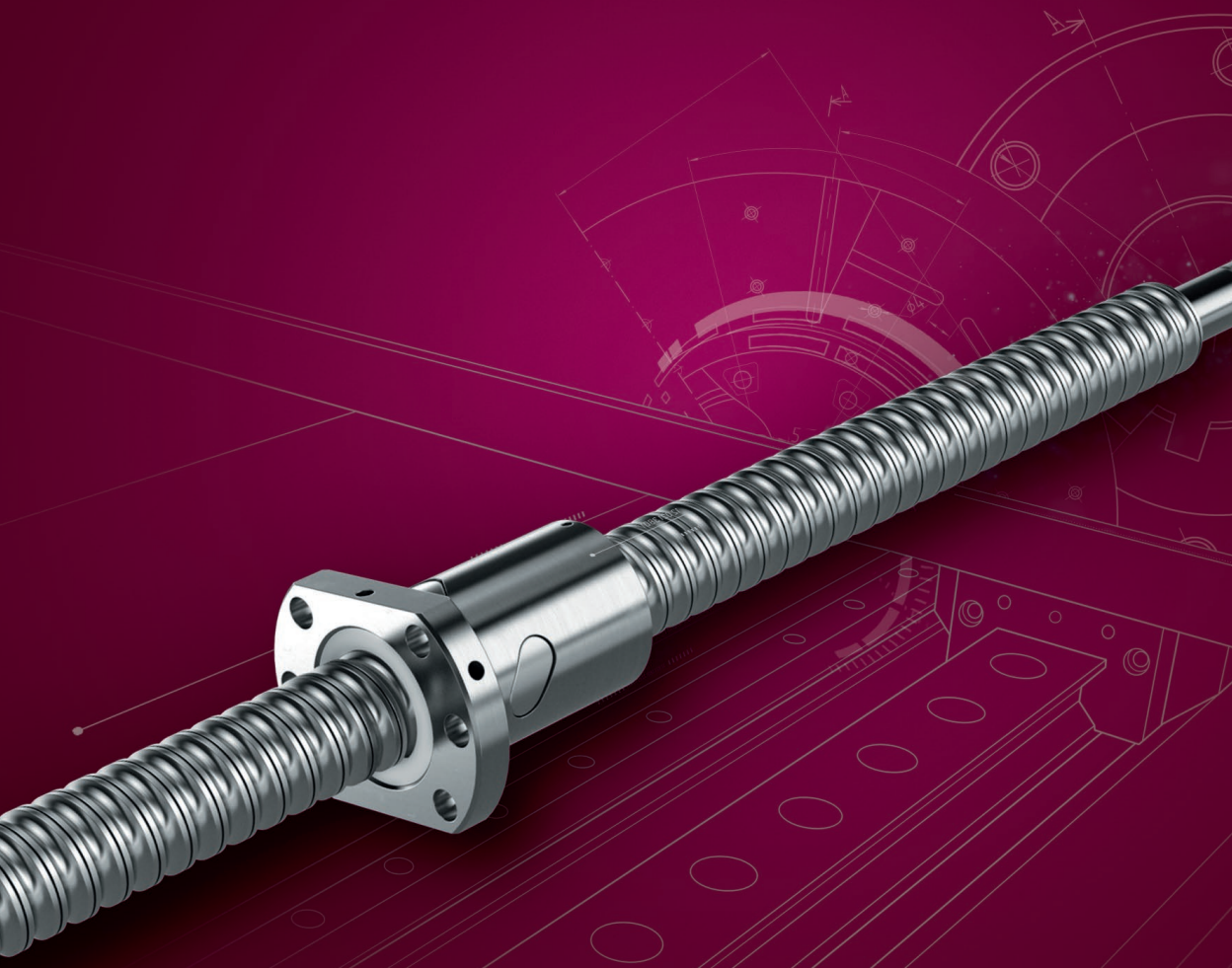
SHUTON

IPIRANGA

ROLLON®

BY TIMKEN



XT

Xtrem

Transport

SHUTON·IPIRANGA has verified the accuracy of all the data contained in this catalogue. However, it does not accept liability for any possible incorrect or incomplete data.

Due to the constant development of products, SHUTON·IPIRANGA reserves the right to modify any information or data in this catalogue without notice.

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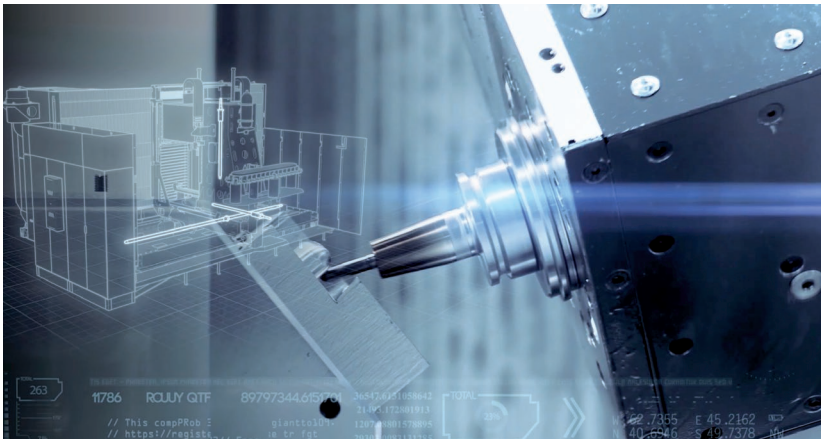
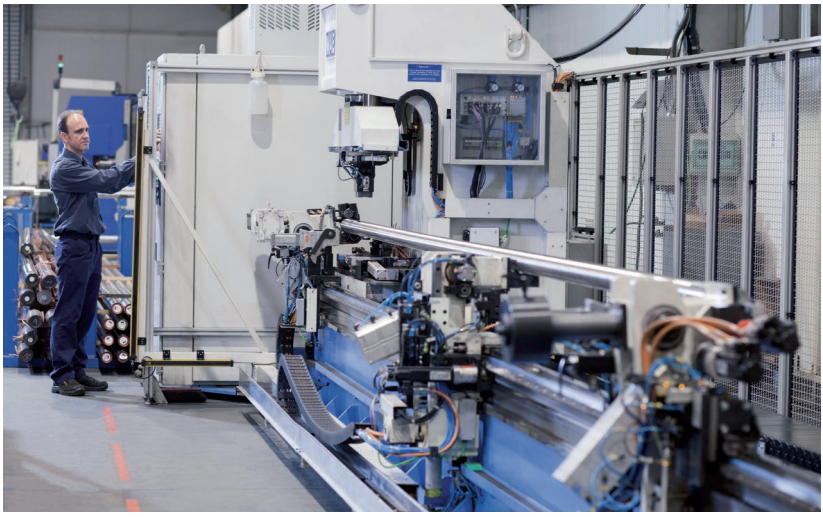
Version EN23

PRECISION BALL SCREWS

This catalogue contains the tables of dimensions, loads and nut rigidities,
according to DIN 69051 and ISO 3408 standards,
of precision ball screws manufactured by SHUTON·IPIRANGA.

INDEX





A global and joint project that allows us to expand our product range with more technologies, group perspective investments and access to more markets.

NEW challenges strategies

As a result of the evolution of the market and the challenges the new competitive scenarios demand, we are proud to announce the merge of two important players in the ball screw manufacturing sector.

Shuton and Ipiranga, specialized in the design and manufacture of Precision Ball screws and with over 50 years' experience each one, started a path of collaboration in the year 2018 that has resulted in the final merge as presented in this catalogue.

We join forces, multiplying capacities, adding solvencies. A single organization that optimizes resources to be more efficient

This year has also brought us an important milestone, as we become part of the world's leading bearings and power transmission manufacturer The Timken Company.

A global and joint project that allows us to expand our product range with more technologies, group perspective investments and access to more markets.

HIGHER PERFORMANCE

Improvement in ball screw acceleration and feed speeds for a better performance for longer duration in extreme applications.

HIGHER RIGIDITY

Efficient rigidity oriented at enhancing the machining quality of the parts, optimizing the natural frequency of the system and improving motor parameters Kv and Kp, and the jerk.

HIGHER DYNAMICS

Improvement of accelerations and feed speeds of the drive, keeping optimum temperature and noise levels.

Engineered by SHUTON·IPIRANGA

HIGHER DURABILITY

Parallel improvements in materials, treatment and manufacturing processes contribute to an additional increase of the ball screw life.

INCREASED UPTIME

Improvement of ball screw life for increasing the machine uptime.

LESS MAINTENANCE

Improvement of ball screw performance and life for a reduction of life-cycle costing (LCC).

HIGH DYNAMICS INSIDE

Xtrem Dynamics redefines **SHUTON·IPIRANGA**'s philosophy in the search of technologies and materials with the aim of increasing the rigidity of the Ball screws, to improve the dynamics and therefore the efficiency of the machine, resulting in productivity for longer.

In line with this Xtrem Dynamics philosophy and with the aim of obtaining the best results in the most demanding applications, SHUTON·IPIRANGA has developed different ball screw technologies adapted to the main application areas, classified in three families:

XP
Xtrem
Position

XL
Xtrem
Load

XT
Xtrem
Transport

Ball screw technology

The SHUTON·IPIRANGA ball screw range is the result of internal developments by the R&D&i department. Numerous tests and measurements have been carried out over several years in the technological centre that SHUTON·IPIRANGA has in its premises as well as in collaborations with universities and research and development centres.

SHUTON·IPIRANGA ball screws are manufactured with premium steel and subject to heat treatments of the highest quality.

In order to get the most of the advantages a ball screw can offer, it is necessary to choose the correct ball screw configuration for each application. SHUTON·IPIRANGA offers its customers comprehensive advice for the selection of the most appropriate ball screw and optimal use for each application, studying the different solutions. For more details on Engineering Service, Technical application form and Technical studies, see page 18.

SHUTON·IPIRANGA has developed the following ball screw technologies to give a response to our customers' requirements:

	Features	Sector	Technology	Nut Type
XT Transport ball screws	Integrability Interchangeability Quick supply	· Automation · Railway · Automatisms · Semiconductor · Actuators	TMBS	TS Single Nut
			ROLLED	TS Single Nut

CUSTOMISED SOLUTIONS

Adapted solutions for specific requirements: Asymmetric nut, Ceramic balls, Special wipers, Single nut with Preload, Special nuts, Rotary nut system, Special spindle end machining, Refrigerated shaft, Safety Nut, W spaced balls recirculation system, iBallscrew.

Description page 18.

XT HIGH EFFICIENCY BALL SCREWS FOR AUTOMATION APPLICATIONS

SECTORS

SECTORS:

· Automation

· Railway

· Automatisms

· Semiconductor

· Actuators

TECHNOLOGIES

TMBS

High efficiency precision transport ball screws, accuracy grade ISO1-3-5.

ROLLED

High efficiency transport ball screws, accuracy grade ISO5-7.

Transport: TMBS Technology

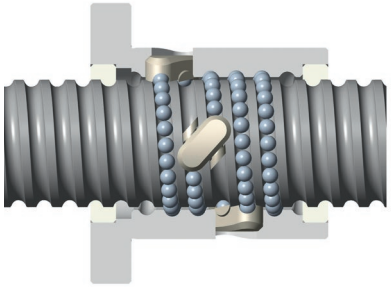
TMBS ball screws are high efficiency precision ball screws for pick and place applications, factory automation, actuators and other transport applications where they can be used as a cost-effective alternative to pneumatic and hydraulic actuators.

TMBS ball screws are precision ball screws, assembled with non-preloaded single nuts.

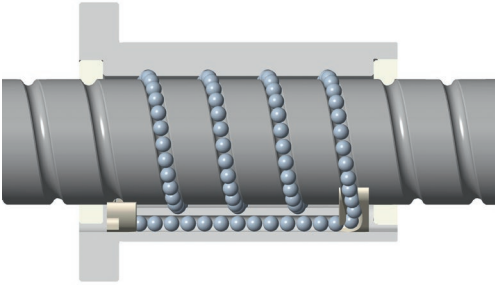
TMBS ball screw are manufactured with the highest material and quality standards in order to obtain the best performance throughout the life cycle of the ball screw.

TMBS ball screws are equipped with an S-type recirculation for short leads or in case of nut diameter limitations and with a U-type recirculation for greater leads.

S-type recirculation system



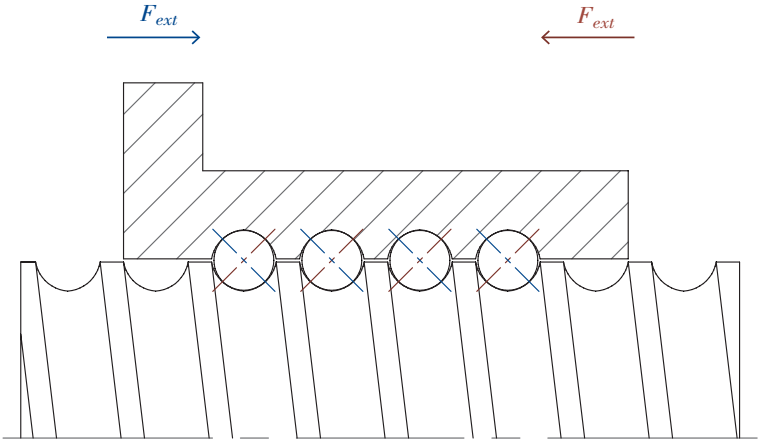
U-type recirculation system



Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
TMBS	· Automation · Railway · Automatisms · Semiconductor · Actuators	Precision transportation ball screws	NO	TS Single Nut	S	20-100	5-20	3-9	General transportation application
					U	25-100	10-80	5-11	General transportation application, higher speed and load requirement

TS, TMBS Single non preloaded nut

TS, TMBS Single non preloaded nut, S-type recirculation



TMBS single non preloaded single nut, contact points

For more technical information on the ball screw technology, see Technical description catalogue.
For detailed ball screw load and dimensional information, see pages 26-75 in this catalogue.

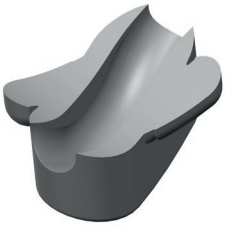
Transport: ROLLED Ball screws

ROLLED ball screws are an efficient solution for the linear drives requiring speed and load, but not the configuration and accuracy grade of a precision ball screw.

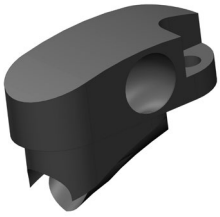
ROLLED ball screws are manufactured by cold rolling process under the DIN69051 standard, accuracy classes IT5 and IT7.

U-type recirculation system

S-type recirculation system



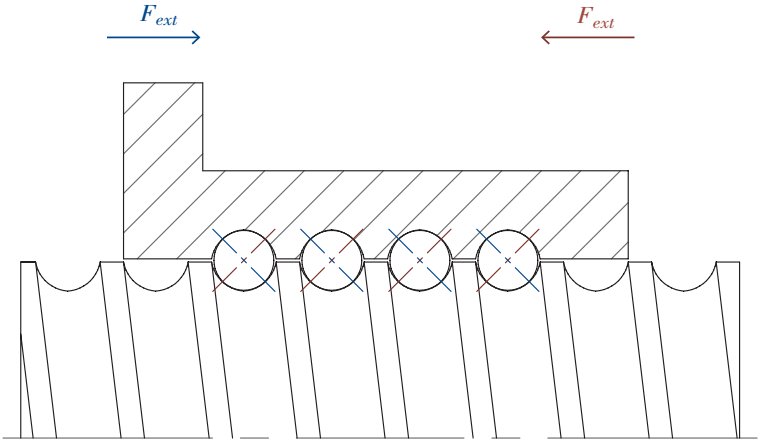
B-type recirculation system



Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
ROLLED	· Automation · Railway · Automatisms · Semiconductor · Actuators	Transport ball screw	NO	TS Single Nut	S,U,B	16,63	5-50	3-7	General transport aplication without accuracy requirement DN up to 90.000

TS, ROLLED Single non preloaded nut

TS, ROLLED Single non preloaded nut, S-type recirculation



ROLLED single non preloaded single nut, contact points

In this catalogue ROLLED ball screws adopt the general nomenclature type as the rest of the ball screw references. For nomenclature according previous catalogues, please see equivalencies.

· Serie 18 TSB(1s) Flanged nut, single start

· Serie 20 TSL(1s) Cylindrical nut, single start

· Serie 22 TSB(_s) Flanged nut, multi start

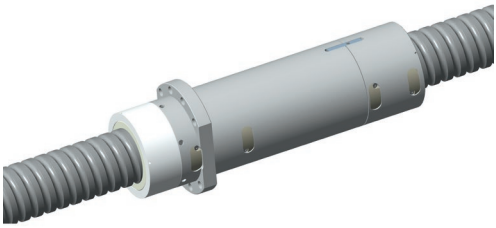
· Serie 24 TSL(_s) Cylindrical nut, multi start

For series 10, 12, 14 and 16 kindly check our Commercial Department.

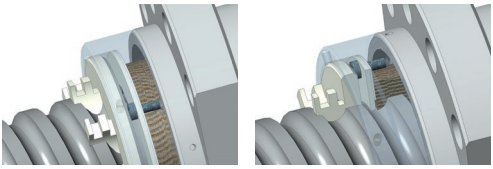
Customised solutions

Depending on the specific requirements of each application, a ball screw, independently of its technology, can have different customizations in order to optimize its results. Customized solutions include the following:

ASYMMETRIC NUT

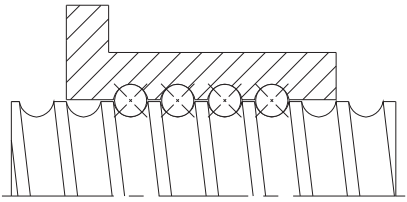


SPECIAL WIPERS

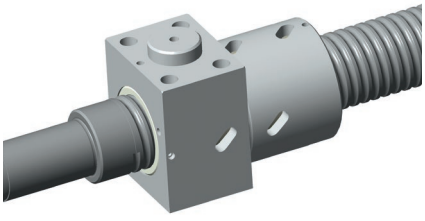


CERAMIC BALLS

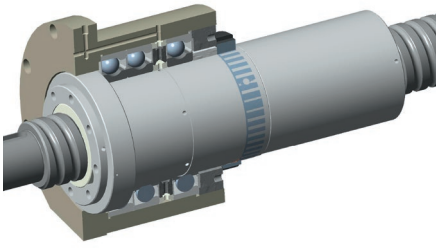
SINGLE NUT WITH PRELOAD



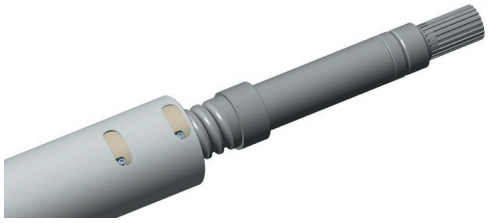
SPECIAL NUTS



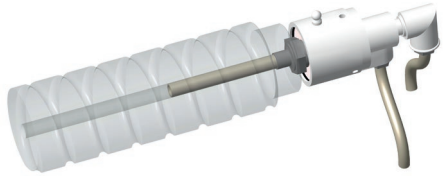
ROTARY NUT SYSTEM



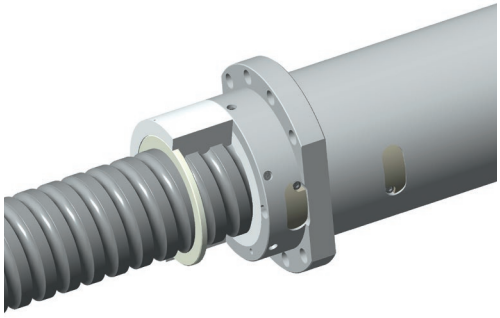
SPECIAL SPINDLE END MACHINING



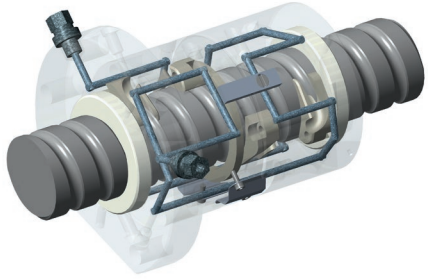
REFRIGERATED SHAFT



SAFETY NUT



REFRIGERATED NUT



COATING

Engineering Service

SHUTON·IPIRANGA Applied Engineering Department offers its customers comprehensive advice for the selection of the most appropriate ball screw and optimal use for each application, studying the different solutions.

There are two possibilities to carry out the studies:

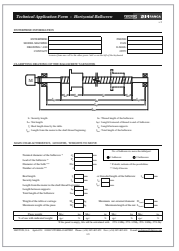
- Calculate the performance of a specific ball screw with a given set of bearings, motor and transmission system, getting result for:
  - · Ball screw fatigue life
  - · Table or head feed speed
  - · Ball screw critical rotation speed and speed limit
  - · Deflections or radial deformations, and advice on rests
  - · Estimated noise level [dB]
  - · Expected temperature increase
  - · Necessary pretensioning force in the event of a pretensioned shaft
  - · Grease amount or oil and recommended lubrication
  - · Maximum supported force and recommended limit
  - · Approximate drive natural frequency and estimated gains of position kv and speed kp links
  - · Required table acceleration and motor torque
  - · Relationship between inertias and servo control response
  - · Ball screw force and preload torque
  - · Rigidity of nut and entire ball screw

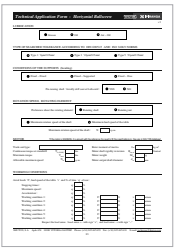
- Calculate which drive (ball screw, motor, transmission system, etc.) is best suited to achieve desired speed, acceleration, rigidity and fatigue life.

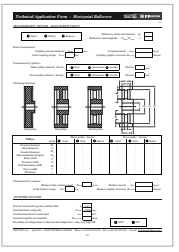
One of the most innovative and important aspects of the ball screw study is its provision of approximate motor control values, that is, closed control loop position kv and speed kp gains. These values are extremely important for getting an idea of a machines dynamics. Two or more potential drives can be compared during the design phase of the machine, revealing the drive component that limits the machine's dynamic behaviour* (ball screw, bearings, pulleys, etc.).

SHUTON·IPIRANGA Engineering Service team has broad experience in the study of different applications keeping close collaboration with leading manufacturers in different application fields.

Technical application forms can be requested at https://www.shuton.com/en/engineering-service or through your closest Shuton-Ipiranga contact.

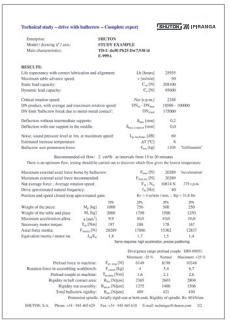






'Technical Form'

SHUTON IPIRANGA
ENGINEERING SERVICE



'Study report'

* The programme cannot know if it really is the drive that limits machine dynamics, as it has not data about the structure. If it is the structure that is the limiting factor, improvements to any of the drive elements will have no effect.

BALL SCREW ORDERING INFORMATION

Simplified application form for ball screw configuration:

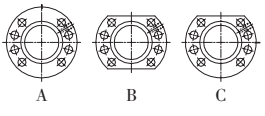
Required information for ball screw order

SHUTON IPIRANGA

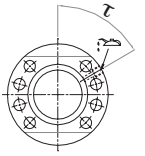
Enterprise: _____ Drawing: _____ Date: _____

The indispensable data for the manufacturing a Ballscrew are the following:

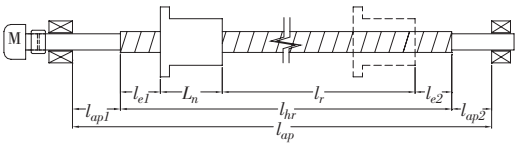
- Type of nut: Double TD ☐ Compact TC ☐ Single TS ☐
- Tying type: Lateral Flange ☐ Centred Flange ☐ Cylindrical Nut ☐
- Flange shape: A Shape ☐ B Shape ☐ C Shape ☐
- Nominal diameter, d_0: _____
- Lead, P_h: _____
- Ball diameter, D_W: _____ and material: Steel ☐ Ceramics ☐
- Quantity of circuits, i: _____
- Threaded length, L_{hr}: _____
- Ball recirculation system: External 'U' ☐ Internal 'S' ☐
- Manufacturing tolerance: ISO1 ☐ ISO3 ☐ ISO5 ☐ ISO7 ☐ ISO10 ☐



The following data is necessary if it is required to have the proper preload and to put the wipers and recirculation systems in the suitable position according to machine requirements and SHUTON to check if there is any problem of loads or speed:



- Nut position assembled in machine, oiling angle with the vertical, τ:_____ 'see drawing'
- Ballscrew rotation speed N: _____$r.p.m.$ or table feed speed v: _____m/min
- Stroke l_r: _____ and security lengths l_{e1}: _____ and l_{e2}: _____ between the final position of the nut in each end and the end of thread of the shaft
- Distances between end of thread and each support l_{ap1}: _____ y l_{ap2}: _____ o l_{ap}:_____ si $l_{ap1}=l_{ap2}$



- Disposition: Horizontal ☐ Vertical without counterweight ☐ Vertical with balanced counterweight ☐
- Lubrication system: Grease ☐ Oil ☐ Air-Oil ☐
- Rotating element: Rotary shaft ☐ Rotary nut ☐
- Fixed–Fixed ☐ Fixed–Supported ☐ Fixed–Free ☐ Supported–Supported ☐
- Pretensed shaft ☐ Non pretensed tied shaft ☐ Axially free shaft in one of the supports ☐
- Maximum machining force $F_{max,mec}$: _____N
- Maximum inertia force $F_{max,inertia}$: _____N, or combination that gives the highest result of total weight to move M: _____kg multiplied by acceleration of the table a: _____m/s^2

If it is required SHUTON to check the life expectancy, is necessary to fill in with as real data as possible the duty cycle with percentages of time, machining forces and table feed speeds:

Stopping Times:	q: _____ %		
Maximum Speed:	q: _____ %		
Acceleration:	q: _____ %		
Working Condition 1:	q: _____ %	F: _____ N	v: _____ m/min
Working Condition 2:	q: _____ %	F: _____ N	v: _____ m/min
Working Condition 3:	q: _____ %	F: _____ N	v: _____ m/min
Working Condition 4:	q: _____ %	F: _____ N	v: _____ m/min
Working Condition 5:	q: _____ %	F: _____ N	v: _____ m/min
Working Condition 6:	q: _____ %	F: _____ N	v: _____ m/min

Is important the customer to facilitate all these data when doing the order, so as the operation is good and the Ballscrew is well dimensioned.

The aim is to perform a basic study to detect if the ball screw will suffer speed, load, life, rigidity, noise or temperature issues. Where operation can be improved, SHUTON·IPIRANGA will contact the customer to inform them of the problem and propose an alternative.

Information about machine nut position can assist our designers in achieving the optimum distribution of internal components, for smoother and longer-lasting operation.

Technical study - drive with ball screw - Basic report

SHUTON IPIRANGA

Enterprise:	**SHUTON**
Model / drawing nº / axis:	**study example**
Main characteristics:	**TD-U do50 Ph25 Dw7,938 i4**
Date [D/M/Y]:	**07/07/2008**
Study code, "put on drawing":	**E-999**

		Double fixed nut with external recirculation 'U'	
Nominal diameter:	d_0 [mm]	50	
Lead:	P_h [mm]	25	
Diameter of the balls:	D_w [mm]	7,938	
Number of circuits with balls inside nut:	i	4	
Real length done by the table (useful travel):	l_r [mm]	1800	
Length between supports of end of the ballscrew:	l_{ap} [mm]	2110	
External diameter of the nut:	D_1 [mm]	82	
Length of the nut:	L_n [mm]	260	
Total maximum mass to be moved by ballscrew:	M [kg]	2000	
Maximum rotation speed:	N [r.p.m.]	2000	

Condition of ballscrew end supports:	Class of tolerance:	Nut lubrication:
Fixed-Fixed - Pretensed spindle	ISO 3	Oil - Air

Duty cycle	Time [%]	Machining force [N]	Speed [m/min]	Rotation speed [r.p.m.]
Stopping times:	20	0	0	0
Maximum speed:	10	0	50	2000
Acceleration:, a:'10m/s2':	10	20196	25	1000
Working condition 1:	15	3750	10	400
Working condition 2:	15	7500	7,5	300
Working condition 3:	15	11250	5	200
Working condition 4:	15	15000	2,5	100

RESULTS: *Basic study: horizontal shaft, or vertical shaft without counterweight*

Life expectancy with correct lubrication and alignment:	Lh [hours]	24917	
Maximum table advance speed:	v [m/min]	50	
Static load capacity:	C_{oa} [N]	208100	
Dynamic load capacity:	C_a [N]	95600	
Maximum external axial force borne by ballscrew:	F_{max} [N]	20196	'Acceleration'
Maximum external axial force recommended:	$F_{max,rec}$ [N]	21037	
Critical rotation speed	Ncr [r.p.m.]	2891	
DN product, with average and maximum rotation speed:	DN_m - DN_{max}	22500 - 100000	
DN limit 'ballscrew break due to metal-metal contact':	DN_{crash}	200000	
Deflection without intermediate supports:	δ_{max} [mm]	0,2	
Deflection with one support in the middle:	$\delta_{max,1support}$ [mm]	0,0	
Noise, sound pressure level at 1m, at maximum speed:	$L_{p,1m,Nmax}$ [dB]	69	
Ballscrew without refrigeration, estimated increase temperature:	ΔT [ºC]	8	

Oil-air' lubrication, an oil flow of 0,1 - 0,2 cm³ each 5 minutes is recommended

Continuous air flow 2 - 4 bar. If oil is not reaching the nut, either increase the flow or redure the time

Divergence range preload couple DIN 69051:		Minimum: -25 %	Normal	Maximum: +25 %
Preload force:	F_{pr} [N]	6375	8500	10625
Rotation force:	F_r [kg]	4	5,4	6,7
Preload couple:	T_{pr} [Nm]	1,6	2,2	2,7
Rigidity in ball contact area:	$R_{b/t}$ [N/µm]	2394	2635	2838
Rigidity nut assembly:	$R_{nu.ar}$ [N/µm]	1290	1417	1524
Total ballscrew rigidity:	R_{tot} [N/µm]	436	450	460

Pretension spindle. Axially rigid seat at both ends. Rigidity of spindle, Rs: 658N/um

SHUTON, S.A. Phone: +34 - 945 465 629 Fax: +34 - 945 465 610 E-mail: technique@shuton.com

Quick selection of a ball screw

Essential drive design starting data is:

- Mass M to be moved with the drive, 'table+part'
- The travel l_r or distance the table is moved
- Feed speed v
- Acceleration a
- Duty cycle

First of all, It is necessary to select the family of the ball screw:

· With Preload: Positioning ball screws, Technologies COMPLEX or PRIME

Now find out the maximum force to be applied to the ball screw, this may be the inertia force, or machining force:

$$F_{max} \approx MAX\ (M\ a\ ;\ F_{max,machining})$$

The preload force should be at least: $F_{pr} \geq \frac{F_{max}}{2,83}$

Ball screw fatigue life depends on the entire duty cycle, although initially, a ball screw with a preload of 8% of dynamic load can be chosen, and therefore:

$$C_a \approx \frac{F_{pr}}{0,08} \longrightarrow C_a \geq \frac{F_{max}}{2,83 \text{ x } 0,08} \longrightarrow C_a \geq 4,5\ F_{max}$$

In the Load and Dimension tables, two or three combinations can be selected that meet this condition.

$$\text{From the tables } \Rightarrow d_0\ ;\ D_w\ ;\ i$$

The shaft lead must comply with: $P_h \geq \frac{v}{N_{advised}}$

From the DN table on page 50 maximum rotation speed is obtained in order to keep temperature under control, according to lubrication type and ball recirculation system. It is recommended not to work over 75% of limit speed:

$$N_{advised} = 0,75 \text{ x } N_{lim} = 0,75 \frac{DN}{d_0}$$

· Without Preload: Loading and transport ball screws, Technologies IML, HDL, PKL, TMBS

The first thing is to choose the lead (P_h) according to $N_{advised}$, and then in the tables choose a combination $(d_0; D_w; i)$ so that $C_{oa}>5*F_{max}$, and calculate life with the cycle to verify that it is sufficient.

If it is required a shorter lead or a higher rotation speed, it is recommended to refer the case to SHUTON·IPIRANGA for a detailed study.

The greater P_h, the lower the temperature and noise and longer the life.

Fatigue life and rigidity can be calculated with d_0, P_h, D_w, i. (see pages 39-42)

If fatigue life is low, N can be reduced with a greater P_h value, or if not choose a ball screw with a higher dynamic load C_a, increasing d_0, D_w or i. Also F_{pr} can be reduced at the expense of less rigidity.

If ball screw rigidity is low, check which is most important, shaft rigidity or nut rigidity. If it is the shaft then it can be pretensioned or the nominal diameter d_0 increased. If it is the nut increase d_0 or i, or also increase F_{pr} at the expense of reducing fatigue life.

Lastly, check static load, bending, critical rotation speed and deflection or radial deformation; in case it is necessary to carry out one of the following actions:

- Increase the nominal diameter d_0
- Use a rotating nut
- Change the support mounting method
- Insert a rest or intermediate support

e.g. M:2000kg, v:50m/min, a:5m/s², Fmec,max:15000N without axial play
Preload & high speed → COMPLEX family
Inertia force:

$F_{in} \approx Ma = 2000 \text{ x } 5 = 10000\ N$

$F_{max} = 15000\ N$

$F_{pr} \geq \frac{15000}{2,83} = 67500\ N$

$C_a \geq 4,5 \text{ x } 15000 = 67500\ N$

Can be:

A/ d_0:40 - D_w:6,35 - i:5

B/ d_0:50 - D_w:6,35 - i:4

C/ d_0:50 - D_w:7,938 - i:3

Speed is high, and therefore we will use *external 'U' recirculation* and *oil* lubrication. *DN:* 180000

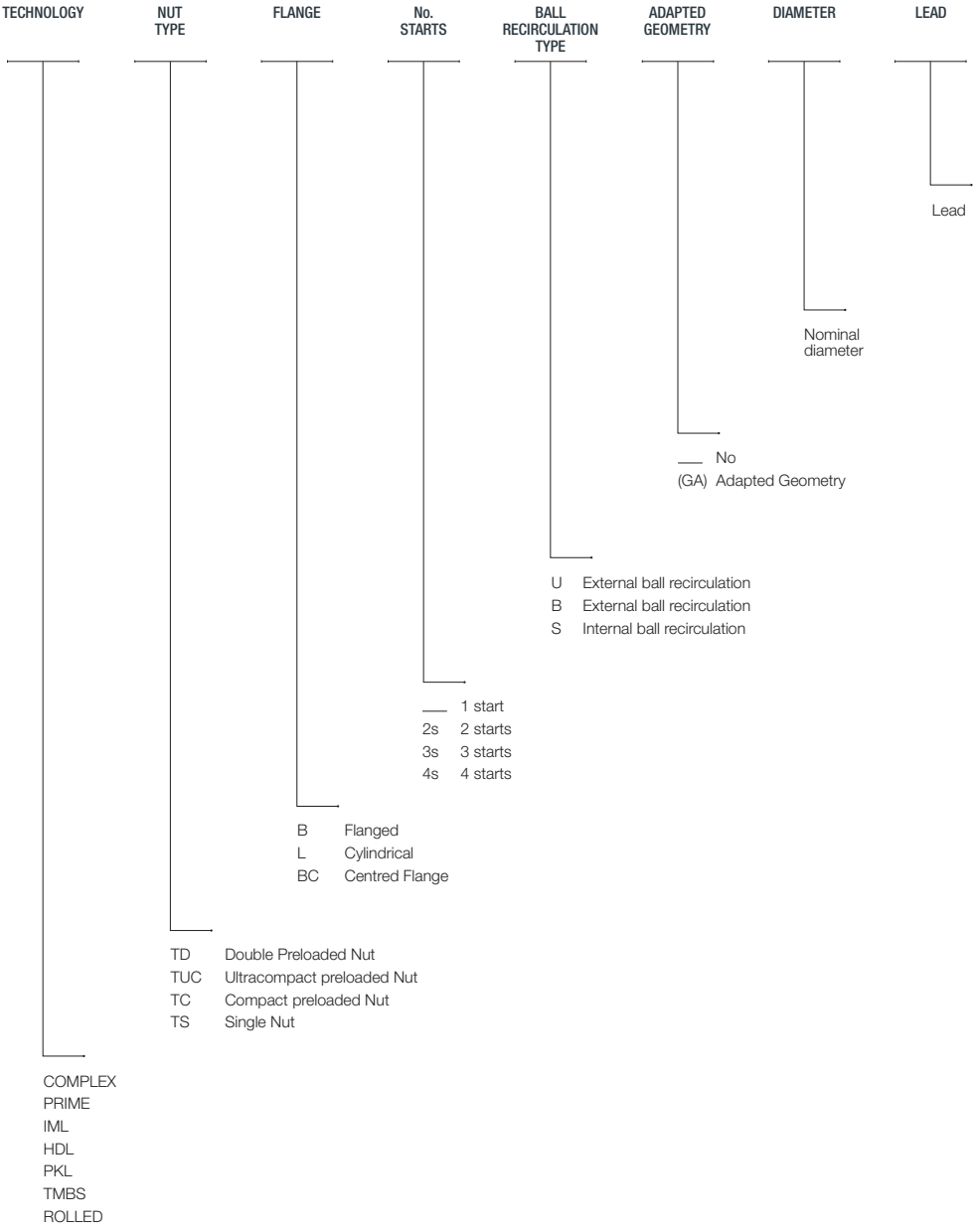
For the nut to be as short as possible, we start with option C, d_0:50 - D_w:7,938 - i:3

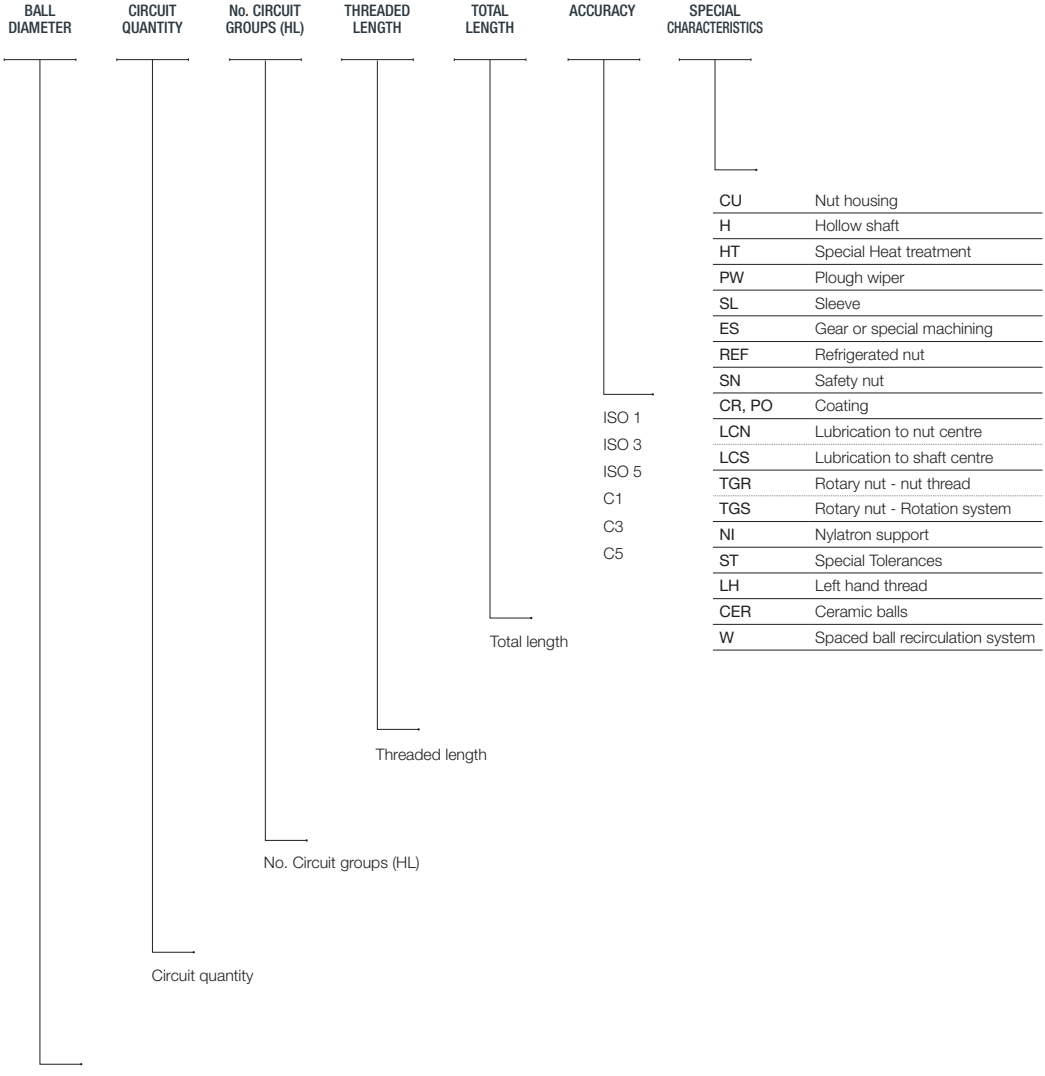
$N_{advised} = 0,75 \text{ x } \frac{180000}{50} = 2700$

$P_h \geq \frac{50 \text{ x } 1000}{2700} = 18,5$

With P_h:20 it is sufficient, although if we use P_h:25, fatigue life, temperature and noise will improve.

Reference definition (nomenclature)





D_W	3,175	3,969	4,762	6,35	7,144	7,938	9,525	11,11	12,7	15,875	19,05	25,4
Abbreviation	3	4	5	6	7	8	9	11	12	15	19	25

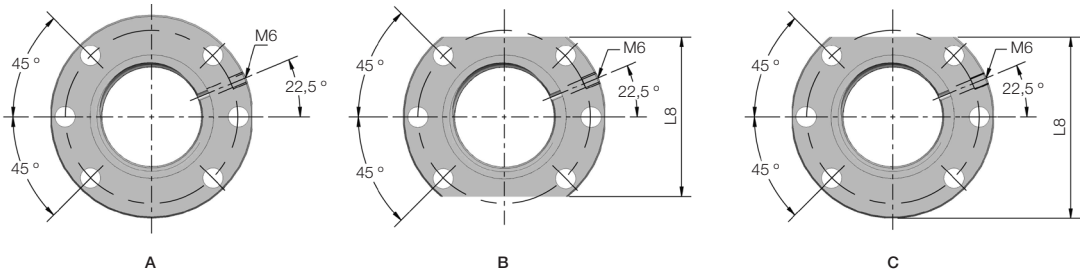
CU	Nut housing
H	Hollow shaft
HT	Special Heat treatment
PW	Plough wiper
SL	Sleeve
ES	Gear or special machining
REF	Refrigerated nut
SN	Safety nut
CR, PO	Coating
LCN	Lubrication to nut centre
LCS	Lubrication to shaft centre
TGR	Rotary nut - nut thread
TGS	Rotary nut - Rotation system
NI	Nylatron support
ST	Special Tolerances
LH	Left hand thread
CER	Ceramic balls
W	Spaced ball recirculation system

Ball screws according fastening method

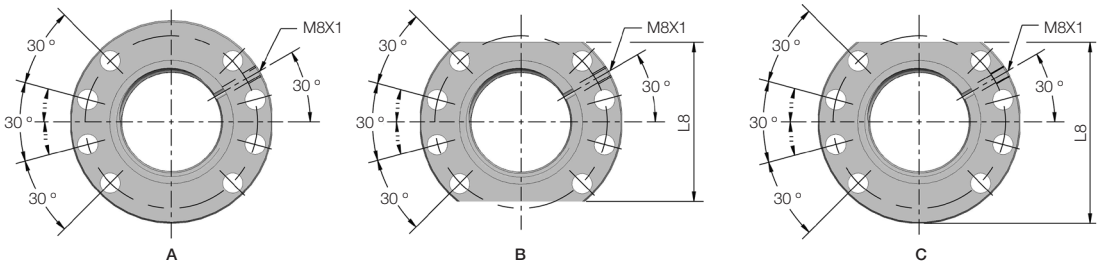
In most cases, ball screws are fastened to the table via a lateral flange.

This flange can be a customer's design, although it is recommended that one of the 3 standard forms defined by standards DIN69051 and ISO3408 is chosen:

do ≦ 32

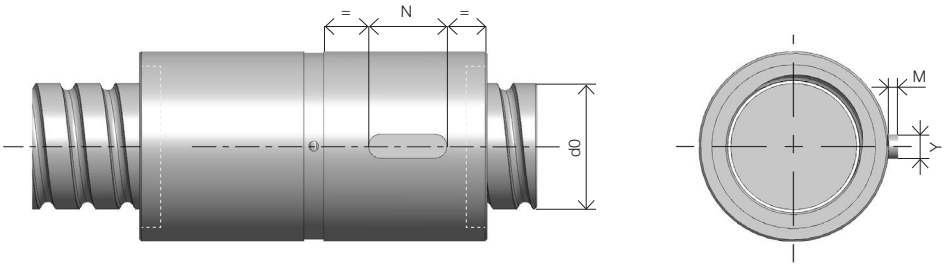


do ≧ 40



Wherever possible, a type A flange is recommended, above all if the assembly involves a rotating nut, so that the nut is balanced. SHUTON·IPIRANGA recommends a centred flange when radial forces cannot be entirely eliminated from the nut.

Sometimes there is no other option but to use a cylindrical nut and fasten to the table with a keyway.



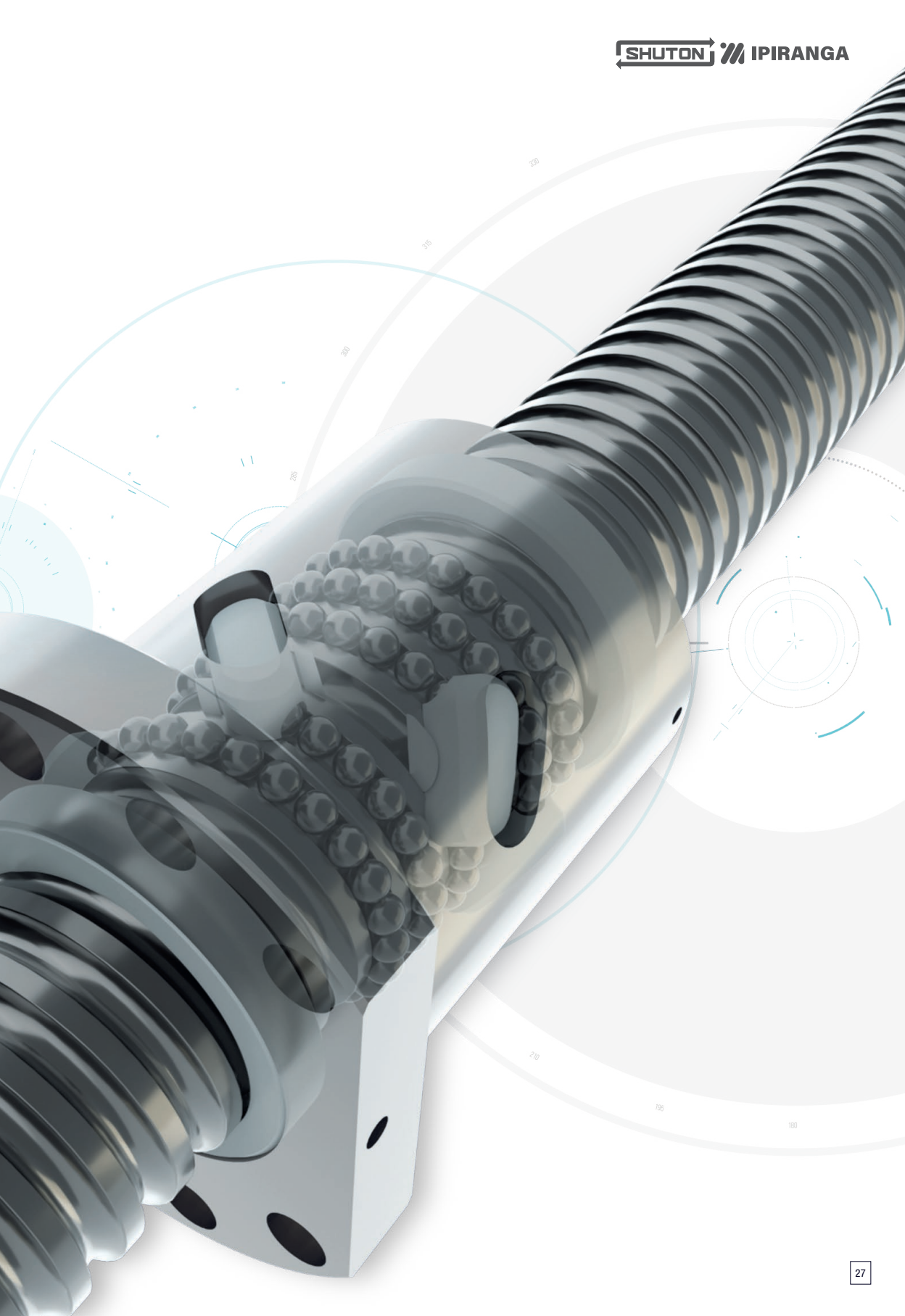
The standard dimensions for this keyway are a function of the nominal diameter of the ball screw and the dynamic load according to the following tables:

d_0	Y	M
20-25	6	2
32-40	8	3
50-63	10	4
80-100	12	4
120-160	14	6

C_a	N
< 25000	15
< 50000	20
< 100000	30
< 150000	40
< 250000	50
≥ 250000	60

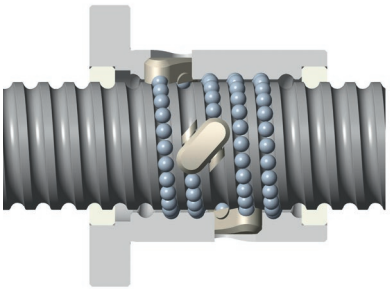
TMBS TECHNOLOGY

High efficiency precision transport ball screws,
accuracy grade ISO1-3-5.

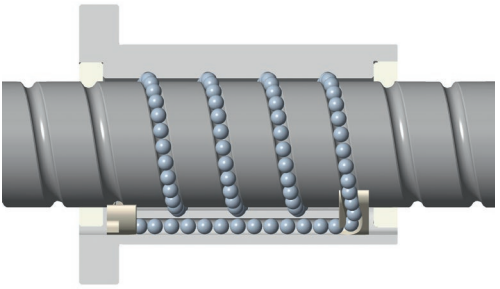


TMBS TECHNOLOGY

S-type recirculation system

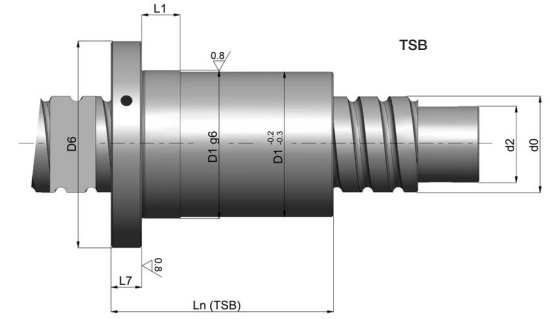


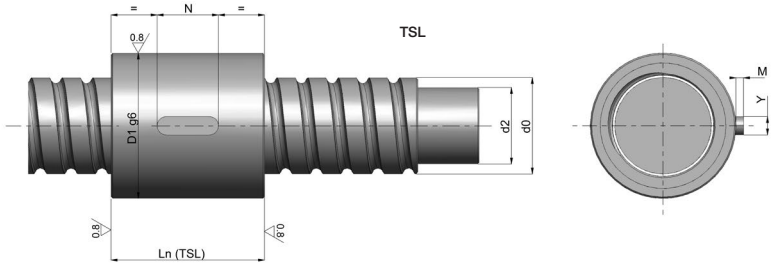
U-type recirculation system

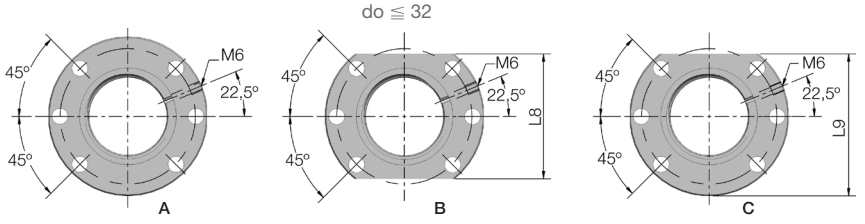


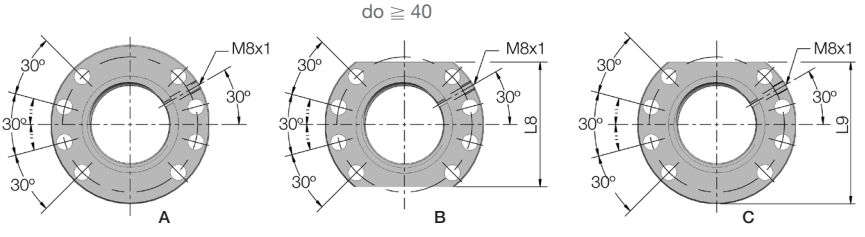
Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
TMBS	· Automation · Railway · Automatisms · Semiconductor · Actuators	Precision transportation ball screws	NO	TS Single Nut	S	20-100	5-20	3-9	General transportation application
					U	25-100	10-80	5-11	General transportation application, higher speed and load requirement

TMBS Single Nut









TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 20-5-3-2	1	20	5	3,175	17,8	2	8200	11900	250	230	40
TSB-S 20-5-3-3	1	20	5	3,175	17,8	3	11000	17900	360	330	46
TSB-S 20-5-3-4	1	20	5	3,175	17,8	4	13900	23900	470	430	51
TSB-S 20-5-3-5	1	20	5	3,175	17,8	5	16800	29900	580	540	56
TSB-S 20-5-3-6	1	20	5	3,175	17,8	6	19600	35800	690	640	61
TSB-S 20-5-4-2	1	20	5	3,969	17	2	11800	16300	300	270	40
TSB-S 20-5-4-3	1	20	5	3,969	17	3	15900	24500	430	400	46
TSB-S 20-5-4-4	1	20	5	3,969	17	4	20100	32700	560	520	51
TSB-S 20-5-4-5	1	20	5	3,969	17	5	24200	40800	690	640	56
TSB-S 20-5-4-6	1	20	5	3,969	17	6	28200	49000	820	770	61
TSB-S 25-5-3-2	1	25	5	3,175	22,8	2	9300	15700	310	270	40
TSB-S 25-5-3-3	1	25	5	3,175	22,8	3	12600	23500	450	400	46
TSB-S 25-5-3-4	1	25	5	3,175	22,8	4	15900	31300	590	520	51
TSB-S 25-5-3-5	1	25	5	3,175	22,8	5	19200	39200	730	650	56
TSB-S 25-5-3-6	1	25	5	3,175	22,8	6	22400	47000	870	770	61
TSB-S 25-5-4-2	1	25	5	3,969	22	2	13600	21700	380	340	40
TSB-S 25-5-4-3	1	25	5	3,969	22	3	18400	32500	550	490	46
TSB-S 25-5-4-4	1	25	5	3,969	22	4	23200	43400	720	640	51
TSB-S 25-5-4-5	1	25	5	3,969	22	5	28000	54200	880	790	56
TSB-S 25-5-4-6	1	25	5	3,969	22	6	32700	65100	1050	940	61
TSB-U 25-10-5-2	1	25	10	4,762	20,8	2	16700	24400	350	340	49
TSB-U 25-10-5-3	1	25	10	4,762	20,8	3	23600	39300	540	520	59
TSB-U 25-10-5-4	1	25	10	4,762	20,8	4	30400	54100	730	690	69
TSB-U 25-12-5-2	1	25	12	4,762	20,8	2	16600	24400	350	340	53
TSB-U 25-12-5-3	1	25	12	4,762	20,8	3	23500	39200	540	520	65
TSB-U 25-15-5-2	1	25	15	4,762	20,8	2	16500	24200	350	330	58
TSB-U 25-15-5-3	1	25	15	4,762	20,8	3	23300	38900	530	520	73
TSB-U 25-16-5-2	1	25	16	4,762	20,8	2	16400	24200	340	330	60
TSB-U 25-20-5-2	1	25	20	4,762	20,8	2	16600	24800	350	340	67
TSB-U 25-25-5-2	1	25	25	4,762	20,8	2	16200	24400	340	330	75
TSB-S 32-5-3-2	1	32	5	3,175	29,8	2	10600	20900	400	340	42
TSB-S 32-5-3-3	1	32	5	3,175	29,8	3	14300	31300	570	490	48
TSB-S 32-5-3-4	1	32	5	3,175	29,8	4	18100	41800	750	650	53
TSB-S 32-5-3-5	1	32	5	3,175	29,8	5	21800	52200	930	800	58
TSB-S 32-5-3-6	1	32	5	3,175	29,8	6	25500	62700	1100	950	63
TSB-S 32-5-3-7	1	32	5	3,175	29,8	7	29100	73100	1280	1100	68
TSB-S 32-5-3-8	1	32	5	3,175	29,8	8	32600	83500	1450	1250	74

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
36		47	58	6,6	10	10	44	51	2,1
36		47	58	6,6	10	10	44	51	2,5
36		47	58	6,6	10	10	44	51	2,7
36		47	58	6,6	10	10	44	51	3
36		47	58	6,6	10	10	44	51	3,3
36		47	58	6,6	10	10	44	51	2,8
36		47	58	6,6	10	10	44	51	3,3
36		47	58	6,6	10	10	44	51	3,6
36		47	58	6,6	10	10	44	51	4
36		47	58	6,6	10	10	44	51	4,3
40		51	62	6,6	10	10	48	55	2,6
40		51	62	6,6	10	10	48	55	3
40		51	62	6,6	10	10	48	55	3,3
40		51	62	6,6	10	10	48	55	3,7
40		51	62	6,6	10	10	48	55	4
40		51	62	6,6	10	10	48	55	3,5
40		51	62	6,6	10	10	48	55	4
40		51	62	6,6	10	10	48	55	4,4
40		51	62	6,6	10	10	48	55	4,8
40		51	62	6,6	10	10	48	55	5,2
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	2,9
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	3,5
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	4,2
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	2,9
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	3,6
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	2,9
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,7
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,1
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,3
50		65	80	9	12	10	62	71	3,5
50		65	80	9	12	10	62	71	4,1
50		65	80	9	12	10	62	71	4,5
50		65	80	9	12	10	62	71	4,8
50		65	80	9	12	10	62	71	5,2
50		65	80	9	12	10	62	71	5,6
50		65	80	9	12	10	62	71	6,1

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 32-5-4-2	1	32	5	3,969	29	2	15900	29700	490	420	42
TSB-S 32-5-4-3	1	32	5	3,969	29	3	21500	44600	710	620	48
TSB-S 32-5-4-4	1	32	5	3,969	29	4	27100	59500	930	810	53
TSB-S 32-5-4-5	1	32	5	3,969	29	5	32700	74300	1150	1000	58
TSB-S 32-5-4-6	1	32	5	3,969	29	6	38100	89200	1370	1190	63
TSB-S 32-5-4-7	1	32	5	3,969	29	7	43500	104100	1590	1380	68
TSB-S 32-5-4-8	1	32	5	3,969	29	8	48700	118900	1800	1570	74
TSB-S 32-6-4-2	1	32	6	3,969	29,2	2	15100	27300	420	360	45
TSB-S 32-6-4-3	1	32	6	3,969	29,2	3	20300	41000	610	530	52
TSB-S 32-6-4-4	1	32	6	3,969	29,2	4	25700	54600	800	690	59
TSB-S 32-6-4-5	1	32	6	3,969	29,2	5	31000	68300	980	860	65
TSB-S 32-6-4-6	1	32	6	3,969	29,2	6	36100	82000	1170	1020	72
TSB-S 32-10-6-2	1	32	10	6,35	27,6	2	24700	36300	370	340	66
TSB-S 32-10-6-3	1	32	10	6,35	27,6	3	33300	54500	540	490	79
TSB-S 32-10-6-4	1	32	10	6,35	27,6	4	42100	72700	710	650	87
TSB-S 32-10-6-5	1	32	10	6,35	27,6	5	50800	90800	870	800	101
TSB-S 32-10-6-6	1	32	10	6,35	27,6	6	59300	109000	1040	950	111
TSB-U 32-10-6-2	1	32	10	6,35	26,5	2	26800	40200	430	400	54
TSB-U 32-10-6-3	1	32	10	6,35	26,5	3	38600	66600	680	640	64
TSB-U 32-10-6-4	1	32	10	6,35	26,5	4	49800	91300	920	860	74
TSB-U 32-10-6-5	1	32	10	6,35	26,5	5	61200	117600	1160	1080	84
TSB-U 32-10-6-6	1	32	10	6,35	26,5	6	71800	142400	1370	1270	94
TSB-U 32-10-6-7	1	32	10	6,35	26,5	7	82200	167200	1580	1470	104
TSB-U 32-12-6-2	1	32	12	6,35	26,5	2	26700	40200	430	410	58
TSB-U 32-12-6-3	1	32	12	6,35	26,5	3	38500	66400	680	640	70
TSB-U 32-12-6-4	1	32	12	6,35	26,5	4	49600	91100	920	860	82
TSB-U 32-12-6-5	1	32	12	6,35	26,5	5	61000	117400	1150	1090	94
TSB-U 32-12-6-6	1	32	12	6,35	26,5	6	71600	142100	1360	1280	106
TSB-U 32-15-6-2	1	32	15	6,35	26,5	2	27300	41600	440	420	63
TSB-U 32-15-6-3	1	32	15	6,35	26,5	3	38300	66200	680	640	78
TSB-U 32-15-6-4	1	32	15	6,35	26,5	4	49900	92300	920	880	93
TSB-U 32-15-6-5	1	32	15	6,35	26,5	5	60700	117000	1140	1090	108
TSB-U 32-16-6-2	1	32	16	6,35	26,5	2	27200	41500	440	420	64
TSB-U 32-16-6-3	1	32	16	6,35	26,5	3	38300	66100	670	640	80
TSB-U 32-16-6-4	1	32	16	6,35	26,5	4	49900	92200	920	880	96
TSB-U 32-20-6-2	1	32	20	6,35	26,5	2	27000	41200	430	420	71
TSB-U 32-20-6-3	1	32	20	6,35	26,5	3	38000	65700	660	640	91

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
50		65	80	9	12	10	62	71	4,7
50		65	80	9	12	10	62	71	5,3
50		65	80	9	12	10	62	71	5,8
50		65	80	9	12	10	62	71	6,3
50		65	80	9	12	10	62	71	6,7
50		65	80	9	12	10	62	71	7,2
50		65	80	9	12	10	62	71	7,8
50		65	80	9	12	10	62	71	4,9
50		65	80	9	12	10	62	71	5,6
50		65	80	9	12	10	62	71	6,4
50		65	80	9	12	10	62	71	6,9
50		65	80	9	12	10	62	71	7,7
50		65	80	9	14	16	62	71	11
50		65	80	9	14	16	62	71	14
50		65	80	9	14	16	62	71	15
50		65	80	9	14	16	62	71	18
50		65	80	9	14	16	62	71	19
56		71	86	9	14	20	65	75,5	6,3
56		71	86	9	14	20	65	75,5	7,3
56		71	86	9	14	20	65	75,5	8,4
56		71	86	9	14	20	65	75,5	9,6
56		71	86	9	14	20	65	75,5	11
56		71	86	9	14	20	65	75,5	12
56		71	86	9	14	20	65	75,5	6,1
56		71	86	9	14	20	65	75,5	7,3
56		71	86	9	14	20	65	75,5	8,6
56		71	86	9	14	20	65	75,5	9,9
56		71	86	9	14	20	65	75,5	11
56		71	86	9	14	20	65	75,5	5,9
56		71	86	9	14	20	65	75,5	7,4
56		71	86	9	14	20	65	75,5	8,8
56		71	86	9	14	20	65	75,5	10
56		71	86	9	14	20	65	75,5	5,7
56		71	86	9	14	20	65	75,5	7,3
56		71	86	9	14	20	65	75,5	8,8
56		71	86	9	14	20	65	75,5	5,9
56		71	86	9	14	20	65	75,5	7,8

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 32-25-6-2	1	32	25	6,35	26,5	2	26700	40800	420	410	83
TSB-U 32-25-6-3	1	32	25	6,35	26,5	3	38000	66500	660	650	106
TSB-U 32-32-6-2	1	32	32	6,35	26,5	2	26700	41600	420	410	94
TSB-S 40-5-3-2	1	40	5	3,175	37,8	2	11800	26900	480	400	44
TSB-S 40-5-3-3	1	40	5	3,175	37,8	3	16000	40300	700	590	50
TSB-S 40-5-3-4	1	40	5	3,175	37,8	4	20200	53700	920	780	55
TSB-S 40-5-3-5	1	40	5	3,175	37,8	5	24300	67200	1140	960	60
TSB-S 40-5-3-6	1	40	5	3,175	37,8	6	28400	80600	1350	1140	65
TSB-S 40-5-3-7	1	40	5	3,175	37,8	7	32400	94000	1560	1320	70
TSB-S 40-5-3-8	1	40	5	3,175	37,8	8	36300	107400	1780	1500	76
TSB-S 40-5-4-2	1	40	5	3,969	37	2	17600	37800	600	510	44
TSB-S 40-5-4-3	1	40	5	3,969	37	3	23800	56800	870	740	50
TSB-S 40-5-4-4	1	40	5	3,969	37	4	30100	75700	1140	970	55
TSB-S 40-5-4-5	1	40	5	3,969	37	5	36200	94600	1400	1200	60
TSB-S 40-5-4-6	1	40	5	3,969	37	6	42300	113500	1670	1430	65
TSB-S 40-5-4-7	1	40	5	3,969	37	7	48200	132500	1930	1650	70
TSB-S 40-5-4-8	1	40	5	3,969	37	8	54000	151400	2190	1880	76
TSB-S 40-6-4-2	1	40	6	3,969	37,2	2	16700	34800	510	430	47
TSB-S 40-6-4-3	1	40	6	3,969	37,2	3	22600	52200	740	630	54
TSB-S 40-6-4-4	1	40	6	3,969	37,2	4	28600	69600	970	830	62
TSB-S 40-6-4-5	1	40	6	3,969	37,2	5	34400	87000	1200	1030	67
TSB-S 40-6-4-6	1	40	6	3,969	37,2	6	40200	104400	1420	1220	73
TSB-S 40-8-5-2	1	40	8	4,762	36,7	2	21400	41200	510	450	56
TSB-S 40-8-5-3	1	40	8	4,762	36,7	3	28900	61800	750	650	66
TSB-S 40-8-5-4	1	40	8	4,762	36,7	4	36500	82500	980	860	74
TSB-S 40-8-5-5	1	40	8	4,762	36,7	5	44000	103100	1200	1060	82
TSB-S 40-8-5-6	1	40	8	4,762	36,7	6	51300	123700	1430	1260	91
TSB-S 40-8-5-7	1	40	8	4,762	36,7	7	58500	144300	1660	1470	99
TSB-S 40-10-6-2	1	40	10	6,35	35,6	2	28700	48300	480	430	68
TSB-S 40-10-6-3	1	40	10	6,35	35,6	3	38800	72500	690	620	79
TSB-S 40-10-6-4	1	40	10	6,35	35,6	4	49000	96700	900	820	90
TSB-S 40-10-6-5	1	40	10	6,35	35,6	5	59100	120800	1120	1010	99
TSB-S 40-10-6-6	1	40	10	6,35	35,6	6	68900	145000	1330	1200	111
TSB-S 40-10-6-7	1	40	10	6,35	35,6	7	78600	169100	1540	1390	121
TSB-S 40-10-6-8	1	40	10	6,35	35,6	8	88100	193300	1750	1580	132
TSB-U 40-10-6-2	1	40	10	6,35	34,5	2	31100	53600	550	500	55
TSB-U 40-10-6-3	1	40	10	6,35	34,5	3	44200	86600	840	760	65

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
56		71	86	9	14	20	65	75,5	6,7
56		71	86	9	14	20	65	75,5	8,6
56		71	86	9	14	20	65	75,5	7,1
63		78	93	9	14	10	70	81,5	4,7
63		78	93	9	14	10	70	81,5	5,4
63		78	93	9	14	10	70	81,5	5,8
63		78	93	9	14	10	70	81,5	6,3
63		78	93	9	14	10	70	81,5	6,7
63		78	93	9	14	10	70	81,5	7,2
63		78	93	9	14	10	70	81,5	7,8
63		78	93	9	14	10	70	81,5	6,3
63		78	93	9	14	10	70	81,5	7,1
63		78	93	9	14	10	70	81,5	7,6
63		78	93	9	14	10	70	81,5	8,2
63		78	93	9	14	10	70	81,5	8,7
63		78	93	9	14	10	70	81,5	9,3
63		78	93	9	14	10	70	81,5	10
63		78	93	9	14	10	70	81,5	6,4
63		78	93	9	14	10	70	81,5	7,4
63		78	93	9	14	10	70	81,5	8,5
63		78	93	9	14	10	70	81,5	9
63		78	93	9	14	10	70	81,5	9,7
63		78	93	9	14	10	70	81,5	8,4
63		78	93	9	14	10	70	81,5	10
63		78	93	9	14	10	70	81,5	11
63		78	93	9	14	10	70	81,5	12
63		78	93	9	14	10	70	81,5	14
63		78	93	9	14	10	70	81,5	15
63		78	93	9	14	16	70	81,5	14
63		78	93	9	14	16	70	81,5	16
63		78	93	9	14	16	70	81,5	19
63		78	93	9	14	16	70	81,5	21
63		78	93	9	14	16	70	81,5	23
63		78	93	9	14	16	70	81,5	25
63		78	93	9	14	16	70	81,5	28
63		78	93	9	14	16	70	81,5	7,9
63		78	93	9	14	16	70	81,5	9,3

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a *[N]*	C_{oa} *[N]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
TSB-U 40-10-6-4	1	40	10	6,35	34,5	4	56700	118100	1130	1020	75
TSB-U 40-10-6-5	1	40	10	6,35	34,5	5	69000	149600	1400	1270	85
TSB-U 40-10-6-6	1	40	10	6,35	34,5	6	81400	182700	1670	1520	95
TSB-U 40-10-6-7	1	40	10	6,35	34,5	7	93100	214200	1920	1750	105
TSB-U 40-10-6-8	1	40	10	6,35	34,5	8	104600	245700	2160	1960	115
TSB-S 40-10-7-2	1	40	10	7,144	33,9	2	36800	61400	580	530	66
TSB-S 40-10-7-3	1	40	10	7,144	33,9	3	49800	92000	840	770	78
TSB-S 40-10-7-4	1	40	10	7,144	33,9	4	62900	122700	1100	1010	89
TSB-S 40-10-7-5	1	40	10	7,144	33,9	5	75800	153400	1360	1250	99
TSB-S 40-10-7-6	1	40	10	7,144	33,9	6	88400	184100	1620	1480	109
TSB-S 40-10-7-7	1	40	10	7,144	33,9	7	100800	214800	1880	1720	119
TSB-S 40-10-7-8	1	40	10	7,144	33,9	8	113000	245500	2130	1950	130
TSB-U 40-10-7-2	1	40	10	7,144	33,9	2	36800	61400	580	540	55
TSB-U 40-10-7-3	1	40	10	7,144	33,9	3	51900	98200	890	830	65
TSB-U 40-10-7-4	1	40	10	7,144	33,9	4	67000	135000	1190	1100	75
TSB-U 40-10-7-5	1	40	10	7,144	33,9	5	82400	173900	1510	1390	85
TSB-U 40-10-7-6	1	40	10	7,144	33,9	6	96700	210700	1790	1650	95
TSB-U 40-10-7-7	1	40	10	7,144	33,9	7	110800	247500	2070	1910	105
TSB-U 40-10-7-8	1	40	10	7,144	33,9	8	124600	284300	2320	2140	115
TSB-S 40-12-6-2	1	40	12	6,35	35,6	2	28700	48300	480	430	69
TSB-S 40-12-6-3	1	40	12	6,35	35,6	3	38700	72400	690	630	83
TSB-S 40-12-6-4	1	40	12	6,35	35,6	4	48900	96500	900	830	96
TSB-S 40-12-6-5	1	40	12	6,35	35,6	5	59000	120700	1110	1020	109
TSB-S 40-12-6-6	1	40	12	6,35	35,6	6	68800	144800	1320	1220	121
TSB-U 40-12-6-2	1	40	12	6,35	34,5	2	31100	53500	550	510	58
TSB-U 40-12-6-3	1	40	12	6,35	34,5	3	44100	86500	840	770	70
TSB-U 40-12-6-4	1	40	12	6,35	34,5	4	56600	118000	1130	1040	82
TSB-U 40-12-6-5	1	40	12	6,35	34,5	5	68800	149400	1390	1280	94
TSB-U 40-12-6-6	1	40	12	6,35	34,5	6	81300	182500	1670	1540	106
TSB-U 40-12-6-7	1	40	12	6,35	34,5	7	93000	213900	1920	1770	118
TSB-U 40-12-6-8	1	40	12	6,35	34,5	8	104900	247000	2170	2000	130
TSB-U 40-12-7-2	1	40	12	7,144	33,9	2	36800	61300	580	540	58
TSB-U 40-12-7-3	1	40	12	7,144	33,9	3	51900	98100	890	840	70
TSB-U 40-12-7-4	1	40	12	7,144	33,9	4	66900	134800	1190	1110	82
TSB-U 40-12-7-5	1	40	12	7,144	33,9	5	82200	173600	1500	1400	94
TSB-U 40-12-7-6	1	40	12	7,144	33,9	6	96600	210400	1780	1670	106
TSB-U 40-12-7-7	1	40	12	7,144	33,9	7	110600	247200	2060	1930	118

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
63		78	93	9	14	16	70	81,5	11
63		78	93	9	14	16	70	81,5	12
63		78	93	9	14	16	70	81,5	14
63		78	93	9	14	16	70	81,5	15
63		78	93	9	14	16	70	81,5	17
63		78	93	9	14	16	70	81,5	15
63		78	93	9	14	16	70	81,5	18
63		78	93	9	14	16	70	81,5	21
63		78	93	9	14	16	70	81,5	23
63		78	93	9	14	16	70	81,5	25
63		78	93	9	14	16	70	81,5	27
63		78	93	9	14	16	70	81,5	29
70		85	100	9	18	25	75	87,5	11
70		85	100	9	18	25	75	87,5	13
70		85	100	9	18	25	75	87,5	15
70		85	100	9	18	25	75	87,5	16
70		85	100	9	18	25	75	87,5	18
70		85	100	9	18	25	75	87,5	20
70		85	100	9	18	25	75	87,5	22
63		78	93	9	14	20	70	81,5	13
63		78	93	9	14	20	70	81,5	16
63		78	93	9	14	20	70	81,5	19
63		78	93	9	14	20	70	81,5	22
63		78	93	9	14	20	70	81,5	24
63		78	93	9	14	20	70	81,5	7,4
63		78	93	9	14	20	70	81,5	9
63		78	93	9	14	20	70	81,5	11
63		78	93	9	14	20	70	81,5	12
63		78	93	9	14	20	70	81,5	14
63		78	93	9	14	20	70	81,5	16
63		78	93	9	14	20	70	81,5	18
70		85	100	9	18	25	75	87,5	11
70		85	100	9	18	25	75	87,5	12
70		85	100	9	18	25	75	87,5	14
70		85	100	9	18	25	75	87,5	16
70		85	100	9	18	25	75	87,5	18
70		85	100	9	18	25	75	87,5	20

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Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 40-12-7-8	1	40	12	7,144	33,9	8	124400	283900	2310	2170	130
TSB-U 40-15-6-2	1	40	15	6,35	34,5	2	31000	53400	550	510	64
TSB-U 40-15-6-3	1	40	15	6,35	34,5	3	44000	86300	840	790	79
TSB-U 40-15-6-4	1	40	15	6,35	34,5	4	56400	117700	1120	1050	94
TSB-U 40-15-6-5	1	40	15	6,35	34,5	5	69100	150600	1400	1310	109
TSB-U 40-15-6-6	1	40	15	6,35	34,5	6	81000	182000	1660	1560	124
TSB-U 40-15-6-7	1	40	15	6,35	34,5	7	92700	213400	1910	1800	139
TSB-U 40-15-8-2	1	40	15	7,938	33,3	2	43200	70500	620	590	69
TSB-U 40-15-8-3	1	40	15	7,938	33,3	3	60800	112200	940	900	84
TSB-U 40-15-8-4	1	40	15	7,938	33,3	4	79100	156600	1290	1220	99
TSB-U 40-15-8-5	1	40	15	7,938	33,3	5	96200	198400	1600	1520	114
TSB-U 40-15-8-6	1	40	15	7,938	33,3	6	113700	242700	1910	1810	129
TSB-S 40-16-6-2	1	40	16	6,35	35,6	2	28600	48100	470	440	81
TSB-S 40-16-6-3	1	40	16	6,35	35,6	3	38600	72200	680	640	100
TSB-S 40-16-6-4	1	40	16	6,35	35,6	4	48700	96200	900	840	117
TSB-S 40-16-6-5	1	40	16	6,35	35,6	5	58700	120300	1110	1040	134
TSB-U 40-16-6-2	1	40	16	6,35	34,5	2	30900	53300	540	510	65
TSB-U 40-16-6-3	1	40	16	6,35	34,5	3	43900	86200	830	790	81
TSB-U 40-16-6-4	1	40	16	6,35	34,5	4	56400	117600	1120	1060	97
TSB-U 40-16-6-5	1	40	16	6,35	34,5	5	69000	150500	1400	1320	113
TSB-U 40-16-6-6	1	40	16	6,35	34,5	6	80900	181900	1660	1560	129
TSB-U 40-16-8-2	1	40	16	7,938	33,3	2	43200	70400	620	590	71
TSB-U 40-16-8-3	1	40	16	7,938	33,3	3	60700	112100	940	900	87
TSB-U 40-16-8-4	1	40	16	7,938	33,3	4	79000	156500	1290	1220	103
TSB-U 40-16-8-5	1	40	16	7,938	33,3	5	96100	198200	1600	1520	119
TSB-U 40-16-8-6	1	40	16	7,938	33,3	6	113600	242500	1910	1810	135
TSB-S 40-20-6-2	1	40	20	6,35	35,6	2	29500	50700	490	470	89
TSB-S 40-20-6-3	1	40	20	6,35	35,6	3	39900	76100	720	680	112
TSB-S 40-20-6-4	1	40	20	6,35	35,6	4	50400	101500	940	890	136
TSB-U 40-20-6-2	1	40	20	6,35	34,5	2	31400	54600	550	530	72
TSB-U 40-20-6-3	1	40	20	6,35	34,5	3	43700	85900	830	790	92
TSB-U 40-20-6-4	1	40	20	6,35	34,5	4	56600	118600	1130	1070	112
TSB-U 40-20-6-5	1	40	20	6,35	34,5	5	68600	149900	1380	1320	132
TSB-U 40-20-8-2	1	40	20	7,938	33,3	2	42900	70100	610	590	77
TSB-U 40-20-8-3	1	40	20	7,938	33,3	3	60400	111700	930	900	97
TSB-U 40-20-8-4	1	40	20	7,938	33,3	4	78600	155800	1280	1230	117
TSB-U 40-20-8-5	1	40	20	7,938	33,3	5	96400	200000	1600	1540	137

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
70		85	100	9	18	25	75	87,5	23
65	(63)	78	93	9	16	20	70	81,5	7,4
65	(63)	78	93	9	16	20	70	81,5	9,2
65	(63)	78	93	9	16	20	70	81,5	11
65	(63)	78	93	9	16	20	70	81,5	13
65	(63)	78	93	9	16	20	70	81,5	15
65	(63)	78	93	9	16	20	70	81,5	17
70		85	100	9	18	25	75	87,5	11
70		85	100	9	18	25	75	87,5	14
70		85	100	9	18	25	75	87,5	17
70		85	100	9	18	25	75	87,5	19
70		85	100	9	18	25	75	87,5	22
63		78	93	9	16	20	70	81,5	15
63		78	93	9	16	20	70	81,5	19
63		78	93	9	16	20	70	81,5	22
63		78	93	9	16	20	70	81,5	26
65	(63)	78	93	9	16	20	70	81,5	7,3
65	(63)	78	93	9	16	20	70	81,5	9,2
65	(63)	78	93	9	16	20	70	81,5	11
65	(63)	78	93	9	16	20	70	81,5	13
65	(63)	78	93	9	16	20	70	81,5	15
70		85	100	9	18	25	75	87,5	11
70		85	100	9	18	25	75	87,5	14
70		85	100	9	18	25	75	87,5	17
70		85	100	9	18	25	75	87,5	20
70		85	100	9	18	25	75	87,5	23
63		78	93	9	18	20	70	81,5	16
63		78	93	9	18	20	70	81,5	20
63		78	93	9	18	20	70	81,5	25
65	(63)	78	93	9	18	20	70	81,5	7,3
65	(63)	78	93	9	18	20	70	81,5	9,7
65	(63)	78	93	9	18	20	70	81,5	12
65	(63)	78	93	9	18	20	70	81,5	14
70		85	100	9	18	25	75	87,5	11
70		85	100	9	18	25	75	87,5	15
70		85	100	9	18	25	75	87,5	18
70		85	100	9	18	25	75	87,5	21

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a *[N]*	C_{oa} *[N]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
TSB-U 40-25-6-2	1	40	25	6,35	34,5	2	31100	54300	550	530	81
TSB-U 40-25-6-3	1	40	25	6,35	34,5	3	43900	86800	830	800	106
TSB-U 40-25-6-4	1	40	25	6,35	34,5	4	56100	117900	1110	1070	131
TSB-U 40-25-8-2	1	40	25	7,938	33,3	2	42600	69700	600	580	87
TSB-U 40-25-8-3	1	40	25	7,938	33,3	3	60800	113500	940	910	112
TSB-U 40-25-8-4	1	40	25	7,938	33,3	4	78000	154800	1260	1220	137
TSB-U 40-30-6-2	1	40	30	6,35	34,5	2	30800	53900	540	520	89
TSB-U 40-30-6-3	1	40	30	6,35	34,5	3	43400	86200	820	790	119
TSB-U 40-30-8-2	1	40	30	7,938	33,3	2	42200	69100	590	580	95
TSB-U 40-30-8-3	1	40	30	7,938	33,3	3	60200	112700	930	900	125
TSB-U 40-40-6-2	1	40	40	6,35	34,5	2	30600	54300	530	520	109
TSB-U 40-40-8-2	1	40	40	7,938	33,3	2	42100	70300	590	580	113
TSB-U 40-50-6-2	1	40	50	6,35	34,5	2	30200	54500	520	510	124
TSB-U 40-50-8-2	1	40	50	7,938	33,3	2	41800	71100	580	570	124
TSB-U 40-60-6-2	1	40	60	6,35	34,5	2	29600	54400	500	490	141
TSB-U 40-60-8-2	1	40	60	7,938	33,3	2	41300	71600	560	560	142
TSB-S 50-5-3-2	1	50	5	3,175	47,8	2	13100	34300	590	470	46
TSB-S 50-5-3-3	1	50	5	3,175	47,8	3	17700	51500	860	690	52
TSB-S 50-5-3-4	1	50	5	3,175	47,8	4	22300	68700	1120	900	57
TSB-S 50-5-3-5	1	50	5	3,175	47,8	5	26900	85800	1380	1120	62
TSB-S 50-5-3-6	1	50	5	3,175	47,8	6	31400	103000	1650	1330	67
TSB-S 50-5-4-2	1	50	5	3,969	47	2	19600	48600	730	590	46
TSB-S 50-5-4-3	1	50	5	3,969	47	3	26500	73000	1060	870	52
TSB-S 50-5-4-4	1	50	5	3,969	47	4	33400	97300	1390	1140	57
TSB-S 50-5-4-5	1	50	5	3,969	47	5	40300	121600	1720	1410	62
TSB-S 50-5-4-6	1	50	5	3,969	47	6	47000	145900	2040	1680	67
TSB-S 50-6-4-2	1	50	6	3,969	47,2	2	18600	44800	630	510	49
TSB-S 50-6-4-3	1	50	6	3,969	47,2	3	25200	67100	910	740	56
TSB-S 50-6-4-4	1	50	6	3,969	47,2	4	31800	89500	1190	970	63
TSB-S 50-6-4-5	1	50	6	3,969	47,2	5	38300	111900	1470	1200	69
TSB-S 50-6-4-6	1	50	6	3,969	47,2	6	44700	134300	1750	1430	75
TSB-S 50-8-5-2	1	50	8	4,762	46,7	2	24100	53800	640	540	59
TSB-S 50-8-5-3	1	50	8	4,762	46,7	3	32600	80700	930	780	68
TSB-S 50-8-5-4	1	50	8	4,762	46,7	4	41200	107600	1210	1030	77
TSB-S 50-8-5-5	1	50	8	4,762	46,7	5	49600	134500	1500	1270	85
TSB-S 50-8-5-6	1	50	8	4,762	46,7	6	57900	161300	1780	1520	93
TSB-S 50-10-6-2	1	50	10	6,35	44,5	2	35500	70200	690	610	70

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
65	(63)	78	93	9	18	20	70	81,5	7,8
65	(63)	78	93	9	18	20	70	81,5	10
65	(63)	78	93	9	18	20	70	81,5	13
70		85	100	9	18	25	75	87,5	12
70		85	100	9	18	25	75	87,5	16
70		85	100	9	18	25	75	87,5	20
65	(63)	78	93	9	18	20	70	81,5	8,2
65	(63)	78	93	9	18	20	70	81,5	11
70		85	100	9	18	25	75	87,5	13
70		85	100	9	18	25	75	87,5	17
65	(63)	78	93	9	18	20	70	81,5	9,7
70		85	100	9	18	25	75	87,5	15
65	(63)	78	93	9	18	20	70	81,5	11
70		85	100	9	18	25	75	87,5	15
65	(63)	78	93	9	18	20	70	81,5	12
70		85	100	9	18	25	75	87,5	18
75		93	110	11	16	10	85	97,5	6,3
75		93	110	11	16	10	85	97,5	7
75		93	110	11	16	10	85	97,5	7,6
75		93	110	11	16	10	85	97,5	8,2
75		93	110	11	16	10	85	97,5	8,7
75		93	110	11	16	10	85	97,5	8,3
75		93	110	11	16	10	85	97,5	9,3
75		93	110	11	16	10	85	97,5	9,9
75		93	110	11	16	10	85	97,5	11
75		93	110	11	16	10	85	97,5	11
75		93	110	11	16	10	85	97,5	8,5
75		93	110	11	16	10	85	97,5	9,6
75		93	110	11	16	10	85	97,5	11
75		93	110	11	16	10	85	97,5	12
75		93	110	11	16	10	85	97,5	12
75		93	110	11	16	10	85	97,5	11
75		93	110	11	16	10	85	97,5	13
75		93	110	11	16	10	85	97,5	15
75		93	110	11	16	10	85	97,5	16
75		93	110	11	16	10	85	97,5	17
75		93	110	11	16	16	85	97,5	15

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 50-10-6-3	1	50	10	6,35	44,5	3	47900	105400	1000	880	81
TSB-S 50-10-6-4	1	50	10	6,35	44,5	4	60500	140500	1310	1160	92
TSB-S 50-10-6-5	1	50	10	6,35	44,5	5	73000	175600	1620	1440	103
TSB-S 50-10-6-6	1	50	10	6,35	44,5	6	85200	210700	1920	1710	113
TSB-S 50-10-6-7	1	50	10	6,35	44,5	7	97100	245800	2220	1980	123
TSB-S 50-10-6-8	1	50	10	6,35	44,5	8	108800	281000	2530	2250	134
TSB-U 50-10-6-2	1	50	10	6,35	44,5	2	35500	70200	680	600	56
TSB-U 50-10-6-3	1	50	10	6,35	44,5	3	49400	110200	1030	910	66
TSB-U 50-10-6-4	1	50	10	6,35	44,5	4	63700	151700	1370	1210	76
TSB-U 50-10-6-5	1	50	10	6,35	44,5	5	77300	191600	1700	1500	86
TSB-U 50-10-6-6	1	50	10	6,35	44,5	6	90700	231500	2010	1780	96
TSB-U 50-10-6-7	1	50	10	6,35	44,5	7	104100	273000	2330	2060	106
TSB-U 50-10-6-8	1	50	10	6,35	44,5	8	116900	312900	2620	2320	116
TSB-S 50-10-7-2	1	50	10	7,144	43,9	2	41600	78900	720	640	68
TSB-S 50-10-7-3	1	50	10	7,144	43,9	3	56100	118300	1040	920	80
TSB-S 50-10-7-4	1	50	10	7,144	43,9	4	70900	157700	1360	1210	91
TSB-S 50-10-7-5	1	50	10	7,144	43,9	5	85500	197200	1680	1500	101
TSB-S 50-10-7-6	1	50	10	7,144	43,9	6	99700	236600	2000	1780	111
TSB-S 50-10-7-7	1	50	10	7,144	43,9	7	113700	276000	2310	2070	121
TSB-S 50-10-7-8	1	50	10	7,144	43,9	8	127500	315500	2630	2350	132
TSB-U 50-10-7-2	1	50	10	7,144	43,9	2	42300	80900	740	660	56
TSB-U 50-10-7-3	1	50	10	7,144	43,9	3	58700	126600	1090	990	66
TSB-U 50-10-7-4	1	50	10	7,144	43,9	4	75800	174300	1470	1320	76
TSB-U 50-10-7-5	1	50	10	7,144	43,9	5	92000	220000	1810	1630	86
TSB-U 50-10-7-6	1	50	10	7,144	43,9	6	108300	267700	2170	1960	96
TSB-U 50-10-7-7	1	50	10	7,144	43,9	7	124300	315500	2500	2260	106
TSB-U 50-10-7-8	1	50	10	7,144	43,9	8	139500	361100	2810	2540	116
TSB-U 50-12-6-2	1	50	12	6,35	44,5	2	35400	70200	680	610	59
TSB-U 50-12-6-3	1	50	12	6,35	44,5	3	49300	110100	1030	930	71
TSB-U 50-12-6-4	1	50	12	6,35	44,5	4	63600	151500	1370	1230	83
TSB-U 50-12-6-5	1	50	12	6,35	44,5	5	77200	191400	1700	1530	95
TSB-U 50-12-6-6	1	50	12	6,35	44,5	6	90600	231300	2010	1810	107
TSB-U 50-12-6-7	1	50	12	6,35	44,5	7	104000	272800	2320	2100	119
TSB-S 50-12-8-2	1	50	12	7,938	44,5	2	44400	78700	610	530	78
TSB-S 50-12-8-3	1	50	12	7,938	44,5	3	60000	118000	880	770	92
TSB-S 50-12-8-4	1	50	12	7,938	44,5	4	75800	157300	1150	1010	105
TSB-S 50-12-8-5	1	50	12	7,938	44,5	5	91300	196700	1420	1250	117

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	16	16	85	97,5	18
75		93	110	11	16	16	85	97,5	20
75		93	110	11	16	16	85	97,5	22
75		93	110	11	16	16	85	97,5	24
75		93	110	11	16	16	85	97,5	26
75		93	110	11	16	16	85	97,5	29
75		93	110	11	16	16	85	97,5	10
75		93	110	11	16	16	85	97,5	12
75		93	110	11	16	16	85	97,5	14
75		93	110	11	16	16	85	97,5	15
75		93	110	11	16	16	85	97,5	17
75		93	110	11	16	16	85	97,5	19
75		93	110	11	16	16	85	97,5	21
75		93	110	11	16	16	85	97,5	20
75		93	110	11	16	16	85	97,5	23
75		93	110	11	16	16	85	97,5	26
75		93	110	11	16	16	85	97,5	29
75		93	110	11	16	16	85	97,5	31
75		93	110	11	16	16	85	97,5	34
75		93	110	11	16	16	85	97,5	37
82		100	118	11	16/18	20	92	105	14
82		100	118	11	16/18	20	92	105	16
82		100	118	11	16/18	20	92	105	18
82		100	118	11	16/18	20	92	105	21
82		100	118	11	16/18	20	92	105	23
82		100	118	11	16/18	20	92	105	25
82		100	118	11	16/18	20	92	105	28
75		93	110	11	16	20	85	97,5	9,4
75		93	110	11	16	20	85	97,5	11
75		93	110	11	16	20	85	97,5	13
75		93	110	11	16	20	85	97,5	15
75		93	110	11	16	20	85	97,5	18
75		93	110	11	16	20	85	97,5	20
75		93	110	11	16	20	85	97,5	25
75		93	110	11	16	20	85	97,5	30
75		93	110	11	16	20	85	97,5	34
75		93	110	11	16	20	85	97,5	38

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 50-12-8-6	1	50	12	7,938	44,5	6	106600	236000	1690	1490	130
TSB-S 50-12-8-7	1	50	12	7,938	44,5	7	121500	275300	1950	1730	142
TSB-S 50-12-8-8	1	50	12	7,938	44,5	8	136200	314700	2220	1970	154
TSB-U 50-12-8-2	1	50	12	7,938	43,3	2	48900	90400	760	700	65
TSB-U 50-12-8-3	1	50	12	7,938	43,3	3	69500	146200	1170	1070	77
TSB-U 50-12-8-4	1	50	12	7,938	43,3	4	89200	199400	1550	1430	89
TSB-U 50-12-8-5	1	50	12	7,938	43,3	5	109200	255200	1960	1800	101
TSB-U 50-12-8-6	1	50	12	7,938	43,3	6	128000	308400	2320	2130	113
TSB-U 50-12-8-7	1	50	12	7,938	43,3	7	147100	364300	2690	2470	125
TSB-U 50-12-8-8	1	50	12	7,938	43,3	8	165200	417400	3020	2780	137
TSB-U 50-15-6-2	1	50	15	6,35	44,5	2	35400	70100	680	620	64
TSB-U 50-15-6-3	1	50	15	6,35	44,5	3	49700	111500	1040	950	79
TSB-U 50-15-6-4	1	50	15	6,35	44,5	4	63500	151300	1370	1250	94
TSB-U 50-15-6-5	1	50	15	6,35	44,5	5	77100	191100	1690	1550	109
TSB-U 50-15-6-6	1	50	15	6,35	44,5	6	90800	232500	2020	1850	124
TSB-U 50-15-6-7	1	50	15	6,35	44,5	7	103800	272300	2320	2130	139
TSB-S 50-15-8-2	1	50	15	7,938	44,5	2	44300	78600	600	540	87
TSB-S 50-15-8-3	1	50	15	7,938	44,5	3	59800	117800	870	790	104
TSB-S 50-15-8-4	1	50	15	7,938	44,5	4	75600	157100	1150	1040	120
TSB-S 50-15-8-5	1	50	15	7,938	44,5	5	91100	196400	1410	1280	136
TSB-S 50-15-8-6	1	50	15	7,938	44,5	6	106400	235700	1680	1520	152
TSB-S 50-15-8-7	1	50	15	7,938	44,5	7	121300	274900	1950	1770	167
TSB-U 50-15-8-2	1	50	15	7,938	43,3	2	48800	90300	760	710	70
TSB-U 50-15-8-3	1	50	15	7,938	43,3	3	69400	146000	1170	1090	85
TSB-U 50-15-8-4	1	50	15	7,938	43,3	4	89000	199100	1550	1450	100
TSB-U 50-15-8-5	1	50	15	7,938	43,3	5	108900	254900	1950	1820	115
TSB-U 50-15-8-6	1	50	15	7,938	43,3	6	127700	308000	2310	2160	130
TSB-U 50-15-8-7	1	50	15	7,938	43,3	7	146800	363700	2680	2500	145
TSB-U 50-15-8-8	1	50	15	7,938	43,3	8	164900	416800	3010	2810	160
TSB-U 50-16-6-2	1	50	16	6,35	44,5	2	35300	70000	670	620	66
TSB-U 50-16-6-3	1	50	16	6,35	44,5	3	49600	111400	1040	960	82
TSB-U 50-16-6-4	1	50	16	6,35	44,5	4	63500	151200	1360	1260	98
TSB-U 50-16-6-5	1	50	16	6,35	44,5	5	77000	191000	1690	1560	114
TSB-U 50-16-6-6	1	50	16	6,35	44,5	6	90700	232400	2010	1860	130
TSB-U 50-16-6-7	1	50	16	6,35	44,5	7	103700	272200	2310	2140	146
TSB-S 50-16-8-2	1	50	16	7,938	44,5	2	44300	78500	600	550	86
TSB-S 50-16-8-3	1	50	16	7,938	44,5	3	59800	117800	870	790	104

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	16	20	85	97,5	42
75		93	110	11	16	20	85	97,5	46
75		93	110	11	16	20	85	97,5	50
82		100	118	11	16	25	92	105	15
82		100	118	11	16	25	92	105	18
82		100	118	11	16	25	92	105	21
82		100	118	11	16	25	92	105	23
82		100	118	11	16	25	92	105	26
82		100	118	11	16	25	92	105	29
82		100	118	11	16	25	92	105	33
75		93	110	11	16	20	85	97,5	9,1
75		93	110	11	16	20	85	97,5	11
75		93	110	11	16	20	85	97,5	14
75		93	110	11	16	20	85	97,5	16
75		93	110	11	16	20	85	97,5	18
75		93	110	11	16	20	85	97,5	21
75		93	110	11	16	20	85	97,5	26
75		93	110	11	16	20	85	97,5	32
75		93	110	11	16	20	85	97,5	37
75		93	110	11	16	20	85	97,5	42
75		93	110	11	16	20	85	97,5	48
75		93	110	11	16	20	85	97,5	52
82		100	118	11	16	25	92	105	14
82		100	118	11	16	25	92	105	18
82		100	118	11	16	25	92	105	21
82		100	118	11	16	25	92	105	24
82		100	118	11	16	25	92	105	28
82		100	118	11	16	25	92	105	31
82		100	118	11	16	25	92	105	35
75		93	110	11	16	20	85	97,5	9,2
75		93	110	11	16	20	85	97,5	11
75		93	110	11	16	20	85	97,5	14
75		93	110	11	16	20	85	97,5	16
75		93	110	11	16	20	85	97,5	19
75		93	110	11	16	20	85	97,5	22
75		93	110	11	16	20	85	97,5	25
75		93	110	11	16	20	85	97,5	31

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a *[N]*	C_{oa} *[N]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
TSB-S 50-16-8-4	1	50	16	7,938	44,5	4	75600	157000	1140	1040	122
TSB-S 50-16-8-5	1	50	16	7,938	44,5	5	91100	196300	1410	1290	138
TSB-S 50-16-8-6	1	50	16	7,938	44,5	6	106300	235500	1680	1530	155
TSB-S 50-16-8-7	1	50	16	7,938	44,5	7	121200	274800	1950	1770	171
TSB-U 50-16-8-2	1	50	16	7,938	43,3	2	48800	90200	760	710	72
TSB-U 50-16-8-3	1	50	16	7,938	43,3	3	69300	145900	1160	1090	88
TSB-U 50-16-8-4	1	50	16	7,938	43,3	4	88900	199000	1550	1450	104
TSB-U 50-16-8-5	1	50	16	7,938	43,3	5	108900	254700	1950	1830	120
TSB-U 50-16-8-6	1	50	16	7,938	43,3	6	127600	307800	2310	2170	136
TSB-U 50-16-8-7	1	50	16	7,938	43,3	7	146700	363500	2670	2510	152
TSB-U 50-16-8-8	1	50	16	7,938	43,3	8	164700	416600	3000	2820	168
TSB-U 50-20-6-2	1	50	20	6,35	44,5	2	35200	69800	670	630	73
TSB-U 50-20-6-3	1	50	20	6,35	44,5	3	49500	111100	1030	970	93
TSB-U 50-20-6-4	1	50	20	6,35	44,5	4	63200	150800	1360	1270	113
TSB-U 50-20-6-5	1	50	20	6,35	44,5	5	77200	192100	1690	1590	133
TSB-U 50-20-6-6	1	50	20	6,35	44,5	6	90400	231700	2000	1880	153
TSB-U 50-20-6-7	1	50	20	6,35	44,5	7	103700	273000	2310	2170	173
TSB-S 50-20-8-2	1	50	20	7,938	44,5	2	44100	78300	600	550	98
TSB-S 50-20-8-3	1	50	20	7,938	44,5	3	59600	117500	870	800	122
TSB-S 50-20-8-4	1	50	20	7,938	44,5	4	75300	156600	1140	1060	143
TSB-S 50-20-8-5	1	50	20	7,938	44,5	5	90800	195800	1410	1300	164
TSB-U 50-20-8-2	1	50	20	7,938	43,3	2	49600	92600	780	740	79
TSB-U 50-20-8-3	1	50	20	7,938	43,3	3	69100	145500	1160	1100	99
TSB-U 50-20-8-4	1	50	20	7,938	43,3	4	89400	201100	1560	1480	119
TSB-U 50-20-8-5	1	50	20	7,938	43,3	5	108500	254000	1940	1840	139
TSB-U 50-20-8-6	1	50	20	7,938	43,3	6	127900	309600	2310	2200	159
TSB-U 50-20-8-7	1	50	20	7,938	43,3	7	146200	362500	2660	2530	179
TSB-U 50-25-6-2	1	50	25	6,35	44,5	2	35600	71100	680	650	82
TSB-U 50-25-6-3	1	50	25	6,35	44,5	3	49200	110600	1020	970	107
TSB-U 50-25-6-4	1	50	25	6,35	44,5	4	63300	151700	1360	1290	132
TSB-U 50-25-6-5	1	50	25	6,35	44,5	5	76800	191200	1680	1590	157
TSB-U 50-25-6-6	1	50	25	6,35	44,5	6	90300	232300	2000	1900	182
TSB-U 50-25-8-2	1	50	25	7,938	43,3	2	49300	92200	770	740	87
TSB-U 50-25-8-3	1	50	25	7,938	43,3	3	68700	144900	1150	1100	112
TSB-U 50-25-8-4	1	50	25	7,938	43,3	4	88900	200300	1540	1480	137
TSB-U 50-25-8-5	1	50	25	7,938	43,3	5	108600	255600	1940	1860	162
TSB-U 50-25-8-6	1	50	25	7,938	43,3	6	127200	308300	2290	2200	187

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	16	20	85	97,5	37
75		93	110	11	16	20	85	97,5	42
75		93	110	11	16	20	85	97,5	47
75		93	110	11	16	20	85	97,5	53
82		100	118	11	16	25	92	105	14
82		100	118	11	16	25	92	105	18
82		100	118	11	16	25	92	105	21
82		100	118	11	16	25	92	105	25
82		100	118	11	16	25	92	105	28
82		100	118	11	16	25	92	105	32
82		100	118	11	16	25	92	105	36
75		93	110	11	18	25	85	97,5	9,3
75		93	110	11	18	25	85	97,5	12
75		93	110	11	18	25	85	97,5	15
75		93	110	11	18	25	85	97,5	18
75		93	110	11	18	25	85	97,5	21
75		93	110	11	18	25	85	97,5	24
75		93	110	11	18	20	85	97,5	28
75		93	110	11	18	20	85	97,5	36
75		93	110	11	18	20	85	97,5	42
75		93	110	11	18	20	85	97,5	49
82		100	118	11	18	25	92	105	14
82		100	118	11	18	25	92	105	19
82		100	118	11	18	25	92	105	23
82		100	118	11	18	25	92	105	27
82		100	118	11	18	25	92	105	31
82		100	118	11	18	25	92	105	36
75		93	110	11	18	25	85	97,5	9,8
75		93	110	11	18	25	85	97,5	13
75		93	110	11	18	25	85	97,5	16
75		93	110	11	18	25	85	97,5	20
75		93	110	11	18	25	85	97,5	23
82		100	118	11	18	25	92	105	15
82		100	118	11	18	25	92	105	20
82		100	118	11	18	25	92	105	25
82		100	118	11	18	25	92	105	30
82		100	118	11	18	25	92	105	35

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 50-30-6-2	1	50	30	6,35	44,5	2	35300	70700	670	640	91
TSB-U 50-30-6-3	1	50	30	6,35	44,5	3	49300	111600	1020	980	121
TSB-U 50-30-6-4	1	50	30	6,35	44,5	4	62900	150900	1340	1290	151
TSB-U 50-30-6-5	1	50	30	6,35	44,5	5	76700	191800	1670	1600	181
TSB-U 50-30-8-2	1	50	30	7,938	43,3	2	49000	91800	760	730	96
TSB-U 50-30-8-3	1	50	30	7,938	43,3	3	69100	146800	1150	1120	126
TSB-U 50-30-8-4	1	50	30	7,938	43,3	4	88300	199200	1530	1480	156
TSB-U 50-30-8-5	1	50	30	7,938	43,3	5	107900	254300	1920	1850	186
TSB-U 50-40-6-2	1	50	40	6,35	44,5	2	35200	71400	670	650	109
TSB-U 50-40-6-3	1	50	40	6,35	44,5	3	48900	111700	1010	980	149
TSB-U 50-40-6-4	1	50	40	6,35	44,5	4	62700	152100	1330	1290	189
TSB-U 50-40-8-2	1	50	40	7,938	43,3	2	49100	93200	760	740	115
TSB-U 50-40-8-3	1	50	40	7,938	43,3	3	68700	147500	1140	1110	156
TSB-U 50-50-6-2	1	50	50	6,35	44,5	2	34500	70200	640	630	129
TSB-U 50-50-6-3	1	50	50	6,35	44,5	3	48400	111500	990	960	178
TSB-U 50-50-8-2	1	50	50	7,938	43,3	2	48100	91700	730	720	133
TSB-U 50-50-8-3	1	50	50	7,938	43,3	3	68100	147700	1120	1100	183
TSB-U 50-60-6-2	1	50	60	6,35	44,5	2	34100	70400	630	620	145
TSB-U 50-60-8-2	1	50	60	7,938	43,3	2	47800	92500	720	710	145
TSB-S 63-5-3-2	1	63	5	3,175	60,8	2	14500	44100	720	540	48
TSB-S 63-5-3-3	1	63	5	3,175	60,8	3	19500	66100	1040	790	54
TSB-S 63-5-3-4	1	63	5	3,175	60,8	4	24700	88100	1370	1040	59
TSB-S 63-5-3-5	1	63	5	3,175	60,8	5	29700	110200	1690	1280	64
TSB-S 63-5-3-6	1	63	5	3,175	60,8	6	34700	132200	2010	1530	70
TSB-S 63-5-4-2	1	63	5	3,969	60	2	21600	62200	890	680	48
TSB-S 63-5-4-3	1	63	5	3,969	60	3	29200	93300	1290	1000	54
TSB-S 63-5-4-4	1	63	5	3,969	60	4	36900	124300	1690	1310	59
TSB-S 63-5-4-5	1	63	5	3,969	60	5	44400	155400	2090	1620	64
TSB-S 63-5-4-6	1	63	5	3,969	60	6	51800	186500	2480	1930	69
TSB-S 63-8-5-2	1	63	8	4,762	59,7	2	26500	68200	770	620	61
TSB-S 63-8-5-3	1	63	8	4,762	59,7	3	35800	102300	1120	910	70
TSB-S 63-8-5-4	1	63	8	4,762	59,7	4	45300	136400	1470	1190	79
TSB-S 63-8-5-5	1	63	8	4,762	59,7	5	54600	170500	1810	1470	87
TSB-S 63-8-5-6	1	63	8	4,762	59,7	6	63700	204600	2160	1760	95
TSB-S 63-10-6-2	1	63	10	6,35	57,5	2	39600	90400	850	720	72
TSB-S 63-10-6-3	1	63	10	6,35	57,5	3	53500	135600	1230	1050	84
TSB-S 63-10-6-4	1	63	10	6,35	57,5	4	67500	180700	1610	1370	95

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	18	25	85	97,5	10
75		93	110	11	18	25	85	97,5	14
75		93	110	11	18	25	85	97,5	18
75		93	110	11	18	25	85	97,5	22
82		100	118	11	18	25	92	105	16
82		100	118	11	18	25	92	105	22
82		100	118	11	18	25	92	105	27
82		100	118	11	18	25	92	105	33
75		93	110	11	18	25	85	97,5	12
75		93	110	11	18	25	85	97,5	17
75		93	110	11	18	25	85	97,5	22
82		100	118	11	18	25	92	105	18
82		100	118	11	18	25	92	105	26
75		93	110	11	18	25	85	97,5	14
75		93	110	11	18	25	85	97,5	20
82		100	118	11	18	25	92	105	21
82		100	118	11	18	25	92	105	30
75		93	110	11	18	25	85	97,5	16
82		100	118	11	18	25	92	105	22
90		108	125	11	18	16	95	110	8,4
90		108	125	11	18	16	95	110	9,3
90		108	125	11	18	16	95	110	10
90		108	125	11	18	16	95	110	11
90		108	125	11	18	16	95	110	12
90		108	125	11	18	16	95	110	11
90		108	125	11	18	16	95	110	12
90		108	125	11	18	16	95	110	13
90		108	125	11	18	16	95	110	14
90		108	125	11	18	16	95	110	15
90		108	125	11	18	16	95	110	15
90		108	125	11	18	16	95	110	17
90		108	125	11	18	16	95	110	19
90		108	125	11	18	16	95	110	21
90		108	125	11	18	16	95	110	22
90		108	125	11	18	16	95	110	20
90		108	125	11	18	16	95	110	23
90		108	125	11	18	16	95	110	26

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

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TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 63-10-6-5	1	63	10	6,35	57,5	5	81400	225900	1980	1700	105
TSB-S 63-10-6-6	1	63	10	6,35	57,5	6	95000	271100	2360	2030	115
TSB-S 63-10-6-7	1	63	10	6,35	57,5	7	108300	316300	2730	2350	123
TSB-S 63-10-6-8	1	63	10	6,35	57,5	8	121400	361500	3100	2670	136
TSB-U 63-10-6-2	1	63	10	6,35	57,5	2	40100	92000	850	720	56
TSB-U 63-10-6-3	1	63	10	6,35	57,5	3	55600	143600	1260	1070	66
TSB-U 63-10-6-4	1	63	10	6,35	57,5	4	70700	193700	1660	1420	76
TSB-U 63-10-6-5	1	63	10	6,35	57,5	5	86000	245300	2070	1760	86
TSB-U 63-10-6-6	1	63	10	6,35	57,5	6	100900	296900	2460	2100	96
TSB-S 63-10-7-2	1	63	10	7,144	56,9	2	47500	105000	910	770	70
TSB-S 63-10-7-3	1	63	10	7,144	56,9	3	64200	157500	1320	1130	82
TSB-S 63-10-7-4	1	63	10	7,144	56,9	4	81100	210000	1730	1480	93
TSB-S 63-10-7-5	1	63	10	7,144	56,9	5	97800	262500	2130	1830	103
TSB-S 63-10-7-6	1	63	10	7,144	56,9	6	114100	315000	2540	2180	113
TSB-S 63-10-7-7	1	63	10	7,144	56,9	7	130100	367500	2940	2530	123
TSB-S 63-10-7-8	1	63	10	7,144	56,9	8	145800	420000	3330	2870	134
TSB-U 63-10-7-2	1	63	10	7,144	56,9	2	47500	105000	900	780	56
TSB-U 63-10-7-3	1	63	10	7,144	56,9	3	65900	163800	1340	1170	66
TSB-U 63-10-7-4	1	63	10	7,144	56,9	4	84900	224700	1790	1560	76
TSB-U 63-10-7-5	1	63	10	7,144	56,9	5	102900	283500	2220	1930	86
TSB-U 63-10-7-6	1	63	10	7,144	56,9	6	120600	342300	2630	2290	96
TSB-U 63-10-7-7	1	63	10	7,144	56,9	7	138400	403200	3030	2650	106
TSB-S 63-12-8-2	1	63	12	7,938	57,5	2	52100	107900	790	680	82
TSB-S 63-12-8-3	1	63	12	7,938	57,5	3	70400	161900	1150	990	96
TSB-S 63-12-8-4	1	63	12	7,938	57,5	4	89000	215800	1500	1300	109
TSB-S 63-12-8-5	1	63	12	7,938	57,5	5	107200	269800	1850	1610	121
TSB-S 63-12-8-6	1	63	12	7,938	57,5	6	125100	323700	2210	1910	134
TSB-S 63-12-8-7	1	63	12	7,938	57,5	7	142700	377700	2550	2220	146
TSB-S 63-12-8-8	1	63	12	7,938	57,5	8	159900	431600	2900	2520	158
TSB-U 63-12-8-2	1	63	12	7,938	56,3	2	56400	121200	960	850	65
TSB-U 63-12-8-3	1	63	12	7,938	56,3	3	78000	188500	1450	1290	77
TSB-U 63-12-8-4	1	63	12	7,938	56,3	4	100500	258600	1920	1710	89
TSB-U 63-12-8-5	1	63	12	7,938	56,3	5	121800	325900	2370	2110	101
TSB-U 63-12-8-6	1	63	12	7,938	56,3	6	143300	395900	2820	2520	113
TSB-U 63-12-8-7	1	63	12	7,938	56,3	7	164300	466000	3260	2910	125
TSB-U 63-12-8-8	1	63	12	7,938	56,3	8	184300	533300	3660	3270	137
TSB-U 63-15-8-2	1	63	15	7,938	56,3	2	56300	121100	960	870	71

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
90		108	125	11	18	16	95	110	29
90		108	125	11	18	16	95	110	31
90		108	125	11	18	16	95	110	32
90		108	125	11	18	16	95	110	36
90		108	125	11	18	16	95	110	12
90		108	125	11	18	16	95	110	15
90		108	125	11	18	16	95	110	17
90		108	125	11	18	16	95	110	19
90		108	125	11	18	16	95	110	21
90		108	125	11	18	16	95	110	26
90		108	125	11	18	16	95	110	30
90		108	125	11	18	16	95	110	33
90		108	125	11	18	16	95	110	36
90		108	125	11	18	16	95	110	39
90		108	125	11	18	16	95	110	42
90		108	125	11	18	16	95	110	45
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	18
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	20
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	23
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	26
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	29
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	32
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	33
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	39
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	44
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	48
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	53
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	58
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	62
95		115	135	13,5	20	25	100	117,5	18
95		115	135	13,5	20	25	100	117,5	22
95		115	135	13,5	20	25	100	117,5	25
95		115	135	13,5	20	25	100	117,5	29
95		115	135	13,5	20	25	100	117,5	33
95		115	135	13,5	20	25	100	117,5	37
95		115	135	13,5	20	25	100	117,5	41
95		115	135	13,5	20	25	100	117,5	18

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 63-15-8-3	1	63	15	7,938	56,3	3	77900	188400	1440	1310	86
TSB-U 63-15-8-4	1	63	15	7,938	56,3	4	100300	258300	1920	1740	101
TSB-U 63-15-8-5	1	63	15	7,938	56,3	5	122300	328300	2390	2170	116
TSB-U 63-15-8-6	1	63	15	7,938	56,3	6	143100	395500	2820	2570	131
TSB-U 63-15-8-7	1	63	15	7,938	56,3	7	164100	465500	3250	2970	146
TSB-S 63-16-8-2	1	63	16	7,938	57,5	2	52000	107800	790	700	90
TSB-S 63-16-8-3	1	63	16	7,938	57,5	3	70300	161600	1140	1020	109
TSB-S 63-16-8-4	1	63	16	7,938	57,5	4	88800	215500	1500	1340	126
TSB-S 63-16-8-5	1	63	16	7,938	57,5	5	107000	269400	1850	1660	143
TSB-S 63-16-8-6	1	63	16	7,938	57,5	6	124900	323300	2200	1970	159
TSB-S 63-16-8-7	1	63	16	7,938	57,5	7	142400	377200	2550	2290	175
TSB-S 63-16-8-8	1	63	16	7,938	57,5	8	159600	431100	2890	2600	192
TSB-U 63-16-8-2	1	63	16	7,938	56,3	2	56300	121000	960	880	74
TSB-U 63-16-8-3	1	63	16	7,938	56,3	3	77900	188300	1440	1320	89
TSB-U 63-16-8-4	1	63	16	7,938	56,3	4	100300	258200	1910	1750	105
TSB-U 63-16-8-5	1	63	16	7,938	56,3	5	122200	328200	2380	2180	121
TSB-U 63-16-8-6	1	63	16	7,938	56,3	6	143000	395400	2820	2580	137
TSB-U 63-16-8-7	1	63	16	7,938	56,3	7	164000	465300	3250	2980	153
TSB-U 63-16-9-2	1	63	16	9,525	55,2	2	72200	144600	990	910	80
TSB-U 63-16-9-3	1	63	16	9,525	55,2	3	100400	226600	1470	1360	96
TSB-U 63-16-9-4	1	63	16	9,525	55,2	4	129800	312600	1980	1830	112
TSB-U 63-16-9-5	1	63	16	9,525	55,2	5	157400	394700	2460	2270	128
TSB-U 63-16-9-6	1	63	16	9,525	55,2	6	185500	480600	2920	2710	144
TSB-U 63-16-9-7	1	63	16	9,525	55,2	7	212100	562700	3360	3110	160
TSB-U 63-16-9-8	1	63	16	9,525	55,2	8	239000	648600	3800	3520	176
TSB-S 63-20-8-2	1	63	20	7,938	57,5	2	51900	107600	790	720	101
TSB-S 63-20-8-3	1	63	20	7,938	57,5	3	70100	161400	1140	1040	124
TSB-S 63-20-8-4	1	63	20	7,938	57,5	4	88600	215200	1490	1370	146
TSB-S 63-20-8-5	1	63	20	7,938	57,5	5	106800	269000	1840	1690	167
TSB-S 63-20-8-6	1	63	20	7,938	57,5	6	124600	322700	2190	2010	187
TSB-S 63-20-8-7	1	63	20	7,938	57,5	7	142100	376500	2540	2330	207
TSB-U 63-20-8-2	1	63	20	7,938	56,3	2	56200	120800	950	890	80
TSB-U 63-20-8-3	1	63	20	7,938	56,3	3	77700	188000	1440	1340	100
TSB-U 63-20-8-4	1	63	20	7,938	56,3	4	100100	257800	1910	1780	122
TSB-U 63-20-8-5	1	63	20	7,938	56,3	5	121900	327600	2370	2210	142
TSB-U 63-20-8-6	1	63	20	7,938	56,3	6	142700	394700	2810	2620	160
TSB-U 63-20-8-7	1	63	20	7,938	56,3	7	163600	464500	3240	3020	180

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
95		115	135	13,5	20	25	100	117,5	22
95		115	135	13,5	20	25	100	117,5	26
95		115	135	13,5	20	25	100	117,5	31
95		115	135	13,5	20	25	100	117,5	35
95		115	135	13,5	20	25	100	117,5	40
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	33
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	40
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	47
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	54
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	59
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	65
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	72
95		115	135	13,5	20	25	100	117,5	19
95		115	135	13,5	20	25	100	117,5	22
95		115	135	13,5	20	25	100	117,5	27
95		115	135	13,5	20	25	100	117,5	31
95		115	135	13,5	20	25	100	117,5	36
95		115	135	13,5	20	25	100	117,5	41
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	27
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	33
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	38
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	44
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	50
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	57
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	63
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	35
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	45
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	53
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	61
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	68
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	76
95		115	135	13,5	20	25	100	117,5	18
95		115	135	13,5	20	25	100	117,5	23
95		115	135	13,5	20	25	100	117,5	29
95		115	135	13,5	20	25	100	117,5	35
95		115	135	13,5	20	25	100	117,5	39
95		115	135	13,5	20	25	100	117,5	45

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 63-20-9-2	1	63	20	9,525	55,2	2	72000	144300	980	920	87
TSB-U 63-20-9-3	1	63	20	9,525	55,2	3	100200	226200	1470	1380	107
TSB-U 63-20-9-4	1	63	20	9,525	55,2	4	129500	312100	1970	1850	127
TSB-U 63-20-9-5	1	63	20	9,525	55,2	5	157100	394000	2450	2300	147
TSB-U 63-20-9-6	1	63	20	9,525	55,2	6	185100	479800	2910	2740	167
TSB-U 63-20-9-7	1	63	20	9,525	55,2	7	211600	561700	3350	3150	187
TSB-U 63-20-9-8	1	63	20	9,525	55,2	8	238500	647500	3790	3560	207
TSB-U 63-20-11-2	1	63	20	11,113	54,1	2	87500	165700	1000	940	79
TSB-U 63-20-11-3	1	63	20	11,113	54,1	3	122400	261900	1530	1430	99
TSB-U 63-20-11-4	1	63	20	11,113	54,1	4	158800	363500	2050	1930	119
TSB-U 63-20-11-5	1	63	20	11,113	54,1	5	194400	465000	2580	2420	139
TSB-U 63-20-11-6	1	63	20	11,113	54,1	6	227700	561300	3050	2860	159
TSB-U 63-20-11-7	1	63	20	11,113	54,1	7	261800	662800	3520	3310	179
TSB-U 63-20-11-8	1	63	20	11,113	54,1	8	293800	759000	3960	3730	199
TSB-U 63-25-8-2	1	63	25	7,938	56,3	2	56000	120500	950	900	89
TSB-U 63-25-8-3	1	63	25	7,938	56,3	3	78200	190100	1450	1370	114
TSB-U 63-25-8-4	1	63	25	7,938	56,3	4	99700	257100	1900	1790	139
TSB-U 63-25-8-5	1	63	25	7,938	56,3	5	121500	326700	2360	2230	164
TSB-U 63-25-8-6	1	63	25	7,938	56,3	6	142800	396300	2810	2650	189
TSB-U 63-25-9-2	1	63	25	9,525	55,2	2	71800	143900	980	930	95
TSB-U 63-25-9-3	1	63	25	9,525	55,2	3	99800	225600	1460	1390	120
TSB-U 63-25-9-4	1	63	25	9,525	55,2	4	129000	311200	1960	1870	145
TSB-U 63-25-9-5	1	63	25	9,525	55,2	5	157600	396800	2460	2340	170
TSB-U 63-25-9-6	1	63	25	9,525	55,2	6	184500	478500	2900	2760	195
TSB-U 63-25-9-7	1	63	25	9,525	55,2	7	211800	564100	3350	3190	220
TSB-U 63-25-9-8	1	63	25	9,525	55,2	8	237700	645800	3760	3590	245
TSB-U 63-25-11-2	1	63	25	11,113	54,1	2	87200	165300	1000	950	87
TSB-U 63-25-11-3	1	63	25	11,113	54,1	3	122000	261200	1520	1440	112
TSB-U 63-25-11-4	1	63	25	11,113	54,1	4	158300	362500	2040	1940	137
TSB-U 63-25-11-5	1	63	25	11,113	54,1	5	193800	463800	2560	2440	162
TSB-U 63-25-11-6	1	63	25	11,113	54,1	6	227000	559800	3030	2880	187
TSB-U 63-25-11-7	1	63	25	11,113	54,1	7	260900	661100	3500	3330	212
TSB-U 63-25-11-8	1	63	25	11,113	54,1	8	294200	762400	3970	3780	237
TSB-U 63-30-8-2	1	63	30	7,938	56,3	2	55700	120100	940	900	97
TSB-U 63-30-8-3	1	63	30	7,938	56,3	3	77800	189500	1440	1370	127
TSB-U 63-30-8-4	1	63	30	7,938	56,3	4	100000	258900	1900	1810	157
TSB-U 63-30-8-5	1	63	30	7,938	56,3	5	121700	328300	2360	2250	187

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	27
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	34
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	40
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	47
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	54
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	62
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	69
105		125	145	13,5	25	25	110	127,5	31
105		125	145	13,5	25	25	110	127,5	40
105		125	145	13,5	25	25	110	127,5	48
105		125	145	13,5	25	25	110	127,5	56
105		125	145	13,5	25	25	110	127,5	65
105		125	145	13,5	25	25	110	127,5	75
105		125	145	13,5	25	25	110	127,5	84
95		115	135	13,5	20	25	100	117,5	19
95		115	135	13,5	20	25	100	117,5	25
95		115	135	13,5	20	25	100	117,5	31
95		115	135	13,5	20	25	100	117,5	38
95		115	135	13,5	20	25	100	117,5	44
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	27
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	35
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	43
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	51
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	60
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	69
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	78
105		125	145	13,5	25	25	110	127,5	32
105		125	145	13,5	25	25	110	127,5	42
105		125	145	13,5	25	25	110	127,5	52
105		125	145	13,5	25	25	110	127,5	62
105		125	145	13,5	25	25	110	127,5	73
105		125	145	13,5	25	25	110	127,5	84
105		125	145	13,5	25	25	110	127,5	95
95		115	135	13,5	20	25	100	117,5	20
95		115	135	13,5	20	25	100	117,5	27
95		115	135	13,5	20	25	100	117,5	34
95		115	135	13,5	20	25	100	117,5	41

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 63-30-8-6	1	63	30	7,938	56,3	6	142200	395000	2790	2660	217
TSB-U 63-30-9-2	1	63	30	9,525	55,2	2	71500	143500	970	930	104
TSB-U 63-30-9-3	1	63	30	9,525	55,2	3	100600	228800	1470	1410	134
TSB-U 63-30-9-4	1	63	30	9,525	55,2	4	128500	310200	1950	1870	164
TSB-U 63-30-9-5	1	63	30	9,525	55,2	5	156900	395500	2440	2340	194
TSB-U 63-30-9-6	1	63	30	9,525	55,2	6	184700	480800	2900	2780	224
TSB-U 63-30-9-7	1	63	30	9,525	55,2	7	210900	562300	3330	3200	254
TSB-U 63-30-11-2	1	63	30	11,113	54,1	2	86900	164700	990	950	96
TSB-U 63-30-11-3	1	63	30	11,113	54,1	3	123100	265700	1540	1470	126
TSB-U 63-30-11-4	1	63	30	11,113	54,1	4	157600	361400	2030	1950	156
TSB-U 63-30-11-5	1	63	30	11,113	54,1	5	193000	462400	2550	2440	186
TSB-U 63-30-11-6	1	63	30	11,113	54,1	6	227500	563300	3040	2910	216
TSB-U 63-30-11-7	1	63	30	11,113	54,1	7	261200	664300	3500	3360	247
TSB-U 63-40-8-2	1	63	40	7,938	56,3	2	56000	121800	950	910	115
TSB-U 63-40-8-3	1	63	40	7,938	56,3	3	77700	190600	1430	1380	155
TSB-U 63-40-8-4	1	63	40	7,938	56,3	4	99600	259400	1890	1820	195
TSB-U 63-40-8-5	1	63	40	7,938	56,3	5	121000	328200	2340	2260	235
TSB-U 63-40-9-2	1	63	40	9,525	55,2	2	70700	142300	960	930	120
TSB-U 63-40-9-3	1	63	40	9,525	55,2	3	99500	226900	1450	1400	160
TSB-U 63-40-9-4	1	63	40	9,525	55,2	4	128200	311600	1940	1880	200
TSB-U 63-40-9-5	1	63	40	9,525	55,2	5	156300	396200	2420	2350	240
TSB-U 63-40-11-2	1	63	40	11,113	54,1	2	86000	163400	980	950	113
TSB-U 63-40-11-3	1	63	40	11,113	54,1	3	121800	263600	1510	1460	153
TSB-U 63-40-11-4	1	63	40	11,113	54,1	4	157500	363800	2020	1960	193
TSB-U 63-40-11-5	1	63	40	11,113	54,1	5	192400	463900	2530	2450	233
TSB-U 63-50-8-2	1	63	50	7,938	56,3	2	55200	120500	920	900	135
TSB-U 63-50-8-3	1	63	50	7,938	56,3	3	76700	188600	1400	1360	185
TSB-U 63-50-8-4	1	63	50	7,938	56,3	4	98900	259300	1860	1810	235
TSB-U 63-50-9-2	1	63	50	9,525	55,2	2	71000	144700	960	940	137
TSB-U 63-50-9-3	1	63	50	9,525	55,2	3	99300	228400	1440	1400	187
TSB-U 63-50-9-4	1	63	50	9,525	55,2	4	127500	312200	1920	1870	237
TSB-U 63-50-11-2	1	63	50	11,113	54,1	2	86700	167000	980	960	130
TSB-U 63-50-11-3	1	63	50	11,113	54,1	3	121800	266200	1510	1470	180
TSB-U 63-50-11-4	1	63	50	11,113	54,1	4	157000	365300	2010	1960	230
TSB-S 70-10-6-2	1	70	10	6,35	64,5	2	42200	103700	950	810	72
TSB-S 70-10-6-3	1	70	10	6,35	64,5	3	57000	155600	1380	1180	84
TSB-S 70-10-6-4	1	70	10	6,35	64,5	4	72000	207400	1800	1550	95

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
95		115	135	13,5	20	25	100	117,5	49
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	28
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	38
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	47
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	57
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	67
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	77
105		125	145	13,5	25	25	110	127,5	34
105		125	145	13,5	25	25	110	127,5	45
105		125	145	13,5	25	25	110	127,5	57
105		125	145	13,5	25	25	110	127,5	69
105		125	145	13,5	25	25	110	127,5	81
105		125	145	13,5	25	25	110	127,5	95
95		115	135	13,5	20	25	100	117,5	23
95		115	135	13,5	20	25	100	117,5	32
95		115	135	13,5	20	25	100	117,5	41
95		115	135	13,5	20	25	100	117,5	50
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	31
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	43
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	56
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	68
105		125	145	13,5	25	25	110	127,5	38
105		125	145	13,5	25	25	110	127,5	53
105		125	145	13,5	25	25	110	127,5	68
105		125	145	13,5	25	25	110	127,5	84
95		115	135	13,5	20	25	100	117,5	27
95		115	135	13,5	20	25	100	117,5	38
95		115	135	13,5	20	25	100	117,5	49
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	35
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	50
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	65
105		125	145	13,5	25	25	110	127,5	43
105		125	145	13,5	25	25	110	127,5	61
105		125	145	13,5	25	25	110	127,5	80
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	22
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	26
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	29

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 70-10-6-5	1	70	10	6,35	64,5	5	86700	259300	2220	1910	105
TSB-S 70-10-6-6	1	70	10	6,35	64,5	6	101200	311100	2640	2280	115
TSB-S 70-10-6-7	1	70	10	6,35	64,5	7	115400	363000	3060	2640	125
TSB-S 70-10-6-8	1	70	10	6,35	64,5	8	129400	414800	3480	3000	136
TSB-U 70-10-6-2	1	70	10	6,35	64,5	2	42200	103700	930	790	56
TSB-U 70-10-6-3	1	70	10	6,35	64,5	3	58100	160400	1380	1180	66
TSB-U 70-10-6-4	1	70	10	6,35	64,5	4	74200	217100	1830	1570	76
TSB-U 70-10-6-5	1	70	10	6,35	64,5	5	90000	273800	2250	1930	86
TSB-S 70-10-7-2	1	70	10	7,144	63,9	2	50000	118100	1000	860	72
TSB-S 70-10-7-3	1	70	10	7,144	63,9	3	67600	177200	1450	1250	84
TSB-S 70-10-7-4	1	70	10	7,144	63,9	4	85400	236300	1900	1640	95
TSB-S 70-10-7-5	1	70	10	7,144	63,9	5	102900	295300	2350	2030	105
TSB-S 70-10-7-6	1	70	10	7,144	63,9	6	120100	354400	2790	2420	115
TSB-S 70-10-7-7	1	70	10	7,144	63,9	7	136900	413400	3230	2800	125
TSB-S 70-10-7-8	1	70	10	7,144	63,9	8	153500	472500	3670	3180	136
TSB-U 70-10-7-2	1	70	10	7,144	63,9	2	50000	118100	990	850	56
TSB-U 70-10-7-3	1	70	10	7,144	63,9	3	69700	185600	1490	1280	66
TSB-U 70-10-7-4	1	70	10	7,144	63,9	4	88900	251000	1960	1690	76
TSB-U 70-10-7-5	1	70	10	7,144	63,9	5	107700	316400	2420	2080	86
TSB-U 70-10-7-6	1	70	10	7,144	63,9	6	126700	383900	2880	2480	96
TSB-S 70-12-8-2	1	70	12	7,938	64,5	2	53900	117900	850	720	82
TSB-S 70-12-8-3	1	70	12	7,938	64,5	3	72800	176900	1230	1050	96
TSB-S 70-12-8-4	1	70	12	7,938	64,5	4	92000	235800	1610	1380	109
TSB-S 70-12-8-5	1	70	12	7,938	64,5	5	110900	294800	1990	1710	121
TSB-S 70-12-8-6	1	70	12	7,938	64,5	6	129400	353700	2360	2040	134
TSB-S 70-12-8-7	1	70	12	7,938	64,5	7	147500	412700	2740	2360	146
TSB-S 70-12-8-8	1	70	12	7,938	64,5	8	165400	471600	3110	2680	158
TSB-U 70-12-8-2	1	70	12	7,938	63,3	2	59100	135300	1050	930	66
TSB-U 70-12-8-3	1	70	12	7,938	63,3	3	82600	213800	1590	1400	78
TSB-U 70-12-8-4	1	70	12	7,938	63,3	4	105500	289600	2100	1850	90
TSB-U 70-12-8-5	1	70	12	7,938	63,3	5	127900	365400	2600	2290	102
TSB-U 70-12-8-6	1	70	12	7,938	63,3	6	150500	443900	3100	2740	114
TSB-U 70-12-8-7	1	70	12	7,938	63,3	7	172000	519700	3550	3150	126
TSB-U 70-15-8-2	1	70	15	7,938	63,3	2	59000	135200	1050	950	71
TSB-U 70-15-8-3	1	70	15	7,938	63,3	3	82500	213700	1590	1430	86
TSB-U 70-15-8-4	1	70	15	7,938	63,3	4	105400	289400	2090	1890	101
TSB-U 70-15-8-5	1	70	15	7,938	63,3	5	127800	365100	2590	2350	116

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0{,}1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	31
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	34
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	36
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	39
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	14
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	16
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	19
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	21
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	30
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	34
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	38
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	41
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	44
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	48
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	51
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	20
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	22
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	25
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	28
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	32
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	36
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	43
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	49
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	54
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	59
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	65
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	70
105		125	145	13,5	20	25	110	127,5	21
105		125	145	13,5	20	25	110	127,5	25
105		125	145	13,5	20	25	110	127,5	29
105		125	145	13,5	20	25	110	127,5	33
105		125	145	13,5	20	25	110	127,5	37
105		125	145	13,5	20	25	110	127,5	41
105		125	145	13,5	20	25	110	127,5	20
105		125	145	13,5	20	25	110	127,5	24
105		125	145	13,5	20	25	110	127,5	29
105		125	145	13,5	20	25	110	127,5	34

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 70-15-8-6	1	70	15	7,938	63,3	6	150400	443500	3090	2800	131
TSB-U 70-15-8-7	1	70	15	7,938	63,3	7	171900	519300	3550	3210	146
TSB-S 70-16-8-2	1	70	16	7,938	64,5	2	53800	117800	850	750	90
TSB-S 70-16-8-3	1	70	16	7,938	64,5	3	72700	176700	1230	1090	109
TSB-S 70-16-8-4	1	70	16	7,938	64,5	4	91900	235500	1610	1430	126
TSB-S 70-16-8-5	1	70	16	7,938	64,5	5	110700	294400	1980	1770	143
TSB-S 70-16-8-6	1	70	16	7,938	64,5	6	129200	353300	2360	2110	159
TSB-S 70-16-8-7	1	70	16	7,938	64,5	7	147300	412200	2730	2440	175
TSB-S 70-16-8-8	1	70	16	7,938	64,5	8	165100	471100	3100	2770	192
TSB-U 70-16-8-2	1	70	16	7,938	63,3	2	59000	135200	1050	950	73
TSB-U 70-16-8-3	1	70	16	7,938	63,3	3	82500	213600	1590	1440	89
TSB-U 70-16-8-4	1	70	16	7,938	63,3	4	105300	289300	2090	1900	105
TSB-U 70-16-8-5	1	70	16	7,938	63,3	5	127800	365000	2590	2360	121
TSB-U 70-16-8-6	1	70	16	7,938	63,3	6	150300	443400	3090	2820	137
TSB-U 70-16-9-2	1	70	16	9,525	62,2	2	75800	161200	1080	990	81
TSB-U 70-16-9-3	1	70	16	9,525	62,2	3	106200	255500	1630	1480	97
TSB-U 70-16-9-4	1	70	16	9,525	62,2	4	136500	349900	2180	1980	113
TSB-U 70-16-9-5	1	70	16	9,525	62,2	5	166300	444200	2700	2460	129
TSB-U 70-16-9-6	1	70	16	9,525	62,2	6	194400	534600	3180	2900	145
TSB-U 70-16-9-7	1	70	16	9,525	62,2	7	222900	629000	3660	3350	161
TSB-U 70-16-9-8	1	70	16	9,525	62,2	8	250900	723300	4140	3790	177
TSB-S 70-20-8-2	1	70	20	7,938	64,5	2	53700	117600	840	770	101
TSB-S 70-20-8-3	1	70	20	7,938	64,5	3	72600	176400	1220	1110	124
TSB-S 70-20-8-4	1	70	20	7,938	64,5	4	91700	235200	1600	1460	146
TSB-S 70-20-8-5	1	70	20	7,938	64,5	5	110500	294000	1980	1800	167
TSB-S 70-20-8-6	1	70	20	7,938	64,5	6	129000	352800	2350	2150	188
TSB-S 70-20-8-7	1	70	20	7,938	64,5	7	147100	411600	2720	2490	208
TSB-S 70-20-8-8	1	70	20	7,938	64,5	8	164800	470500	3090	2830	228
TSB-U 70-20-8-2	1	70	20	7,938	63,3	2	58900	135000	1050	970	80
TSB-U 70-20-8-3	1	70	20	7,938	63,3	3	82400	213300	1580	1470	100
TSB-U 70-20-8-4	1	70	20	7,938	63,3	4	105200	288900	2090	1930	120
TSB-U 70-20-8-5	1	70	20	7,938	63,3	5	128200	367200	2600	2410	140
TSB-U 70-20-8-6	1	70	20	7,938	63,3	6	150000	442800	3080	2860	160
TSB-U 70-20-9-2	1	70	20	9,525	62,2	2	75600	160900	1080	1000	88
TSB-U 70-20-9-3	1	70	20	9,525	62,2	3	106000	255200	1620	1510	108
TSB-U 70-20-9-4	1	70	20	9,525	62,2	4	136300	349400	2170	2010	128
TSB-U 70-20-9-5	1	70	20	9,525	62,2	5	166000	443600	2690	2500	148

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
105		125	145	13,5	20	25	110	127,5	39
105		125	145	13,5	20	25	110	127,5	44
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	36
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	45
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	52
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	60
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	66
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	73
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	80
105		125	145	13,5	20	25	110	127,5	20
105		125	145	13,5	20	25	110	127,5	25
105		125	145	13,5	20	25	110	127,5	30
105		125	145	13,5	20	25	110	127,5	35
105		125	145	13,5	20	25	110	127,5	39
110		130	150	13,5	25	25	115	132,5	31
110		130	150	13,5	25	25	115	132,5	37
110		130	150	13,5	25	25	115	132,5	43
110		130	150	13,5	25	25	115	132,5	49
110		130	150	13,5	25	25	115	132,5	56
110		130	150	13,5	25	25	115	132,5	63
110		130	150	13,5	25	25	115	132,5	70
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	39
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	49
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	59
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	68
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	77
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	85
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	93
105		125	145	13,5	20	25	110	127,5	20
105		125	145	13,5	20	25	110	127,5	26
105		125	145	13,5	20	25	110	127,5	32
105		125	145	13,5	20	25	110	127,5	37
105		125	145	13,5	20	25	110	127,5	43
110		130	150	13,5	25	25	115	132,5	30
110		130	150	13,5	25	25	115	132,5	38
110		130	150	13,5	25	25	115	132,5	45
110		130	150	13,5	25	25	115	132,5	53

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 70-20-9-6	1	70	20	9,525	62,2	6	195000	537800	3190	2970	168
TSB-U 70-20-9-7	1	70	20	9,525	62,2	7	222500	628100	3650	3400	188
TSB-U 70-20-9-8	1	70	20	9,525	62,2	8	250400	722300	4130	3850	208
TSB-U 70-25-8-2	1	70	25	7,938	63,3	2	58700	134700	1040	980	89
TSB-U 70-25-8-3	1	70	25	7,938	63,3	3	82100	212800	1580	1480	114
TSB-U 70-25-8-4	1	70	25	7,938	63,3	4	104900	288200	2080	1950	139
TSB-U 70-25-8-5	1	70	25	7,938	63,3	5	127800	366400	2590	2440	164
TSB-U 70-25-8-6	1	70	25	7,938	63,3	6	149600	441800	3070	2890	189
TSB-U 70-25-9-2	1	70	25	9,525	62,2	2	75400	160600	1070	1010	96
TSB-U 70-25-9-3	1	70	25	9,525	62,2	3	105700	254600	1620	1520	121
TSB-U 70-25-9-4	1	70	25	9,525	62,2	4	135900	348600	2160	2030	146
TSB-U 70-25-9-5	1	70	25	9,525	62,2	5	165500	442600	2680	2520	171
TSB-U 70-25-9-6	1	70	25	9,525	62,2	6	194500	536600	3180	3000	196
TSB-U 70-25-9-7	1	70	25	9,525	62,2	7	222800	630600	3660	3450	221
TSB-U 70-30-8-2	1	70	30	7,938	63,3	2	59300	137000	1050	1000	98
TSB-U 70-30-8-3	1	70	30	7,938	63,3	3	81800	212200	1570	1490	128
TSB-U 70-30-8-4	1	70	30	7,938	63,3	4	105100	290200	2080	1980	158
TSB-U 70-30-8-5	1	70	30	7,938	63,3	5	127300	365400	2580	2450	188
TSB-U 70-30-9-2	1	70	30	9,525	62,2	2	75200	160200	1070	1010	104
TSB-U 70-30-9-3	1	70	30	9,525	62,2	3	105300	253900	1610	1530	134
TSB-U 70-30-9-4	1	70	30	9,525	62,2	4	135400	347700	2150	2040	164
TSB-U 70-30-9-5	1	70	30	9,525	62,2	5	164900	441500	2660	2540	194
TSB-U 70-30-9-6	1	70	30	9,525	62,2	6	193800	535200	3160	3010	224
TSB-U 70-30-9-7	1	70	30	9,525	62,2	7	222000	629000	3640	3470	254
TSB-U 70-40-8-2	1	70	40	7,938	63,3	2	58800	136100	1040	1000	116
TSB-U 70-40-8-3	1	70	40	7,938	63,3	3	81800	213500	1560	1500	156
TSB-U 70-40-8-4	1	70	40	7,938	63,3	4	104200	288200	2050	1980	196
TSB-U 70-40-8-5	1	70	40	7,938	63,3	5	126800	365600	2560	2460	236
TSB-U 70-40-9-2	1	70	40	9,525	62,2	2	75700	163000	1080	1040	121
TSB-U 70-40-9-3	1	70	40	9,525	62,2	3	105500	256100	1610	1550	161
TSB-U 70-40-9-4	1	70	40	9,525	62,2	4	135300	349300	2140	2060	201
TSB-U 70-40-9-5	1	70	40	9,525	62,2	5	164500	442400	2650	2550	241
TSB-U 70-50-8-2	1	70	50	7,938	63,3	2	58100	134900	1020	990	136
TSB-U 70-50-8-3	1	70	50	7,938	63,3	3	80900	211700	1540	1490	186
TSB-U 70-50-8-4	1	70	50	7,938	63,3	4	103700	288400	2030	1970	236
TSB-U 70-50-9-2	1	70	50	9,525	62,2	2	74900	161600	1060	1030	138
TSB-U 70-50-9-3	1	70	50	9,525	62,2	3	104300	254000	1580	1530	188

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
110		130	150	13,5	25	25	115	132,5	60
110		130	150	13,5	25	25	115	132,5	69
110		130	150	13,5	25	25	115	132,5	77
105		125	145	13,5	20	25	110	127,5	21
105		125	145	13,5	20	25	110	127,5	28
105		125	145	13,5	20	25	110	127,5	35
105		125	145	13,5	20	25	110	127,5	42
105		125	145	13,5	20	25	110	127,5	49
110		130	150	13,5	25	25	115	132,5	30
110		130	150	13,5	25	25	115	132,5	39
110		130	150	13,5	25	25	115	132,5	48
110		130	150	13,5	25	25	115	132,5	57
110		130	150	13,5	25	25	115	132,5	67
110		130	150	13,5	25	25	115	132,5	77
105		125	145	13,5	20	25	110	127,5	22
105		125	145	13,5	20	25	110	127,5	30
105		125	145	13,5	20	25	110	127,5	38
105		125	145	13,5	20	25	110	127,5	46
110		130	150	13,5	25	25	115	132,5	31
110		130	150	13,5	25	25	115	132,5	42
110		130	150	13,5	25	25	115	132,5	52
110		130	150	13,5	25	25	115	132,5	63
110		130	150	13,5	25	25	115	132,5	74
110		130	150	13,5	25	25	115	132,5	85
105		125	145	13,5	20	25	110	127,5	26
105		125	145	13,5	20	25	110	127,5	36
105		125	145	13,5	20	25	110	127,5	46
105		125	145	13,5	20	25	110	127,5	56
110		130	150	13,5	25	25	115	132,5	35
110		130	150	13,5	25	25	115	132,5	48
110		130	150	13,5	25	25	115	132,5	62
110		130	150	13,5	25	25	115	132,5	75
105		125	145	13,5	20	25	110	127,5	30
105		125	145	13,5	20	25	110	127,5	42
105		125	145	13,5	20	25	110	127,5	55
110		130	150	13,5	25	25	115	132,5	39
110		130	150	13,5	25	25	115	132,5	56

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 70-50-9-4	1	70	50	9,525	62,2	4	134800	350200	2120	2060	238
TSB-S 80-10-6-2	1	80	10	6,35	74,5	2	44900	120500	1070	880	79
TSB-S 80-10-6-3	1	80	10	6,35	74,5	3	60600	180700	1550	1290	91
TSB-S 80-10-6-4	1	80	10	6,35	74,5	4	76600	240900	2030	1690	95
TSB-S 80-10-6-5	1	80	10	6,35	74,5	5	92400	301100	2510	2100	107
TSB-S 80-10-6-6	1	80	10	6,35	74,5	6	107800	361400	2980	2490	115
TSB-S 80-10-6-7	1	80	10	6,35	74,5	7	122900	421600	3450	2890	125
TSB-S 80-10-6-8	1	80	10	6,35	74,5	8	137700	481800	3920	3290	135
TSB-S 80-10-7-2	1	80	10	7,144	73,9	2	52900	135700	1120	930	77
TSB-S 80-10-7-3	1	80	10	7,144	73,9	3	71500	203500	1620	1360	89
TSB-S 80-10-7-4	1	80	10	7,144	73,9	4	90300	271300	2120	1780	100
TSB-S 80-10-7-5	1	80	10	7,144	73,9	5	108800	339200	2620	2210	110
TSB-S 80-10-7-6	1	80	10	7,144	73,9	6	127000	407000	3120	2630	120
TSB-S 80-10-7-7	1	80	10	7,144	73,9	7	144800	474900	3610	3050	130
TSB-S 80-10-7-8	1	80	10	7,144	73,9	8	162300	542700	4100	3460	141
TSB-U 80-10-7-2	1	80	10	7,144	73,9	2	53500	137800	1110	930	56
TSB-U 80-10-7-3	1	80	10	7,144	73,9	3	73900	214100	1660	1390	66
TSB-U 80-10-7-4	1	80	10	7,144	73,9	4	94500	290400	2190	1830	76
TSB-U 80-10-7-5	1	80	10	7,144	73,9	5	114200	364600	2700	2260	86
TSB-U 80-10-7-6	1	80	10	7,144	73,9	6	134000	440900	3200	2680	96
TSB-S 80-12-8-2	1	80	12	7,938	74,5	2	57800	137600	960	820	87
TSB-S 80-12-8-3	1	80	12	7,938	74,5	3	78000	206300	1400	1200	101
TSB-S 80-12-8-4	1	80	12	7,938	74,5	4	98600	275100	1830	1570	114
TSB-S 80-12-8-5	1	80	12	7,938	74,5	5	118800	343900	2260	1940	127
TSB-S 80-12-8-6	1	80	12	7,938	74,5	6	138600	412700	2680	2310	139
TSB-S 80-12-8-7	1	80	12	7,938	74,5	7	158100	481500	3110	2680	151
TSB-S 80-12-8-8	1	80	12	7,938	74,5	8	177200	550300	3530	3040	163
TSB-U 80-12-8-2	1	80	12	7,938	73,3	2	63200	157800	1200	1050	66
TSB-U 80-12-8-3	1	80	12	7,938	73,3	3	87300	244900	1770	1560	78
TSB-U 80-12-8-4	1	80	12	7,938	73,3	4	112200	334700	2350	2070	90
TSB-U 80-12-8-5	1	80	12	7,938	73,3	5	135900	421800	2900	2560	102
TSB-U 80-12-8-6	1	80	12	7,938	73,3	6	159200	508900	3440	3040	114
TSB-U 80-12-9-2	1	80	12	9,525	72,2	2	81900	190100	1220	1070	64
TSB-U 80-12-9-3	1	80	12	9,525	72,2	3	113600	297100	1830	1600	76
TSB-U 80-12-9-4	1	80	12	9,525	72,2	4	145500	404000	2440	2130	88
TSB-U 80-12-9-5	1	80	12	9,525	72,2	5	176700	510900	3000	2630	100
TSB-U 80-12-9-6	1	80	12	9,525	72,2	6	207300	617900	3570	3130	112

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
110		130	150	13,5	25	25	115	132,5	72
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	29
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	33
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	33
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	37
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	38
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	41
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	44
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	38
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	43
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	47
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	51
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	54
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	58
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	62
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	22
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	25
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	29
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	32
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	36
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	45
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	53
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	59
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	66
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	71
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	77
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	83
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	24
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	28
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	33
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	37
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	42
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	26
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	31
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	37
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	43
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	50

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 80-12-9-7	1	80	12	9,525	72,2	7	237300	724800	4110	3610	124
TSB-U 80-15-8-2	1	80	15	7,938	73,3	2	63200	157700	1190	1080	71
TSB-U 80-15-8-3	1	80	15	7,938	73,3	3	87200	244800	1760	1590	86
TSB-U 80-15-8-4	1	80	15	7,938	73,3	4	112100	334500	2350	2120	101
TSB-U 80-15-8-5	1	80	15	7,938	73,3	5	135800	421500	2900	2620	116
TSB-U 80-15-8-6	1	80	15	7,938	73,3	6	159000	508600	3430	3110	131
TSB-U 80-15-9-2	1	80	15	9,525	72,2	2	81800	190000	1220	1100	80
TSB-U 80-15-9-3	1	80	15	9,525	72,2	3	113600	296900	1830	1640	95
TSB-U 80-15-9-4	1	80	15	9,525	72,2	4	145400	403800	2430	2180	110
TSB-U 80-15-9-5	1	80	15	9,525	72,2	5	176600	510600	3000	2700	125
TSB-U 80-15-9-6	1	80	15	9,525	72,2	6	207100	617500	3560	3210	140
TSB-U 80-15-9-7	1	80	15	9,525	72,2	7	237100	724400	4110	3700	155
TSB-S 80-16-8-2	1	80	16	7,938	74,5	2	57700	137400	960	850	95
TSB-S 80-16-8-3	1	80	16	7,938	74,5	3	77900	206200	1390	1240	114
TSB-S 80-16-8-4	1	80	16	7,938	74,5	4	98500	274900	1820	1620	131
TSB-S 80-16-8-5	1	80	16	7,938	74,5	5	118700	343600	2250	2010	148
TSB-S 80-16-8-6	1	80	16	7,938	74,5	6	138500	412300	2680	2390	164
TSB-S 80-16-8-7	1	80	16	7,938	74,5	7	157900	481100	3100	2770	180
TSB-S 80-16-8-8	1	80	16	7,938	74,5	8	177000	549800	3520	3150	197
TSB-U 80-16-8-2	1	80	16	7,938	73,3	2	63100	157700	1190	1080	73
TSB-U 80-16-8-3	1	80	16	7,938	73,3	3	87200	244700	1760	1600	89
TSB-U 80-16-8-4	1	80	16	7,938	73,3	4	112000	334400	2350	2130	105
TSB-U 80-16-8-5	1	80	16	7,938	73,3	5	135800	421400	2900	2640	121
TSB-U 80-16-9-2	1	80	16	9,525	72,2	2	81800	190000	1220	1100	81
TSB-U 80-16-9-3	1	80	16	9,525	72,2	3	113500	296800	1830	1650	97
TSB-U 80-16-9-4	1	80	16	9,525	72,2	4	145300	403700	2430	2200	113
TSB-U 80-16-9-5	1	80	16	9,525	72,2	5	176600	510500	3000	2710	129
TSB-U 80-16-9-6	1	80	16	9,525	72,2	6	207100	617400	3560	3220	145
TSB-U 80-16-9-7	1	80	16	9,525	72,2	7	237000	724200	4100	3720	161
TSB-S 80-20-9-2	1	80	20	9,525	73,3	2	73900	163700	980	880	109
TSB-S 80-20-9-3	1	80	20	9,525	73,3	3	99800	245600	1420	1280	132
TSB-S 80-20-9-4	1	80	20	9,525	73,3	4	126200	327500	1860	1690	154
TSB-S 80-20-9-5	1	80	20	9,525	73,3	5	152000	409400	2300	2080	175
TSB-S 80-20-9-6	1	80	20	9,525	73,3	6	177400	491200	2730	2480	196
TSB-S 80-20-9-7	1	80	20	9,525	73,3	7	202300	573100	3160	2870	216
TSB-S 80-20-9-8	1	80	20	9,525	73,3	8	226800	655000	3590	3260	236
TSB-U 80-20-9-2	1	80	20	9,525	72,2	2	81700	189800	1220	1120	88

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	56
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	23
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	28
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	33
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	38
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	44
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	36
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	42
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	49
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	56
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	63
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	71
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	45
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	55
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	63
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	71
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	78
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	86
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	94
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	23
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	28
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	34
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	39
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	35
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	42
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	49
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	56
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	64
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	72
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	60
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	74
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	87
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	99
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	111
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	123
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	134
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	34

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 80-20-9-3	1	80	20	9,525	72,2	3	113400	296500	1820	1680	108
TSB-U 80-20-9-4	1	80	20	9,525	72,2	4	145100	403200	2430	2240	128
TSB-U 80-20-9-5	1	80	20	9,525	72,2	5	176300	510000	2990	2760	148
TSB-U 80-20-9-6	1	80	20	9,525	72,2	6	206800	616700	3550	3280	168
TSB-U 80-20-9-7	1	80	20	9,525	72,2	7	236700	723400	4100	3780	188
TSB-U 80-20-11-2	1	80	20	11,113	71,1	2	99400	217000	1260	1160	87
TSB-U 80-20-11-3	1	80	20	11,113	71,1	3	140200	347300	1910	1760	107
TSB-U 80-20-11-4	1	80	20	11,113	71,1	4	179400	472100	2540	2340	127
TSB-U 80-20-11-5	1	80	20	11,113	71,1	5	217900	596900	3140	2890	147
TSB-U 80-20-11-6	1	80	20	11,113	71,1	6	256900	727100	3740	3450	167
TSB-U 80-20-11-7	1	80	20	11,113	71,1	7	293700	851900	4310	3980	187
TSB-U 80-20-11-8	1	80	20	11,113	71,1	8	331100	982100	4860	4490	207
TSB-S 80-20-12-2	1	80	20	12,7	71,2	2	103900	202300	940	840	120
TSB-S 80-20-12-3	1	80	20	12,7	71,2	3	140300	303500	1360	1230	140
TSB-S 80-20-12-4	1	80	20	12,7	71,2	4	177200	404700	1790	1610	165
TSB-S 80-20-12-5	1	80	20	12,7	71,2	5	213600	505900	2210	1990	186
TSB-S 80-20-12-6	1	80	20	12,7	71,2	6	249200	607000	2620	2370	207
TSB-S 80-20-12-7	1	80	20	12,7	71,2	7	284200	708200	3040	2740	227
TSB-S 80-20-12-8	1	80	20	12,7	71,2	8	318500	809400	3450	3120	247
TSB-U 80-25-9-2	1	80	25	9,525	72,2	2	81500	189400	1210	1140	97
TSB-U 80-25-9-3	1	80	25	9,525	72,2	3	113100	296000	1820	1700	122
TSB-U 80-25-9-4	1	80	25	9,525	72,2	4	144800	402500	2420	2260	147
TSB-U 80-25-9-5	1	80	25	9,525	72,2	5	175900	509100	2980	2790	172
TSB-U 80-25-9-6	1	80	25	9,525	72,2	6	207200	619600	3560	3340	197
TSB-U 80-25-9-7	1	80	25	9,525	72,2	7	237000	726200	4100	3850	222
TSB-U 80-25-11-2	1	80	25	11,113	71,1	2	99200	216700	1250	1170	96
TSB-U 80-25-11-3	1	80	25	11,113	71,1	3	139900	346700	1910	1780	121
TSB-U 80-25-11-4	1	80	25	11,113	71,1	4	179100	471300	2530	2370	146
TSB-U 80-25-11-5	1	80	25	11,113	71,1	5	218800	601300	3150	2950	171
TSB-U 80-25-11-6	1	80	25	11,113	71,1	6	256300	725900	3720	3490	196
TSB-U 80-25-11-7	1	80	25	11,113	71,1	7	294300	855900	4320	4050	221
TSB-U 80-25-11-8	1	80	25	11,113	71,1	8	330400	980500	4840	4540	246
TSB-U 80-30-9-2	1	80	30	9,525	72,2	2	81300	189000	1210	1140	106
TSB-U 80-30-9-3	1	80	30	9,525	72,2	3	112800	295400	1810	1710	136
TSB-U 80-30-9-4	1	80	30	9,525	72,2	4	144400	401700	2410	2280	166
TSB-U 80-30-9-5	1	80	30	9,525	72,2	5	176400	512000	2990	2830	196
TSB-U 80-30-9-6	1	80	30	9,525	72,2	6	206700	618300	3550	3360	226

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	43
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	51
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	60
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	69
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	78
125		145	165	13,5	25	25	130	147,5	47
125		145	165	13,5	25	25	130	147,5	57
125		145	165	13,5	25	25	130	147,5	68
125		145	165	13,5	25	25	130	147,5	79
125		145	165	13,5	25	25	130	147,5	90
125		145	165	13,5	25	25	130	147,5	101
125		145	165	13,5	25	25	130	147,5	114
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	101
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	117
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	141
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	159
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	177
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	193
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	210
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	35
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	45
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	55
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	66
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	76
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	87
125		145	165	13,5	25	25	130	147,5	48
125		145	165	13,5	25	25	130	147,5	60
125		145	165	13,5	25	25	130	147,5	73
125		145	165	13,5	25	25	130	147,5	86
125		145	165	13,5	25	25	130	147,5	99
125		145	165	13,5	25	25	130	147,5	113
125		145	165	13,5	25	25	130	147,5	127
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	37
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	49
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	61
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	73
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	85

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 80-30-11-2	1	80	30	11,113	71,1	2	99000	216200	1250	1180	104
TSB-U 80-30-11-3	1	80	30	11,113	71,1	3	139500	346000	1900	1800	134
TSB-U 80-30-11-4	1	80	30	11,113	71,1	4	178600	470300	2520	2380	164
TSB-U 80-30-11-5	1	80	30	11,113	71,1	5	218200	600100	3140	2970	194
TSB-U 80-30-11-6	1	80	30	11,113	71,1	6	255600	724400	3710	3510	224
TSB-U 80-30-11-7	1	80	30	11,113	71,1	7	293600	854200	4300	4070	254
TSB-U 80-40-9-2	1	80	40	9,525	72,2	2	80800	188100	1200	1150	123
TSB-U 80-40-9-3	1	80	40	9,525	72,2	3	113000	297800	1810	1740	163
TSB-U 80-40-9-4	1	80	40	9,525	72,2	4	144400	403600	2400	2310	203
TSB-U 80-40-9-5	1	80	40	9,525	72,2	5	175200	509400	2960	2840	243
TSB-U 80-40-11-2	1	80	40	11,113	71,1	2	99900	220500	1260	1210	121
TSB-U 80-40-11-3	1	80	40	11,113	71,1	3	138600	344200	1880	1800	161
TSB-U 80-40-11-4	1	80	40	11,113	71,1	4	178800	473300	2520	2420	201
TSB-U 80-40-11-5	1	80	40	11,113	71,1	5	218100	602400	3130	3000	241
TSB-U 80-40-11-6	1	80	40	11,113	71,1	6	255200	726100	3690	3550	281
TSB-U 80-50-9-2	1	80	50	9,525	72,2	2	81200	190700	1200	1160	140
TSB-U 80-50-9-3	1	80	50	9,525	72,2	3	112100	295800	1790	1730	190
TSB-U 80-50-9-4	1	80	50	9,525	72,2	4	144100	404800	2390	2310	240
TSB-U 80-50-11-2	1	80	50	11,113	71,1	2	99100	219100	1250	1210	139
TSB-U 80-50-11-3	1	80	50	11,113	71,1	3	138900	347300	1880	1820	189
TSB-U 80-50-11-4	1	80	50	11,113	71,1	4	178600	475600	2510	2430	239
TSB-S 100-10-6-2	1	100	10	6,35	94,5	2	48900	150700	1280	990	76
TSB-S 100-10-6-3	1	100	10	6,35	94,5	3	66100	226000	1850	1450	88
TSB-S 100-10-6-4	1	100	10	6,35	94,5	4	83500	301400	2430	1900	99
TSB-S 100-10-6-5	1	100	10	6,35	94,5	5	100600	376700	3000	2360	109
TSB-S 100-10-6-6	1	100	10	6,35	94,5	6	117400	452100	3560	2810	120
TSB-S 100-10-6-7	1	100	10	6,35	94,5	7	133900	527400	4130	3260	130
TSB-S 100-10-6-8	1	100	10	6,35	94,5	8	150100	602800	4690	3700	140
TSB-S 100-10-7-2	1	100	10	7,144	93,9	2	58900	175000	1380	1070	77
TSB-S 100-10-7-3	1	100	10	7,144	93,9	3	79500	262500	1990	1560	89
TSB-S 100-10-7-4	1	100	10	7,144	93,9	4	100500	350000	2610	2060	100
TSB-S 100-10-7-5	1	100	10	7,144	93,9	5	121100	437600	3220	2540	110
TSB-S 100-10-7-6	1	100	10	7,144	93,9	6	141400	525100	3830	3030	120
TSB-S 100-10-7-7	1	100	10	7,144	93,9	7	161200	612600	4440	3520	130
TSB-S 100-10-7-8	1	100	10	7,144	93,9	8	180700	700100	5040	4000	141
TSB-U 100-10-7-2	1	100	10	7,144	93,9	2	59400	177200	1370	1070	57
TSB-U 100-10-7-3	1	100	10	7,144	93,9	3	81300	271100	2000	1570	67

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
125		145	165	13,5	25	25	130	147,5	49
125		145	165	13,5	25	25	130	147,5	63
125		145	165	13,5	25	25	130	147,5	78
125		145	165	13,5	25	25	130	147,5	93
125		145	165	13,5	25	25	130	147,5	109
125		145	165	13,5	25	25	130	147,5	124
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	41
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	56
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	71
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	87
125		145	165	13,5	25	25	130	147,5	53
125		145	165	13,5	25	25	130	147,5	72
125		145	165	13,5	25	25	130	147,5	91
125		145	165	13,5	25	25	130	147,5	110
125		145	165	13,5	25	25	130	147,5	131
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	45
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	64
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	83
125		145	165	13,5	25	25	130	147,5	59
125		145	165	13,5	25	25	130	147,5	82
125		145	165	13,5	25	25	130	147,5	106
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	34
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	39
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	44
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	47
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	51
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	55
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	58
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	47
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	53
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	58
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	62
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	66
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	71
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	76
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	28
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	32

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-U 100-10-7-4	1	100	10	7,144	93,9	4	103800	367100	2640	2070	77
TSB-S 100-12-8-2	1	100	12	7,938	94,5	2	64300	176900	1180	970	92
TSB-S 100-12-8-3	1	100	12	7,938	94,5	3	86900	265400	1710	1410	106
TSB-S 100-12-8-4	1	100	12	7,938	94,5	4	109800	353900	2240	1850	119
TSB-S 100-12-8-5	1	100	12	7,938	94,5	5	132300	442300	2770	2290	132
TSB-S 100-12-8-6	1	100	12	7,938	94,5	6	154400	530800	3290	2730	144
TSB-S 100-12-8-7	1	100	12	7,938	94,5	7	176100	619300	3810	3160	156
TSB-S 100-12-8-8	1	100	12	7,938	94,5	8	197400	707700	4330	3590	169
TSB-U 100-12-8-2	1	100	12	7,938	93,3	2	70300	202900	1460	1240	66
TSB-U 100-12-8-3	1	100	12	7,938	93,3	3	96600	312600	2150	1830	78
TSB-U 100-12-8-4	1	100	12	7,938	93,3	4	123100	422200	2820	2420	90
TSB-U 100-12-9-2	1	100	12	9,525	92,2	2	91100	243800	1500	1270	65
TSB-U 100-12-9-3	1	100	12	9,525	92,2	3	126200	379600	2230	1880	77
TSB-U 100-12-9-4	1	100	12	9,525	92,2	4	160600	511500	2930	2480	89
TSB-U 100-12-9-5	1	100	12	9,525	92,2	5	195100	647400	3630	3080	101
TSB-U 100-12-9-6	1	100	12	9,525	92,2	6	228900	783300	4310	3660	113
TSB-U 100-15-8-2	1	100	15	7,938	93,3	2	70200	202800	1450	1280	72
TSB-U 100-15-8-3	1	100	15	7,938	93,3	3	96500	312400	2140	1890	87
TSB-U 100-15-8-4	1	100	15	7,938	93,3	4	123000	422100	2820	2490	102
TSB-U 100-15-9-2	1	100	15	9,525	92,2	2	91100	243700	1500	1310	80
TSB-U 100-15-9-3	1	100	15	9,525	92,2	3	126100	379500	2230	1940	95
TSB-U 100-15-9-4	1	100	15	9,525	92,2	4	160500	511300	2930	2560	110
TSB-U 100-15-9-5	1	100	15	9,525	92,2	5	195000	647100	3630	3170	125
TSB-S 100-16-8-2	1	100	16	7,938	94,5	2	64300	176800	1180	1010	100
TSB-S 100-16-8-3	1	100	16	7,938	94,5	3	86800	265300	1710	1470	119
TSB-S 100-16-8-4	1	100	16	7,938	94,5	4	109700	353700	2240	1930	136
TSB-S 100-16-8-5	1	100	16	7,938	94,5	5	132200	442100	2760	2390	153
TSB-S 100-16-8-6	1	100	16	7,938	94,5	6	154300	530500	3290	2850	169
TSB-S 100-16-8-7	1	100	16	7,938	94,5	7	176000	618900	3810	3300	185
TSB-S 100-16-8-8	1	100	16	7,938	94,5	8	197200	707300	4320	3750	202
TSB-U 100-16-8-2	1	100	16	7,938	93,3	2	70200	202800	1450	1290	74
TSB-U 100-16-8-3	1	100	16	7,938	93,3	3	96500	312400	2140	1900	90
TSB-U 100-16-8-4	1	100	16	7,938	93,3	4	123000	422000	2820	2500	106
TSB-U 100-16-9-2	1	100	16	9,525	92,2	2	91100	243600	1500	1320	82
TSB-U 100-16-9-3	1	100	16	9,525	92,2	3	126100	379400	2220	1960	98
TSB-U 100-16-9-4	1	100	16	9,525	92,2	4	160400	511200	2930	2580	114
TSB-U 100-16-9-5	1	100	16	9,525	92,2	5	195000	647000	3630	3200	130

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	37
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	61
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	70
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	78
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	86
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	93
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	99
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	107
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	29
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	35
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	40
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	33
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	40
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	47
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	55
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	62
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	29
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	35
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	42
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	44
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	52
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	61
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	69
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	60
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	72
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	82
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	92
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	101
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	110
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	120
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	29
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	36
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	42
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	43
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	52
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	61
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	70

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

TMBS, Single nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut, with Fext: 20%Ca	Nut length
	1/2	d_0	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
TSB-S 100-20-9-2	1	100	20	9,525	93,3	2	83500	213700	1220	1070	114
TSB-S 100-20-9-3	1	100	20	9,525	93,3	3	112700	320500	1770	1560	138
TSB-S 100-20-9-4	1	100	20	9,525	93,3	4	142400	427400	2320	2040	159
TSB-S 100-20-9-5	1	100	20	9,525	93,3	5	171600	534200	2860	2530	180
TSB-S 100-20-9-6	1	100	20	9,525	93,3	6	200300	641000	3400	3010	201
TSB-S 100-20-9-7	1	100	20	9,525	93,3	7	228400	747900	3940	3480	221
TSB-S 100-20-9-8	1	100	20	9,525	93,3	8	256000	854700	4470	3960	242
TSB-U 100-20-9-2	1	100	20	9,525	92,2	2	91000	243500	1500	1350	89
TSB-U 100-20-9-3	1	100	20	9,525	92,2	3	126000	379200	2220	2000	109
TSB-U 100-20-9-4	1	100	20	9,525	92,2	4	160300	510900	2920	2640	129
TSB-U 100-20-9-5	1	100	20	9,525	92,2	5	194800	646600	3620	3270	149
TSB-S 100-20-12-2	1	100	20	12,7	91,2	2	118600	265400	1180	1030	125
TSB-S 100-20-12-3	1	100	20	12,7	91,2	3	160100	398100	1710	1500	148
TSB-S 100-20-12-4	1	100	20	12,7	91,2	4	202300	530800	2240	1960	175
TSB-S 100-20-12-5	1	100	20	12,7	91,2	5	243900	663500	2770	2430	191
TSB-S 100-20-12-6	1	100	20	12,7	91,2	6	284600	796200	3290	2890	212
TSB-S 100-20-12-7	1	100	20	12,7	91,2	7	324500	928900	3810	3350	232
TSB-S 100-20-12-8	1	100	20	12,7	91,2	8	363700	1061500	4330	3810	252
TSB-U 100-25-9-2	1	100	25	9,525	92,2	2	90900	243200	1490	1370	98
TSB-U 100-25-9-3	1	100	25	9,525	92,2	3	125800	378800	2220	2040	123
TSB-U 100-25-9-4	1	100	25	9,525	92,2	4	160100	510300	2910	2680	148
TSB-U 100-25-9-5	1	100	25	9,525	92,2	5	194500	645900	3610	3330	173
TSB-U 100-30-9-2	1	100	30	9,525	92,2	2	90700	242900	1490	1390	107
TSB-U 100-30-9-3	1	100	30	9,525	92,2	3	125600	378300	2210	2060	137
TSB-U 100-30-9-4	1	100	30	9,525	92,2	4	160600	513600	2930	2730	167
TSB-U 100-30-9-5	1	100	30	9,525	92,2	5	194200	645000	3600	3360	197
TSB-U 100-40-9-2	1	100	40	9,525	92,2	2	90300	242100	1480	1400	125
TSB-U 100-40-9-3	1	100	40	9,525	92,2	3	125000	377000	2190	2080	165
TSB-U 100-40-9-4	1	100	40	9,525	92,2	4	159900	511900	2910	2760	205
TSB-U 100-40-9-5	1	100	40	9,525	92,2	5	194100	646800	3600	3420	245
TSB-U 100-50-9-2	1	100	50	9,525	92,2	2	90800	245000	1490	1430	143
TSB-U 100-50-9-3	1	100	50	9,525	92,2	3	125200	379300	2200	2110	193
TSB-U 100-50-9-4	1	100	50	9,525	92,2	4	159900	513700	2900	2780	243

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions									Grease quantity TS
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	79
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	97
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	112
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	127
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	141
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	155
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	169
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	43
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	53
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	64
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	131
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	156
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	188
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	201
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	222
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	242
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	262
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	44
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	57
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	69
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	82
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	46
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	61
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	91
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	51
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	70
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	89
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	109
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	57
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	81
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	104

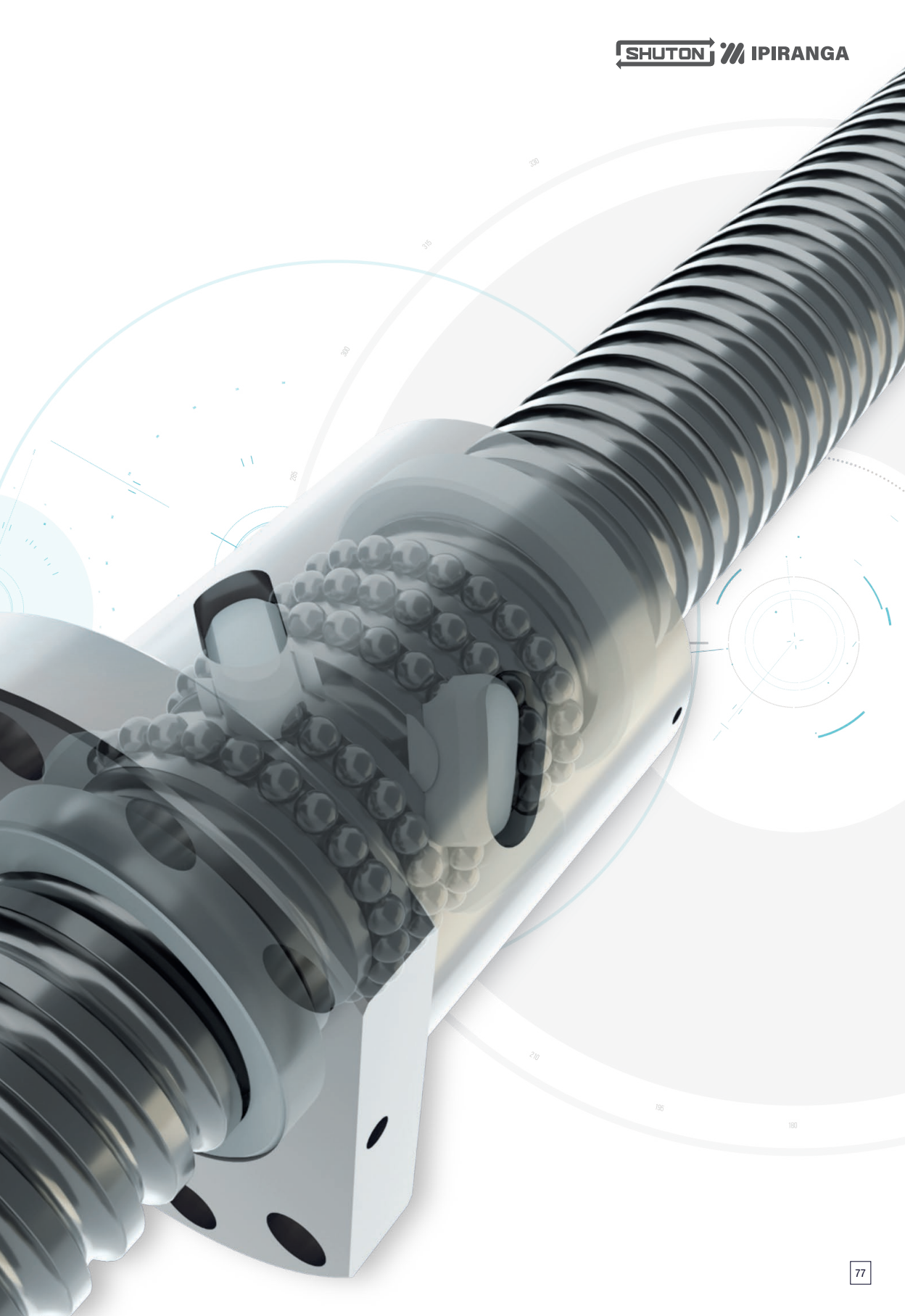
SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

ROLLED TECHNOLOGY

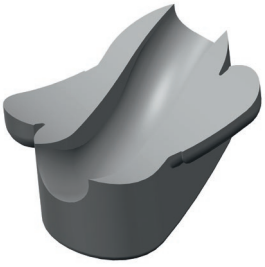
High efficiency transport ball screws,
accuracy grade ISO5-7.



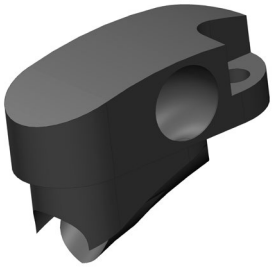
ROLLED TECHNOLOGY

U-type recirculation system

S-type recirculation system

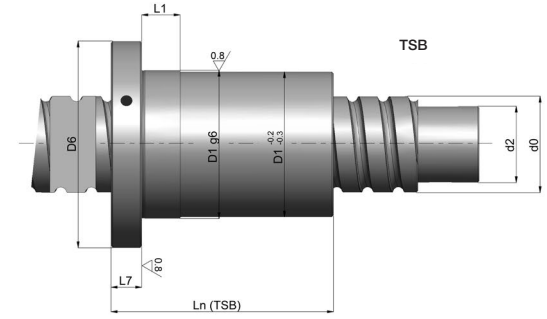


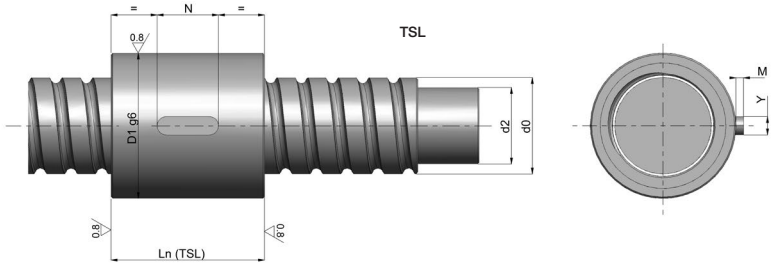
B-type recirculation system

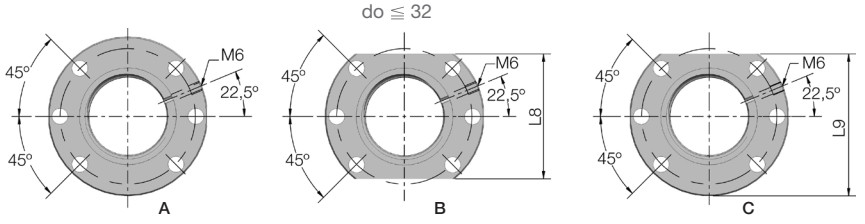


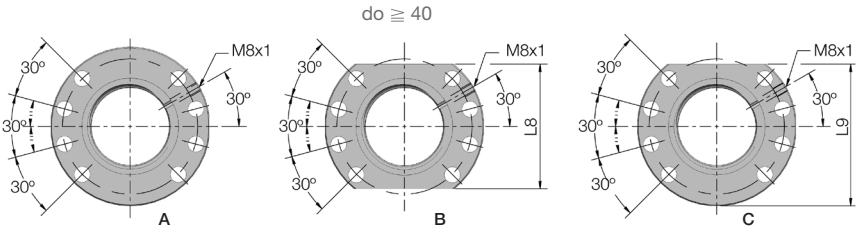
Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
ROLLED	· Automation · Railway · Automatisms · Semiconductor · Actuators	Transport ball screw	NO	TS Single Nut	S,U,B	16,63	5-50	3-7	General transport aplication without accuracy requirement DN up to 90.000

ROLLED Single Nut









ROLLED, Single Nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Shaft diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut	Nut length
	$1/2$	d_0	d_1	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
RLD TSB-S 16-5-3,5-3	1	16	15,4	5	3,5	12,7	3	10500	14900	326	307	44
RLD TSB-S 20-5-3,5-3	1	20	19,4	5	3,5	16,7	3	12000	19300	402	376	44
RLD TSB-S 20-5-3,5-4	1	20	19,4	5	3,5	16,7	4	15300	25700	528	494	49
RLD TSB-S 25-5-3,5-3	1	25	24,4	5	3,5	21,7	3	14200	26600	522	472	44
RLD TSB-S 25-5-3,5-4	1	25	24,4	5	3,5	21,7	4	18100	35400	686	622	49
RLD TSB(2S)-U 25-10-3,5-2	2	25	24,4	10	3,5	21,9	2x2	17100	39900	390	369	42
RLD TSB(2S)-U 25-10-3,5-3	2	25	24,4	10	3,5	21,9	3x2	22800	61200	562	532	52
RLD TSB(5S)-B 25-25-3,5-1	5	25	24,4	25	3,5	21,9	1x5	21400	44600	277	268	52
RLD TSB(5S)-B 25-25-3,5-2	5	25	24,4	25	3,5	21,9	2x5	35700	95800	521	505	77
RLD TSB-S 32-5-3,5-4	1	32	31,4	5	3,5	28,7	4	20600	47200	861	762	52
RLD TSB-S 32-5-3,5-5	1	32	31,4	5	3,5	28,7	5	25000	58900	1037	922	57
RLD TSB-S 32-5-3,5-6	1	32	31,4	5	3,5	28,7	6	29600	72000	1238	1101	60
RLD TSB-S 32-10-6-3	1	32	32,1	10	6,35	27,5	3	35400	63000	701	642	71
RLD TSB-S 32-10-6-4	1	32	32,1	10	6,35	27,5	4	45500	84000	923	847	81
RLD TSB(4S)-B 32-20-3,5-1	4	32	31,4	20	3,5	28,7	1x4	21200	50000	344	330	52
RLD TSB(4S)-B 32-20-3,5-2	4	32	31,4	20	3,5	28,7	2x4	34500	103800	642	618	72
RLD TSB(4S)-B 32-20-3,5-3	4	32	31,4	20	3,5	28,7	3x4	45600	157600	923	889	92
RLD TSB(4S)-U 32-40-3,5-1	4	32	31,4	40	3,5	28,7	1x4	18900	44000	296	291	62
RLD TSB(4S)-U 32-40-3,5-2	4	32	31,4	40	3,5	28,7	2x4	31500	95000	556	547	102
RLD TSB-S 40-5-3,5-4	1	40	39,3	5	3,5	36,7	4	23000	60800	1053	915	53
RLD TSB-S 40-5-3,5-5	1	40	39,3	5	3,5	36,7	5	27900	76100	1303	1134	58
RLD TSB-S 40-10-7-3	1	40	39,3	10	7,144	34,1	3	43400	80300	782	717	72
RLD TSB-S 40-10-7-4	1	40	39,3	10	7,144	34,1	4	55600	107100	1029	945	90
RLD TSB(2S)-B 40-40-7-1	2	40	39,4	40	7,144	34,3	1x2	33000	62300	379	370	73
RLD TSB(4S)-B 40-40-7-1	4	40	39,4	40	7,144	34,3	1x4	59900	124600	462	448	79
RLD TSB(4S)-B 40-40-7-2	4	40	39,4	40	7,144	34,3	2x4	96900	256600	861	836	119
RLD TSB-S 50-10-7-4	1	50	49,2	10	7,144	44	4	65600	147400	1335	1191	85
RLD TSB-S 50-10-7-5	1	50	49,2	10	7,144	44	5	79600	184300	1653	1476	97
RLD TSB-S 50-10-7-6	1	50	49,2	10	7,144	44	6	93100	221100	1966	1758	107
RLD TSB(2S)-B 50-20-7-3	2	50	49,4	20	7,144	44	3x2	82400	254600	1178	1113	92
RLD TSB(2S)-B 50-20-7-4	2	50	49,4	20	7,144	44	4x2	62900	169700	1525	1444	72
RLD TSB(2S)-B 50-20-7-4	2	50	49,4	20	7,144	44	4x2	100500	343300	1525	1444	112
RLD TSB(2S)-B 50-20-7-5	2	50	49,4	20	7,144	44	5x2	116500	428100	1860	1763	132
RLD TSB(5S)-B 50-50-7-1	5	50	49,4	50	7,144	44,2	1x5	80300	194900	564	546	90
RLD TSB(5S)-B 50-50-7-2	5	50	49,4	50	7,144	44,2	2x5	129500	399100	1050	1019	140
RLD TSB-S 63-10-7-4	1	63	62,2	10	7,144	57	4	73100	188300	1620	1401	87
RLD TSB-S 63-10-7-5	1	63	62,2	10	7,144	57	5	88600	235500	2004	1735	99

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions

$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8
28	28	38	48	5,5	10	10	40
36	32	47	58	6,6	10	10	44
36	32	47	58	6,6	10	10	44
40	38	51	62	6,6	10	10	48
40	38	51	62	6,6	10	10	48
40	40	51	62	6,6	10	10	48
40	40	51	62	6,6	10	10	48
40	40	51	62	6,6	10	10	48
40	40	51	62	6,6	10	10	48
50	45	65	80	9	12	10	62
50	45	65	80	9	12	10	62
50	45	65	80	9	12	10	62
50	50	65	80	9	12	10	62
50	50	65	80	9	12	10	62
56	50	71	86	9	14	20	65
56	50	71	86	9	14	20	65
56	50	71	86	9	14	20	65
56	50	71	86	9	14	20	65
56	50	71	86	9	14	20	65
63	53	78	93	9	14	10	70
63	53	78	93	9	14	10	70
63	63	78	93	9	14	20	70
63	63	78	93	9	14	20	70
70	70	85	100	9	14	20	75
70	70	85	100	9	14	20	75
70	70	85	100	9	14	20	75
75	72	93	110	11	16	20	85
75	72	93	110	11	16	20	85
75	72	93	110	11	16	20	85
82	80	100	118	11	16	25	92
82	80	100	118	11	16	25	92
82	80	100	118	11	16	25	92
82	80	100	118	11	16	25	92
82	80	100	118	11	16	25	92
82	80	100	118	11	16	25	92
90	85	108	125	11	18	20	95
90	85	108	125	11	18	20	95

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

ROLLED, Single Nut

Ball screw reference	Number of starts	Nominal diameter (mm)	Shaft diameter (mm)	Lead (mm)	Ball Diameter (mm)	Root diameter (mm)	Circuits	Dynamic load capacity	Static load capacity	Rigidity of ball contact zone	Rigidity of nut	Nut length
	$1/2$	d_0	d_1	P_h	D_w	d_2	i	C_a [N]	C_{oa} [N]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
RLD TSB-S 63-10-7-6	1	63	62,2	10	7,144	57	6	106300	282500	2405	2082	111
RLD TSB-S 63-10-7-8	1	63	62,2	10	7,144	57	8	137200	381200	3171	2749	133
RLD TSB(2S)-B 63-20-7-4	2	63	62,4	20	7,144	57	4x2	69700	215000	1907	1766	72
RLD TSB(2S)-B 63-20-7-4	2	63	62,4	20	7,144	57	4x2	111900	437900	1907	1766	112
RLD TSB(2S)-B 63-20-7-5	2	63	62,4	20	7,144	57	5x2	129800	547400	2324	2156	132
RLD TSB(2S)-B 63-20-7-6	2	63	62,4	20	7,144	57	6x2	91700	324500	1473	1361	92

- Ca and Coa: Modified static and dynamic load capacities, calculated according to DIN 69051/4 standard and ISO3408/5. See Technical description catalogue (pg. 39-43).
- Rb/t: Rigidity of the balls contact zone for an external force 10% of Ca. See page 46. For a different preload force, multiply by $\sqrt[3]{F_{pr}/0,1\ C_a}$
- Rnu: Total rigidity of the complete nut. It must be multiplied by the factor f_{ar} which depends on the manufacturing tolerance. See Technical description catalogue (pg. 48).

Nut dimensions

$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8
90	85	108	125	11	18	20	95
90	85	108	125	11	18	20	95
95	92	115	135	13,5	20	25	100
95	92	115	135	13,5	20	25	100
95	92	115	135	13,5	20	25	100
95	92	115	135	13,5	20	25	100

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions. In brackets () second options.

Smaller nut diameters than the first option of the table can reduce the rigidity of the assembly between 5 and 10%.

Please consult SHUTON·IPIRANGA.

NOTE

NOTE

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