)\with shield (S)\ballscrew type (B): There are two types of additional requirements for the B-type: with shield (S)\ballscrew type.

6\Representation of square screw jacks

Example CS10 - L – A – U – 3 – 500 – PSB

Additional designator (Mark when needed)

Screw stroke (mm)

Screw joint type designation ("3" for threaded type)

Assembly method designation ("U for screw up mounting")

Structural form designation ("A" for axial movement of the screw)

Transmission ratio code ("L" for slow speed ratio, and "N" for ordinary speed ratio is not marked)

Body specifications ("CS" is the screw jacks series code: "10" is the load capacity of 10 KN)

Note: Without the "B" at the end, the default is to use Tr screws (trapezoidal screws).

Model CS	Unit	CS2.5	CS5	CS10	CS25	CS50	CS100	CS150	CS250	CS350	CS500
Max. lifting capacity dynamic/static	kN	2.5	5	10	25	50	100	150	250	350	500
Max. tensile load dynamic/static	kN	2.5	5	10	25	50	100	150	250	350	500
Screw Tr①		14×4	18×4	20×4	30×6	40×7	55×9	60×9	80×10	100×10	120×14
Ratio N		4:1	4:1	4:1	6:1	7:1	9:1	9:1	10:1	10:1	14:1
Lift per revolution for ratio N	mm/r	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ratio L		16:1	16:1	16:1	24:1	28:1	36:1	36:1	40:1	40:1	56:1
Lift per revolution for ratio L	mm/r	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Max. drive capacity② at T = 20℃ Duty cycle (ED) 20 %/h	kW	0.18	0.3	0.5	1.2	2.3	5.1	5.1	10	15	22
Max. drive capacity②at T=20℃ Duty cycle (ED) 10 %/h	kW	0.25	0.42	0.7	1.7	3.2	7.1	7.1	14	21	30
Overall efficiency for ratio N	%	34	30	28	27	25	20	19	19	15	15
Overall efficiency for ratio L	%	24	23	21	19	18	15	14	14	11	11
Screw efficiency rating	%	49	42.5	40	40	36.5	35	32.5	29	24	28
Torque, capacity, turning–speed at 20 % ED/h and 20℃		see performance tables "Table 7–2".									
Screw torque at max. lifting power	Nm	3.2	7.5	16	60	153	406	437	1390	2312	4100
Max. permitted drive–shaft torque	Nm	1.5	3.4	7.1	18	38	93	93	240	340	570
Max. permitted screw length for compression load	mm	see buckling diagrams page "Table 7–3".									
Housing material		AL-Leg				GG			GGG		
Weight without stroke length and protection tube	kg	0.6	1.2	2.1	6	17	32	32	57	85	160
Screw weight per 100 mm stroke	kg	0.1	0.35	0.45	0.7	1.2	1.6	2	4.2	6.6	10.3
Amount of lubricant in worm gear	kg	0.03	0.08	0.14	0.24	0.8	1.1	1.1	2.0	2.7	3.2
Mass moment of inertia J③ Ratio N type A	kgcm²	0.070	0.122	0.160	0.780	1.917	3.412	3.412	16.04	49.12	96.27
Mass moment of inertia J③ Ratio N type B	kgcm²	0.069	0.126	0.165	0.794	1.952	3.741	3.741	17.58	52.45	103.39
Mass moment of inertia J③ Ratio L type A	kgcm²	0.045	0.088	0.115	0.558	1.371	2.628	2.628	12.35	37.05	72.62
Mass moment of inertia J③ Ratio L type B	kgcm²	0.050	0.091	0.119	0.552	1.381	2.647	2.647	12.44	37.37	73.15
No–load torque for ratio N	Nm	0.06	0.10	0.26	0.36	0.76	1.9	1.90	2.64	3.24	3.96
No–load torque for ratio L	Nm	0.04	0.08	0.16	0.26	0.54	1.2	1.20	1.94	2.20	2.84

① Also applies to ball screw, refer to Table 7-5 of the Ball Screw specifications;
② Max. permitted values for type A and Tr screw. Higher values are possible when using type B or ball screw.
③ Referring to 100 mm screw length.

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Table CS7-2\ Lifting force and lifting speed table

CS2.5 Trapezoidal screw14 × 4

Speed rpm	Increase speed N	L	F=2.5(KN) N Nm	KW	L Nm	KW	F=2(KN) N Nm	KW	L Nm	KW	F=1.5(KN) N Nm	KW	L Nm	KW	F=1(KN) N Nm	KW	L Nm	KW	F=0.75(KN) N Nm	KW	L Nm	KW	F=0.5(KN) N Nm	KW	L Nm	KW	F=0.25(KN) N Nm	KW	L Nm	KW
1500	1.50	0.375	1.2	0.18	0.4	0.1	0.9	0.15	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	1.00	0.250	1.2	0.12	0.4	0.1	0.9	0.10	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
750	0.75	0.188	1.2	0.10	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
600	0.6	0.150	1.2	0.1	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.5	0.125	1.2	0.1	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
300	0.3	0.075	1.2	0.1	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
100	0.1	0.025	1.2	0.1	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
50	0.05	0.013	1.2	0.1	0.4	0.1	0.9	0.1	0.3	0.1	0.7	0.1	0.2	0.1	0.5	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1

CS5 Trapezoidal screw18 × 4

Speed rpm	Increase speed N	L	F=5(KN) N Nm	KW	L Nm	KW	F=4(KN) N Nm	KW	L Nm	KW	F=3(KN) N Nm	KW	L Nm	KW	F=2.5(KN) N Nm	KW	L Nm	KW	F=2(KN) N Nm	KW	L Nm	KW	F=1.5(KN) N Nm	KW	L Nm	KW	F=1(KN) N Nm	KW	L Nm	KW
1500	1.50	0.375	2.7	0.42	0.9	0.1	2.1	0.33	0.7	0.1	1.6	0.25	0.5	0.1	1.3	0.21	0.4	0.1	1.1	0.2	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
1000	1.00	0.250	2.7	0.28	0.9	0.1	2.1	0.22	0.7	0.1	1.6	0.17	0.5	0.1	1.3	0.14	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
750	0.75	0.188	2.7	0.21	0.9	0.1	2.1	0.17	0.7	0.1	1.6	0.13	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
600	0.6	0.150	2.7	0.17	0.9	0.1	2.1	0.13	0.7	0.1	1.6	0.1	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
500	0.5	0.125	2.7	0.14	0.9	0.1	2.1	0.1	0.7	0.1	1.6	0.1	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
300	0.3	0.075	2.7	0.1	0.9	0.1	2.1	0.1	0.7	0.1	1.6	0.1	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
100	0.1	0.025	2.7	0.1	0.9	0.1	2.1	0.1	0.7	0.1	1.6	0.1	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1
50	0.05	0.013	2.7	0.1	0.9	0.1	2.1	0.1	0.7	0.1	1.6	0.1	0.5	0.1	1.3	0.1	0.4	0.1	1.1	0.1	0.3	0.1	0.8	0.1	0.3	0.1	0.5	0.1	0.2	0.1

CS10 Trapezoidal screw20 × 4

Speed rpm	Increase speed N	L	F=10(KN) N Nm	KW	L Nm	KW	F=8(KN) N Nm	KW	L Nm	KW	F=6(KN) N Nm	KW	L Nm	KW	F=4(KN) N Nm	KW	L Nm	KW	F=3(KN) N Nm	KW	L Nm	KW	F=2(KN) N Nm	KW	L Nm	KW	F=1(KN) N Nm	KW	L Nm	KW
1500	1.50	0.375	5.7	0.89	1.9	0.30	4.5	0.71	1.5	0.24	3.4	0.54	1.1	0.18	2.3	0.36	0.8	0.1	1.7	0.27	0.6	0.1	1.1	0.2	0.4	0.1	0.6	0.1	0.2	0.1
1000	1.00	0.250	5.7	0.60	1.9	0.20	4.5	0.48	1.5	0.16	3.4	0.36	1.1	0.12	2.3	0.24	0.8	0.1	1.7	0.18	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
750	0.75	0.188	5.7	0.45	1.9	0.15	4.5	0.36	1.5	0.12	3.4	0.27	1.1	0.1	2.3	0.18	0.8	0.1	1.7	0.13	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
600	0.6	0.150	5.7	0.36	1.9	0.12	4.5	0.29	1.5	0.1	3.4	0.21	1.1	0.1	2.3	0.14	0.8	0.1	1.7	0.1	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
500	0.5	0.125	5.7	0.30	1.9	0.1	4.5	0.24	1.5	0.1	3.4	0.18	1.1	0.1	2.3	0.12	0.8	0.1	1.7	0.1	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
300	0.3	0.075	5.7	0.18	1.9	0.1	4.5	0.14	1.5	0.1	3.4	0.11	1.1	0.1	2.3	0.1	0.8	0.1	1.7	0.1	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
100	0.1	0.025	5.7	0.1	1.9	0.1	4.5	0.1	1.5	0.1	3.4	0.1	1.1	0.1	2.3	0.1	0.8	0.1	1.7	0.1	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1
50	0.05	0.013	5.7	0.1	1.9	0.1	4.5	0.1	1.5	0.1	3.4	0.1	1.1	0.1	2.3	0.1	0.8	0.1	1.7	0.1	0.6	0.1	1.1	0.1	0.4	0.1	0.6	0.1	0.2	0.1

CS25 Trapezoidal screw30 × 6

Speed rpm	Increase speed N	Increase speed L	F=25 N Nm	F=25 N KW	F=25 L Nm	F=25 L KW	F=20 N Nm	F=20 N KW	F=20 L Nm	F=20 L KW	F=15 N Nm	F=15 N KW	F=15 L Nm	F=15 L KW	F=10 N Nm	F=10 N KW	F=10 L Nm	F=10 L KW	F=5 N Nm	F=5 N KW	F=5 L Nm	F=5 L KW	F=2.5 N Nm	F=2.5 N KW	F=2.5 L Nm	F=2.5 L KW	F=1 N Nm	F=1 N KW	F=1 L Nm	F=1 L KW
1500	1.50	0.375	14.7	2.31	5.2	0.82	11.8	1.85	4.2	0.66	8.8	1.39	3.1	0.49	5.9	0.93	2.1	0.33	2.9	0.46	1.0	0.2	1.5	0.2	0.5	0.1	0.6	0.1	0.2	0.1
1000	1.00	0.250	14.7	1.54	5.2	0.55	11.8	1.23	4.2	0.44	8.8	0.93	3.1	0.33	5.9	0.62	2.1	0.22	2.9	0.31	1.0	0.1	1.5	0.2	0.5	0.1	0.6	0.1	0.2	0.1
750	0.75	0.188	14.7	1.16	5.2	0.41	11.8	0.93	4.2	0.33	8.8	0.69	3.1	0.25	5.9	0.46	2.1	0.16	2.9	0.23	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1
600	0.6	0.150	14.7	0.93	5.2	0.33	11.8	0.74	4.2	0.26	8.8	0.56	3.1	0.20	5.9	0.37	2.1	0.13	2.9	0.19	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1
500	0.5	0.125	14.7	0.77	5.2	0.27	11.8	0.62	4.2	0.22	8.8	0.46	3.1	0.16	5.9	0.31	2.1	0.11	2.9	0.15	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1
300	0.3	0.075	14.7	0.46	5.2	0.16	11.8	0.37	4.2	0.13	8.8	0.28	3.1	0.1	5.9	0.19	2.1	0.1	2.9	0.1	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1
100	0.1	0.025	14.7	0.15	5.2	0.1	11.8	0.12	4.2	0.1	8.8	0.1	3.1	0.1	5.9	0.1	2.1	0.1	2.9	0.1	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1
50	0.05	0.013	14.7	0.1	5.2	0.1	11.8	0.1	4.2	0.1	8.8	0.1	3.1	0.1	5.9	0.1	2.1	0.1	2.9	0.1	1.0	0.1	1.5	0.1	0.5	0.1	0.6	0.1	0.2	0.1

CS50 Trapezoidal screw40 × 7

Speed rpm	Increase speed N	Increase speed L	F=50 N Nm	F=50 N KW	F=50 L Nm	F=50 L KW	F=40 N Nm	F=40 N KW	F=40 L Nm	F=40 L KW	F=30 N Nm	F=30 N KW	F=30 L Nm	F=30 L KW	F=20 N Nm	F=20 N KW	F=20 L Nm	F=20 L KW	F=10 N Nm	F=10 N KW	F=10 L Nm	F=10 L KW	F=5 N Nm	F=5 N KW	F=5 L Nm	F=5 L KW	F=2.5 N Nm	F=2.5 N KW	F=2.5 L Nm	F=2.5 L KW
1500	1.50	0.375	31.8	5.0	11.1	1.7	25.5	4.0	8.8	1.4	19.1	3.0	6.6	1.0	12.7	2.0	4.4	0.7	6.4	1.0	2.2	0.3	3.2	0.5	1.1	0.2	1.6	0.3	0.6	0.1
1000	1.00	0.250	31.8	3.3	11.1	1.2	25.5	2.7	8.8	0.9	19.1	2.0	6.6	0.7	12.7	1.3	4.4	0.5	6.4	0.7	2.2	0.2	3.2	0.3	1.1	0.2	1.6	0.2	0.6	0.1
750	0.75	0.188	31.8	2.5	11.1	0.9	25.5	2.0	8.8	0.7	19.1	1.5	6.6	0.5	12.7	1.0	4.4	0.35	6.4	0.5	2.2	0.2	3.2	0.3	1.1	0.2	1.6	0.1	0.6	0.1
600	0.6	0.150	31.8	2.0	11.1	0.7	25.5	1.6	8.8	0.6	19.1	1.2	6.6	0.4	12.7	0.8	4.4	0.3	6.4	0.4	2.2	0.1	3.2	0.2	1.1	0.2	1.6	0.1	0.6	0.1
500	0.5	0.125	31.8	1.7	11.1	0.6	25.5	1.3	8.8	0.5	19.1	1.0	6.6	0.3	12.7	0.7	4.4	0.2	6.4	0.3	2.2	0.1	3.2	0.2	1.1	0.2	1.6	0.1	0.6	0.1
300	0.3	0.075	31.8	1.0	11.1	0.3	25.5	0.8	8.8	0.3	19.1	0.6	6.6	0.2	12.7	0.4	4.4	0.1	6.4	0.2	2.2	0.1	3.2	0.1	1.1	0.2	1.6	0.1	0.6	0.1
100	0.1	0.025	31.8	0.3	11.1	0.1	25.5	0.3	8.8	0.1	19.1	0.2	6.6	0.1	12.7	0.1	4.4	0.1	6.4	0.1	2.2	0.1	3.2	0.1	1.1	0.2	1.6	0.1	0.6	0.1
50	0.05	0.013	31.8	0.2	11.1	0.1	25.5	0.1	8.8	0.1	19.1	0.1	6.6	0.1	12.7	0.1	4.4	0.1	6.4	0.1	2.2	0.1	3.2	0.1	1.1	0.2	1.6	0.1	0.6	0.1

CS100 Trapezoidal screw55 × 9

Speed rpm	Increase speed N	Increase speed L	F=100 N Nm	F=100 N KW	F=100 L Nm	F=100 L KW	F=80 N Nm	F=80 N KW	F=80 L Nm	F=80 L KW	F=60 N Nm	F=60 N KW	F=60 L Nm	F=60 L KW	F=40 N Nm	F=40 N KW	F=40 L Nm	F=40 L KW	F=300 N Nm	F=300 N KW	F=300 L Nm	F=300 L KW	F=20 N Nm	F=20 N KW	F=20 L Nm	F=20 L KW	F=10KN N Nm	F=10KN N KW	F=10KN L Nm	F=10KN L KW
1500	1.5	0.375	81.5	12.8	27.7	4.4	65.6	7.8	22.4	3.5	49.6	7.8	17.1	2.7	33.7	5.3	11.8	1.9	25.8	4.0	9.2	1.4	17.8	2.8	6.5	1.0	9.9	1.5	3.9	0.6
1000	1	0.25	81.5	8.5	27.7	2.9	65.6	6.9	22.4	2.3	49.6	5.2	17.1	1.8	33.7	3.5	11.8	1.2	25.8	2.7	9.2	1.0	17.8	1.9	6.5	0.7	9.9	1.0	3.9	0.4
750	0.75	0.188	81.5	6.4	27.7	2.2	65.6	5.1	22.4	1.8	49.6	3.9	17.1	1.3	33.7	2.6	11.8	0.9	25.8	2.0	9.2	0.7	17.8	1.4	6.5	0.5	9.9	0.8	3.9	0.3
600	0.6	0.15	81.5	5.1	27.7	1.7	65.6	4.1	22.4	1.4	49.6	3.1	17.1	1.1	33.7	2.1	11.8	0.7	25.8	1.6	9.2	0.6	17.8	1.1	6.5	0.4	9.9	0.6	3.9	0.2
500	0.5	0.125	81.5	4.3	27.7	1.5	65.6	3.4	22.4	1.2	49.6	2.6	17.1	0.9	33.7	1.8	11.8	0.6	25.8	1.3	9.2	0.5	17.8	0.9	6.5	0.3	9.9	0.5	3.9	0.2
300	0.3	0.075	81.5	2.6	27.7	0.9	65.6	2.1	22.4	0.7	49.6	1.6	17.1	0.5	33.7	1.1	11.8	0.4	25.8	0.8	9.2	0.3	17.8	0.6	6.5	0.2	9.9	0.3	3.9	0.1
100	0.1	0.025	81.5	0.9	27.7	0.3	65.6	0.7	22.4	0.2	49.6	0.5	17.1	0.2	33.7	0.4	11.8	0.1	25.8	0.3	9.2	0.1	17.8	0.2	6.5	0.1	9.9	0.1	3.9	0.0
50	0.05	0.013	81.5	0.4	27.7	0.1	65.6	0.3	22.4	0.1	49.6	0.3	17.1	0.1	33.7	0.2	11.8	0.1	25.8	0.1	9.2	0.0	17.8	0.1	6.5	0.0	9.9	0.1	3.9	0.0

Load ratio 20%/hr or 30%/10min and ambient temperature 20°C

For static loads only (dynamic use not allowed)

Load ratio 10%/hr and ambient temperature 20°C

Table CS7-2\ Lifting force and lifting speed table

CS150 Trapezoidal screw60×9

Speed rpm	Inc. N	Inc. L	F=150 N Nm	F=150 N KW	F=150 L Nm	F=150 L KW	F=100 N Nm	F=100 N KW	F=100 L Nm	F=100 L KW	F=80 N Nm	F=80 N KW	F=80 L Nm	F=80 L KW	F=60 N Nm	F=60 N KW	F=60 L Nm	F=60 L KW	F=40 N Nm	F=40 N KW	F=40 L Nm	F=40 L KW	F=20 N Nm	F=20 N KW	F=20 L Nm	F=20 L KW	F=10 N Nm	F=10 N KW	F=10 L Nm	F=10 L KW
1500	1.50	0.375	125.7	19.7	42.6	6.7	83.8	13.2	28.4	4.5	67.0	10.5	22.7	3.6	50.3	7.9	17.1	2.7	33.5	5.3	11.4	1.8	16.8	2.6	5.7	0.9	8.4	1.3	2.8	0.4
1000	1.00	0.250	125.7	13.2	42.6	4.5	83.8	8.8	28.4	3.0	67.0	7.0	22.7	2.4	50.3	5.3	17.1	1.8	33.5	3.5	11.4	1.2	16.8	1.8	5.7	0.6	8.4	0.9	2.8	0.3
750	0.75	0.188	125.7	9.9	42.6	3.3	83.8	6.6	28.4	2.2	67.0	5.3	22.7	1.8	50.3	3.9	17.1	1.3	33.5	2.6	11.4	0.9	16.8	1.3	5.7	0.4	8.4	0.7	2.8	0.2
600	0.6	0.150	125.7	7.9	42.6	2.7	83.8	5.3	28.4	1.8	67.0	4.2	22.7	1.4	50.3	3.2	17.1	1.1	33.5	2.1	11.4	0.7	16.8	1.1	5.7	0.4	8.4	0.5	2.8	0.2
500	0.5	0.125	125.7	6.6	42.6	2.2	83.8	4.4	28.4	1.5	67.0	3.5	22.7	1.2	50.3	2.6	17.1	0.9	33.5	1.8	11.4	0.6	16.8	0.9	5.7	0.3	8.4	0.4	2.8	0.1
300	0.3	0.075	125.7	3.9	42.6	1.3	83.8	2.6	28.4	0.9	67.0	2.1	22.7	0.7	50.3	1.6	17.1	0.5	33.5	1.1	11.4	0.4	16.8	0.5	5.7	0.2	8.4	0.3	2.8	0.1
100	0.1	0.025	125.7	1.3	42.6	0.4	83.8	0.9	28.4	0.3	67.0	0.7	22.7	0.2	50.3	0.5	17.1	0.2	33.5	0.4	11.4	0.1	16.8	0.2	5.7	0.1	8.4	0.1	2.8	0.1
50	0.05	0.013	125.7	0.7	42.6	0.2	83.8	0.4	28.4	0.1	67.0	0.4	22.7	0.1	50.3	0.3	17.1	0.1	33.5	0.2	11.4	0.1	16.8	0.1	5.7	0.1	8.4	0.1	2.8	0.1

CS250 Trapezoidal screw80×10

Speed rpm	Inc. N	Inc. L	F=250 N Nm	F=250 N KW	F=250 L Nm	F=250 L KW	F=200 N Nm	F=200 N KW	F=200 L Nm	F=200 L KW	F=150 N Nm	F=150 N KW	F=150 L Nm	F=150 L KW	F=100 N Nm	F=100 N KW	F=100 L Nm	F=100 L KW	F=80 N Nm	F=80 N KW	F=80 L Nm	F=80 L KW	F=60 N Nm	F=60 N KW	F=60 L Nm	F=60 L KW	F=40 N Nm	F=40 N KW	F=40 L Nm	F=40 L KW
1500	1.50	0.375	209.4	32.9	71.1	11.2	167.5	26.3	56.8	8.9	125.7	19.7	42.6	6.7	83.8	13.2	28.4	4.5	67.0	10.5	22.7	3.6	50.3	7.9	17.1	2.7	33.5	5.3	11.4	1.8
1000	1.00	0.250	209.4	21.9	71.1	7.4	167.5	17.5	56.8	6.0	125.7	13.2	42.6	4.5	83.8	8.8	28.4	3.0	67.0	7.0	22.7	2.4	50.3	5.3	17.1	1.8	33.5	3.5	11.4	1.2
750	0.75	0.188	209.4	16.4	71.1	5.6	167.5	13.2	56.8	4.5	125.7	9.9	42.6	3.3	83.8	6.6	28.4	2.2	67.0	5.3	22.7	1.8	50.3	3.9	17.1	1.3	33.5	2.6	11.4	0.9
600	0.6	0.150	209.4	13.2	71.1	4.5	167.5	10.5	56.8	3.6	125.7	7.9	42.6	2.7	83.8	5.3	28.4	1.8	67.0	4.2	22.7	1.4	50.3	3.2	17.1	1.1	33.5	2.1	11.4	0.7
500	0.5	0.125	209.4	11.0	71.1	3.7	167.5	8.8	56.8	3.0	125.7	6.6	42.6	2.2	83.8	4.4	28.4	1.5	67.0	3.5	22.7	1.2	50.3	2.6	17.1	0.9	33.5	1.8	11.4	0.6
300	0.3	0.075	209.4	6.6	71.1	2.2	167.5	5.3	56.8	1.8	125.7	3.9	42.6	1.3	83.8	2.6	28.4	0.9	67.0	2.1	22.7	0.7	50.3	1.6	17.1	0.5	33.5	1.1	11.4	0.4
100	0.1	0.025	209.4	2.2	71.1	0.7	167.5	1.8	56.8	0.6	125.7	1.3	42.6	0.4	83.8	0.9	28.4	0.3	67.0	0.7	22.7	0.2	50.3	0.5	17.1	0.2	33.5	0.4	11.4	0.1
50	0.05	0.013	209.4	1.1	71.1	0.4	167.5	0.9	56.8	0.3	125.7	0.7	42.6	0.2	83.8	0.4	28.4	0.1	67.0	0.4	22.7	0.1	50.3	0.3	17.1	0.1	33.5	0.2	11.4	0.1

CS350 Trapezoidal screw100×10

Speed rpm	Inc. N	Inc. L	F=350 N Nm	F=350 N KW	F=350 L Nm	F=350 L KW	F=300 N Nm	F=300 N KW	F=300 L Nm	F=300 L KW	F=250 N Nm	F=250 N KW	F=250 L Nm	F=250 L KW	F=200 N Nm	F=200 N KW	F=200 L Nm	F=200 L KW	F=150 N Nm	F=150 N KW	F=150 L Nm	F=150 L KW	F=100 N Nm	F=100 N KW	F=100 L Nm	F=100 L KW	F=50 N Nm	F=50 N KW	F=50 L Nm	F=50 L KW
1500	1.50	0.375	371.4	58.3	126.6	19.9	318.3	50.0	108.5	17.0	265.3	41.7	90.4	14.2	212.2	33.3	72.3	11.4	159.2	25.0	54.3	8.5	106.1	16.7	36.2	5.7	53.1	8.3	18.1	2.8
1000	1.00	0.250	371.4	38.9	126.6	13.3	318.3	33.3	108.5	11.4	265.3	27.8	90.4	9.5	212.2	22.2	72.3	7.6	159.2	16.7	54.3	5.7	106.1	11.1	36.2	3.8	53.1	5.6	18.1	1.9
750	0.75	0.188	371.4	29.2	126.6	9.9	318.3	25.0	108.5	8.5	265.3	20.8	90.4	7.1	212.2	16.7	72.3	5.7	159.2	12.5	54.3	4.3	106.1	8.3	36.2	2.8	53.1	4.2	18.1	1.4
600	0.6	0.150	371.4	23.3	126.6	8.0	318.3	20.0	108.5	6.8	265.3	16.7	90.4	5.7	212.2	13.3	72.3	4.5	159.2	10.0	54.3	3.4	106.1	6.7	36.2	2.3	53.1	3.3	18.1	1.1
500	0.5	0.125	371.4	19.4	126.6	6.6	318.3	16.7	108.5	5.7	265.3	13.9	90.4	4.7	212.2	11.1	72.3	3.8	159.2	8.3	54.3	2.8	106.1	5.6	36.2	1.9	53.1	2.8	18.1	0.9
300	0.3	0.075	371.4	11.7	126.6	4.0	318.3	10.0	108.5	3.4	265.3	8.3	90.4	2.8	212.2	6.7	72.3	2.3	159.2	5.0	54.3	1.7	106.1	3.3	36.2	1.1	53.1	1.7	18.1	0.6
100	0.1	0.025	371.4	3.9	126.6	1.3	318.3	3.3	108.5	1.1	265.3	2.8	90.4	0.9	212.2	2.2	72.3	0.8	159.2	1.7	54.3	0.6	106.1	1.1	36.2	0.4	53.1	0.6	18.1	0.2
50	0.05	0.013	371.4	1.9	126.6	0.7	318.3	1.7	108.5	0.6	265.3	1.4	90.4	0.5	212.2	1.1	72.3	0.4	159.2	0.8	54.3	0.3	106.1	0.6	36.2	0.2	53.1	0.3	18.1	0.1

CS500 Trapezoidal screw120×14

Speed rpm	Inc. N	Inc. L	F=500 N Nm	F=500 N KW	F=500 L Nm	F=500 L KW	F=400 N Nm	F=400 N KW	F=400 L Nm	F=400 L KW	F=300 N Nm	F=300 N KW	F=300 L Nm	F=300 L KW	F=200 N Nm	F=200 N KW	F=200 L Nm	F=200 L KW	F=150 N Nm	F=150 N KW	F=150 L Nm	F=150 L KW	F=100 N Nm	F=100 N KW	F=100 L Nm	F=100 L KW	F=50 N Nm	F=50 N KW	F=50 L Nm	F=50 L KW
1000	1.00	0.250	531	55.6	181	18.9	424	44.4	145	15.2	318	33.3	108	11.4	212	22.2	72	7.6	159	16.7	54	5.7	106	11.1	36	3.8	53	5.6	18	1.9
750	0.75	0.188	531	41.7	181	14.2	424	33.3	145	11.4	318	25.0	108	8.5	212	16.7	72	5.7	159	12.5	54	4.3	106	8.3	36	2.8	53	4.2	18	1.4
600	0.6	0.150	531	33.3	181	11.4	424	26.7	145	9.1	318	20.0	108	6.8	212	13.3	72	4.5	159	10.0	54	3.4	106	6.7	36	2.3	53	3.3	18	1.1
500	0.5	0.125	531	27.8	181	9.5	424	22.2	145	7.6	318	16.7	108	5.7	212	11.1	72	3.8	159	8.3	54	2.8	106	5.6	36	1.9	53	2.8	18	0.9
300	0.3	0.075	531	16.7	181	5.7	424	13.3	145	4.5	318	10.0	108	3.4	212	6.7	72	2.3	159	5.0	54	1.7	106	3.3	36	1.1	53	1.7	18	0.6
100	0.1	0.025	531	5.6	181	1.9	424	4.4	145	1.5	318	3.3	108	1.1	212	2.2	72	0.8	159	1.7	54	0.6	106	1.1	36	0.4	53	0.6	18	0.2
50	0.05	0.013	531	2.8	181	0.9	424	2.2	145	0.8	318	1.7	108	0.6	212	1.1	72	0.4	159	0.8	54	0.3	106	0.6	36	0.2	53	0.3	18	0.1

Load ratio 20%/hr or 30%/10min and ambient temperature 20°C

For static loads only (dynamic use not allowed)

Load ratio 10%/hr and ambient temperature 20°C

When the screw of one of the screw jacks elements is subjected to pressure, the permissible bending force of trapezoidal screw and ball screw can be calibrated with the following bending chart. Fall= Fk×fk/Sk

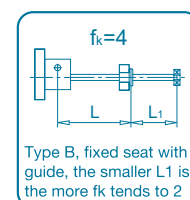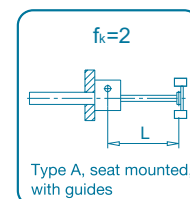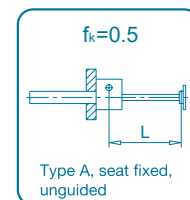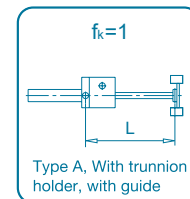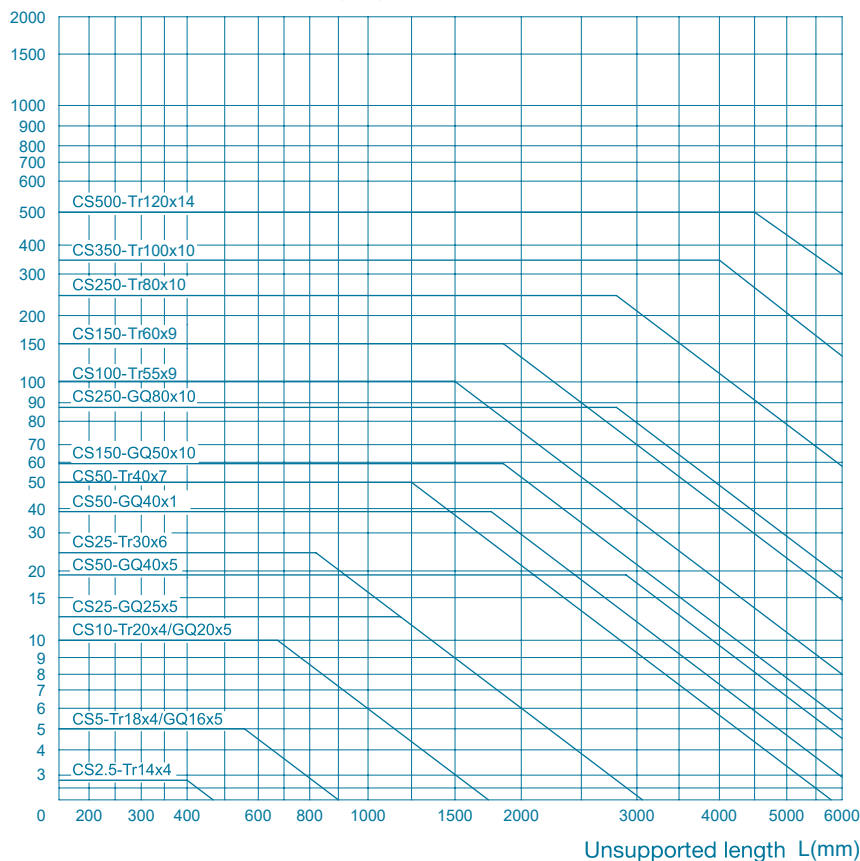Fall: the maximum permissible pressure load acting on the screw, unit KN

Fk: the critical bending force of the screw, according to the unsupported length L, determined according to the following table

fk: correction parameter according to the type of screw bearing and support mode, determined according to the right figure.

Sk: safety coefficient, according to the specific situation, generally between 2-6 options

Critical Bending Force of Screw (KN)

CS500-Tr120x14
CS350-Tr100x10
CS250-Tr80x10
CS150-Tr60x9
CS100-Tr55x9
CS250-GQ80x10
CS150-GQ50x10
CS50-Tr40x7
CS50-GQ40x1
CS25-Tr30x6
CS50-GQ40x5
CS25-GQ25x5
CS10-Tr20x4/GQ20x5
CS5-Tr18x4/GQ16x5
CS2.5-Tr14x4

Unsupported length L(mm)

$f_k=1$
Type A, With trunnion holder, with guide

$f_k=0.5$
Type A, seat fixed, unguided

$f_k=2$
Type A, seat mounted, with guides

$f_k=4$
Type B, fixed seat with guide, the smaller L1 is, the more fk tends to 2

In the above table, Tr is the trapezoidal screw and GQ is the ball screw.

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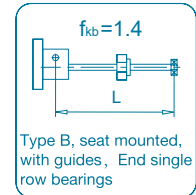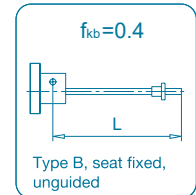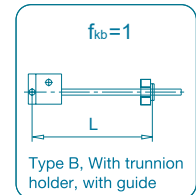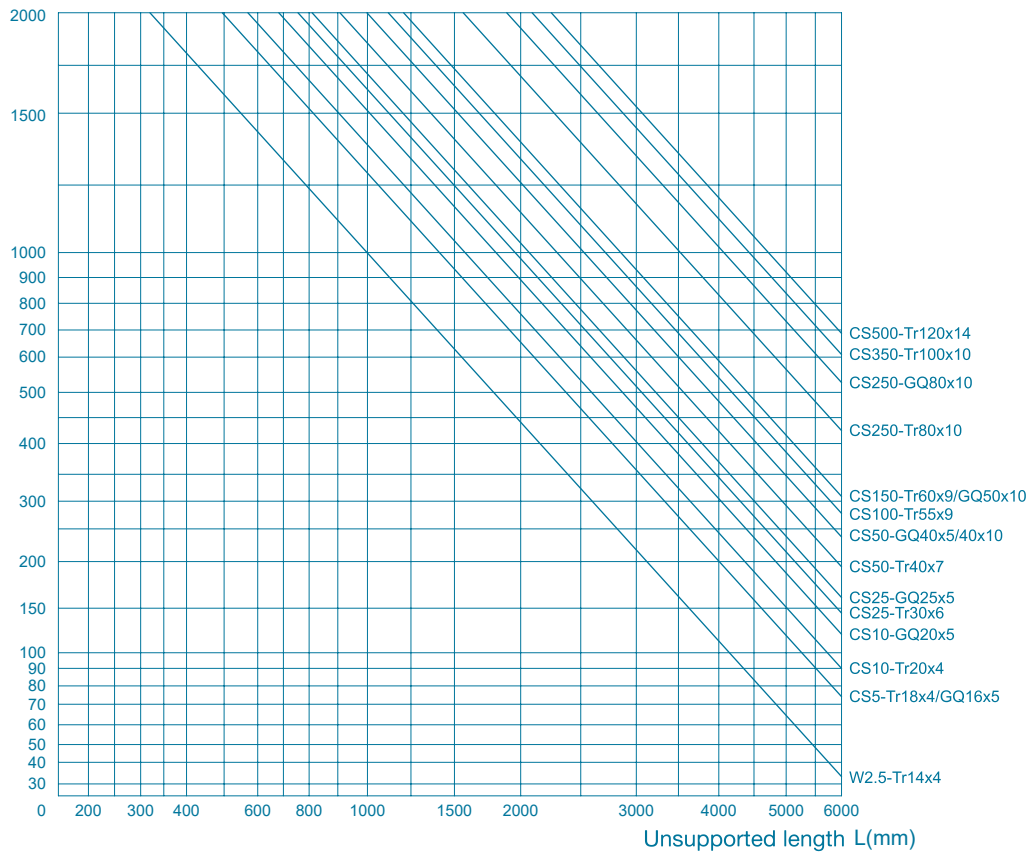## Table CS7-4\Screw speed and Length for B-Type Screw jacks

For the B-type structure of the screw jacks, when the screw is very thin, it is necessary to calculate the maximum permissible speed of the screw, if the required speed is higher than the calculated value, it is necessary to select a larger size of the screw, and check the torque, load and power of the screw jacks.

$n_{all}=0.8×n_{kb}×f_{kb}$ n_{all}: The maximum permissible speed of the screw, unit rpm; n_{kb}: the theoretical critical speed of the screw, determined according to the following table;

f_{kb}: Depending on how the screw is supported and the parameters determined by the resonance source, it is determined according to the following diagram;

Theoretical critical speed of the screw (rpm)

CS500-Tr120x14
CS350-Tr100x10
CS250-GQ80x10
CS250-Tr80x10
CS150-Tr60x9/GQ50x10
CS100-Tr55x9
CS50-GQ40x5/40x10
CS50-Tr40x7
CS25-GQ25x5
CS25-Tr30x6
CS10-GQ20x5
CS10-Tr20x4
CS5-Tr18x4/GQ16x5
W2.5-Tr14x4

Unsupported length L(mm)

$f_{kb}=1$
Type B, With trunnion holder, with guide

$f_{kb}=0.4$
Type B, seat fixed, unguided

$f_{kb}=1.4$
Type B, seat mounted, with guides，End single row bearings

$f_{kb}=2.2$
Type B, fixed seat with guide, End two-way bearing

In the above table, Tr is the trapezoidal screw and GQ is the ball screw.. When calculating, the speed of the screw=input speed/i, where i is the speed ratio of the screw jacks, see Table CS7-1.

Table CS7-5\Ball screw specifications table

The standard dimensions and load capacity of the A-type structure are shown in the table below, while other pitches and load capacities are available upon request. Screws with other pitches and load carrying capacity can be used with the B-type structure. Efficiency of Ball Screws: $\eta = 90\%$

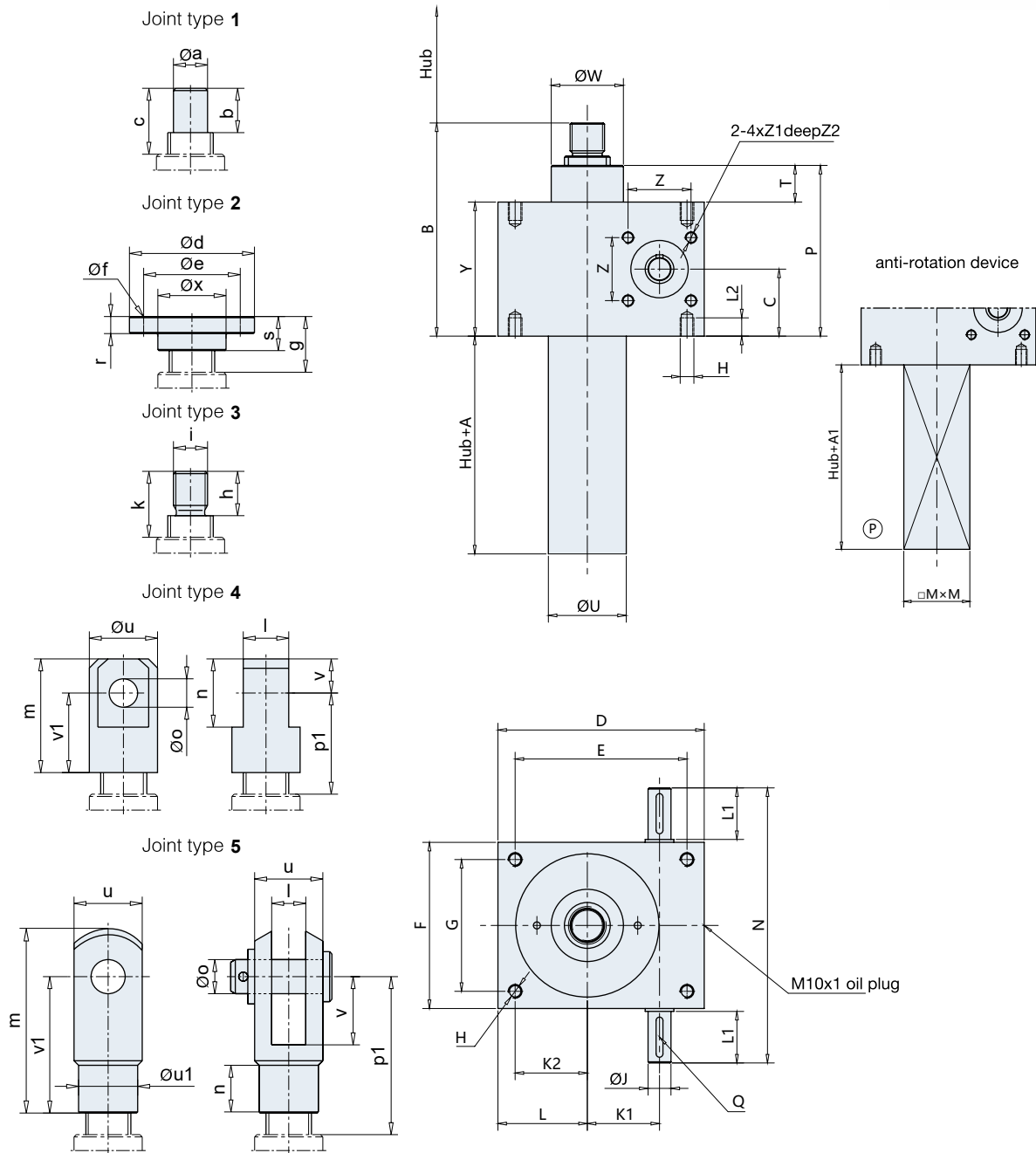| Jacks specification	Ball screw specification	Dynamic load（KN）	Static load（KN）
CS2.5			
CS5	16×5	7	12.7
CS10	20×5	8	17
CS25	25×5	9.5	22.7
CS50	40×5	19	63.5
	40×10	30	70
CS150	50×10	55	153
CS250	80×10	69	260
CS350			
CS500			
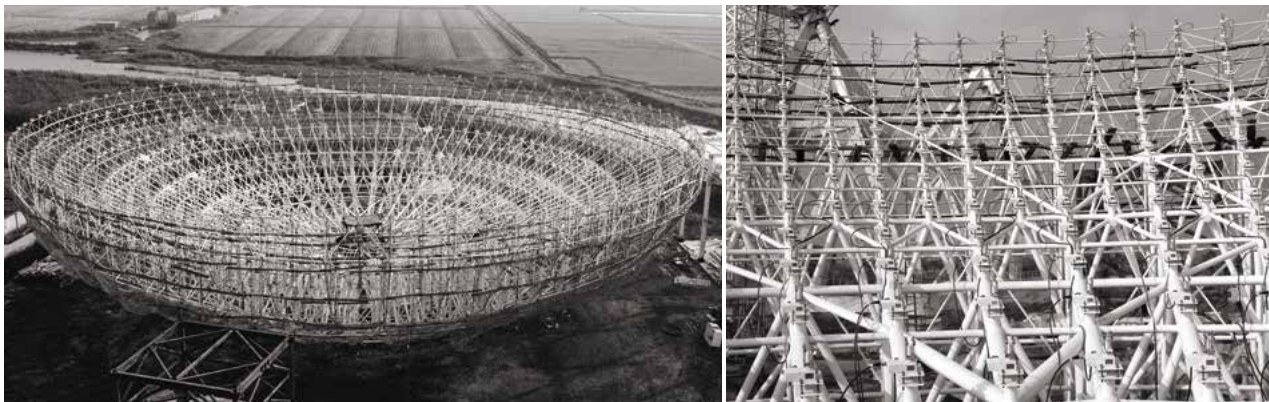
Introduction to the active adjustment system for the main reflecting surface of the 65m radio telescope

The 65-meter radio telescope is Asia's largest full-antenna, rotatable large-scale radio telescope, which is the construction of the Shanghai Astronomical Observatory of the Chinese Academy of Sciences (CAS) and a major cooperation project between CAS and the Shanghai Municipal Government in 2010. Nanjing UNID Precision Machinery Technology Co.,Ltd. and Shanghai Jiao Tong University cooperated to undertake the development of the special actuator (Screw jacks) for the active adjustment system of the main reflecting surface of the 65-meter radio telescope. The main reflecting surface of the antenna consists of 1008 small panels, which are supported and positioned by more than 1000 actuators. The actuator requires high positioning accuracy, only within 15 microns, and can withstand 150kg lateral load, the working life is required to reach more than 20 years.
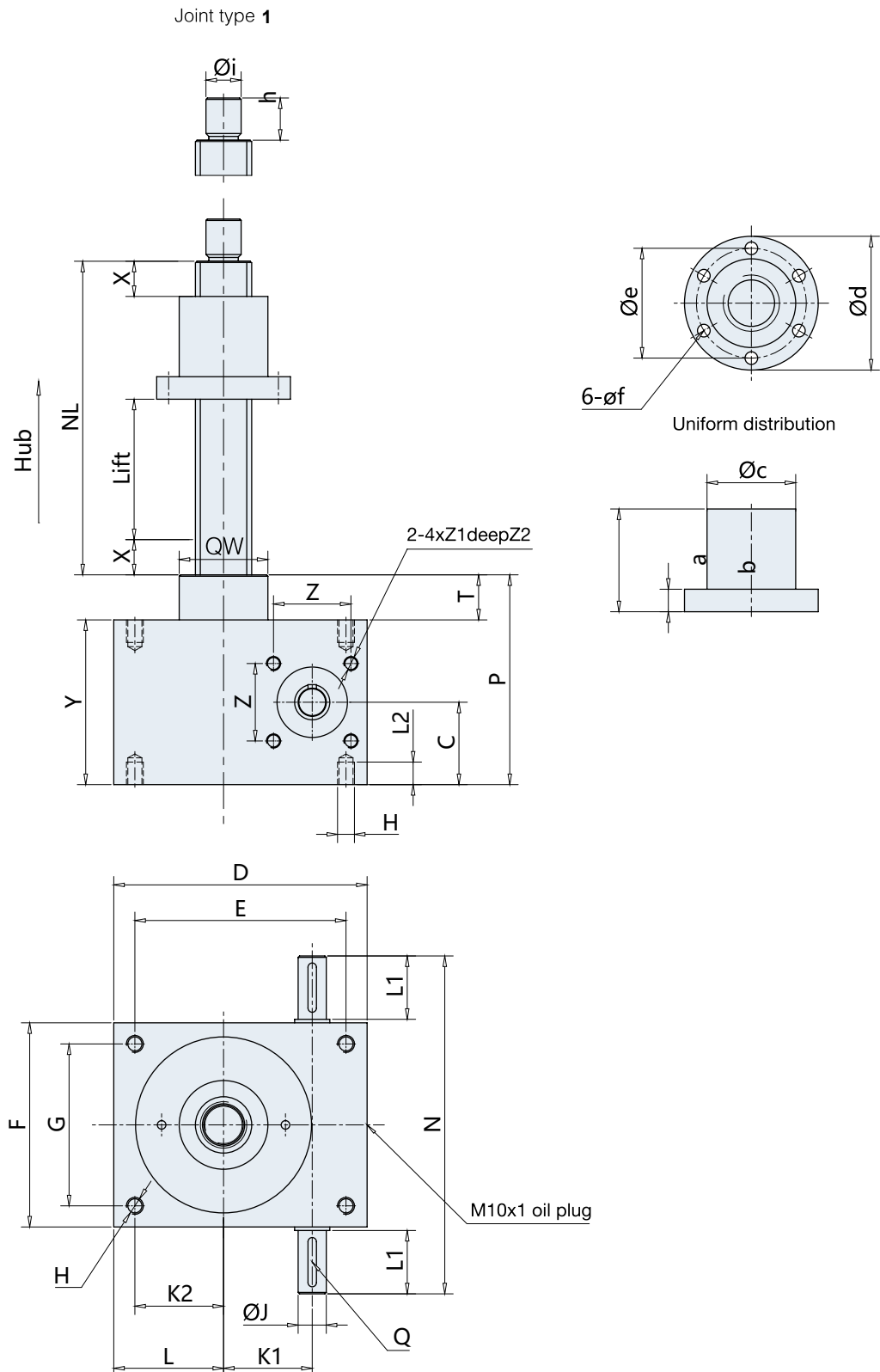
8\Connection dimension table

Table CS8-1 Type A, Standard

Joint type **1**

Joint type **2**

Joint type **3**

Joint type **4**

Joint type **5**

anti-rotation device

2-4xZ1deepZ2

M10x1 oil plug

Model	CS2.5	CS5	CS10	CS25	CS50	CS100	CS150	CS250	CS350	CS500
screw	Tr14×4	Tr18×4	Tr20×4	Tr30×6	Tr40×7	Tr55×9	Tr60×9	Tr80×10	Tr100×10	Tr120×14
A	20	20	30	30	45	55	55	55	65	90
A1	—	35	45	55	70	80	80	100	130	155
B	77	97	118	133.5	184	250	250	270	360	466
C	25	31	37.5	41	58.5	80	80	82.5	110	133
D	60	80	100	130	180	200	200	240	290	360
E	48	60	78	106	150	166	166	190	230	290
F	50	72	85	105	145	165	165	220	250	300
G	38	52	63	81	115	131	131	170	190	230
H	M6	M8	M8	M10	M12	M20	M20	M30	M36	M42
ΦJ(k6)	9	10	14	16	20	25	25	30	35	48
K1	20	25	32	45	63	71	71	80	100	135
K2	16	21	29	42	63	66	66	75	95	117
L	22	31	40	54	78	83	83	100	125	152
L1	20	22.5	25.5	43	45	65	65	65	63	97.5
L2	12	13	15	15	16	30	30	45	54	80
N	92	120	140	195	240	300	300	355	380	500
P	62	74	93	106.5	149	195	195	200	270	326
Q	3×3×14	3×3×18	5×5×20	5×5×36	6×6×36	8×7×56	8×7×56	8×7×56	10×8×56	14×9×90
T	12	12	18	24.5	32	35	35	35	50	60
ΦU	30	37	40	55	68	90	90	125	150	180
ΦW	25	32	35	50	63	85	85	120	140	170
Y	50	62	75	82	117	160	160	165	220	266
Z	24	32.5	35	44	55	70	70	—	—	—
Z1	M6	M8	M8	M8	M10	M10	M10	—	—	—
Z2	6	10	12	12	15	15	15	—	—	—
M	—	35	40	50	70	90	90	120	160	180
Screw joint type 1 (default form)										
Φa(k6)	8	12	15	20	25	40	40	60	80	95
b	12	15	20	25	30	45	45	75	100	120
c	15	20	25	30	35	55	55	90	115	140
Screw joint type 2										
Φd	50	65	80	90	110	150	150	220	260	310
Φe	40	48	60	67	85	117	117	170	205	240
Φf	4×Φ7	4×Φ9	4×Φ11	4×Φ11	4×Φ13	4×Φ17	4×Φ17	4×Φ25	4×Φ32	4×Φ38
g	19	24	28	28	34	57	57	72	92	142
s	16	20	21	23	30	50	50	60	80	120
r	6	7	8	10	15	20	20	30	40	40
Φx	26	30	40	46	60	85	85	120	145	170
Screw joint type 3										
h	12	19	20	22	29	48	48	58	78	118
i	M8	M12	M14	M20	M30	M36	M36	M64×3	M72×3	M100×3
k	15	23	25	27	35	55	55	70	90	140
Screw joint type 4										
l (h10)	12	15	20	30	35	40	40	80	110	120
m	40	55	63	78	100	130	130	155	220	330
n	20	30	36	45	60	66	66	110	170	230
Φo (H8)	10	14	16	24	32	40	40	60	80	90
p1	33	44	52	58	74	104	104	117	147	222
Φu	25	30	40	45	60	85	85	120	160	170
v	10	15	18	25	30	33	33	50	85	130
v1	30	40	45	53	70	97	97	105	135	200
Screw joint type 5										
l (H10)	8	12	14	20	30	36	36	—	—	—
m	42	61	72	105	160	188	188	—	—	—
n	10	15	15	22	40	45	45	—	—	—
Φo (H8)	8	12	14	20	30	35	35	—	—	—
p1	35	52	63.5	85	124	151	151	—	—	—
u	16	24	27	40	60	70	70	—	—	—
Φu1	14	20	24.5	34	52	60	60	—	—	—
v	16	24	28	40	60	72	72	—	—	—
v1	32	48	56	80	120	144	144	—	—	—

Table CS8-2\Type B, Standard

Joint type **1**

Øi

h

X

NL

Hub

Lift

X

QW

Z

Z

Y

T

P

L2

C

H

2-4xZ1deepZ2

Øe

Ød

6-øf

Uniform distribution

Øc

a

b

D

E

L1

F

G

N

H

K2

ØJ

L

K1

Q

L1

M10x1 oil plug

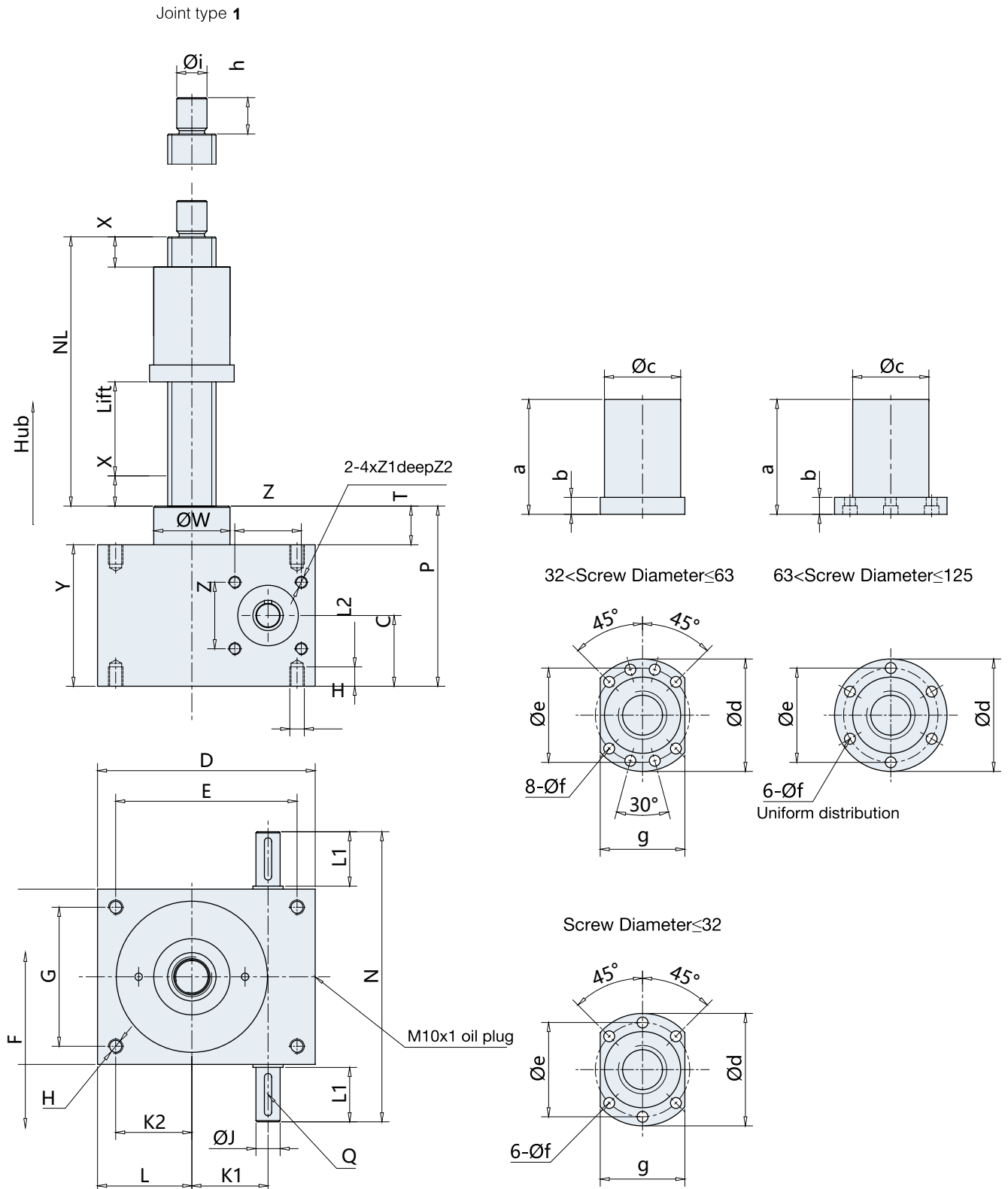| Model	CS2.5	CS5	CS10	CS25	CS50	CS100	CS150	CS250	CS350	CS500
screw	Tr14×4	Tr18×4	Tr20×4	Tr30×6	Tr40×7	Tr55×9	Tr60×9	Tr80×10	Tr100×10	Tr120×14
C	25	31	37.5	41	58.5	80	80	82.5	110	133
D	60	80	100	130	180	200	200	240	290	360
E	48	60	78	106	150	166	166	190	230	290
F	50	72	85	105	145	165	165	220	250	300
G	38	52	63	81	115	131	131	170	190	230
H	M6	M8	M8	M10	M12	M20	M20	M30	M36	M42
ΦJ(k6)	9	10	14	16	20	25	25	30	35	48
K1	20	25	32	45	63	71	71	80	100	135
K2	16	21	29	42	63	66	66	75	95	117
L	22	31	40	54	78	83	83	100	125	152
L1	20	22.5	25.5	43	45	65	65	65	63	97.5
L2	12	13	15	15	16	30	30	45	54	80
N	92	120	140	195	240	300	300	355	380	500
NL	Lift+60	Lift+68	Lift+74	Lift+86	Lift+123	Lift+149	Lift+149	Lift+160	Lift+180	Lift+220
P	62	74	93	106.5	149	195	195	200	270	326
Q	3×3×14	3×3×18	5×5×20	5×5×36	6×6×36	8×7×56	8×7×56	8×7×56	10×8×56	14×9×90
T	12	12	18	24.5	32	35	35	35	50	60
ΦW	25	32	35	50	63	85	85	120	140	170
marginX	10	12	15	20	25	25	25	25	25	30
Y	50	62	75	82	117	160	160	165	220	266
Z	24	32.5	35	44	55	70	70	—	—	—
Z1	M6	M8	M8	M8	M10	M10	M10	—	—	—
Z2	6	10	12	12	15	15	15	—	—	—
Sports nut										
a	40	44	44	46	73	99	99	110	130	160
b	10	12	12	14	16	20	20	30	35	40
Φc(h9)	24	28	32	42	63	85	85	105	130	160
Φd	44	48	55	66	95	125	125	190	240	300
Φe	34	38	45	54	78	105	105	150	185	230
Φf	5	6	7	7	9	11	11	17	25	28
Screw joint type 1										
h	12	15	20	25	30	45	45	75	100	120
Φik6	8	12	15	20	25	40	40	60	80	95

Table CS9-1\Main performance parameters table for B-Type ball screw jacks in the square series

Model CS	Unit	CS5	CS10	CS25	CS50	CS100	CS150	CS250	CS350	CS500
Max. lifting capacity dynamic/static	kN	5	8	17	47	53	60	129	220	251
Max. tensile load dynamic/static	kN	5	8	17	47	53	60	129	220	251
Screw GQ①		GQ16×5	GQ20×5	GQ32×5	GQ40×10	GQ50×10	GQ63×10	GQ80×16	GQ100×20	GQ125×20
Ratio N		4:1	4:1	6:1	7:1	9:1	9:1	10:1	10:1	14:1
Lift per revolution for ratio N	mm/r	1.25	1.25	0.83	0.71	1.11	1.11	1.00	2.00	1.79
Ratio L		16:1	16:1	24:1	28:1	36:1	36:1	40:1	40:1	56:1
Lift per revolution for ratio L	mm/r	0.31	0.31	0.21	0.18	0.28	0.28	0.25	0.50	0.45
Max. drive capacity② at T= 20℃ Duty cycle (ED) 20 %/h	kW	0.3	0.5	1.2	2.3	5.1	5.1	10	15	22
Max. drive capacity②at = 20℃ Duty cycle (ED) 10 %/h	kW	0.42	0.7	1.7	3.2	7.1	7.1	14	21	30
Overall efficiency for ratio N	%	63.53	63.00	60.75	61.64	52.62	52.62	58.97	56.25	48.21
Overall efficiency for ratio L	%	48.71	47.25	42.75	44.38	38.77	38.77	43.45	41.25	35.36
Ball screw efficiency rating	%	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
Screw torque at max. lifting power	Nm	4.42	7.07	15.03	41.56	93.72	106.10	365.00	778.09	887.73
Max. permitted drive−shaft torque	Nm	3.40	7.10	18.00	38.00	93.00	93.00	240.00	340.00	570.00
Max. permitted screw length for compression load	mm	see buckling diagrams page "Table 7−3".								
Housing material					GG			GGG		
Weight without stroke length and protection tube	kg	1.2	2.1	6	17	32	32	57	85	160
Screw weight per 100 mm stroke	kg	0.35	0.45	0.7	1.2	2	2	4.2	6.6	10.3
Amount of lubricant in worm gear	kg	0.08	0.14	0.24	0.8	1.1	1.1	2	2.7	3.2
Mass moment of inertia J③ Ratio N type A	kgcm²	0.122	0.16	0.78	1.917	3.412	3.412	16.04	49.12	96.27
Mass moment of inertia J③ Ratio N type B	kgcm²	0.126	0.165	0.794	1.952	3.741	3.741	17.58	52.45	103.39
Mass moment of inertia J③ Ratio L type A	kgcm²	0.088	0.115	0.558	1.371	2.628	2.628	12.35	37.05	72.62
Mass moment of inertia J③ Ratio L type B	kgcm²	0.091	0.119	0.552	1.381	2.647	2.647	12.44	37.37	73.15
No−load torque for ratio N	Nm	0.10	0.26	0.36	0.76	1.90	1.90	2.64	3.24	3.96
No−load torque for ratio L	Nm	0.08	0.16	0.26	0.54	1.20	1.20	1.94	2.2	2.84

Table CS9-2\Connection dimensions for B-Type Ball screw

Joint type **1**

32<Screw Diameter≤63

63<Screw Diameter≤125

8-Øf

30°

6-Øf
Uniform distribution

Screw Diameter≤32

6-Øf

2-4xZ1deepZ2

M10x1 oil plug

Model	CS5	CS10	CS25	CS50	CS100	CS150	CS250	CS350	CS500
screw	GQ16×5	GQ20×5	GQ32×5	GQ40×10	GQ50×10	GQ63×10	GQ80×16	GQ100×20	GQ125×20
C	31	37.5	41	58.5	80	80	82.5	110	133
D	80	100	130	180	200	200	240	290	360
E	60	78	106	150	166	166	190	230	290
F	72	85	105	145	165	165	220	250	300
G	52	63	81	115	131	131	170	190	230
H	M8	M8	M10	M12	M20	M20	M30	M36	M42
ΦJ(k6)	10	14	16	20	25	25	30	35	48
K1	25	32	45	63	71	71	80	100	135
K2	21	29	42	63	66	66	75	95	117
L	31	40	54	78	83	83	100	125	152
L1	22.5	25.5	43	45	65	65	65	63	97.5
L2	13	15	15	16	30	30	45	54	80
N	120	140	195	240	300	300	355	380	500
NL	Lift+66	Lift+72	Lift+95	Lift+145	Lift+151	Lift+152	Lift+189	Lift+220	Lift+230
P	74	93	106.5	149	195	195	200	270	326
Q	3×3×18	5×5×20	5×5×36	6×6×36	8×7×56	8×7×56	8×7×56	10×8×56	14×9×90
T	12	18	24.5	32	35	35	35	50	60
ΦW	32	35	50	63	85	85	120	140	170
marginX	12	15	20	25	25	25	25	25	30
Y	62	75	82	117	160	160	165	220	266
Z	32.5	35	44	55	70	70	—	—	—
Z1	M8	M8	M8	M10	M10	M10	—	—	—
Z2	10	12	12	15	15	15	—	—	—
Sports nut									
a	42	42	55	95	101	102	139	170	170
b	10	10	12	14	16	18	28	30	30
Φc(g6)	28	36	50	63	75	90	118	145	170
Φd	48	58	80	93	110	125	168	207	232
Φe	38	47	65	78	93	108	140	175	200
Φf	5.5	6.6	9	9	11	11	13.5⌴22↧13	17.5⌴28↧17	17.5⌴28↧17
g	40	44	62	70	85	95	—	—	—
Screw joint type 1(default form)									
h	15	20	25	30	40	45	75	100	120
Φi(k6)	12	15	20	25	35	40	60	80	95

Type A - Screw axial motion type
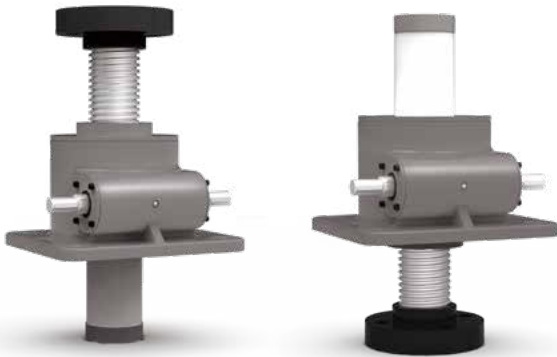
Type B - Nut Axial Motion: The screw rotates and is fixed axially, while the nut moves in an axial motion.

U-type - upward movement of the screw assembly

D-type - downward movement of the screw assembly
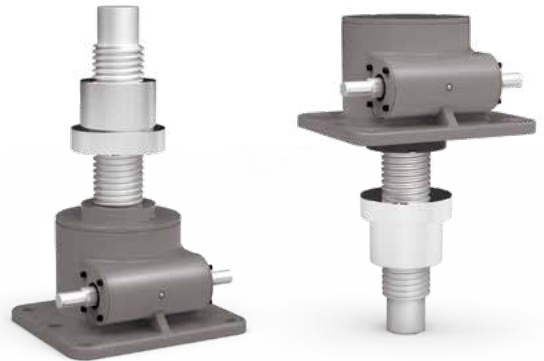
U type - Nut up assembly

D type - Nut down assembly

1\Motion Characteristics and Assembly Methods

Description A drive, the screw moves only axially and does not rotate, the stopping of the screw is limited by an external load; if the external load does not reliably limit the rotation of the screw, an anti-rotation device with a P-type is required.

2\Body specifications There are 11 types of snail-type jackss (CS series) with lifting forces ranging from 25KN to 1500KN.

(Specifications can be customized to user requirements) Material for the snail jacks box can be selected as either ductile cast iron or cast steel.

3\Lifting Speed Jacks can be divided into normal speed ratios according to the number of worm gears and worm teeth.

The speed range of the worm screw jack with the ball screw installed depends on the screw size and lead.
For L-type worm gear lead screw jack with standard trapezoidal lead screw installed, refer to Table S7-1 for the travel of the lead screw per revolution of the worm shaft.
The speed range of the ball screw installed in the worm screw jack is dependent on the screw size and lead.
Higher transmission speed can be achieved by utilizing a large lead screw or a multi-head lead screw.

4\Screw joint type (refer to Table S7-5). The A-type structural form screw head is categorized as follows:

There are five types: Type 1 (Cylindrical) \ Type 2 (Flange) \ Type 3 (Threaded) \ Type 4 (Flat Head) \ Type 5 (Open);
There are two types of screw heads in the B-type structure: Type 1 (cylindrical) and Type 2 (threaded).

5\Additional Requirements (Optional accessories)

There are three extra specifications for A-type construction form: anti-rotation device (P), protective cover (S), and ball screw type (B).
There are two types of additional requirements for the B-type construction form: protective cover (S)\ball screw type (B).

6\Representation method

Example S25 – L – A – U – 3 – 800 – PSB

- Additional designator (Mark when needed)
- Screw stroke (mm)
- Screw joint type designation ("3" for threaded type)
- Assembly method designation ("U for screw up mounting")
- Structural form designation ("A" for axial movement of the screw)
- Transmission ratio code ("L" for slow speed ratio, and "N" for ordinary speed ratio is not marked)
- Body specifications ("S" is the jack series code: "25" is the load capacity of 25 KN)

7\Main performance parameters and dimensions of s series (Snail Type) Screw jacks

Table S7-1\Main performance parameters table

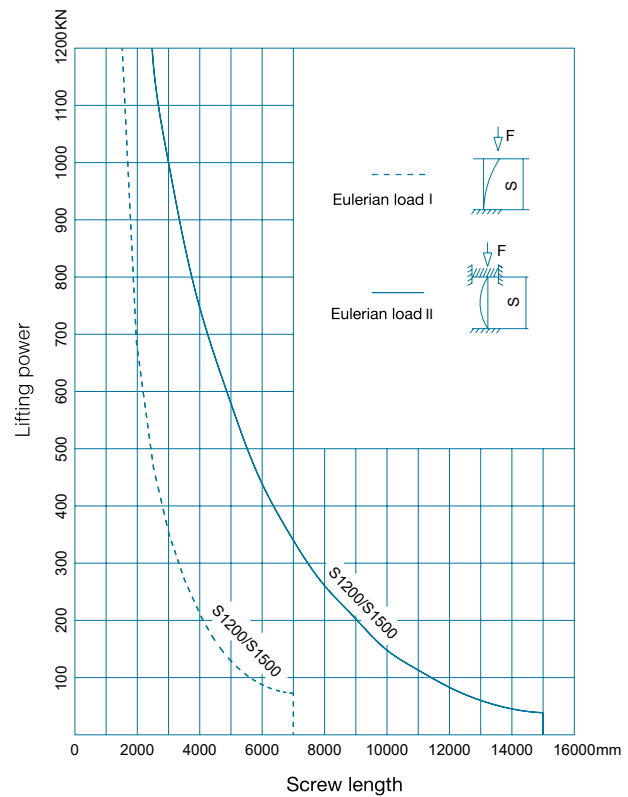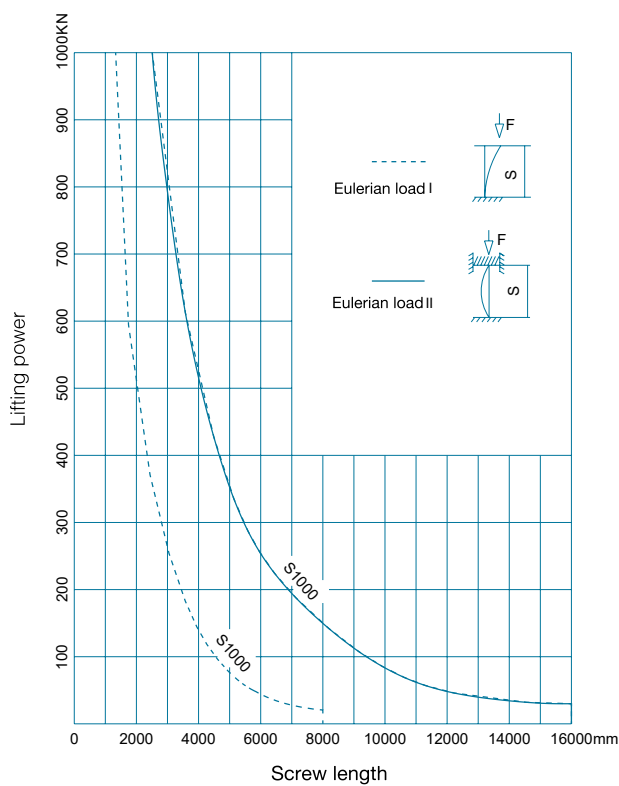| Model S / Item	Unit	25	25L	50	50L	100 150	100L 150L	200	200L	250	250L	350	350L	500	500L	1000	1000L	1200 1500	1200L 1500L
Max. lifting capacity dynamic/static	kN	25		50		100/150		200		250		350		500		1000		1200/1500	
Screw Tr		Tr30*6		Tr40*7		Tr58*12		Tr65*12		Tr90*16		Tr100*16		Tr120*20		Tr160*20		Tr180*25	
Lift per revolution	mm/r	1	0.25	1.17	0.29	1.56	0.5	1.5	0.5	1.5	0.5	1.5	0.5	1.818	0.625	1.916	0.638	2.083	0.694
Worm gear ratio		6:1	24:1	6:1	24:1	7.67:1	24:1	8:1	24:1	10.67:1	32:1	10.67:1	32:1	11:1	32:1	12:1	36:1	12:1	36:1
Maximum screw extension	mm	1500		2000		2500		3000		3500		4000		5500		6500		7000	
Maximum lift at maximum pressure load — unguided	mm	250		385		500		490		850		900		1000		1200		1350	
Maximum lift at maximum pressure load — guided	mm	400		770		1000		980		1700		1850		2000		2400		2700	
Worm torque at max. lifting power	Nm	18.6	8.86	39.5	19.8	119 179	60 90	240	22	366	217	464	253	970	425	2323	997	3316	1658
total efficiency	%	21	11	23	11.5	20.5	13	19.5	12.8	16	9	18	11	15	11	13	10	12	8
Drive power (P)	kW	P=T*n/9549（T–Torque Nm; n–speed rpm）																	
Type A Weight without stroke	kg	7.3		16.2		25		36		70.5		87		420		1010		1350	
Screw weight per 100 mm stroke	kg	0.45		0.82		1.68		2.1		4.15		5.2		7.45		13.6		17.3	
lubricants		Synthetic calcium sodium grease ZGN-2（Temperature range:-20℃～100℃）																	
Amount of lubricant in worm gear	kg	0.2		0.3		0.5		0.75		1		1.9		2		2.5		2.5	

Notes:

① Higher lifting heights are permitted with lower pressure loads, see "CS7-2" for the relationship between pressure load and lifting height.

② The permissible torque, power, and speed for lifting different loads are different, and the maximum power for different starting durations is different.

③For screw jacks with double guide bushings, the screw is allowed to withstand a certain lateral force in addition to the axial force. The worm shaft extension is allowed to withstand a certain radial force, allowing the installation of gears, sprockets or pulleys.

Table S7-2\Relationship chart between screw length and maximum load limit

The permissible bending force of a trapezoidal screw when the screw jacks is under pressure is shown in the chart below:(safety factor K = 3)

Lifting power

1000KN 900 800 700 600 500 400 300 200 100

Eulerian load I

Eulerian load II

S1000

S1000

0 2000 4000 6000 8000 10000 12000 14000 16000mm

Screw length

Lifting power

1200KN 1100 1000 900 800 700 600 500 400 300 200 100

Eulerian load I

Eulerian load II

S1200/S1500

S1200/S1500

0 2000 4000 6000 8000 10000 12000 14000 16000mm
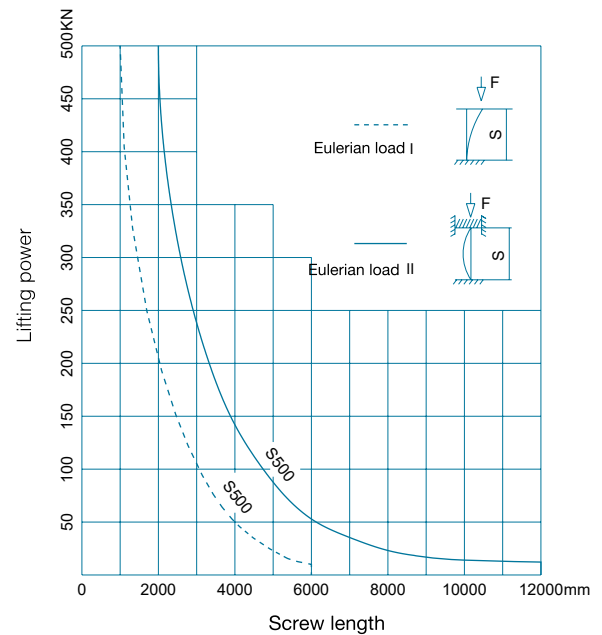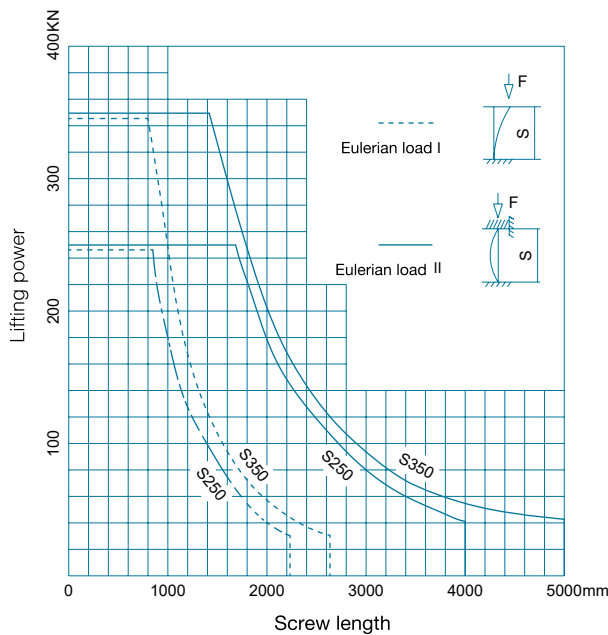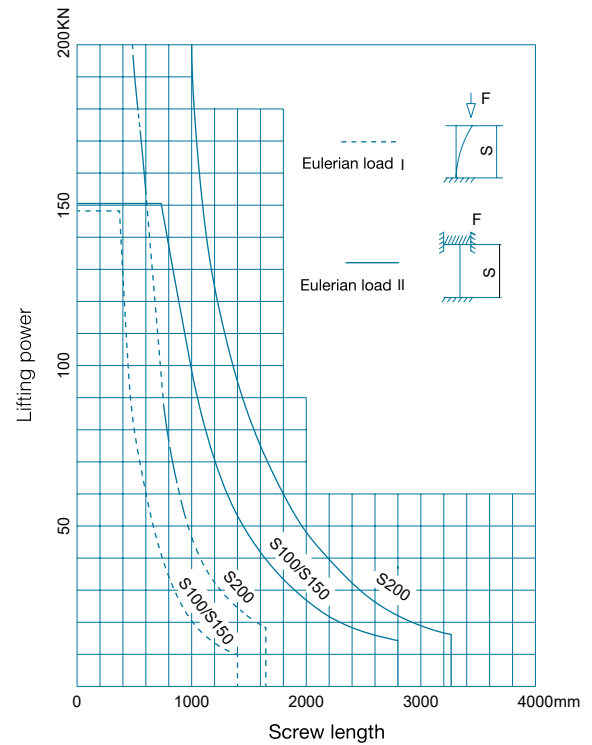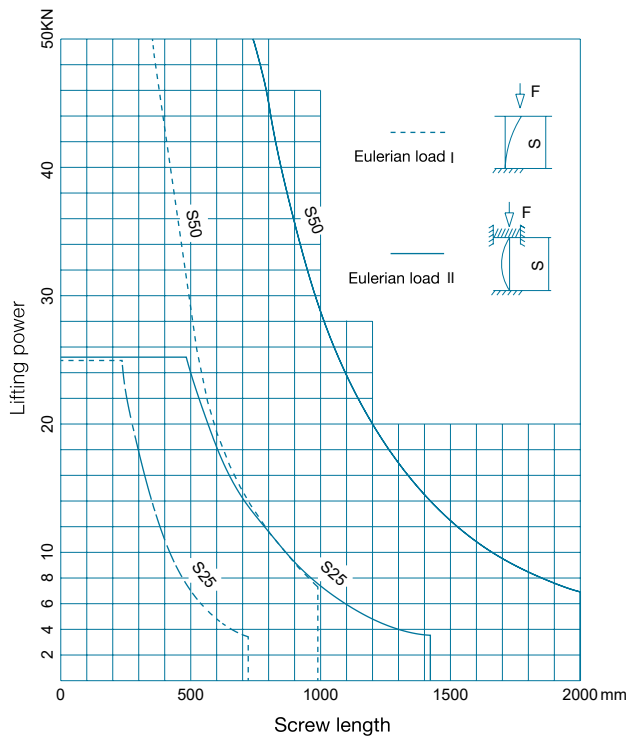
Screw length

For other specifications, refer to the above chart for the permissible bending force of the corresponding length.

Table S7-3\Rated input power of S series screw jacks

Rated input power of S series jacks: PM=（TM x n）/9549

PM:The drive power required for the screw jacks, Unit KW;

TM:Required drive torque for screw jacks,Unit Nm;(See "S7−1 Main Performance Data Sheet".)

n:Input speed required for the screw jack,Unit rpm;

Calibrate the permitted power of the screw jack according to the table below.

Input speed rpm	25	25L	50	50L	100 150	100L 150L	200	200L	250	250L	350	350L	500	500L	1000	1000L	1200 1500	1200 1500
1500	1.45	0.45	2.59	0.84	3.47	1.31	4.02	1.65	6.38	2.26	13.06	6.36	11.74	6.29	23.5	11.78	56.4	28.2
1000	1.01	0.32	1.92	0.7	2.68	1.06	2.94	1.39	4.42	1.87	11.89	5.28	10.62	4.78	21.1	9.44	53.9	22.2
750	0.98	0.24	1.77	0.58	2.15	0.93	2.46	1.15	3.4	1.51	9.9	4.2	8.25	3.63	15.7	6.88	39.8	16.4
500	0.82	0.19	1.45	0.43	1.89	0.64	2.31	0.77	2.67	1.22	6.56	3.13	5.92	2.65	10.9	4.94	26.7	11.4

Connection size table

Table S7-4\Type A, Standard

Assembly Method U
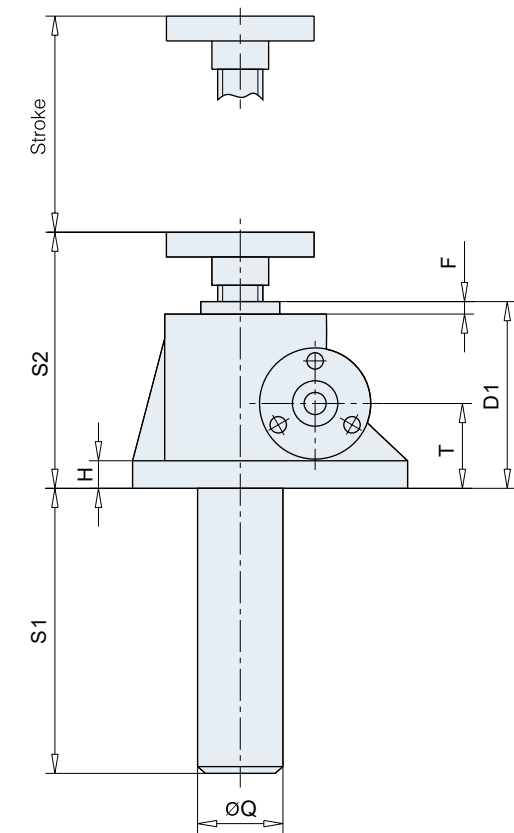
Assembly Method D

Anti-rotation device
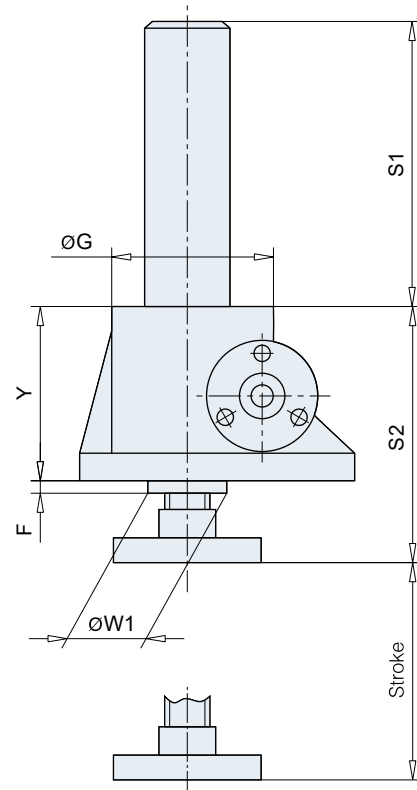
Standard room
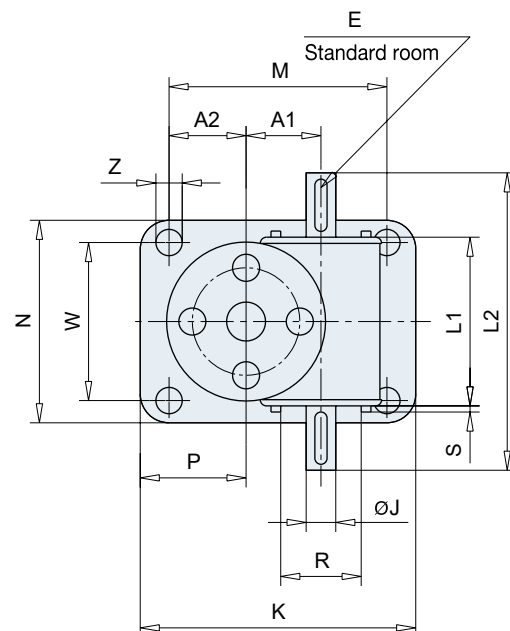
Model CS	25 25L	50 50L	100 100L 150 150L	200 200L	250 250L	350 350L	500 500L	1000 1000L	1200 1200L 1500 1500L
screw	Tr30*6	Tr40*7	Tr58*12	Tr65*12	Tr90*16	Tr100*16	Tr120*20	Tr160*20	Tr180*25
A1	45.2	56.2	66.8	72.5	97	120	140	190	190
A2	50	58	63.5	95	95	135	130	146	146
D1	105.5	142	156.5	182	225	250	296	400	400
E	5×5×32	6×6×32	8×7×50	8×7×45	10×8×50	10×8×70	10×8×90	14×9×100	14×9×100
F	8.5	12	6.5	6	8	10	16	40	40
ΦG	98	122	150	185	205	260	300	420	420
H	12	18	20	20	25	30	32	38	42
ΦJ	16k6	20k6	25k6	28k6	34k6	38k6	40m6	45m6	48m6
K	165	212	235	295	350	430	450	526	526
L1	110.5	132	172	213.5	221	265	310	380	380
L2	190	228	280	322	355	430	558	610	610
M	135	168	190	240	280	360	350	412	412
N	120	155	200	215	260	280	500	622	622
P	65	80	86	122.5	130	170	180	203	203
ΦQ	45	60	76	83	114	121	145	180	220
R	40	55	55	72	80	90	100	130	130
S	5.5	6	7	6	10	10	12.5	12.5	12.5
S1	Lift+20	Lift+20	Lift+20	Lift+20	Lift+20	Lift+20	Lift+20	Lift+20	Lift+20
S2	150.5	193	230	262	317	350	416	550	570
T	45	61.5	70	87	102	115	121	155	155
W	90	114	155	160	190	210	406	508	508
ΦW1	48	65	80	100	130	150	170	240	240
marginX	20	20	25	25	25	30	40	50	50
Y	97	130	150	176	217	240	280	360	360
ΦZ	14	17	21	28	35	35	45	48	48
Anti-rotation device (optional)									
ΦA	98	110	150	160	192	210	—	—	—
AL	Lift+56	Lift+65	Lift+80	Lift+80	Lift+125	Lift+150	—	—	—
AM×AM	60×60	70×70	90×90	106×106	126×126	139×139	—	—	—
AN	12	12	15	18	12	35	—	—	—

Table S7-5\Type B, Standard

Assembly Method U

Assembly Method D

Mounting Base Plate Aperture
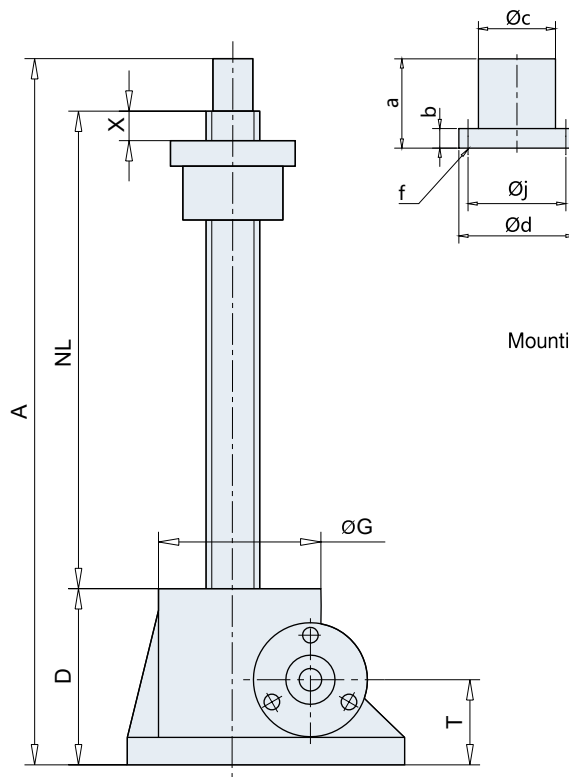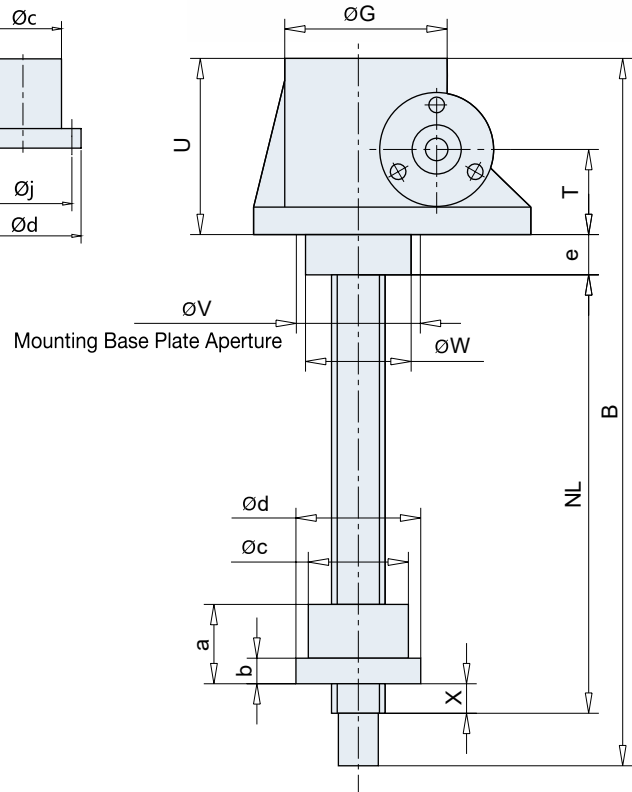
Model S / Type S	25 25L	50 50L	100 100L 150 150L	200 200L	250 250L	350 350L	500 500L	1000 1000L	1200 1200L 1500 1500L
	Tr30*6	Tr40*7	Tr58*12	Tr65*12	Tr90*16	Tr100*16	Tr120*20	Tr160*20	Tr180*25
A	Lift+215	Lift+270	Lift+335	Lift+404	Lift+476	Lift+535	Lift+603	Lift+815	Lift+845
B	Lift+238	Lift+300	Lift+359	Lift+430	Lift+513	Lift+580	Lift+685	Lift+880	Lift+910
D	100	131	160	194	226	260	290	375	375
e	26.5	30	34	39	52	55	65	80	80
NL	Lift+85	Lift+100	Lift+125	Lift+150	Lift+170	Lift+205	Lift+250	Lift+320	Lift+330
U	97	131	150	181	211	250	280	360	360
V	3	3	1	3	3	4	5	6	6
ΦW	68	83	110	140	160	180	200	260	260
a	45	60	75	100	120	145	170	220	270
b	15	18	25	30	35	35	50	70	80
Φc	40	55	80	90	120	130	160	210	230
Φd	90	115	160	185	220	235	280	380	395
Φj	65	85	120	135	170	180	220	295	320
f	4×Φ13.5	4×Φ18	4×Φ22	4×Φ26	6×Φ26	6×Φ26	6×Φ33	6×Φ45	6×Φ45

Note: For other outlines and connection dimensions, see A-type.

Joint type **1**
(Cylindrical)

Joint type **3**
(thread)

Joint type **2**
(flange)
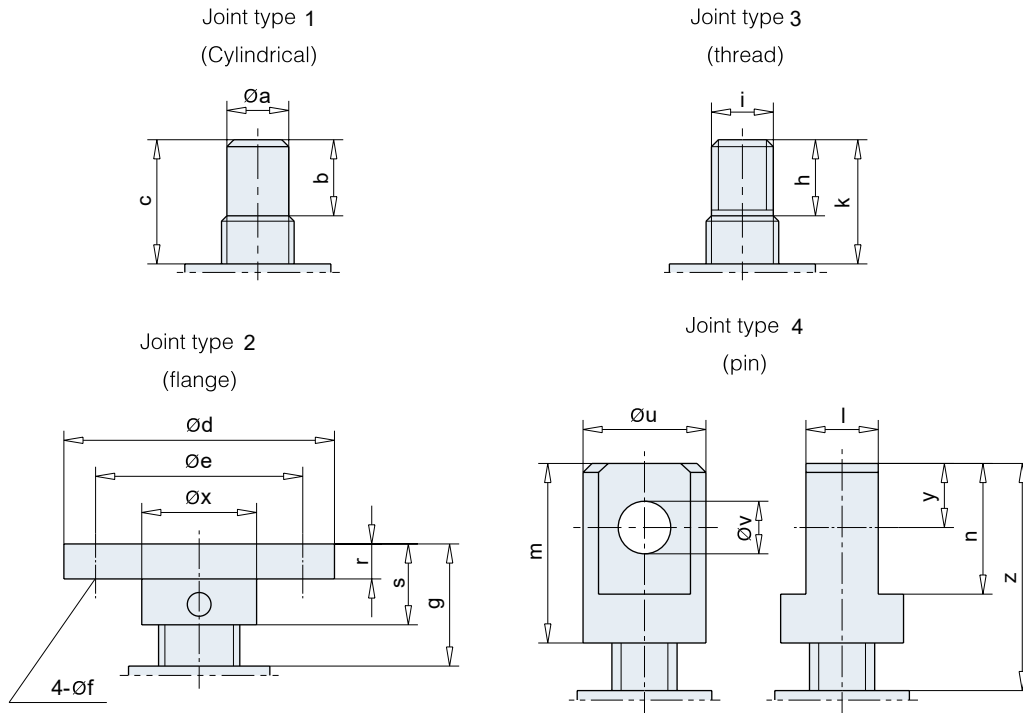
Joint type **4**
(pin)

Model S	25 25L	50 50L	100 100L 150 150L	200 200L	250 250L	350 350L	500 500L	1000 1000L	1200 1200L 1500 1500L
Screw joint type 1(default form)									
Φak6	20	25	40	50	70	80	95	130	150
b	30	40	50	60	70	80	90	120	140
c	45	51	73.5	80	92	100	120	150	170
Screw joint type 2									
Φd	98	122	150	185	205	260	300	370	400
Φe	75	85	105	140	155	200	225	280	310
Φf	14	17	21	26	27	33	39	48	48
g	45	51	73.5	80	92	100	120	150	170
r	12	18	20	20	25	30	35	75	80
s	30	40	50	60	63	80	90	120	140
Φx	40	50	65	90	100	130	150	200	230
Screw joint type 3									
h	30	39	50	60	63	80	90	120	140
i	M22×1.5	M30×2	M40×3	M50×3	M70×3	M80×3	M95×3	M130×4	M150×4
k	40	51	73.5	80	92	100	120	150	170
Screw Joint type 4									
lh10	30	42	60	75	90	105	120	160	180
m	70	105	130	150	175	220	240	300	335
n	50	75	100	120	140	160	160	180	200
Φu	50	65	90	110	130	150	180	220	260
ΦvH8	25	35	50	60	70	80	80	90	95
y	25	37.5	50	60	70	80	80	90	100
z	85	117	153.5	170	204	240	270	330	360

Note: For other outlines and connection dimensions, see A-type.

28

The bevel gearbox adopts spiral bevel gear and precision bearing transmission, which is mainly used for variable direction connection when the **screw** jacks is used in group.

Transmission Ratio:1:1\1:1.5\1:2etc
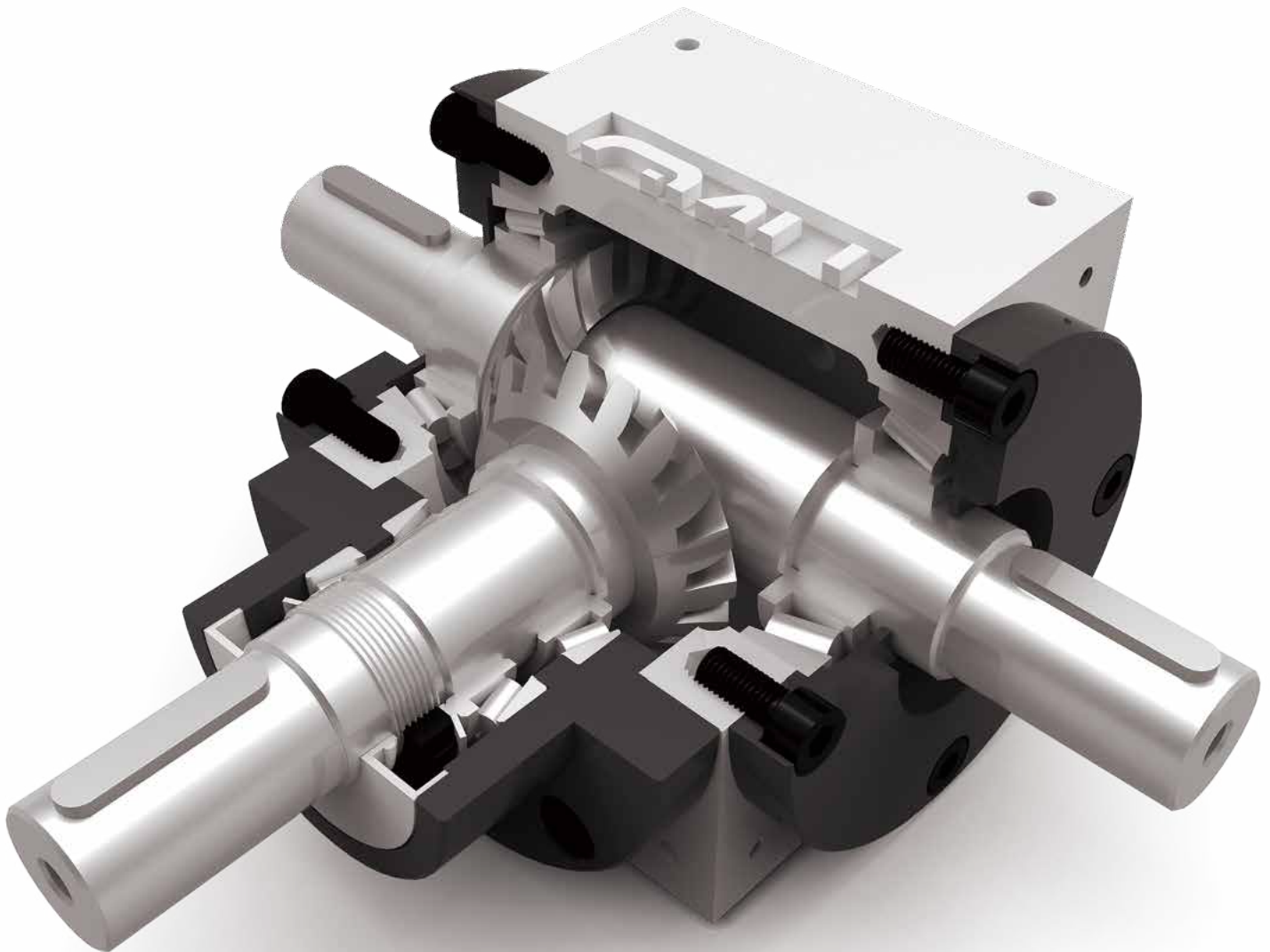
Rated power and rated torque i=1:1

Motor speed rpm	Input speed rpm	CS2.5-MGB		CS5-MGB		CS10-MGB		CS25-MGB		CS50-MGB		CS150-MGB		CS250-MGB		CS350-MGB		CS500-MGB	
		kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm
50	50	0.03	4.7	0.09	18	0.17	34	0.28	52	0.32	54	0.73	140	1.57	300	3.27	625	5.86	1120
200	200	0.1	3.4	0.47	18	0.62	21	0.85	38	1.3	50	2.81	134	6.07	290	12.6	600	21.2	1010
500	500	0.19	2.9	0.89	17	0.95	19	1.44	33	2.5	48	6.49	124	14.1	270	28.8	550	48.2	920
1000	1000	0.28	2.6	1.68	16	1.98	17	3.00	28	4.60	44	11.9	114	24.6	235	52.4	500	84.8	810
1500	1500	0.36	2.4	2.2	14	2.45	16	3.90	25	6.00	39	16.6	106	34.6	220	73.00	465	114.7	730
2000	2000	0.47	2.2	2.5	12	2.84	15	4.98	23	7.2	36	21.2	101	43	210	91.10	435	144.5	690
3000	3000	0.63	2.0	3.1	10	3.4	14	6.54	20	9.0	31	26	83	51.5	165	107.00	340	152.00	485
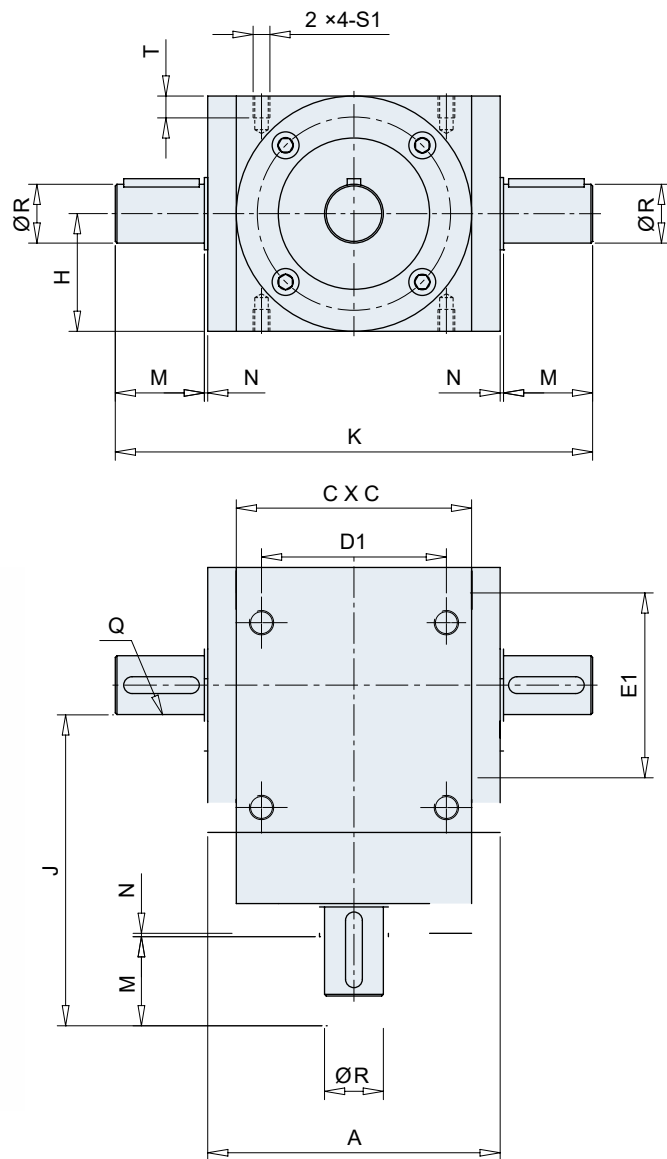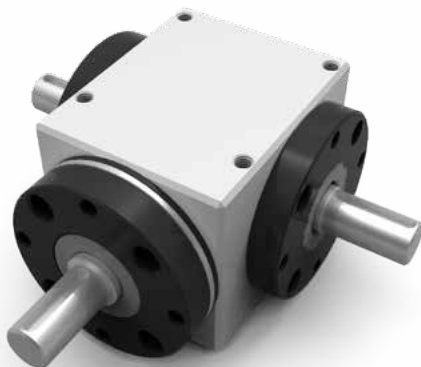
Model	CS2.5-MGB	CS5-MGB	CS10-MGB	CS25-MGB	CS50-MGB	CS150-MGB	CS250-MGB	CS350-MGB	CS500-MGB
A	70	98	98	121	121	126	156	196	234
C	50	74	74	90	90	90	110	140	170
D1(+-0.2)	38	60	60	78	78	78	88	110	134
E1(+-0.2)	38	60	60	78	78	78	88	110	134
H	25	31	37.5	41	45	45	55	70	85
J	66	86	91	119	129	145	180	215	260
K	110	142	152	185	205	210	280	340	400
M	19	21	26	30	40	40	60	70	80
Q	3×3×14	3×3×18	5×5×20	5×5×24	6×6×35	8×7×32	10×8×45	12×8×63	14×9×70
R(j6)	9	10	14	16	20	25	35	40	50
S1	M6	M6	M6	M8	M8	M8	M8	M10	M12
T	9	9	9	12	12	12	12	15	18
N	1	1	1	2	2	2	2	2	3

Bevel gear screw jacks connection size table (Nut screw jacks)
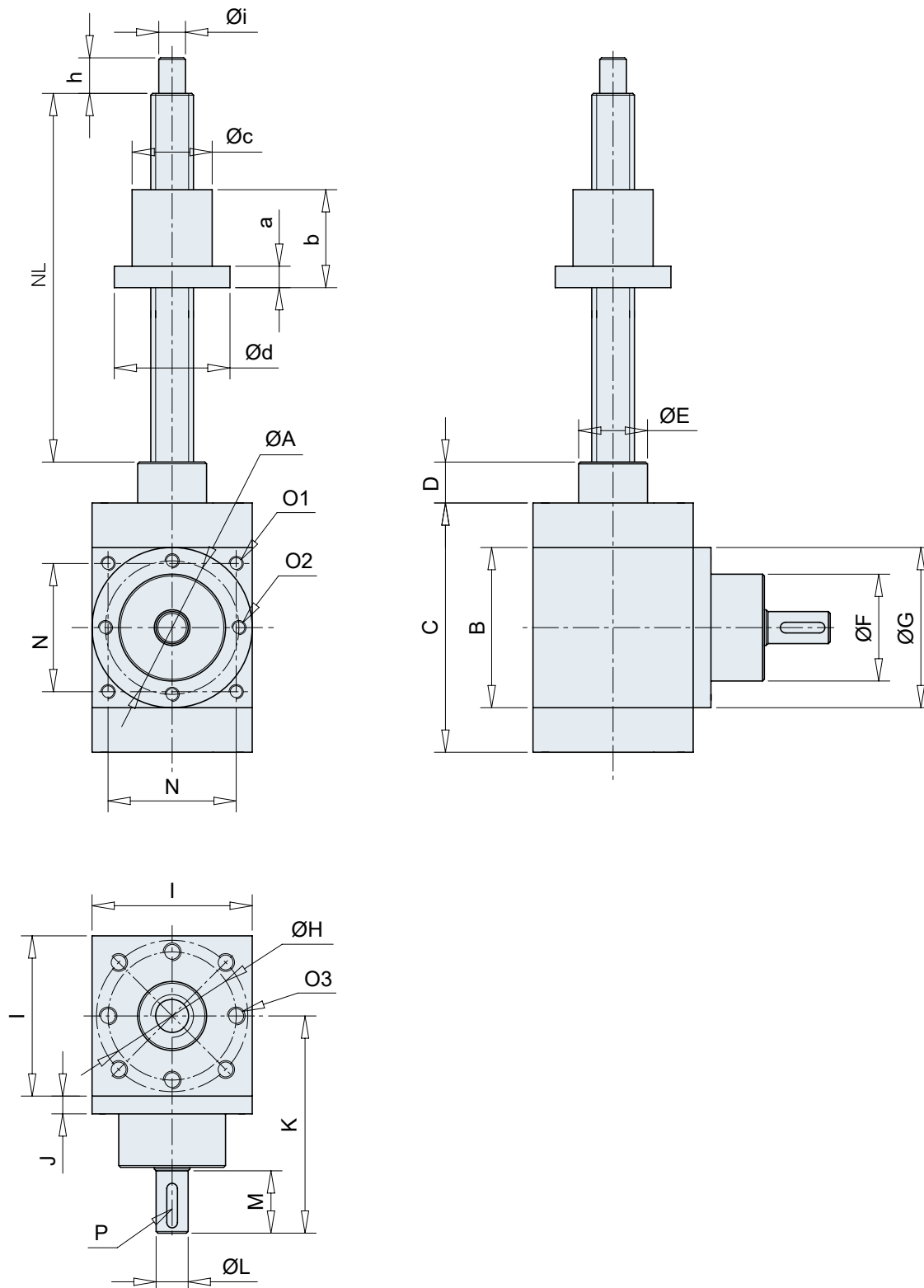
Example G15 – A – U – 1 – 100 – PSB

- Additional models (same as CS, Sseries screw jacks)
- Screw stroke (mm)
- Screw joint type designation ("1" for flange type, see page 33 of catalog)
- Assembly method code("U" is for upward mounting of the screw, "D" is for downward mounting of the screw)
- Structural form code("A" is the axial movement of the screw, "B" is the axial movement of the nut)
- Body specification code ("G" is screw jacks series code, "15" is load capacity 15kN)

Model	15KN		50KN		90KN	
gear ratio	2:1	3:1	2:1	3:1	2:1	3:1
Screw specifications	Tr24×5		Tr40×7		Tr60×9	
A	75	75				
B	90	90	140	140	230	230
C	140	140	190	190	295	295
D	23	23	32	32	40	40
E	38.7	38.7	60	60	90	90
F	60	60	95	95	150	120
G	90	90	135	135	225	225
H	72	72			180	180
I	90	90	140	140	230	230
J	10	10	13	13	17	17
K	122	122	180	180	305	310
L(j6)	18	12	32	28	55	40
M	35	35	50	50	90	80
N			110	110	180	180
O1	M8×10	M8×10				
O2			M12×25	M12×25	M16×18	M16×18
O3	M10×16	M10×16			M20×35	M20×35
P	6×6×25	4×4×25	10×8×45	8×7×45	16×10×80	12×8×60
T	50	50	65	65	40	40
Screw joint type						
i(j6)	15		25		45	
h	20		30		55	
Nut Size						
a	12		18		30	
b	55		80		100	
c(h9)	45		70		90	
d	65		87		120	

UNID Precision Machinery Technology Co.,Ltd.
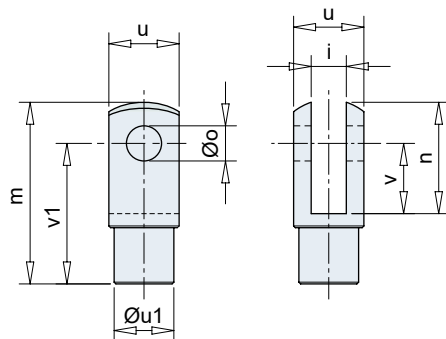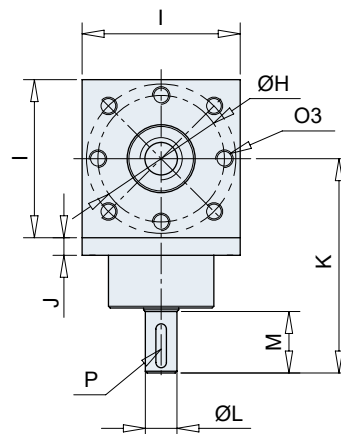
Bevel gear screw jacks connection size table (Screw lifting)

Joint type 1
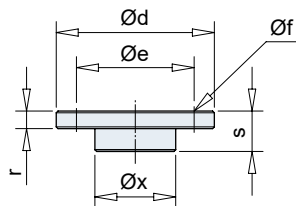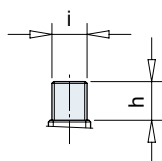
Joint type 2
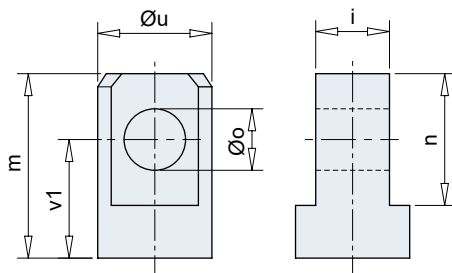
Joint type 3

Joint type 4
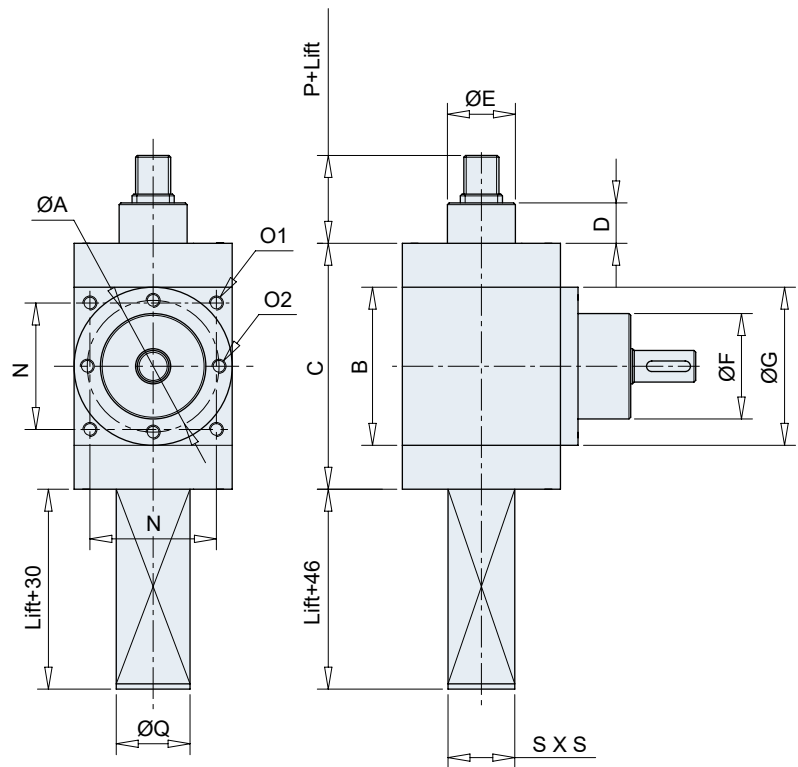
Model	15KN		50KN		90KN	
screw	2:1	3:1	2:1	3:1	2:1	3:1
Screw specifications	Tr24×5		Tr40×7		Tr60×9	
A	75	75				
B	90	90	140	140	230	230
C	140	140	190	190	295	295
D	23	23	32	32	40	40
E	38.7	38.7	60	60	90	90
F	60	60	95	95	150	120
G	90	90	135	135	225	225
H	72	72			180	180
I	90	90	140	140	230	230
J	10	10	13	13	17	17
K	122	122	180	180	305	310
L(j6)	18	12	32	28	55	40
M	35	35	50	50	90	80
N			110	110	180	180
O1	M8×10	M8×10				
O2			M12×25	M12×25	M16×18	M16×18
O3	M10×16	M10×16			M20×35	M20×35
P	6×6×25	4×4×25	10×8×45	8×7×45	16×10×80	12×8×60
Q	42	42	65	65	95	95
S	40	40	65	65	90	90
T	50	50	65	65	40	40

Screw joint type1

	15KN	50KN	90KN
d	90	110	170
e	67	85	130
f	4×11	4×13	4×21
x	46	60	90
r	10	15	25
s	23	30	50

Screw joint type2

	15KN	50KN	90KN
u		65	80
m		105	120
v1		67.5	75
oH8		35	40
ih10		42	60
n		75	90

Screw joint type3

	15KN	50KN	90KN
u	40	60	
m	105	160	
v1	80	120	
u1	34	52	
oH8	20	30	
iH10	20	30	
v	40	60	
n	65	100	

Screw joint type4

	15KN	50KN	90KN
i	M18	M30	M48×2
h	22	29	48
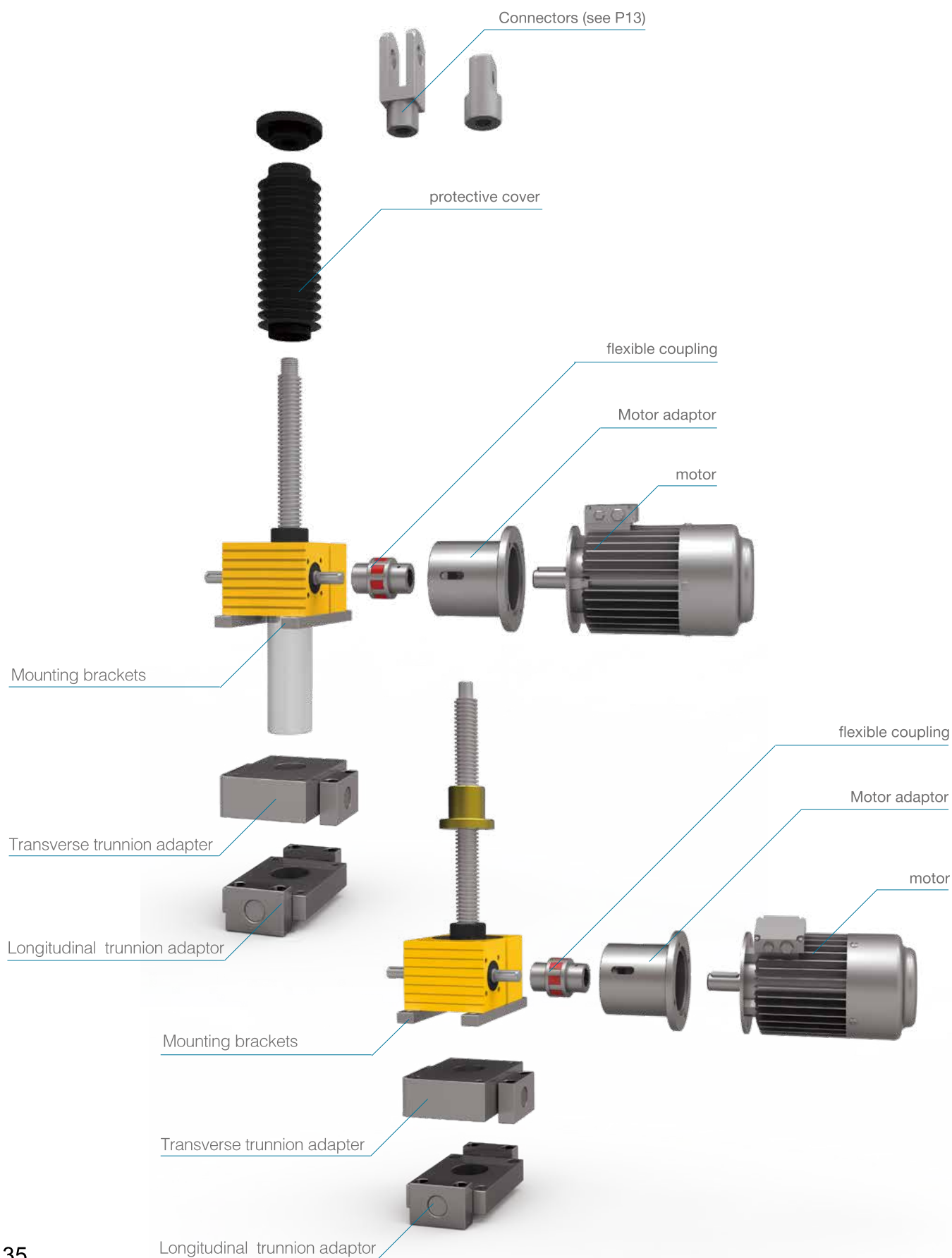
Connectors (see P13)

protective cover

flexible coupling

Motor adaptor

motor

Mounting brackets

Transverse trunnion adapter

Longitudinal trunnion adaptor

flexible coupling

Motor adaptor

motor

Mounting brackets

Transverse trunnion adapter

Longitudinal trunnion adaptor
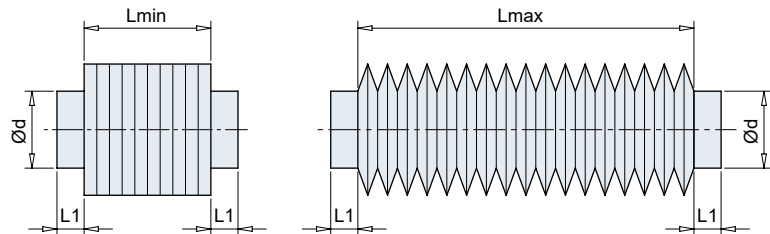
Model	D	d	L1	L(max-min)
CS2.5-S	50	26	10	as required
CS5-S	65	30(48)	13	as required
CS10-S	80	40(57)	13	as required
CS25-S	90	46	13	as required
CS50-S	110	70	15	as required
CS150-S	145	85	30	as required
CS250-S	180	120	30	as required
CS350-S	220	145	30	as required
CS500-S	250	170	30	as required

2\Specifications and Dimensions of Motor adaptor(MA)
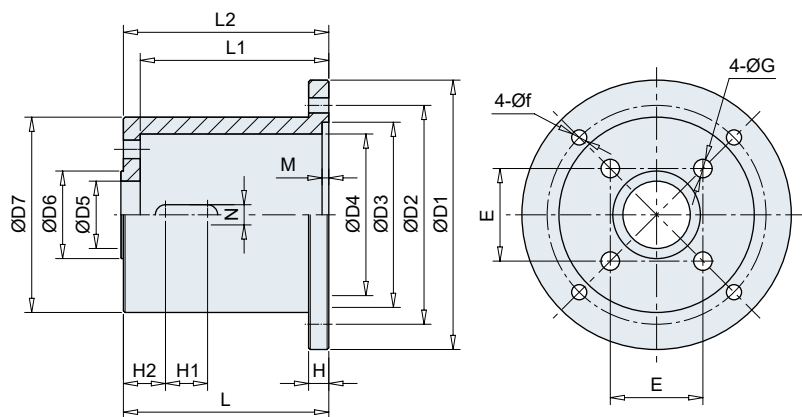
| Model	D1	D2	D3	D4	D5	D6	D7	L	L1	L2	H	H1	H2	M	N	E	F	G
CS2.5-MA	90	75	60	52	16	22	62	57	51	58.5	8	15	16	3	8	24	5.5	6.6
CS5-MA	120	100	80	62	25	31	74	82	75	83.5	10	20	20	4	12	32.5	7	9
CS10-MA	140	115	95	65	25	35	82	100	90	102	12	20	20	4	12	35	9	9
CS25-MA	160	130	110	80	30	40	100	120	110	122	12	25	25	4	12	44	9	9
CS50-MA	160	130	110	96	40	52	116	122	112	124	12	25	25	4	12	55	9	11

Note: If you need other specifications, they can be customized according to the user's actual needs after selecting the motor.

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3\Specifications and Dimensions of Motor (MT)
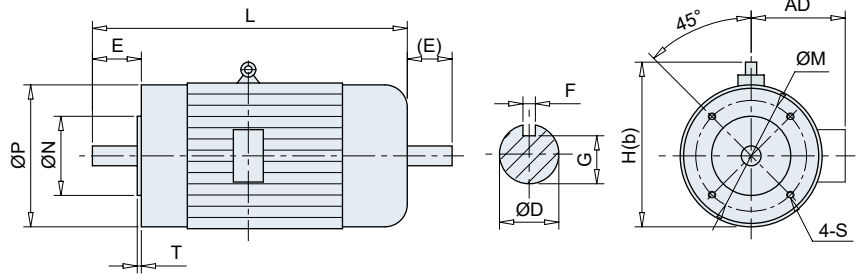
Model	Norm	Power	Shape Characteristics		Mounting dimensions and tolerances									Overall size			
		kw	saddle	rim	ΦD	E	F	G	ΦM	ΦN	ΦP	S	T	ΦAC	ΦAD	H(b)	L
CS2.5-MT	Y2-63 2-4	0.18	63	FT75	11 +0.08 -0.003	23	4	0 -0.030	8.5	75	60 +0.012 -0.007	90	M5	2.5	130	70	–	230
CS5-MT	Y2-80 1-4	0.55	80	FT100	19 +0.09 -0.004	40	6	0 -0.030	15.5	100	80 +0.012 -0.007	120	M6	3.0	175	145	–	295
CS10-MT	Y2-90 S-4	1.1	90	FT115	24 +0.09 -0.004	50	8	0 -0.036	20	115	95 +0.013 -0.009	140	M8	3.0	195	155	–	320
CS25-MT	Y2- 100L-4	3	100L	FT130	28 +0.09 -0.004	60	8	0 -0.036	24	130	100 +0.013 -0.009	160	M8	3.5	215	180	245	385
CS50-MT	Y2- 112M-4	4	112M	FT130	28 +0.09 -0.004	60	8	0 -0.036	24	130	100 +0.013 -0.009	160	M8	3.5	240	190	263	400

4\Flexible coupling specification size (FC)
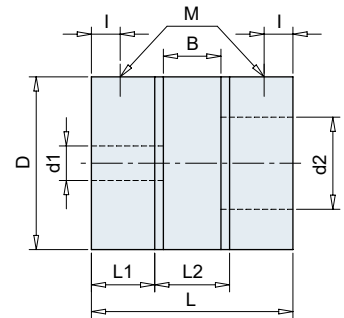
Flexible coupling size	Torsion(Nm)		Finished hole diameter d1,d2(min–max)	Overall dimensions						set screw	
	Rated Tkn	Greatest Tkmax		L	L1	L2	B	S	D	M	I
MTL-00	7.5	15	6--16	35	11	13	10	1.5	30	M4	5
MTL-01	10	20	6--19	66	25	16	12	2	41	M5	10
MTL-02	35	70	9--24	78	30	18	14	2	56	M5	10
MTL-03	95	190	10--28	90	35	20	15	2.5	67	M8	15
MTL-04	190	380	12--38	114	45	24	18	3	80	M8	15
MTL-05	265	530	14--42	126	50	26	20	3	95	M8	20
MTL-06	310	620	15--48	140	56	28	21	3.5	105	M8	20
MTL-07	410	820	20--55	160	65	30	22	4	120	M10	20
MTL-08	625	1250	22--65	185	75	35	26	4.5	135	M10	20
MTL-09	1280	2560	30--75	210	85	40	30	5	160	M10	25
MTL-10	2400	4800	40--90	245	100	45	34	5.5	200	M12	30
MTL-11	3300	6600	50--115	270	110	50	38	6	225	M12	30
MTL-12	4800	9600	60--125	295	120	55	42	6.5	255	M16	35

5\Specifications and dimensions of Longitudinal trunnion adaptor (TAL)
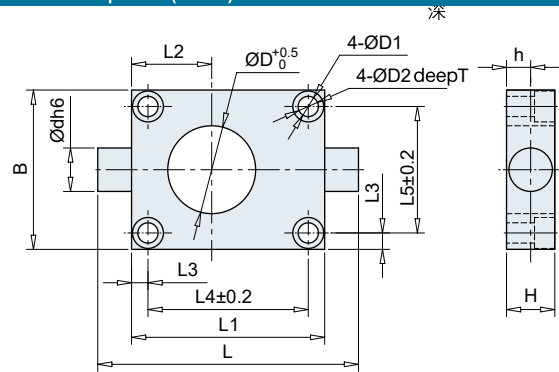
Model	D	d	B	L	L1	L2	L3	L4	L5	D1	D2	T	H	h
CS2.5-TAL	30	12	50	90	60	22	6	48	38	7	11	7	16	8
CS5-TAL	40	15	72	110	80	31	10	60	52	9	15	9	20	10
CS10-TAL	43	20	85	140	100	40	11	78	63	9	15	9	25	12.5
CS25-TAL	56	25	105	170	130	54	12	106	81	11	18	11	30	15
CS50-TAL	70	35	145	240	180	78	15	150	115	13	22	13	40	20
CS150-TAL	91	45	165	270	200	83	17	166	131	21	32	21	50	25
CS250-TAL	126	70	220	330	240	100	25	190	170	32	47	31	80	40
CS350-TAL	151	80	250	390	290	125	30	230	190	38	56	37	90	45
CS500-TAL	181	90	300	520	360	152	35	290	230	50			100	50

6\Specifications and dimensions of Transverse trunnion adapter (TAT)
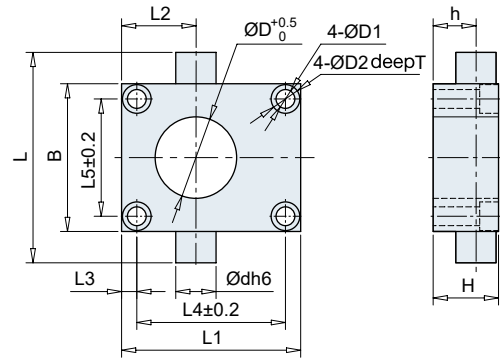
Model	D	d	B	L	L1	L2	L3	L4	L5	D1	D2	T	H	h
CS2.5-TAT	30	12	50	80	60	22	6	48	38	7	11	7	39	31
CS5-TAT	40	15	72	102	80	31	10	60	52	9	15	9	45	35
CS10-TAT	43	20	85	125	100	40	11	78	63	9	15	9	50	37.5
CS25-TAT	56	25	105	145	130	54	12	106	81	11	18	11	62	47
CS50-TAT	70	35	145	205	180	78	15	150	115	13	22	13	66	46
CS150-TAT	91	45	165	235	200	83	17	166	131	21	32	21	73	48
CS250-TAT	126	70	220	310	240	100	25	190	170	32	47	31	80	40
CS350-TAT	151	80	250	350	290	125	30	230	190	38	56	37	90	45
CS500-TAT	181	90	300	460	360	152	35	290	230	50			100	50

7\Specifications and dimensions of Trunnion Block (LB)
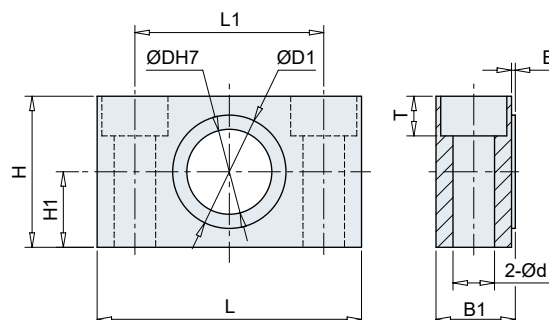
Model	D	D1	H	H1	L	L1	B	B1	d	d1	T
CS2.5-LB	12	20	30	15	50	35	2	18	7	11	7
CS5-LB	15	25	34	17	65	45	2	22	9	15	9
CS10-LB	20	30	38	19	70	50	2	22	9	15	9
CS25-LB	25	35	54	27	80	58	2	22	11	18	11
CS50-LB	35	50	70	35	100	70	2	32	13	22	13
CS150-LB	45	60	80	40	140	100	2	42	22	35	21
CS250-LB	70	90	124	62	220	160	2	65	32	50	31
CS350-LB	80	105	144	72	245	180	2	65	38	60	37
CS500-LB	90	120	160	80	280	200	2	82	50		

8\Specifications and dimensions of Mounting brackets (MF)
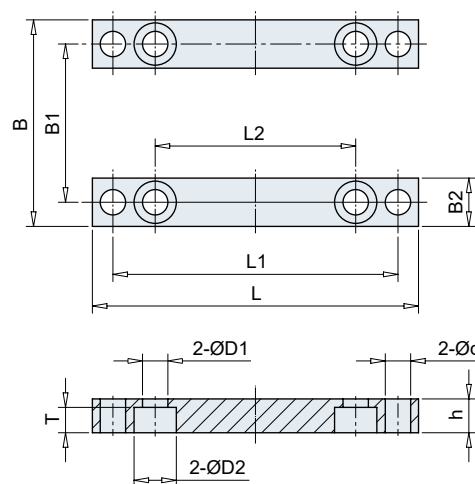
Model	L	L1	L2	B	B1	B2	d	D1	D2	T	h
CS2.5-MF	90	75	48	52	38	14	7	7	11	7	11
CS5-MF	120	100	60	72	52	20	9	9	15	9	13
CS10-MF	140	120	78	85	63	20	9	9	15	9	13
CS25-MF	170	150	106	105	81	25	11	11	18	11	16
CS50-MF	230	204	150	145	115	30	13	13	22	13	18
CS150-MF	270	236	166	171	131	40	21	21	35	21	28
CS250-MF	340	290	190	230	170	60	32	32	50	31	40
CS350-MF	410	350	230	270	190	80	38	38	60	37	50
CS500-MF	500	430	290	330	230	100	50	50	75	50	63

9\Specifications and dimensions of Connection shaft specification (RS)

$\emptyset Dj6$ C L B $^{\ 0}_{-0.2}$ T $^{+0.1}_{\ 0}$
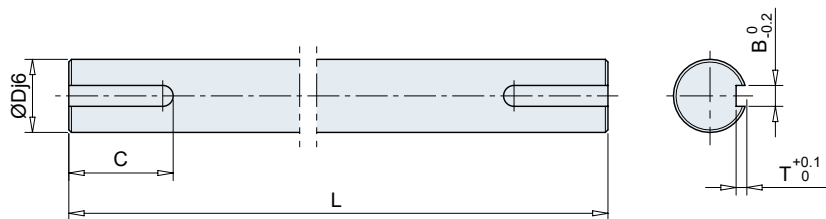
Model	D	C	B	T
RS-11	11	25	4	2.5
RS-19	19	30	6	3.5
RS-24	24	35	8	4
RS-28	28	40	8	4
RS-35	35	40	10	5
RS-40	40	50	12	5
RS-45	45	50	14	5.5

10\Specifications and dimensions of Handwheel (HW)

$\emptyset d$ $\emptyset D1$ $\emptyset D$ h H
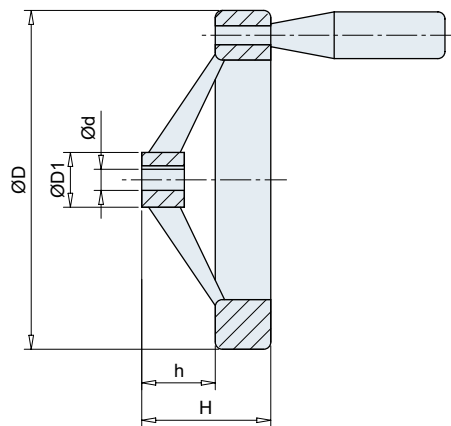
Model	d(H7)	D	D1	H	h
CS2.5-HW	9	80	23	35	17
CS5-HW	10	100	25	35	17
CS10-HW	14	125	31	44	22
CS25-HW	16	160	40	51	27
CS50-HW	20	200	48	55	30
CS150-HW	25	250	52	60	34
CS250-HW	30	320	60	64	40
CS350-HW	35	400	65	72	45
CS500-HW	48	630	80	80	50

The above are commonly used optional accessories, if you need special requirements of accessories, such as: limit units, with angle adapted to the flat head, the specified motor and connecting seat, the specified coupling, the specified speed ratio or the number of output shafts of the bevel gear box, with bearings and/or angle adapted to the trunnion bearing, special requirements of the connecting shafts, and so on ...... Please call or email to customize.

1\Determine the load: according to the required lifting force, transmission speed and installation location of the preliminary selection of the appropriate type of screw jacks and its speed ratio, see "Table 7-1, the main performance parameters table", and the preliminary selection of matching drive components to determine the installation of the entire system location and space, see "4\optional accessories". When there is no special requirement, the number of supporting accessories is only added after the supporting screw jacks model number, such as: "CS10"screw jack supporting Longitudinal trunnion adaptor (part identification: TAL) for "CS10-TAL".

2\Determine the working direction: determine the rotation direction of the input shaft (worm) according to the required working direction. The rotation direction of the worm and the extension and retraction direction of the working lead screw (or nut) are similar to the relation between the gear and the rack, as shown by the arrow in the schematic diagram of "Table 8-1, Table of Connection Dimensions - Type A". When multiple units are used in combination,pay attention to the rotation direction of the bevel gearbox.
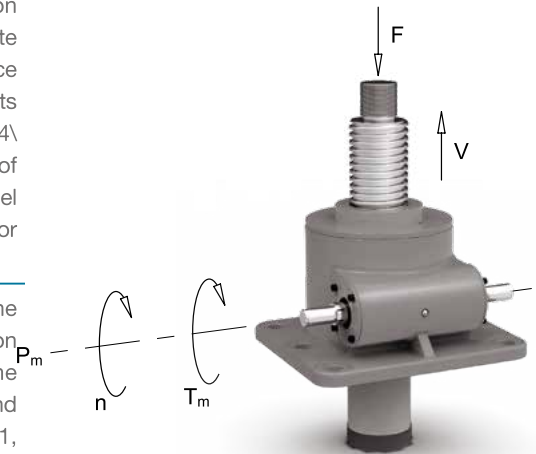
3\Determine the stroke:
After the initial selection of the stroke, according to "Table CS7-3, the relationship between the length of the screw and the ultimate load of the chart" check the critical bending force of the actuator, such as pressure load is too large, it is necessary to increase the specifications of the screw. Usually, it is to increase the specification of the screw jacks (the screw increases with it); in the case that the load of the screw jacks is enough, it is also possible to increase the specification of the screw only (need to contact the manufacturer for customization).

4\Determination of working speed
According to the work cycle and load, according to"Table CS7-2, lifting force and lifting speed table" to check the maximum permissible speed, such as speed is too high, you need to choose a larger specification of the screw jacks, in the case of the screw jacks load is enough can also only increase the lead screw (need to contact with the manufacturer to customize). For B-type of the jack, also need to check the permissible speed of the screw, see "Table CS7-4, B-type of the screw jacks screw speed and length of the relationship between the chart", such as speed is too high, it is necessary to increase screw specifications (need to contact with the manufacturer to customize), or increase the size of the screw jacks.

5\Determine the drive torque:$TM=(F×P)/(2×\pi×\eta×i)+T0$

TM:Required drive torque for screw jacks,Unit Nm；

F:Actual load on the screw,unit KN；

P:Lead of the screw, unit mm; (According to "CS7-1 Main Performance Parameters Table")

η:Total efficiency of the screw screw jacks; (According to"CS7-1 Main Performance Parameters Table")

i:Transmission ratio of the screw jacks; (According to "CS7-1 main performance parameter table")

T0:No-load torque, unit Nm; (According to"CS7-1 main performance parameter table")

Check the permissible torque under the corresponding working conditions according to "Table CS3-2, Lifting Force and Lifting Speed Table". Self-locking torque, starting torque and accelerating torque is generally higher than the torque in continuous operation (usually 1.3 to 1.5 times the calculated value), and the efficiency of intermediate drive components should be considered when multiple units are used in combination.

6\Determine drive power: $PM = TM \times n/9549$

PM:Drive power required for jack,unit Kw；

TM:Required drive torque for jack,Unit Nm；

n：Input speed required for the jack,Unit rpm；

Check the permissible power under the corresponding working conditions according to "Table CS7-2, Table of lifting force and lifting speed". Normally, the power of the motor is selected to be about 1.5 times the calculated value.

The system check must check that the direction of rotation of all worm screw jacks, right-angle drive gearboxes and drive motors is in the same direction as the feed of each worm screw jacks.

Parallelism errors must be ensured that all jacks are in one plane during installation,All drive components must be coaxial and parallel， Failure to do so will increase power consumption and overheating, wear and tear or even damage to the mechanism. Prior to installation, each worm gear screw jacks must be under unloaded conditions.Rotate once by hand over the full range of travel.

The test drive must ensure that all rotational directions of the system are correct before assembling the motor,and the limit switches operate properly. For both type A and type B screw jacks, the screw surface should be coated with a layer of grease to ensure adequate lubrication during operation.
No-load operation of the first test run.

It is not permissible to exceed, even briefly, the loads, speeds and operating conditions specified for the operation of the worm gear screw lifts and their accessories. Failure to observe these conditions renders all safety guarantees null and void.

Maintenance worm gear screw jacks generally use lithium-based grease, screw should be coated with enough grease, intermittent work when the box to add enough grease can be (new machine has been added to the grease), the use of regular refueling, the first six months should be cleaned for oil change; continuous work for more than an hour when the available gear box special lubricants circulating lubrication, the box about 70 ° C is a normal phenomenon.

Precautions: Before fully determining the specifications of the jack and its accessories, it is necessary to pay attention to: minimize the transmission parts and shorten the transmission shaft; The load on each drive component must be sufficient to avoid transmitting too much torque with one gear of the bevel gearbox; it is clear whether the direction of action of each screw jacks screw is correct, and whether the position of the jack and the bevel gearbox is reasonable; any lateral force that may occur on the lift screw must be borne by the external guide rail, and the screw must not be able to bear the lateral force. Selection of this manual standard T-screw jacks can be self-locking; ball screw drive and large lead screw jacks generally can not be self-locking, therefore, in the safety of the occasion and vibration occasions must be equipped with brakes.

Recommendation: Lift systems require experienced engineers and technicians for design and installation, our technical and sales staff are happy to solve any problem you may have, we are always ready to support you in the design of your drive train.

Three elements of the screw jacks layout: pull-up screw, compressor housing, and reduction of fixed bolt loads
(For screw jacks with a stroke of more than 1m,Screw arrangement preferably subject to tension drive,This will make the screw jacks last longer.)

For important occasions, a torque limiter should be installed between the motor and the jack to prevent damage to the mechanism due to overload from various causes.

-When the input speed is below 800 rpm, there is less heat generation and the service life will be longer.

Jack ordering information

Company: Contact person:

Address: Department:

Tel: Fax:

1\ The actual load of the lift:

                        Pressure: KN;   Tension: KN

2\ Load Type: Continuous☐; Oscillating☐; Reciprocating☐; Vibrating☐; Swing☐; Steady☐;

3\ Machine type: Square ☐; Snail ☐; Non-standard ☐

4\ Mounting Location: Vertical☐; Screw up☐; Screw down☐; Horizontal☐;

5\ Jack Speed Ratio: Fast N☐; Slow L☐; Non-standard (fill in data)☐

6\ Jack mechanism: Type A (screw lift type)☐; Type B (nut lift type)☐

7\ Connection form: Cylindrical☐; Flange☐; Thread☐; Flat head☐; Fork☐; Non-standard type (provide

                        drawing)☐.

8\ Anti-rotation device: Yes☐; No☐;

9\ Bellows type shield: Yes☐; No☐;

10\ Linear motion speed: (mm/min)

11\ Motor speed: (rpm, ≤1500 rpm)

12\ Stroke length: (mm)

13\ Work cycle: (reference: 1 hour of exercise/10 minutes of rest)

14\ External guiding device: Yes☐; No☐;

15\ Shaft of lifter: single output shaft ☐ (attached figure); Double output shaft ☐;

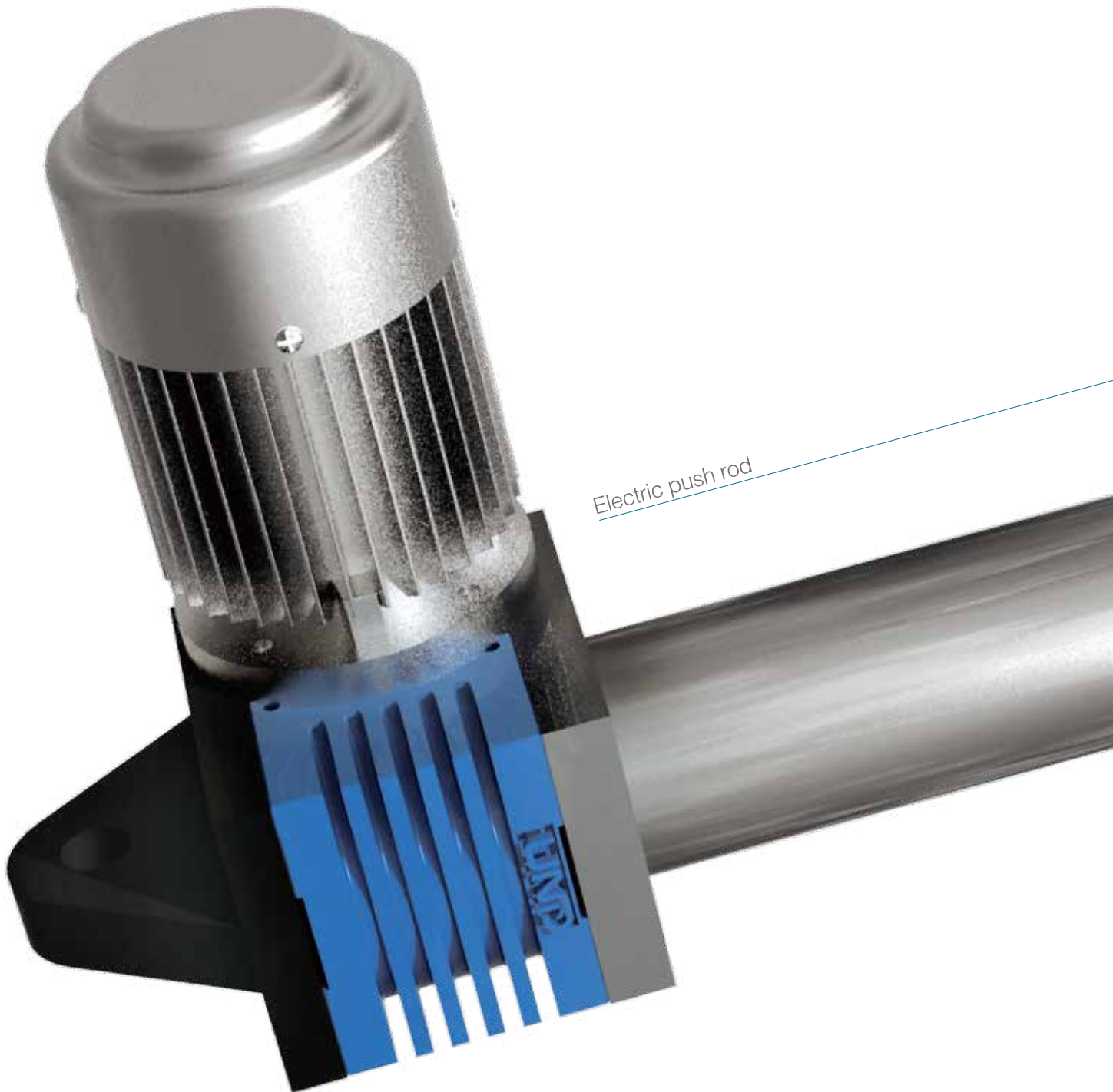16\ Screw Type: Trapezoidal Screw☐; Ball Screw☐

17\ Drive: Motor ☐; Handwheel ☐; Without ☐

18\ Exterior Finish: Paint: Primer (red)☐; Topcoat (specify color)☐; Galvanized☐; No finish☐;
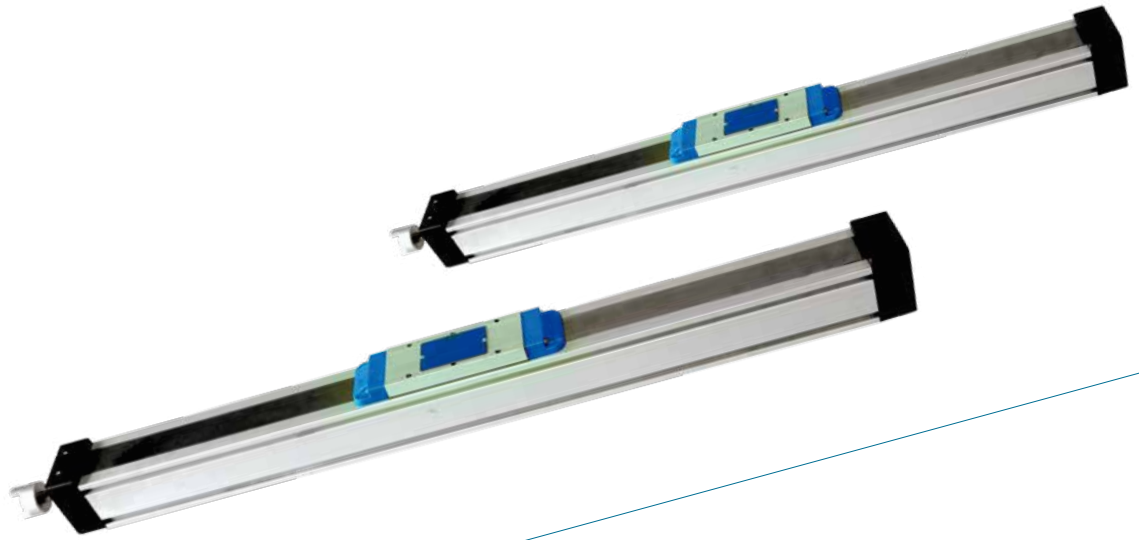
19\ Working environment: Indoor☐; Outdoor☐;

20\ Other annexes:

21\ Customer Suggestion:

Electric push rod

Straight line unit

Electric push rod

1   2   3   4   5   6   7   8

1\ fuselage model :CS for square body, S for snail body

2\ Maximum load capacity series are available:2.5KN,5KN,10KN,25KN,50KN,150KN,250KN,350KN,500KN

3\ gear ratio N: Normal speed ratio L: Slow speed ratio

4\ Type A: Screw moves axially without rotation B: Nut moves axially and screw rotates.

5\ Forms of Screw Joints The A-type forms of screw heads are divided into five types: Type 1 (cylindrical), Type 2 (flange), Type 3 (threaded), Type 4 (flat head), and Type 5 (open).
B type form of the screw head is divided into: type 1 (cylindrical), type 0 (no joint), a total of two types.

6\ For the travel of the jack, refer to the "Relationship between Screw Length and Ultimate Pressure Load" in the catalog.

7\ Additional Requirements Additional requirements for Type A forms are:Ball screw type (B) with anti-rotation device (P)
Additional requirements for Type B structural forms are:Ball Screw Type (B) with protective cover (S)

8\ Optional accessory S: bellows guard

MA: Motor adaptor (if the size is inconsistent with our sample, please indicate in the special requirements) MT: Moto
FC: Flexible coupling TAL: Longitudinal trunnion adaptor TAT: Transverse trunnion adapter LB: Trunnion Block MF:

Mounting brackets RS: Connecting shaft HW: Handwheel

Note: Please indicate below if you have special requirements!

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January 2020

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