

Hi-Speed Jack

New generation jack!

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Smoothy Screw Jack /07

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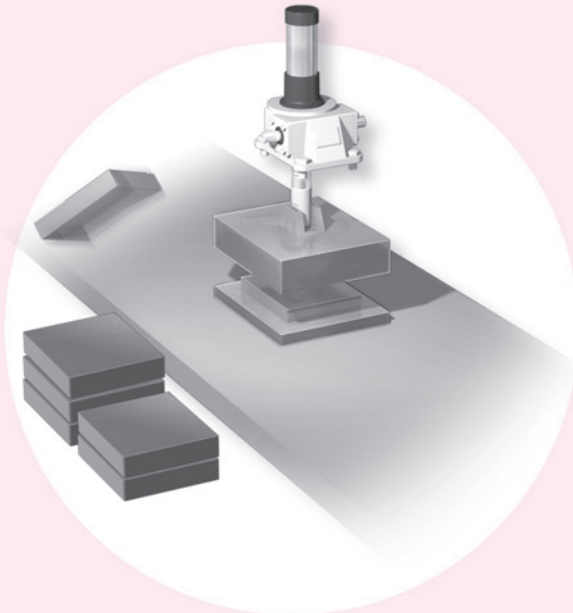
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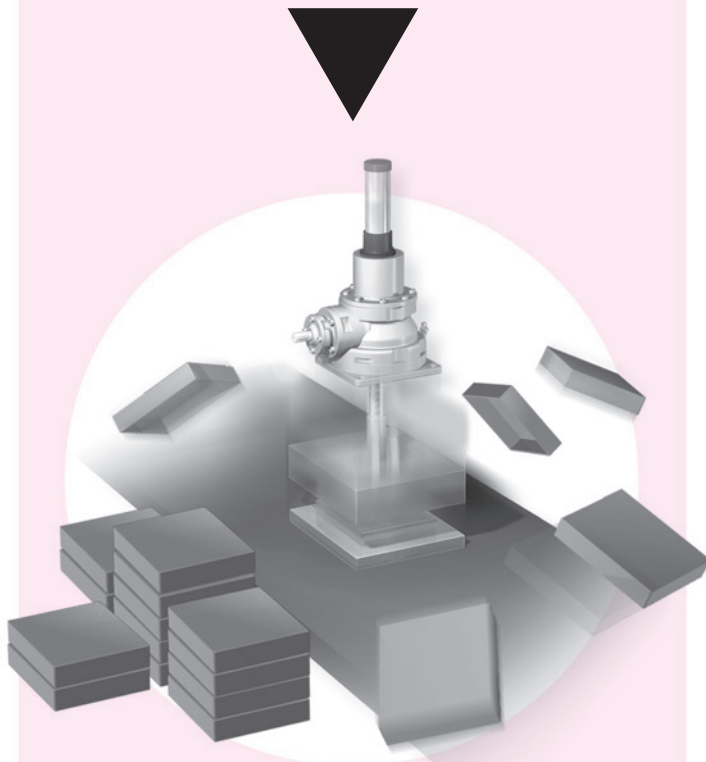
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Hi-Speed Jack: Structure & Features

High speed, high frequency, and high efficiency operation increased productivity and contributes to energy saving and environmental measures. The jack can be used not only for ordinary lifting, but also for various purposes.



The duty cycle of conventional jacks is 12.5%ED.
The maximum time in operation is 7.5 minutes per hour.

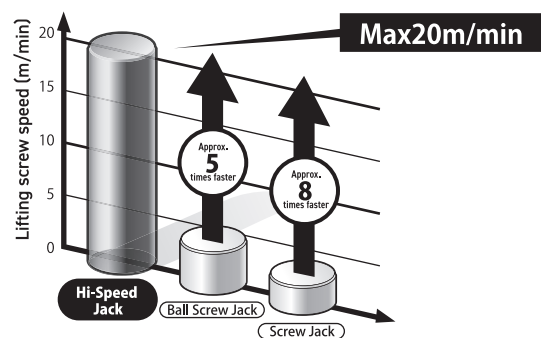


The maximum duty cycle of hi-speed jacks is 70%ED.
The jacks can operate up to 42 minutes per hour.
Achieving higher speeds, the jacks enable faster and increased production.

- This type of jacks, consisting of "a bevel gear and a high-lead ball screw", delivers increased efficiency. It realizes input rotation speed of max. 2000-3000 min⁻¹, and can be used for wide-ranging operations by utilizing a servomotor.

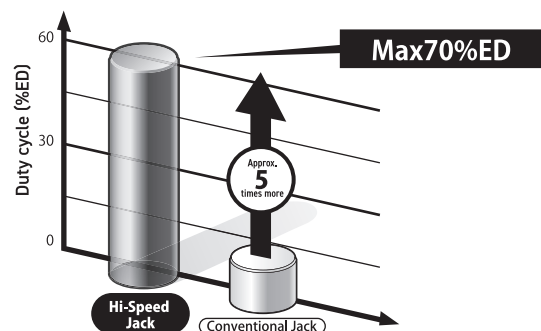
Realized a shorter cycle!!

Lifting screw speed: max. 20m/min!
Not only powerful, but also speedy



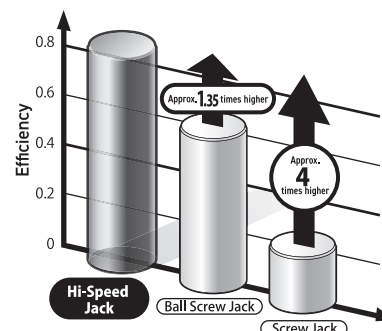
Significant increase in production capacity!

Achieved 70%ED!
Enables higher frequency operation at higher speed



Energy-saving operation!

All series achieved high efficiency of 0.81!
Design to minimize losses



Standard Specifications

Series code	JSH	JOH	J1H	J2H
Capacity	5kN	10kN	25kN	50kN
Lifting screw diameter	20mm	25mm	36mm	40mm
Lifting screw lead	20mm	25mm	36mm	40mm
Worm gear ratio	3	3	3.64	4
Efficiency	0.81	0.81	0.81	0.81
Maximum allowable power	1.3kW	1.6kW	2.5kW	3.3kW
Torque coefficient (a)	1.45	1.81	2.18	2.18
Inertia moment (kg·m ²)	0.0009	0.0025	0.0093	0.0189
Input torque at allowable load *1	7.3N·m	18N·m	55N·m	109N·m
Allowable acceleration torque *1	8.0N·m	20N·m	60N·m	120N·m
Holding torque at maximum load	6N·m	15N·m	43N·m	86N·m
Speed coefficient (c) (screw lead per rotation of input shaft)	6.67mm	8.33mm	10mm	10mm
Maximum allowable input rotation speed	3000min ⁻¹	2400min ⁻¹	2000min ⁻¹	2000min ⁻¹
Anti-rotation key torque at maximum load	2.5N·m	6.3N·m	22.5N·m	50N·m
Input shaft allowable overhang load	120N	150N	400N	800N
Amount of filled grease	20g	25g	45g	80g
Amount of oil	0.1ℓ	0.3ℓ	0.5ℓ	1.8ℓ
Approximate weight (at stroke of 100)	15kg	20kg	45kg	95kg
Operating temperature range	-10~50℃	-10~50℃	-10~50℃	-10~50℃

*1: Calculated by deducting "input shaft torque at no load" from "required input shaft torque" (as per the formula shown in Step 2).

Caution

Caution for Selecting a Jack

- 1 In selecting a jack, please ensure that the motor capacity, lifting load, lifting screw speed, allowable buckling load, etc., which you need, are within the range specified in the specification table. If your selection is not adequate, it may cause damage to not only the jack itself, but also your device, or may lead to a serious accident.
- 2 During the use, the stroke should never exceed the specified stroke range. Prepare a reliable limit detector and stopping device to avoid possible damage to the lifting screw and drive gear. Please select a jack with sufficient allowance against the stroke you need for your operation.
- 3 Please take care to ensure that the load on the jack is applied concentrically with the screw shaft. If eccentric load is applied to the jack, it may induce an excessive bending moment, and damage the jack. Furthermore, if there are excessive restraints, unbalanced load may be induced on the jack. Therefore, when connecting the jack to your device, please secure a certain degree of freedom.
- 4 As a power source, please select an appropriate motor size based on the jack efficiency. If the jack is operated by supplying excessive power, it may cause damage to the jack and/or your device. As this type of jacks does not have a self-locking function, a brake must be installed.
- 5 When installing the jack, please fix it on a highly rigid, flat and level base plate. The standard installation attitude is vertical to the screw shaft. When attaching a motor, speed reducer, etc., please perform the centering.
- 6 The lifting screw does not have an anti-rotation mechanism. Please take necessary action at the side of your device, in order to prevent the rotation of the screw shaft.
- 7 In case the jack is attached to a vibrating machine or device, please take care to ensure that the vibration is not transmitted directly to the jack. If excessive vibration works on the jack, it may lead to the loosening/breakage of locking bolts, or breakage of the lifting shaft cover.
- 8 Dirt on the screw shaft accelerates wear. Protect the shaft by using dustproof bellows, etc.
- 9 The jack is designed for intermittent operation. It cannot be used for continuous operation. Taking 60 minutes as a unit time, the jack must be operated by ensuring that the duty cycle does not exceed 70%ED, and the starting frequency per minute does not exceed 20 times. As for the surface temperature around the input shaft of the housing, please ensure that the temperature does not exceed the ambient temperature plus 50°C and is no more than 93°C at a maximum, while using the jack.

$$\%ED \text{ (duty cycle)} = \frac{\text{Operating time per cycle}}{\text{Operating time per cycle} + \text{Resting time per cycle}} \times 100 (\%)$$

- 10 If the jack's support length (the length "L" indicated on P153 "Allowable Buckling Load") exceeds 1000 mm, please consult with us, as it may induce self-excited vibration.
- 11 Please ensure slow start/slowdown of the jack, not to exceed the allowable acceleration torque.

Calculating Formula

Formula for calculating required power

Step 1 Calculate the input shaft rotation speed.

$$n = \frac{v}{c}$$

V: Lifting screw speed (mm/min)
n: Input shaft rotation speed (min⁻¹)
c: Speed coefficient
(refer to the specification table)

Step 2 Calculate input shaft torque (N·m).

$$T = a \cdot W + b$$

T: Required input shaft torque (N·m)
a: Torque coefficient
(refer to the specification table)
b: Input shaft torque at no load (N·m)
(refer to the table of torque at no load)
W: Lifting load (kN)

$$P_G = \frac{n \times a \cdot W}{9550}$$

* **Consideration:** Please ensure that the value of PG does not exceed the maximum allowable power indicated in the specification table.

Step 4 Calculate the required power (kW).

$$P = \frac{n \times T}{9550}$$

P: Required power (kW)
n: Input shaft rotation speed (min⁻¹)
T: Required input shaft torque (N·m)

Torque at no load (b)

		Screw shaft speed (mm/min)	More than 0 up to 100	More than 100 up to 1000	More than 1000 up to 4000	More than 4000 up to 10000	More than 10000 up to 20000
JSH	Ambient temperature (Celsius)	More than 50°C up to 30°C	0.2	0.6	0.9	1.1	1.2
		More than 30°C up to 10°C	0.6	1.8	3.7	5.8	8.2
		More than 10°C up to -10°C	0.8	2.6	5.1	8.1	11.5
		More than 50°C up to 30°C	0.1	0.4	0.9	1.4	2.0
JOH	Ambient temperature (Celsius)	More than 30°C up to 10°C	0.4	1.2	2.4	3.8	5.4
		More than 10°C up to -10°C	1.1	3.6	7.2	11.4	16.2
J1H	Ambient temperature (Celsius)	More than 50°C up to 30°C	0.3	0.8	1.6	2.5	3.6
		More than 30°C up to 10°C	0.4	1.2	2.4	3.8	5.4
J2H	Ambient temperature (Celsius)	More than 10°C up to -10°C	1.4	4.4	8.9	14.0	19.8
		More than 50°C up to 30°C	0.6	1.8	3.6	5.7	8.0
	Ambient temperature (Celsius)	More than 30°C up to 10°C	1.6	5.0	10.0	15.8	22.4
		More than 10°C up to -10°C	3.5	11.0	22.0	34.8	49.2

Selection of lubricant

Ambient temperature	Lubricating Oil Viscosity / Grade
10°C~50°C	AGMA5EP (ISO No. VG220 gear oil)
-10°C~30°C	AGMA4EP (ISO No. VG150 gear oil)

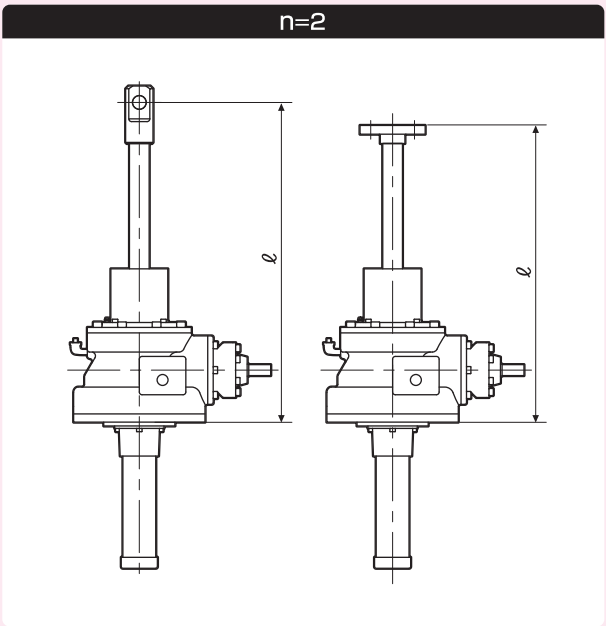
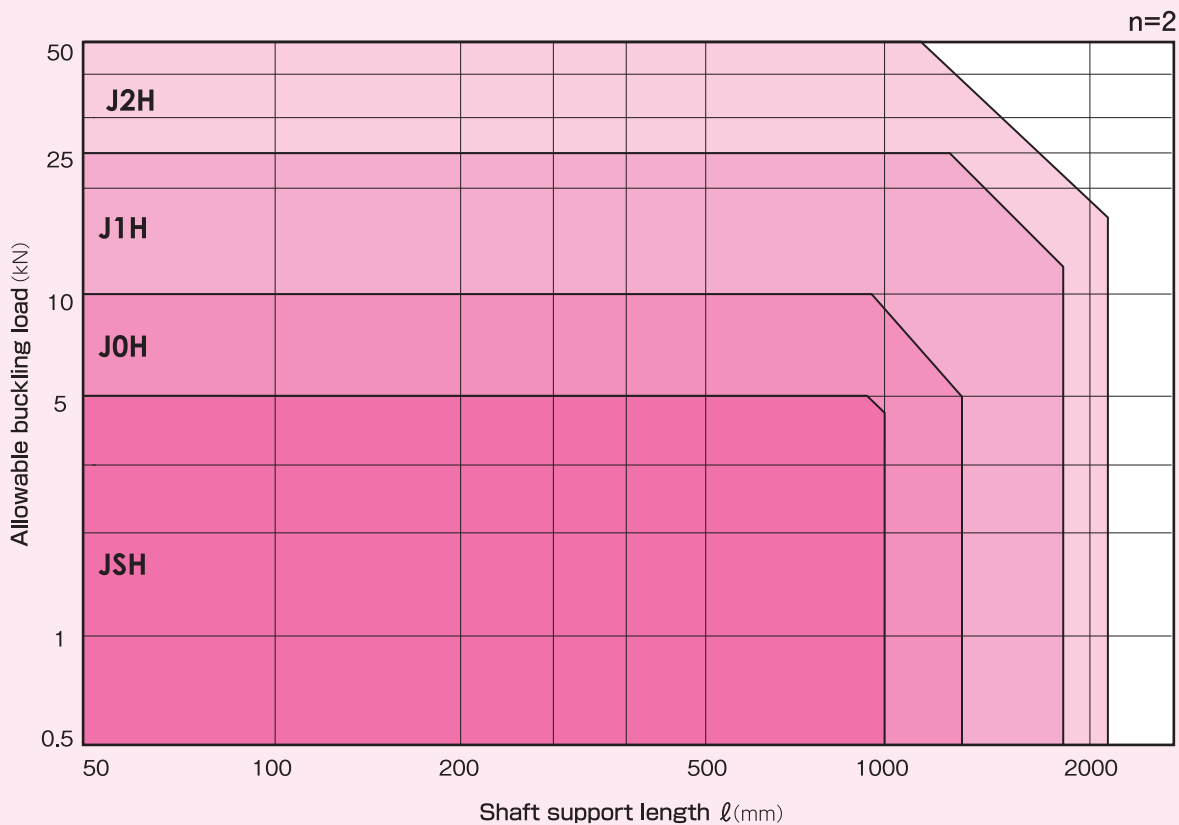
Oil is removed at the time of shipment. Prior to the initial use of the jack, the above-mentioned oil must be filled up to the center line of the oil gauge.

Allowable
buckling
load

Allowable Buckling Load

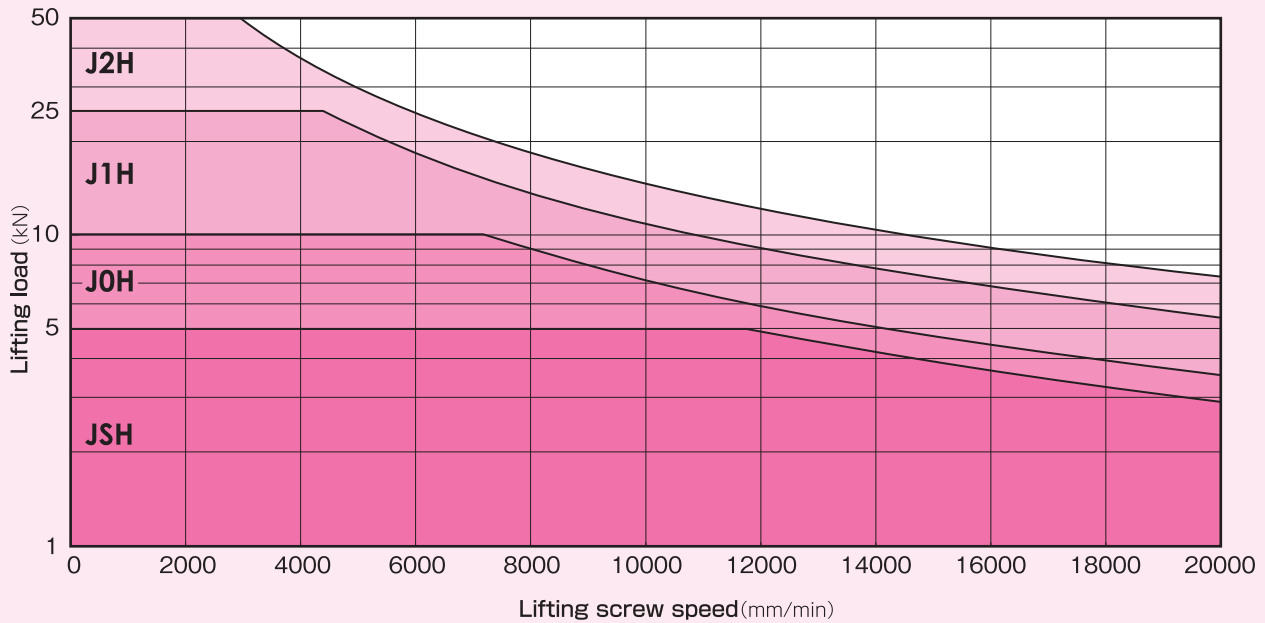
Longer stroke lengths with loads in compression are subject to buckling. Buckling loads differ depending on screw ends and whether the main part is fixed or supported. Please refer to the following graphs, and select the series/size at the intersection of load (vertical axis) and shaft support length (horizontal axis) or above it. * When loaded in tension, there is no need to consider buckling.

Jack fixed / screw end supported



Lifting load/
Lifting screw
speed
graphs

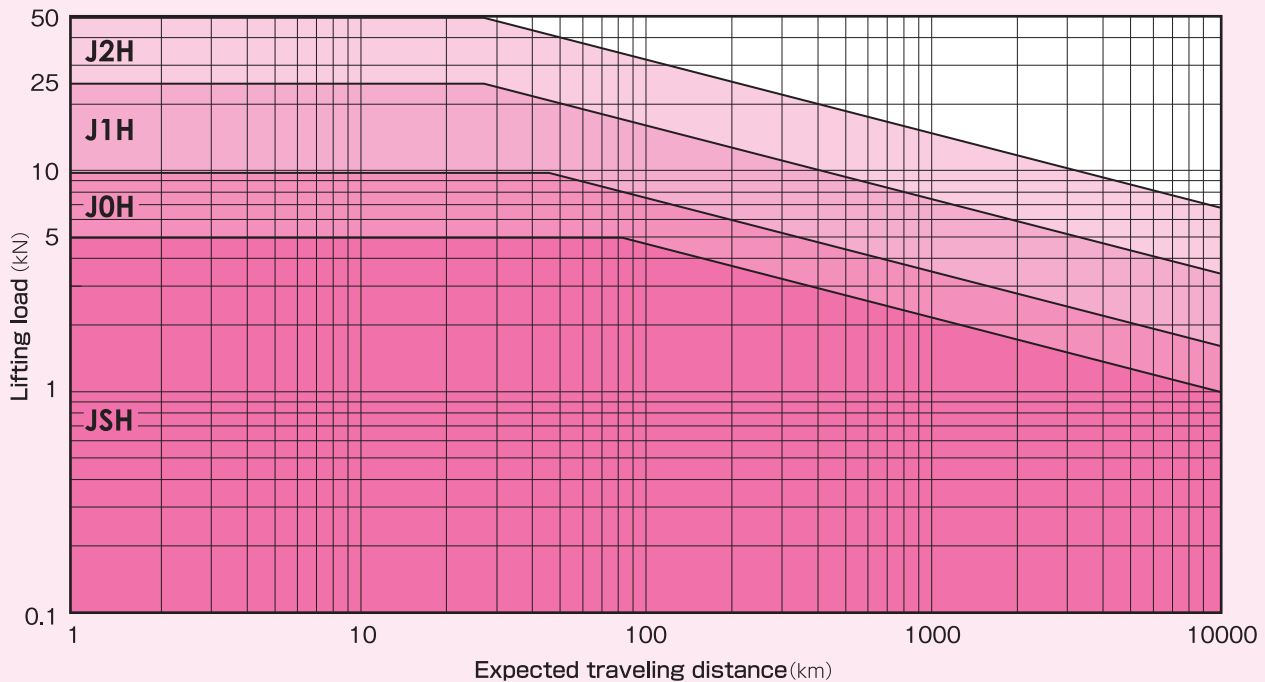
Lifting Load / Lifting Screw Speed Graph



Expected
traveling
distance

Expected Traveling Distance

The ball screw life, similarly to the bearing life, is determined by the flaking of the ball rotating surface due to fatigue. By using the following graph, please check the approximate lifetime (expected traveling distance) of each jack series. As for operating conditions, the graph is prepared for the case of "smooth operation without shock".



Notes concerning the use of the above graph

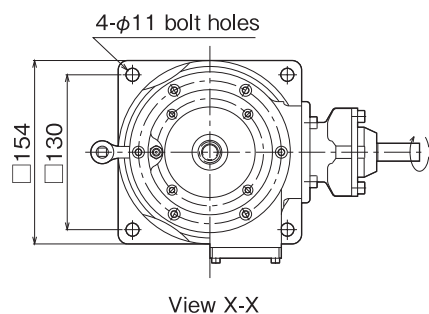
1. Jack's life depends on installed conditions, loading conditions, frequency of use, operating conditions, lubrication conditions, surrounding environment, maintenance conditions. Please take those factors into account to estimate the product lifetime.
2. If your conditions of use are severe, please upsize your model or contact us for special-purpose product.

JSH
 Dimensional
 Drawing

Dimensional Drawing: JSH Translating Hi-Speed Jack

When the input shaft rotates in the direction indicated by an arrow, the lifting screw ascends. Indicated by an arrow, the lifting screw ascends.

Two-dimensional drawing

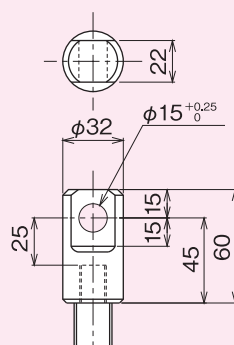


Dimensional drawing of input shaft end

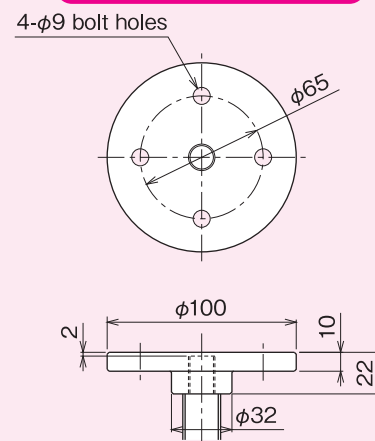


Dimensional drawing of screw end fittings

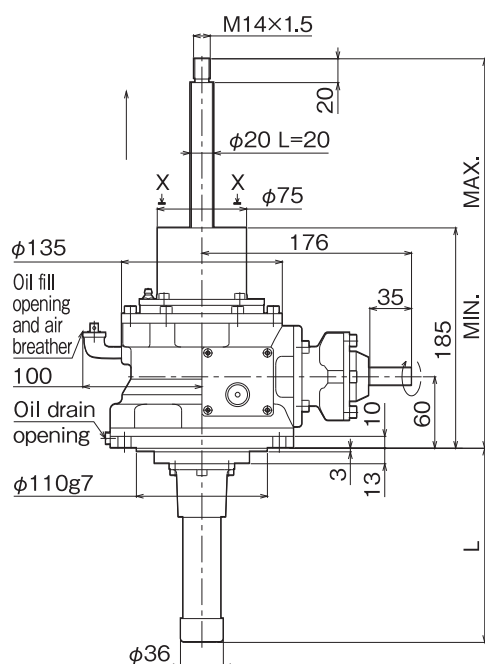
Clevis



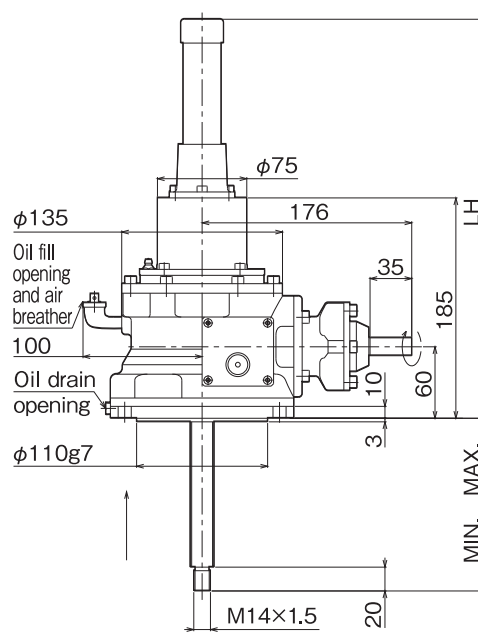
Flange



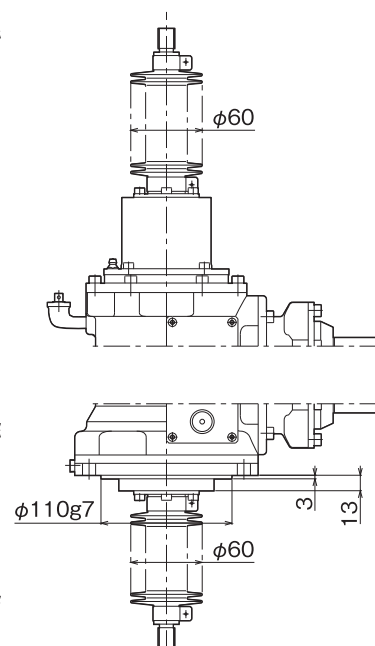
Upright



Inverted



Outer diameter of bellows



JSH Hi-Speed Jack Measurement Table

Stroke	U: Upright						I: Inverted					
	N: Without bellows			B: With bellows			N: Without bellows			B: With bellows		
	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L
100	225	325	263	275	375	263	45	145	435	95	195	435
200	225	425	363	275	475	365	45	245	535	95	295	535
300	225	525	463	305	605	463	45	345	635	125	425	635
400	225	625	563	305	705	563	45	445	735	125	525	735
500	225	725	663	315	815	663	45	545	835	135	635	835
600	225	825	763	315	915	763	45	645	935	135	735	935
800	225	1025	963	365	1165	963	45	845	1135	185	985	1135

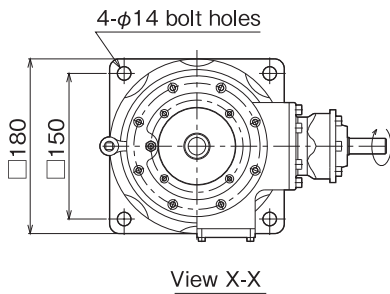
If your required stroke is not shown in the above table, please consult with us, as we can manufacture what you need.

JOH
Dimensional
Drawing

Dimensional Drawing: JOH Translating Hi-Speed Jack

When the input shaft rotates in the direction indicated by an arrow, the lifting screw ascends.

Two-dimensional drawing

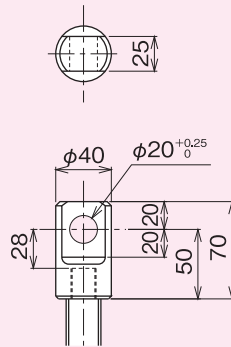


Dimensional drawing of input shaft end

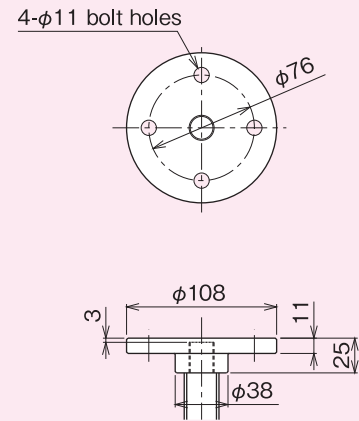


Dimensional drawing of screw end fittings

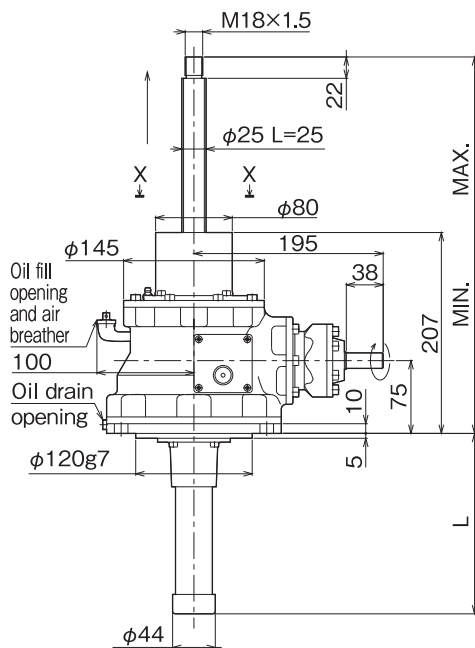
Clevis



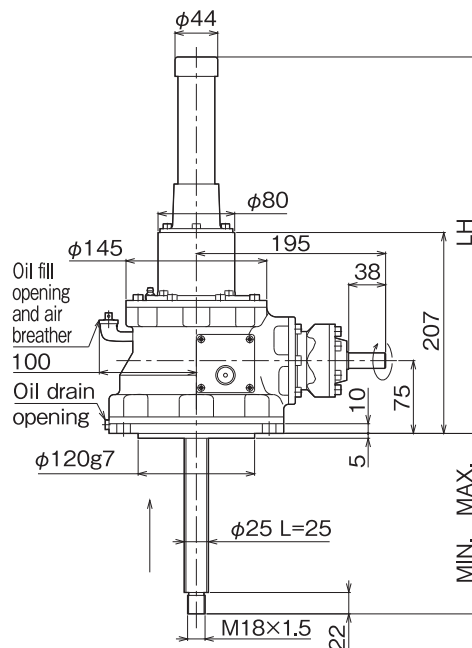
Flange



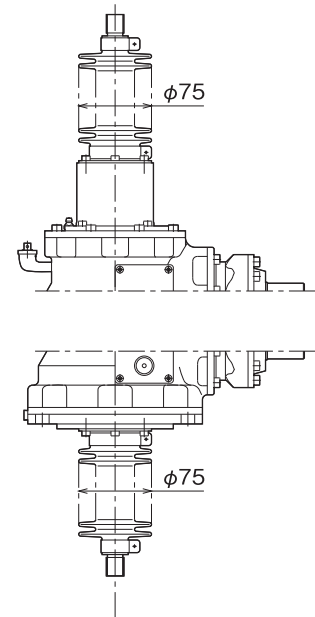
Upright



Inverted



Outer diameter of bellows



JOH Hi-Speed Jack Measurement Table

Stroke	U: Upright						I: Inverted					
	N: Without bellows			B: With bellows			N: Without bellows			B: With bellows		
	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L
100	250	350	260	285	385	260	50	150	463	85	185	463
200	250	450	360	285	485	360	50	250	563	85	285	563
300	250	550	460	320	620	460	50	350	663	120	420	663
400	250	650	560	320	720	560	50	450	763	120	520	763
500	250	750	660	320	820	660	50	550	863	120	620	863
600	250	850	760	360	960	760	50	650	963	160	760	963
800	250	1050	960	360	1160	960	50	850	1163	160	960	1163

If your required stroke is not shown in the above table, please consult with us, as we can manufacture what you need.

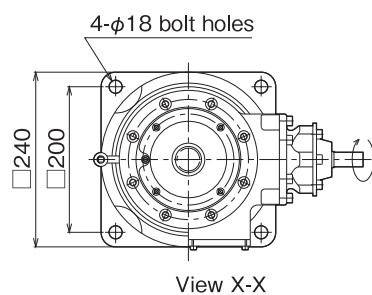
J1H

Dimensional Drawing

Dimensional Drawing: J1H Translating Hi-Speed Jack

When the input shaft rotates in the direction indicated by an arrow, the lifting screw ascends.

Two-dimensional drawing

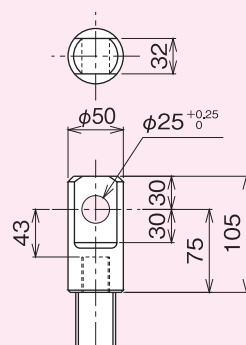


Dimensional drawing of input shaft end

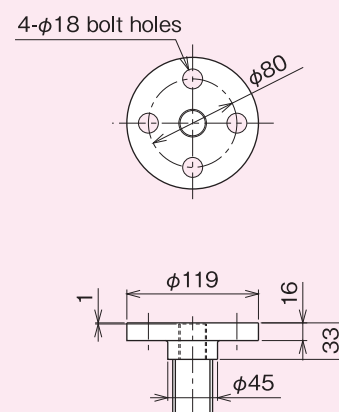


Dimensional drawing of screw end fittings

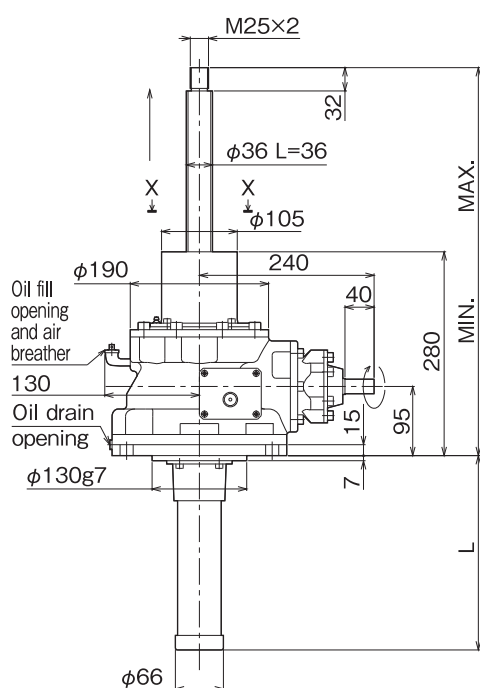
Clevis



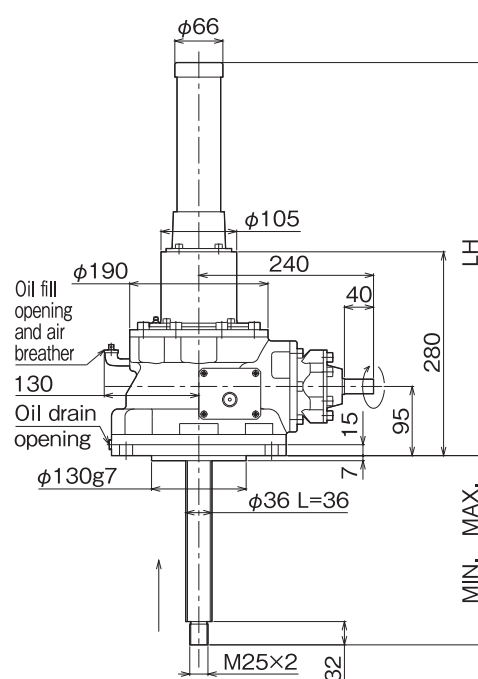
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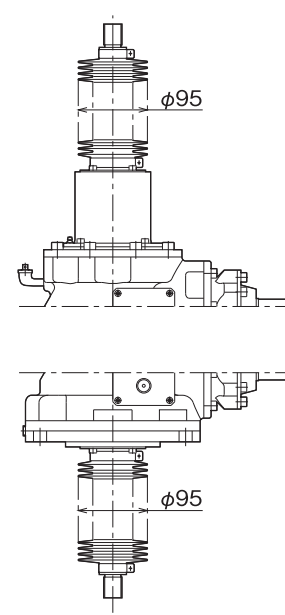
Upright



Inverted



Outer diameter of bellows



■ J1H Hi-Speed Jack Measurement Table

Stroke	U: Upright						I: Inverted					
	N: Without bellows			B: With bellows			N: Without bellows			B: With bellows		
	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L
100	335	435	267	370	470	267	60	160	540	95	195	540
200	335	535	367	370	570	367	60	260	640	95	295	640
300	335	635	467	405	705	467	60	360	740	130	430	740
400	335	735	567	405	805	567	60	460	840	130	530	840
500	335	835	667	405	905	667	60	560	940	130	630	940
600	335	935	767	445	1045	767	60	660	1040	170	770	1040
800	335	1135	967	445	1245	967	60	860	1240	170	970	1240

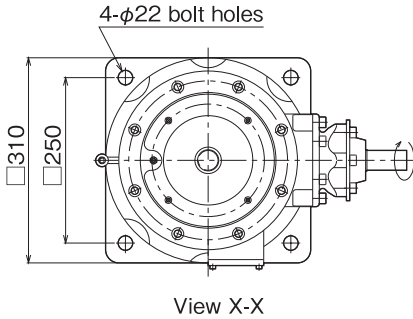
· If your required stroke is not shown in the above table, please consult with us, as we can manufacture what you need.

J2H
Dimensional
Drawing

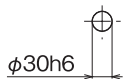
Dimensional Drawing: J2H Translating Hi-Speed Jack

When the input shaft rotates in the direction indicated by an arrow, the lifting screw ascends.

Two-dimensional drawing

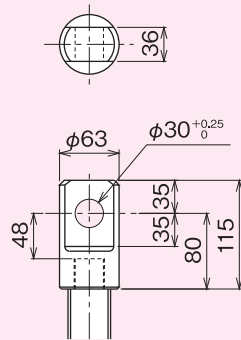


Dimensional drawing of input shaft end

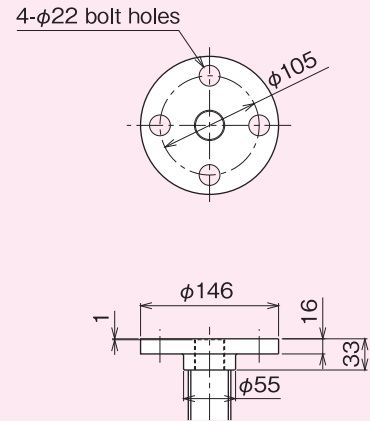


Dimensional drawing of screw end fittings

Clevis



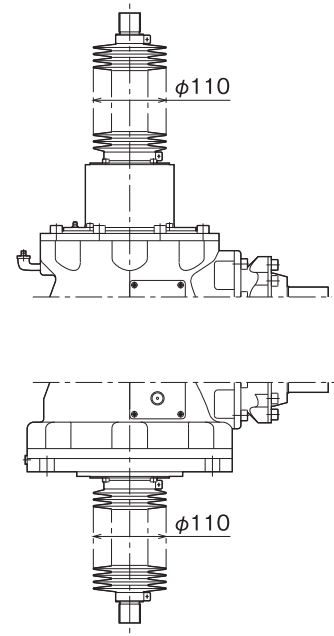
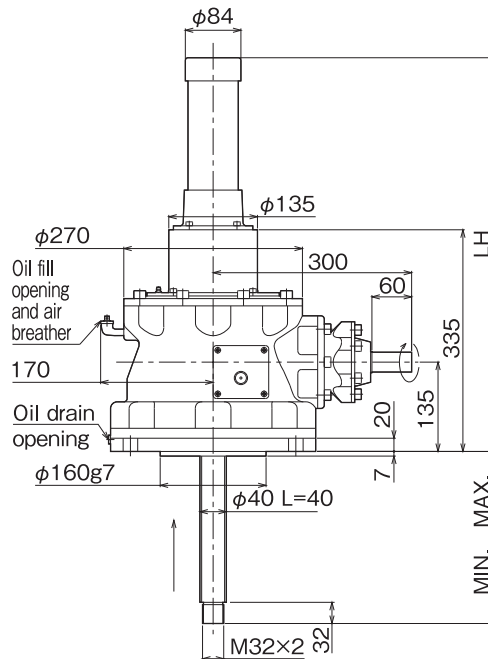
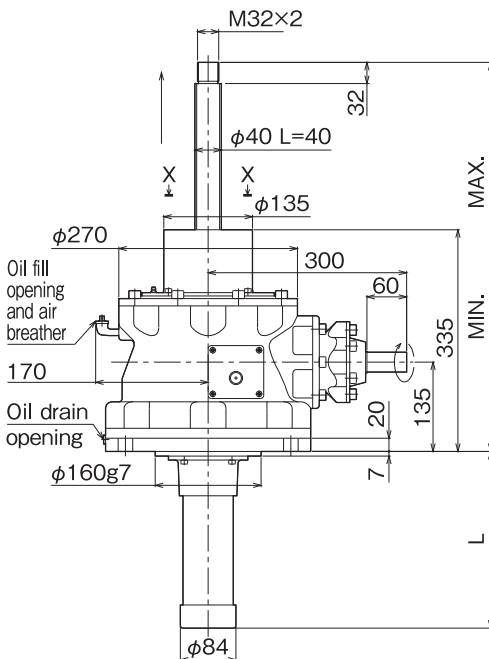
Flange



Upright

Inverted

Outer diameter of bellows



J2H Hi-Speed Jack Measurement Table

Stroke	U: Upright						I: Inverted					
	N: Without bellows			B: With bellows			N: Without bellows			B: With bellows		
	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L	MIN.	MAX.	L
100	390	490	267	425	525	267	60	160	595	95	195	595
200	390	590	367	425	625	367	60	260	695	95	295	695
300	390	690	467	460	760	467	60	360	795	130	430	795
400	390	790	567	460	860	567	60	460	895	130	530	895
500	390	890	667	460	960	667	60	560	995	130	630	995
600	390	990	767	500	1100	767	60	660	1095	170	770	1095
800	390	1190	967	500	1300	967	60	860	1295	170	970	1295

If your required stroke is not shown in the above table, please consult with us, as we can manufacture what you need.