Simran Flowtech Industries

Cubical Worm Gear Screw Jack
CWJ

PRELIMINARY SELECTION TABLE

Cubical Worm Gear Screw Jack CWJ 0.5 to CWJ 50

Cubical Worm Gearbox Type	Standard Cubical Worm Gearbox CWJ																		
Nominal Size, CWJ	0.5		1		2.5		5		10		20		25		35		40		50	
Maximum lifting capacity, KN	5		10		25		50		100		200		250		350		400		500	
Lifting screw TR	18X3		20X4		30X6		40X7		55X9		70X10		80X10		90X10		100X12		120X16	
Normal N, Slow L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L
Ratio	5:1	20:1	10:1	30:1	10:1	30:1	10:1	30:1	10:1	30:1	10:1	30:1	10:1	30:1	10:1	32:1	10.67:1	30:1	10.67:1	32:1
Lift per turn of worm, at ratio, mm	0.6	0.15	0.4	0.13	0.6	0.20	0.7	0.23	0.9	0.3	1	0.33	1	0.33	1	0.33	1.12	0.38	1.5	0.5
Total efficiency, at ratio	0.243	0.15	0.3	0.17	0.26	0.17	0.234	0.16	0.225	0.153	0.21	0.14	0.19	0.126	0.17	0.12	0.18	0.12	0.19	0.13
Screw efficiency	0.353		0.40		0.40		0.365		0.35		0.32		0.29		0.262		0.278		0.30	
Screw torque at max max lifting capacity, at ratio Nm	6.76		15.9		59.8		152.6		411		1007		1390		2129		2752		4236	
Worm torque at max lifting capacity, at ratio Nm	1.98	0.78	2.47	1.22	9.26	4.59	23.6	11.71	63.7	31.60	156	77.3	215.3	106.7	330	164	401	200	618	307
Max permissible torque at worm shaft Nm	8.5		20.5		92		195		195		318		318		840		1960		1960	
Weight without lifting screw, push and protection tube, kg	1.8		6		6.5		18		35		56		63		110		180		180	
Weight per 100 mm of screw, push rod and protection tube, kg	016		0.22		0.5		0.9		1.8		2.8		3.7		4.6		5.6		8	

CWJ 0.5 to CWJ 50 Type 1 & Type 2

HEAD TYPE I   HEAD TYPE III   HEAD TYPE IV   HEAD TYPE II

Type 1

Type 2

Translating Screw — Type 1 Design A

Translating Screw — Type 1 Design B

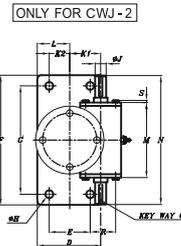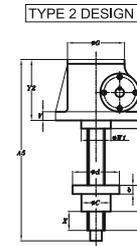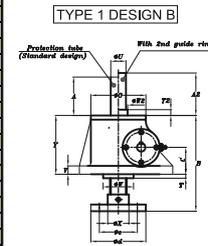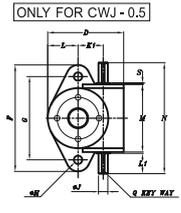Rotating Screw — Type 2 Design A

Rotating Screw — Type 2 Design B
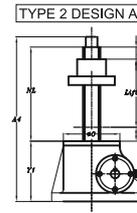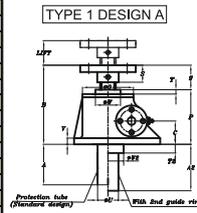
CWJ 0.5 To CWJ 25 & 35 To 50 Type 1 & Type 2

Nominal Size CWJ 0.5 to CWJ 25, Type 1 & Type 2

Nominal Size	0.5	1	2.5	5	10	20	25	35	40	50	60
Lifting Screw Tr	18X3	20x4	30x6	40x7	55x9	70x10	80x10	90x10	100x12	120x16	120x16
A	118	150	206	270	270	350	350	390	490	490	490
A1	70	100	126	160	170	230	230	250	320	320	320
A2	56	80	102	130	134	180	180	200	230	230	230
A3	7	10	12	15	18	25	25	25	45	45	45
A4	7	7.5	12	15	18	25	25	25	25	25	25
A5	80	85	131	165	175	230	230	270	355	355	355
A6	4	1	2	5	5	2	2	2	5	5	5
B	39	56	68	90	115	125	125	160	160	170	170
B1	20	30	35	45	50	50	50	60	60	60	60
C1	15	15	20	25	25	25	25	40	40	40	40
D1	30	44	60	69	90	120	120	150	210	210	210
D11		60	68	86	86	94	94	100			
D12	25	32	51	64	80	102	102	127	153	153	153
E	94	100	155	195	211	280	280	320	405	405	405
E1	29	32.5	45	50	63	75	75	85	105	105	105
F thro'	9	9	11	13							
F1					M20	M30	M30	M30	M30	M30	M30
F2					30	45	45	45	45	45	45
F4xl		M5x10	M6x12	M8x15	M8x15	M10x18	M10x18	M10x18	M12x15	M12x15	M12x15
H	30	30	50	70	70	90	90	110	140	140	140
K	3x3x15	4x4x20	6x6x30	8x7x40	8x7x40	8x7x50	8x7x50	12x8x60	6x10x7	6x10x70	16x10x7
L	24	25	40	55	50	60	60	70	85	85	85
M		30	45	30	30	30	30	45			
nxF6		4xM5x2	4xM6x12	4xM8x16	4xM8x16	6xM8x15	6xM8x15	4xM10x18			
S	50	70	90	120	150	176	176	230	270	270	270
S1	25	35	45	60	75	88	88	115	135	135	135
S2	10	20	25	35	40	40	40	50	50	50	50
dj6	9	12	20	25	25	30	30	40	55	55	55
Head Type II											
D2	54	79	89	109	149	198	218	278	278	298	298
D3	40	60	67	85	117	155	170	220	220	240	240
D4	26	39	46	60	85	105	120	150	150	170	170
L1	14	21	23	30	50	60	60	70	70	80	80
L2	8	8	10	15	20	30	30	40	40	50	50
nxF5	4x7	4x11	4x11	4x13	4x17	4x25	4x25	6x29	6x29	6x32	6x32
Head Type I											
D5	12	15	20	30	40	55	65	75	85	100	100
L3	20	25	30	45	60	80	85	110	120	120	150
Head Type III											
D6	M12x1	M14x2	M20x2.5	M30x3.5	M36x4	M56x5.5	M64x4	M70x6	M70x6	M90x6	M90x6
L4	20	20	30	30	48	58	58	70	70	90	90
Head Type IV											
D7		38	48	68	88	108	118	138	138	168	168
D8		20	25	35	50	60	65	80	80	100	100
L5		75	95	125	180	210	225	280	280	350	350
L6		55	70	90	130	150	160	200	200	250	250
L7		25	30	40	60	75	80	100	100	120	120
L8		40	50	70	100	120	130	160	200	160	200
Travelling Nut Type 2											
NL	72+Lift	90+Lift	110+Lift	145+Lift	165+Lift	190+Lift	190+Lift	230+Lift	285+Lift	285+Lift	285+Lift
D13	50	55	80	87	110	125	140	155	225	225	225
D14	40	40	50	70	85	105	120	130	160	160	160
D16	32	40	45	60	75	100	100	100	155	155	155
D17	10	12	15	18	25	30	30	35	50	50	50

Dimension Drawings

TYPE 1 DESIGN A

TYPE 2 DESIGN A

Protection tube (Standard design)

With 2nd guide ring

TYPE 1 DESIGN B

TYPE 2 DESIGN B

Protection tube (Standard design)

With 2nd guide ring

Dimension Table Type 1 & Type 2

ONLY FOR CWJ - 0.5
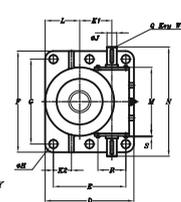
ONLY FOR CWJ - 2

ONLY FOR SWJM - 2.5, 5, 10,15,20,25,30 35 & 75

Q KEY WAY
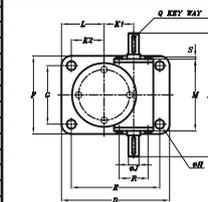
ONLY FOR SWJM-50
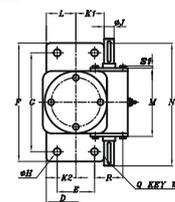
ONLY FOR CWJ - 100 & 150

Q Key Way

Selection of Appropriate Screw Jack

The technical characteristics required of each screw jacks need to be studied. While selecting the screw jack following criteria is used:

1. Always take a screw jack of greater capacity than actually required.
2. Verify the buckling force on the lifting screw in case the load exerts compressive force on screw.

$$Pc = \frac{\pi^2 * E * 0.05 * d^4}{L^2}$$

Pc = Critical Load x safety coefficient (Between 3 & 5)
E = Elastic modulus of screw material (Generally = 2×10^4)
L = Distance between the guiding point of lift screw where the load is guided.
For Free/Unguided Loads take L = 2 x Stroke Length required.

3. Calculate the power absorbed by the Jack by applying the following formula:

$$P(HP) = \frac{Load\ (Tons)\ x\ Lifting\ Speed\ mm/min}{4500\ x\ Efficiency\ of\ Jack\ (Refer\ Table\ -1)}$$

Verify that this power does not exceed the maximum indicated power of the screw jack. If the same is greater you need to select the greater capacity jack or else lessen the lifting speed.

4. Incase where several jacks are to be used in tandem apply the following formula to calculate power required.

$$Total\ P\ (HP) = x\ \frac{P\ absorbed\ by\ each\ jack\ x\ number\ of\ jacks\ required}{Overall\ efficiency\ of\ installation*\ x\ Efficiency\ of\ Angle\ Drives**}$$

- * For 2 Jacks = 0.95, for 3 Jacks = 0.9, for 4 Jacks = 0.85, for 6 Jacks = 0.80
- ** Take 0.90 per angle drive.

5. Verify maximum lifting speed V in mm/min.

$$V\ (mm/min) = 4.5 \times 10^3 \times \frac{Max\ power\ per\ Jack\ (HP)\ x\ Efficiency\ of\ Jack}{Load\ per\ Jack\ (Tons)}$$

Notes:
1. To restrain horizontal stress or to reduce the radial play of the lifting screw, optional second guide ring can be provided upon request.
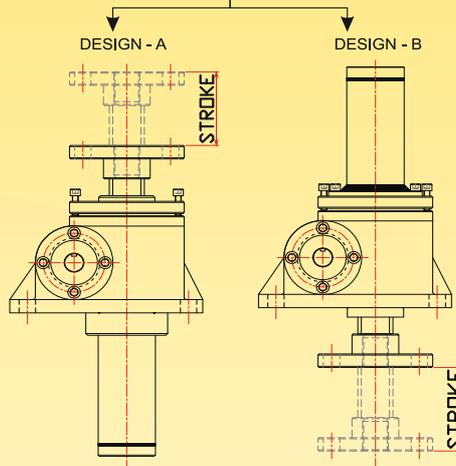2. If the jacks are to be subjected to vibrations, take a greatest reduction ratio or slower raise speed.
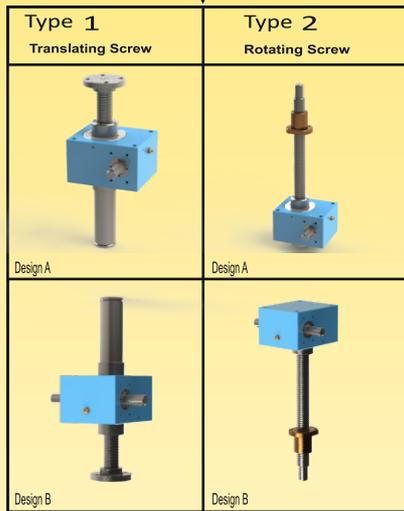
Order Information

Heads

JACK SERIES	CAPACITY		GEAR RATIO	
	METRIC TONS	KN	Normal	Slow
CWJ	0.5	0005	5:1	20:1
CWJ	1	0010	10:1	30:1
CWJ	2.5	0025	10:1	30:1
CWJ	5	0050	10:1	30:1
CWJ	10	0100	10:1	30:1
CWJ	20	0200	10:1	30:1
CWJ	25	0250	10:1	30:1
CWJ	35	0350	10:1	30:1
CWJ	40	0400	10.67:1	32:1
CWJ	50	0500	10.67:1	32:1

TYPE - I

TYPE - IV

TYPE - II

TYPE - V

TYPE - III

TYPE - VI

Our Other Products

Accessories

Hydraulic Cylinder

Rotary Union

Power pack

Jacks Assambly

Over Velocity Device

MODEL	TYPE	DESIGN	0025	GEAR RATIO	STROKE	HEAD	ACCESSORIES
CWJ	2	A	2.5 TON	6:1	200mm	TYPE-II	HAND WHEEL

Type 1 Translating Screw	Type 2 Rotating Screw
Design A	Design A
Design B	Design B

DESIGN - A

STROKE

DESIGN - B

STROKE

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