SHUTON

IPIRANGA

ROLLON®

BY TIMKEN

XP

Xtrem

Position

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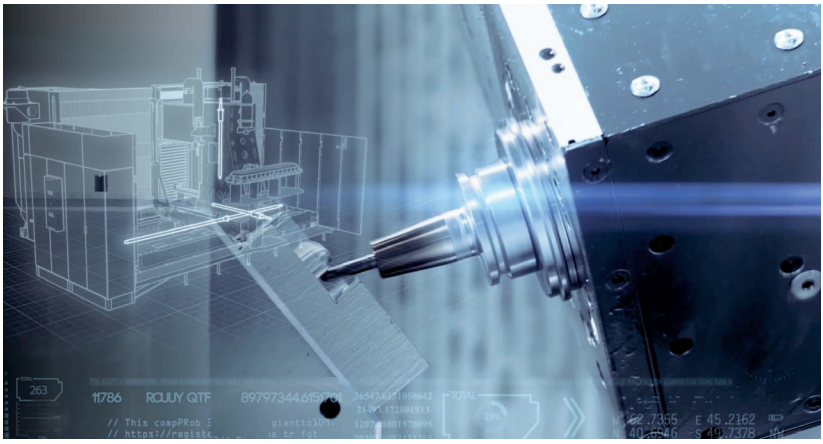
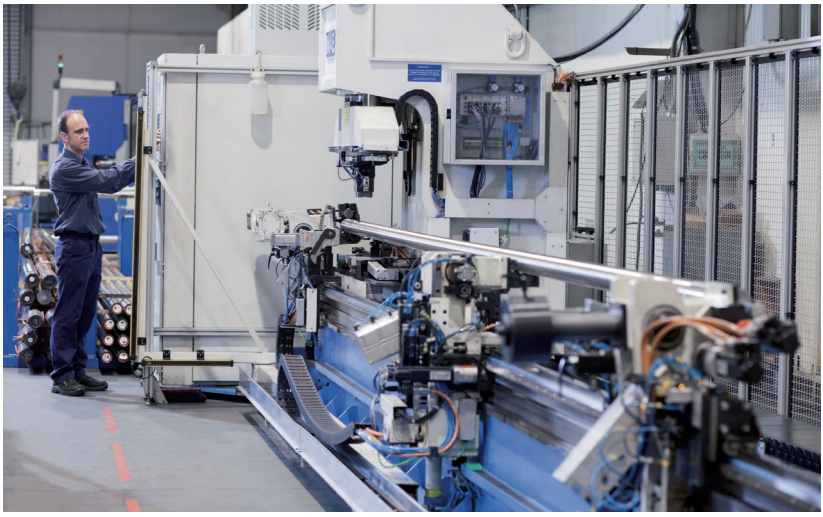
PRECISION BALL SCREWS

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 technologies adapted to the different application areas and 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 20.

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

	Features	Sector	Technology	Nut Type
XP Positioning ball screws	Precision Dynamics Rigidity	**Production technologies:** · Lathe and turning centers · Grinding, honing, lapping, and polishing machines · Transfer and reusable machines · Milling machines · Laser, eroding and other cutting machine tools · Gear cutting and finishing machines · Sawing and cutting machines · Drilling, boring machines, combined boring and milling machines · Other cutting machine tools	COMPLEX	TD Double Nut TUC Ultracompact Nut
			PRIME	TC Compact Nut TD Double Nut

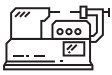
CUSTOMISED SOLUTIONS

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.

XP HIGH PERFORMANCE BALL SCREWS FOR POSITIONING APPLICATIONS

SECTORS



PRODUCTION TECHNOLOGIES:

- Lathe and turning centers
- Grinding, honing, lapping, and polishing machines
- Transfer and reusable machines
- Milling machines
- Laser, eroding and other cutting machine tools
- Gear cutting and finishing machines
- Sawing and cutting machines
- Drilling, boring machines, combined boring and milling machines
- Other cutting machine tools

TECHNOLOGY

COMPLEX

High precision ball screws for high dynamics machine tools with efficient rigidity requirements and extreme duty cycles. Oriented to improve machining times in productively demanding sectors such as automotive, aeronautics, die mold processing machines,etc.

PRIME

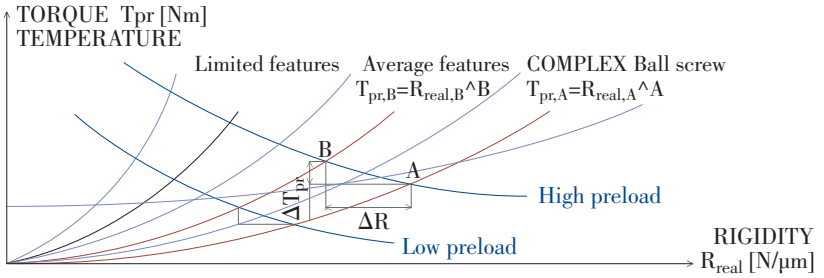
Fine-lead high precision ball screws for precise positioning and average dynamics demand applications, such as grinding machines and EDM machines that ensure smooth rotation in short strokes.

COMPLEX TECHNOLOGY

COMPLEX ball screws have been designed for applications with requirements of accurate positioning, high speeds and high loads, such as high speed, 5 axis machining centres, large sized machining centres and combined machine tools, die mold processing machines, aeronautics and automotive work pieces and other applications with highly demanding conditions.

The great achievement of the COMPLEX technology is to considerably increase the axial rigidity of the ball screw without harming the movement softness and without increasing the preload torque, hence, without generating a temperature increase. This is what we call Efficient Rigidity, the optimum relationship between rigidity and torque, thus getting the highest possible rigidity with the lowest preload/temperature.

By plotting ball screw rigidity and torque on a chart, the area can be divided into different zones as a function of ball screw feature level.



When comparing two identical ball screws, red lines A (COMPLEX ball screw) and B (non COMPLEX ball screw), of the same specifications *(d0, Ph, Dw, i)*, under the same conditions (rotation speed, alignment, ambient temperature, lubrication, wipers, etc.), both with the same preload level (%Ca) (blue line), results show that a COMPLEX ball screw has a higher rigidity at the same torque level, or the required torque level is lower for obtaining an identical rigidity, thus improving performance and the life level of the COMPLEX ball screw.

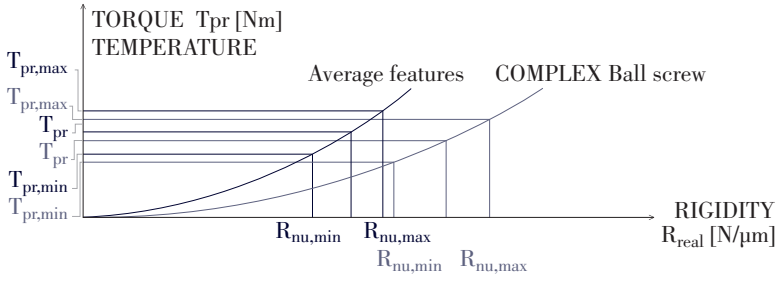
For two identical ball screws, SHUTON·IPIRANGA suggests using the ball screw 'Quality Grade *Q*' to determine the best solution.

The relationship between preload torque and rigidity is: $\frac{T_{pr}}{P_h} = (R_{real})^{Q}$

Ball screw quality grade *Q*: $Q = \frac{ln\left(1000^3 \frac{T_{pr}}{P_h}\right)}{ln\, R_{real}}$

A better ball screw provides a higher rigidity under the same torque; the *Q* value is therefore lower. A lower *Q* value indicates a better ball screw. This is a fast and effective means of comparing two identical ball screws:

$\downarrow Q \longrightarrow$ *Better ball screw*



The axial rigidity of the ball screw influences directly in the total rigidity of the drive, which in turn is key to increasing the natural frequency of the system, improving the control parameters Kv and Kp of the motor and therefore improving the jerk. The greater rigidity of COMPLEX ball screws allows greater accelerations and jerks, thus achieving a more dynamic machine. Depending on the ball screw configuration and providing the alignment, assembly and lubrication conditions are correct, these highly dynamic ball screws can reach DN values of up to 210.000.

The increased rigidity of COMPLEX ball screws allows more demanding working conditions without the appearance of the chatter effect and eliminating the inversion error, avoiding the "lost motion moment" effect, obtaining improved ball bar test results, and therefore considerably improving the surface finish of the work piece, especially in 5-axis machines with challenging machining operations.

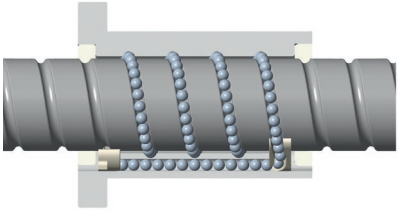
In addition to rigidity efficiency, the COMPLEX technology provides an increase of the dynamic and static load capacities of the ball screw, attaining a very high durability with greater fatigue life and capacity to work under the most extreme conditions.

COMPLEX ball screws show a very high efficiency in low distance forward and backward machining with minimum torque variation.

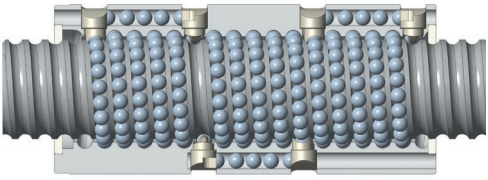
The optimization of the ball recirculation design and the highest geometry accuracy ensure a very low torque variation along the shaft, offering a very smooth rotation and reduced noise levels.

Depending on their application, COMPLEX ball screws, are assembled with preloaded double nuts (with 1 or 2 starts) or TUC Ultracompact nuts. In both cases, the nut can be designed with a U-type or B-type recirculation system.

U-type recirculation system



B-type recirculation system



Types of COMPLEX nuts depending on application:

Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
COMPLEX	MACHINE TOOL High speed 5 axis, large size and combined machines tools, die mold processing machines, aeronautics and automotive work pieces and other applications with highly demanding conditions.	High dynamics Efficient rigidity (optimization of rigidity-torque relation) DN up to 210.000. ⇒ For Highly demanding duty cycles improvement of machining times	YES	TD Double Nut (1 start)	U	25-120	10-80	5-12	High dynamic applications, Average load requirement
					B	50-160	12,7-25	9-19	High dynamic applications, Higher load requirement
				TD Double Nut (2 start)	U	32-120	20-80	6-12	High dynamic applications, Higher load requirement, without nut length limitation
					B	63-140	25-32	9-12	High dynamic applications, Extra high load requirement, without nut length limitation
				TUC Ultracompact Nut (2start)	U	32-100	20-120	6-9	High dynamic applications, high load requirement, with nut length limitation

TD COMPLEX PRELOADED DOUBLE NUT

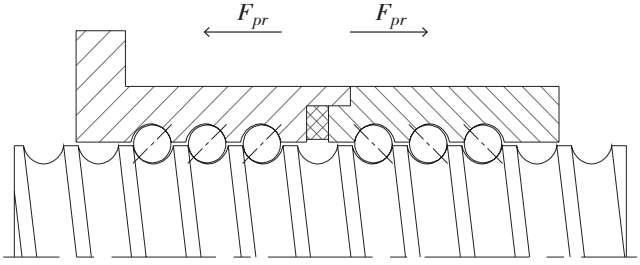
The COMPLEX preloaded double nut is configured with U-type or B-type recirculation system, with 1 or 2 starts. The 2 -start option is used in cases of higher load requirements without nut length limitation.

Ball screws can be maintained quickly, as they do not need to be dismounted from the machine. Just loosen the nut and replace the spacer to preload.

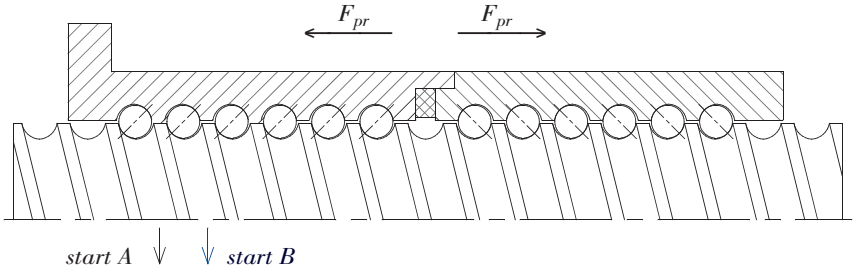
Preload system: The thickness of the washer between the two nuts establishes the preload value.

TD, COMPLEX preloaded double nut

TD, COMPLEX preloaded double nut, U-type recirculation



Preloaded double nut (1 start), contact points



Preloaded double nut (2 starts), 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 28-95 in this catalogue.

TUC COMPLEX PRELOADED ULTRACOMPACT NUT

TUC COMPLEX ultracompact nut is a double start nut built on a single piece. It is configured with U or B recirculation type. It obtains a high dynamic load, static load and axial rigidity while reducing the nut length considerably, offering solutions for cases of space limitation and performance requirements.

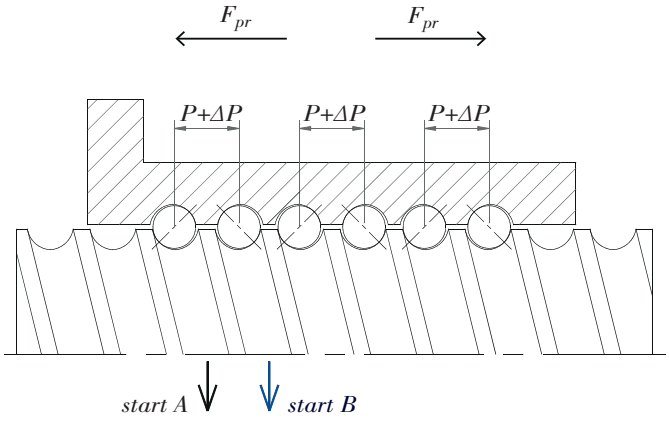
Advantages offered by ultracompact nut ball screws:

- The nut length is almost half, with the same benefits of Dynamic Load Ca, Static Load Coa and Rigidity of nut Rb/t.
- A shorter nut leads to minimum geometrical errors of the shaft covered by the nut and an improved variation of the torque.
- The temperature gradient between the two ends of the nut is reduced. In addition, the recirculation of the balls through the nut distributes the temperature more homogeneously.
- The parallelism and perpendicularity control parameters are better.

Preload system: adapted thread distance between the two threads.

TUC, COMPLEX preloaded ultracompact nut

TUC, COMPLEX preloaded ultracompact nut, U-type recirculation



Preloaded Ultracompact nut (2 starts), 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 28-76 in this catalogue.

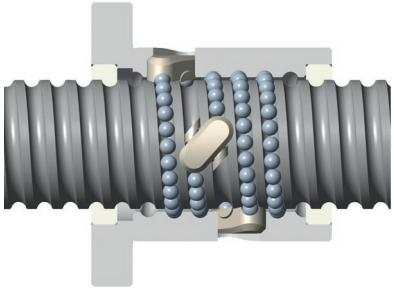
PRIME TECHNOLOGY

PRIME ball screws are used in applications in which the load and the speed requirements are not as demanding as in COMPLEX ball screws. In applications with a maximum DN of 100.000, such as grinding machines, EDM machines, low speed and short lead applications, PRIME ball screws obtain accurate results in positioning and a very smooth rotation in short strokes.

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

Depending on the application, PRIME ball screws can be assembled with preloaded compact or preloaded double nuts.

S-type recirculation system



Each ball circuit is independent, and has its own 'S'-shaped deflector, which enables the ball to overpass the lead groove. A reduced outer nut diameter allows for compact design.

Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
PRIME	Machine tool Grinding machines EDM machines	High precision ball screws DN of 100.000 -> For precise positioning and average dynamics demand	YES	TC Compact Nut (1 start)	S	20-100	5-20	3-9	General Machine tool application, with short nut length. Improved T9
				TD Double Nut (1 start)					General Machine tool application. Possibility of greater circuit quantity

TC PRIME PRELOADED COMPACT NUT

The preloaded PRIME compact nut is configured with an S-type recirculation and has 1 start.

Depending on the application, the compact nut offers:

· Better alignment and concentricity of the whole nut with the screw.

· Reduced nut length, thus less mass.

· Elimination of the bearing holder parts in rotary nut designs.

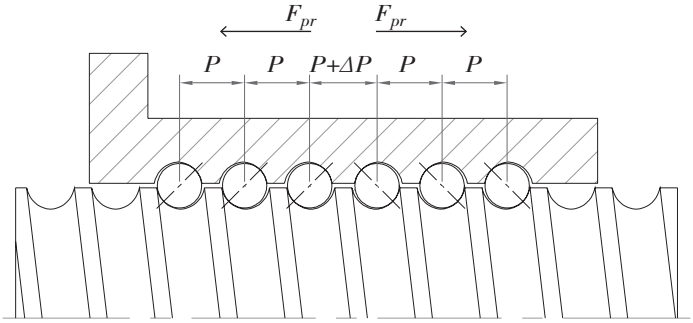
· Possibility of special designs, with compact nut-carrying bodies.

SHUTON·IPIRANGA recommends the use of preloaded compact nuts in short and medium-sized ball screws with short leads.

Preload system: The preload is obtained by modifying the dimension of a thread in the centre of the nut.

TC, PRIME preloaded compact nut

TC, PRIME preloaded compact nut, S-type recirculation system



PRIME preloaded compact nut, contact points

TD PRIME PRELOADED DOUBLE NUT

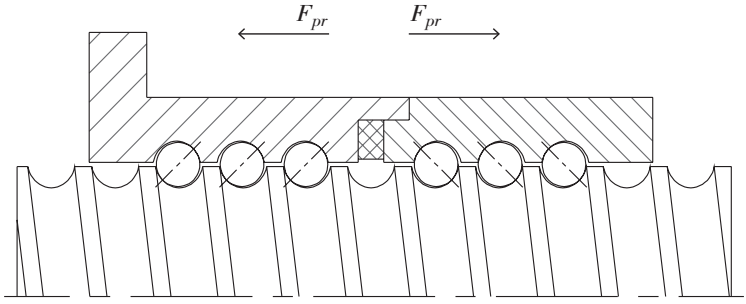
The preloaded PRIME double nut is configured with an S-type recirculation and has 1 start.

Ball screws can be maintained quickly, as they do not need to be dismounted from the machine.

Preload system: The thickness of the washer between the two nuts establishes the preload value.

TD, PRIME preloaded double nut

TD, PRIME preloaded double nut, S-type recirculation



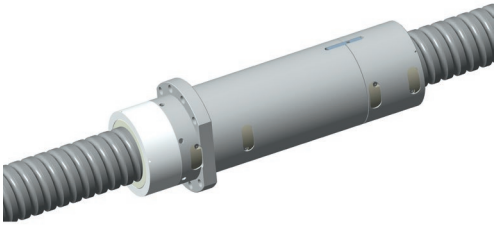
PRIME preloaded double nut, contact points

For more technical information on the ball screw technology, see Technical description catalogue.
For detailed ball screw load and dimensional information, see pages 96-127 in this catalogue.

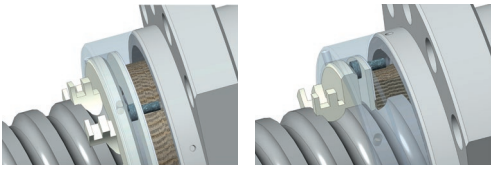
Customised solutions

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

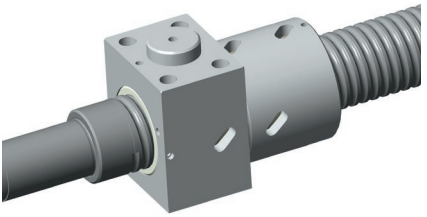


SPECIAL WIPERS

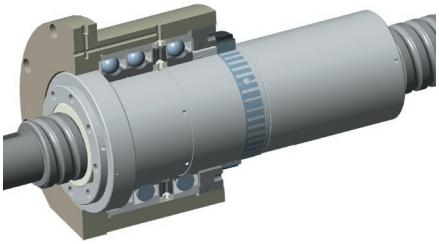


CERAMIC BALLS

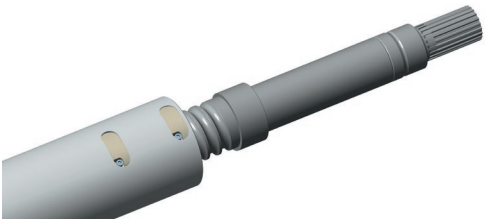
SPECIAL NUTS



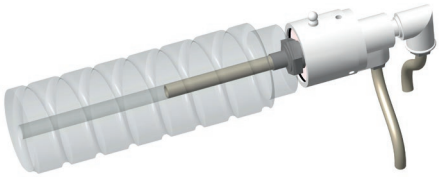
ROTARY NUT SYSTEM



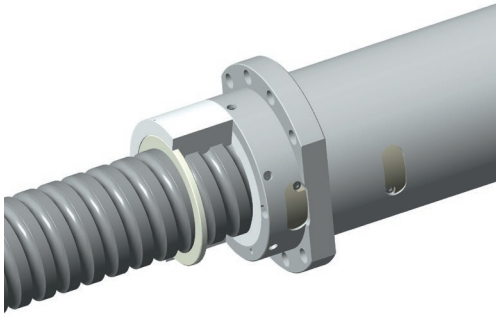
SPECIAL SPINDLE END MACHINING



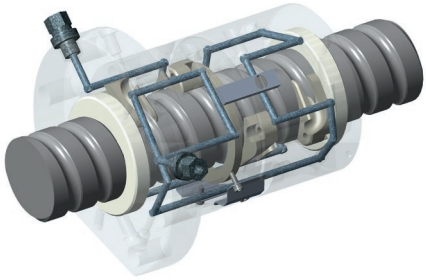
REFRIGERATED SHAFT



SAFETY NUT



REFRIGERATED NUT



COATING

iBALL SCREW

The intelligent ball screw has been developed to match novel industry 4.0 demands, including predictive maintenance, environmental aspects like the reduction in lubrication quantity, optimization of machining parameters, etc.

Specific sensors are placed on strategic nut points in order to obtain the required performance information from the ball screw. Combined data from the ball screw and other components of the machine are analyzed on the edge and the results are stored or communicated to other intelligent systems of the machine.

To optimize the benefits of iBall screw, specific strategies can be followed, like obtaining the fingerprint of the ball screw under a specific duty cycle and periodically compare the results against the original fingerprint. In any case, this optimization requires a close collaboration with the machine manufacturer. Please contact SHUTON·IPIRANGA Engineering Department for further and updated information.

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:

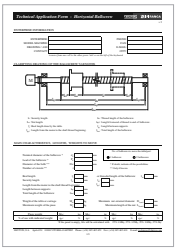
- Calculate the performance of a specific ball screw with a given set of bearings, motor and transmission system, getting result for:
  - · Ball screw fatigue life
  - · Table or head feed speed
  - · Ball screw critical rotation speed and speed limit
  - · Deflections or radial deformations, and advice 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

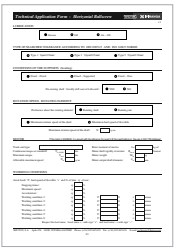
- Calculate which drive (ball screw, motor, transmission system, etc.) is best suited to achieve desired speed, acceleration, rigidity and fatigue life.

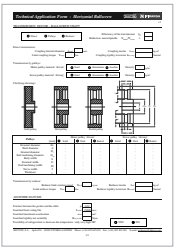
One of the most innovative and important aspects of the ball screw study is its provision of approximate motor control values, that is, closed control loop position kv and speed kp gains. These values are extremely important for getting an idea of a machines dynamics. Two or more potential drives can 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.

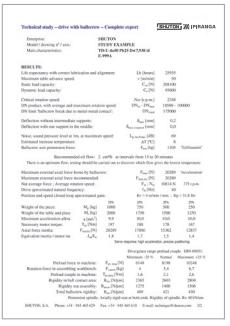






'Technical Form'

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:

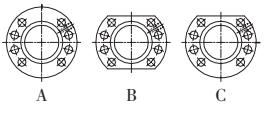
Required information for ball screw order

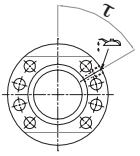
SHUTON IPIRANGA

Enterprise: _____ Drawing: _____ Date: _____

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

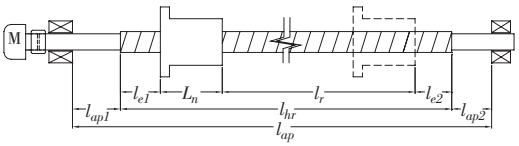
- Type of nut: Double TD ☐ Compact TC ☐ Single TS ☐
- Tying type: Lateral Flange ☐ Centred Flange ☐ Cylindrical Nut ☐
- Flange shape: A Shape ☐ B Shape ☐ C Shape ☐
- Nominal diameter, d_0: _____
- Lead, P_h: _____
- Ball diameter, D_W: _____ and material: Steel ☐ Ceramics ☐
- Quantity of circuits, i: _____
- 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

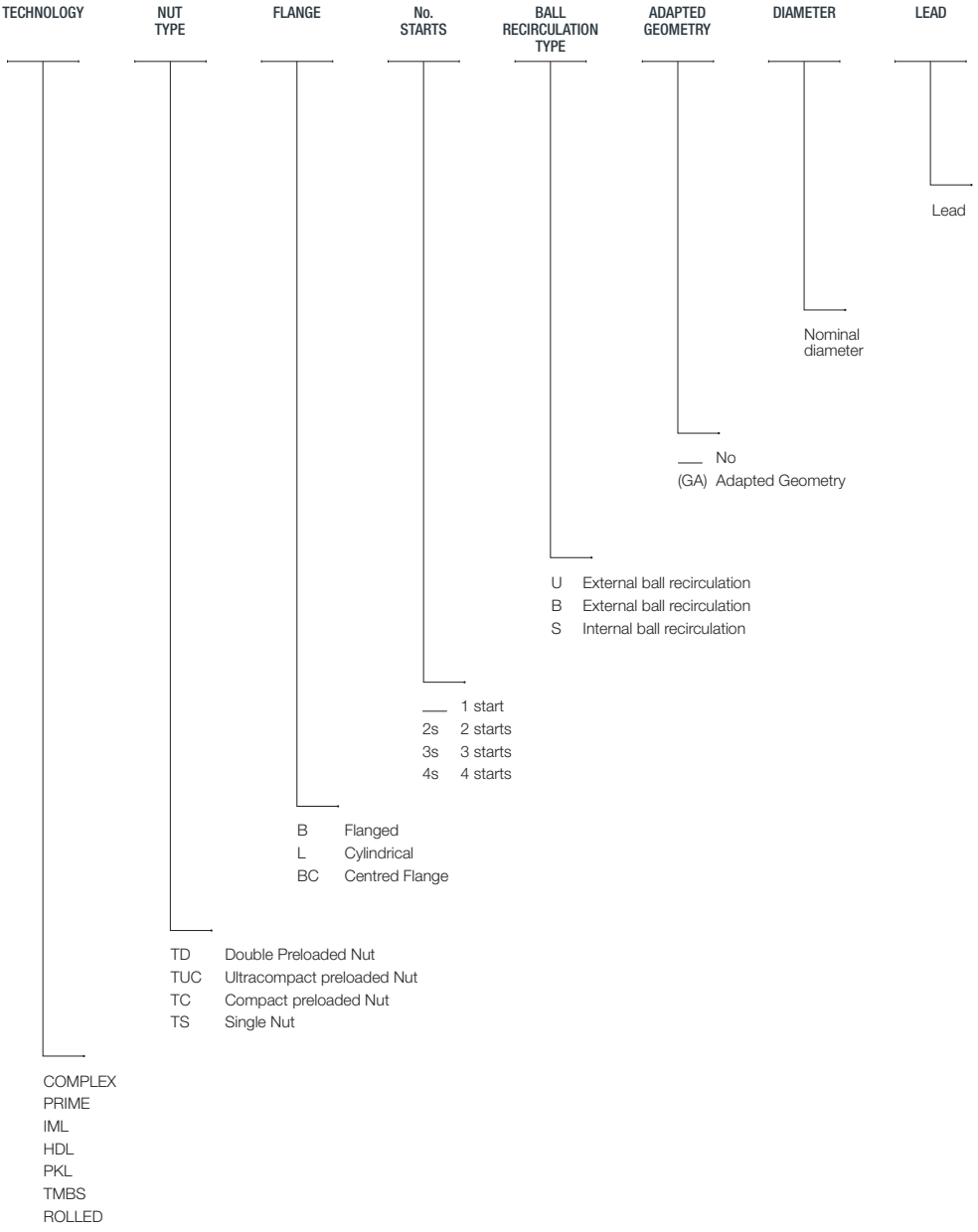
For the nut to be as short as possible, we start with option C, d_0:50 - D_w:7,938 - i:3

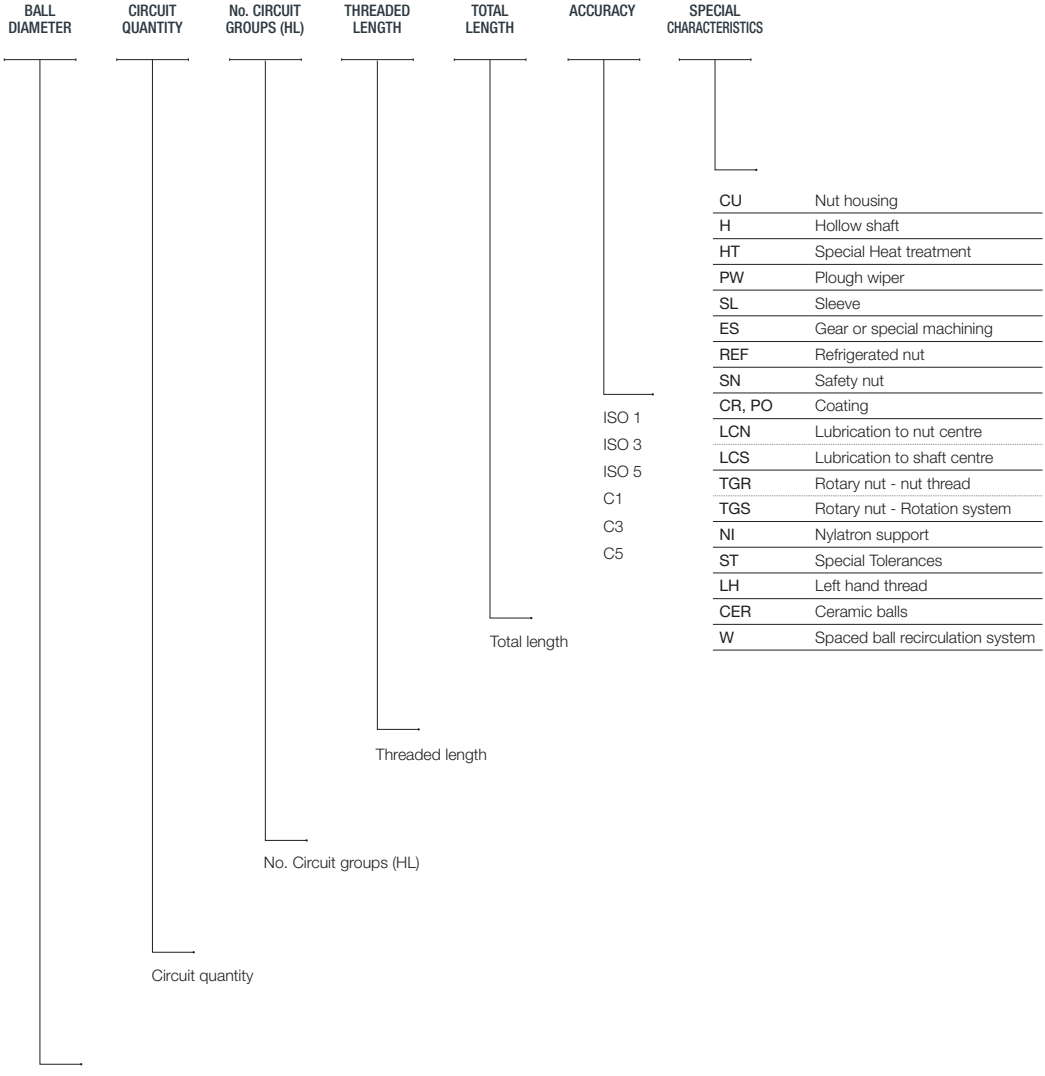
$N_{advised} = 0,75 \text{ x } \frac{180000}{50} = 2700$

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

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

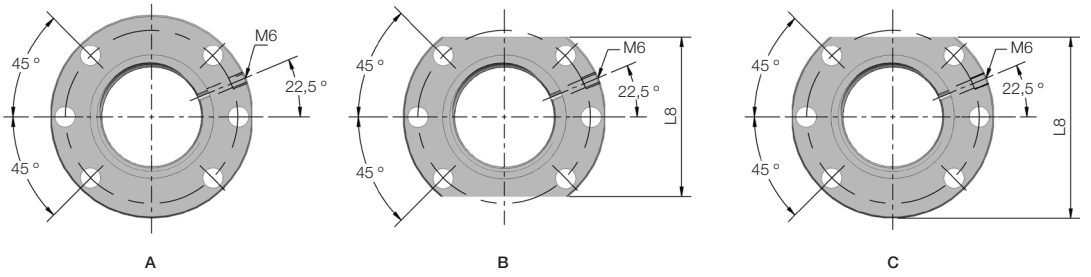
CU	Nut housing
H	Hollow shaft
HT	Special Heat treatment
PW	Plough wiper
SL	Sleeve
ES	Gear or special machining
REF	Refrigerated nut
SN	Safety nut
CR, PO	Coating
LCN	Lubrication to nut centre
LCS	Lubrication to shaft centre
TGR	Rotary nut - nut thread
TGS	Rotary nut - Rotation system
NI	Nylatron support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

Ball screws according fastening method

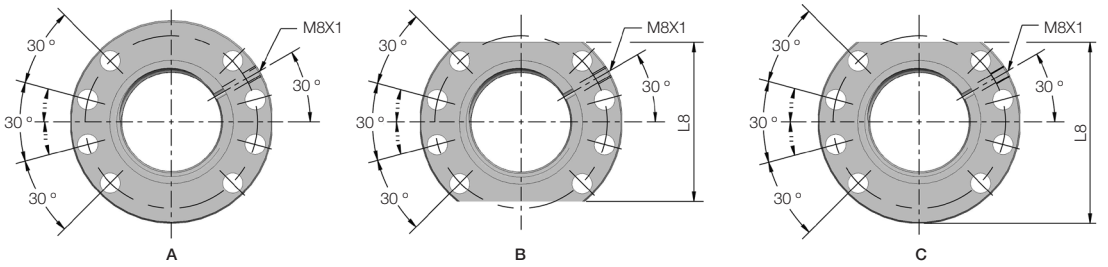
In most cases, ball screws are fastened to the table via a lateral flange.

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

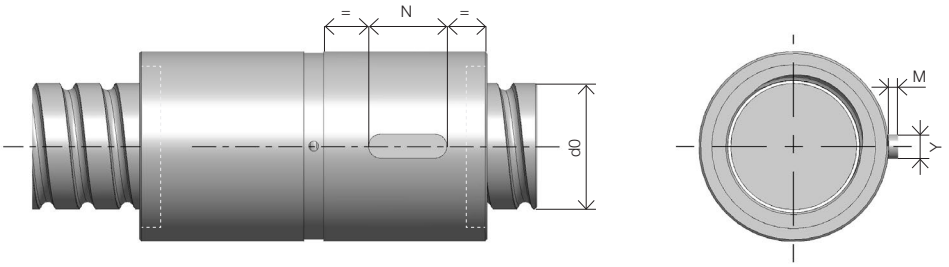


do ≧ 40



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.



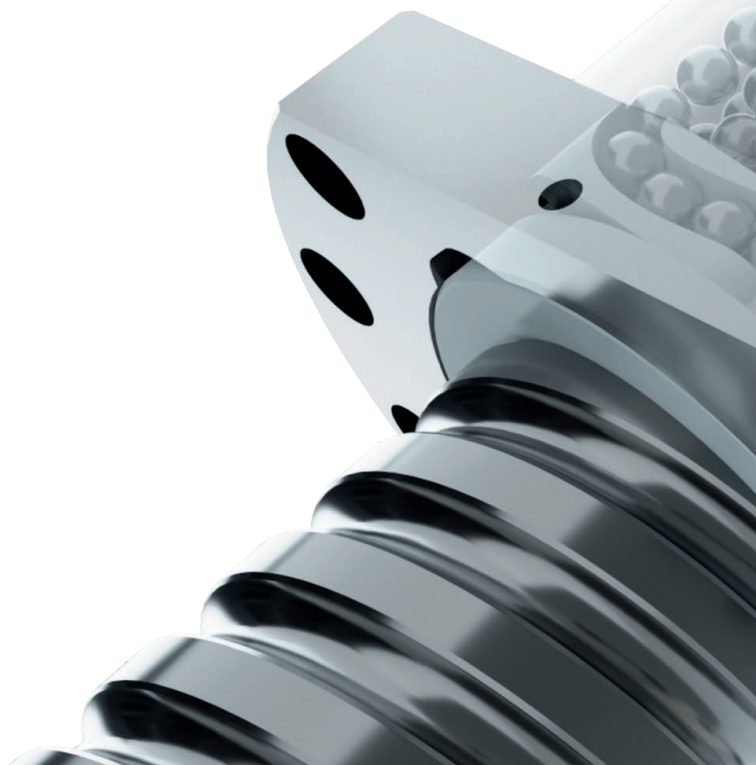
The standard dimensions for this keyway are a function of the nominal diameter of the ball screw and the dynamic load according to the following tables:

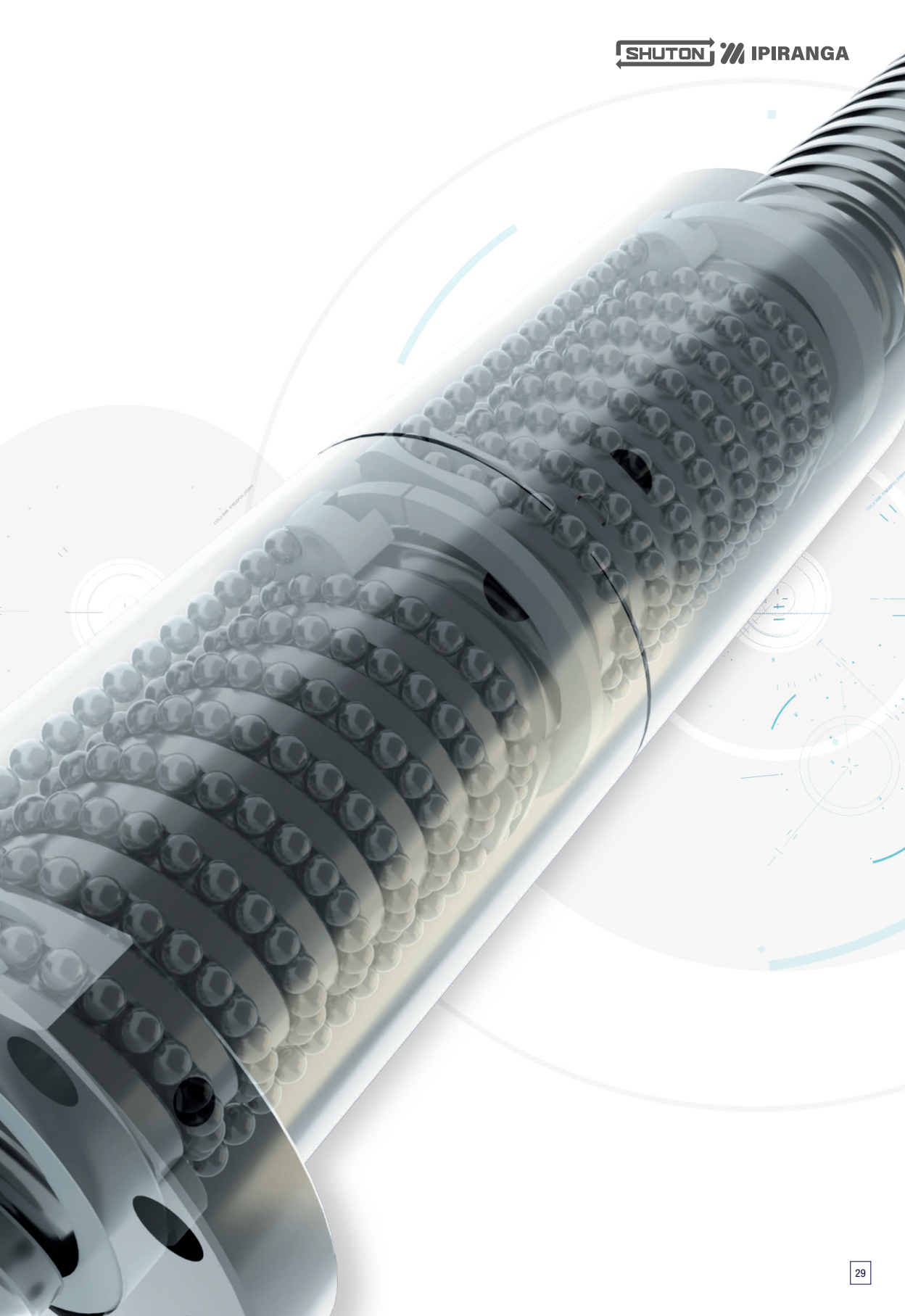
d_0	Y	M
20-25	6	2
32-40	8	3
50-63	10	4
80-100	12	4
120-160	14	6

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

COMPLEX TECHNOLOGY

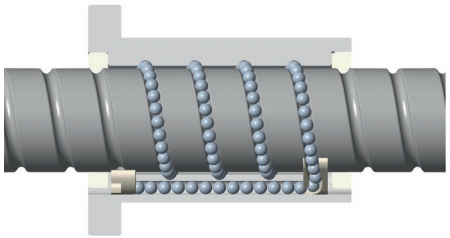
High precision ball screws for high dynamics machine tools with efficient rigidity requirements and extreme duty cycles. Oriented to improve machining times in productively demanding sectors such as automotive, aeronautics, die mold processing machines, etc.



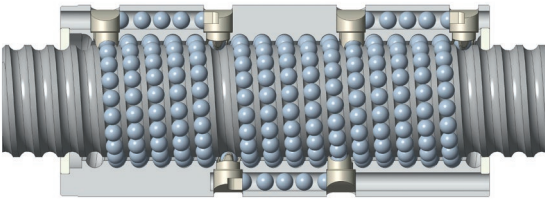


COMPLEX TECHNOLOGY

U-type recirculation system



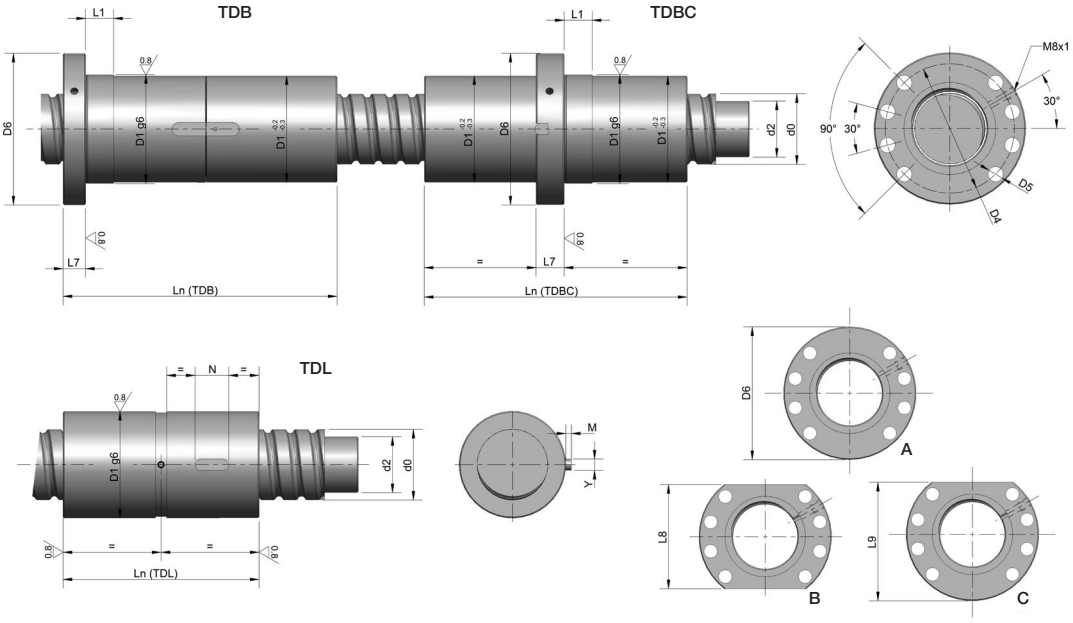
B-type recirculation system



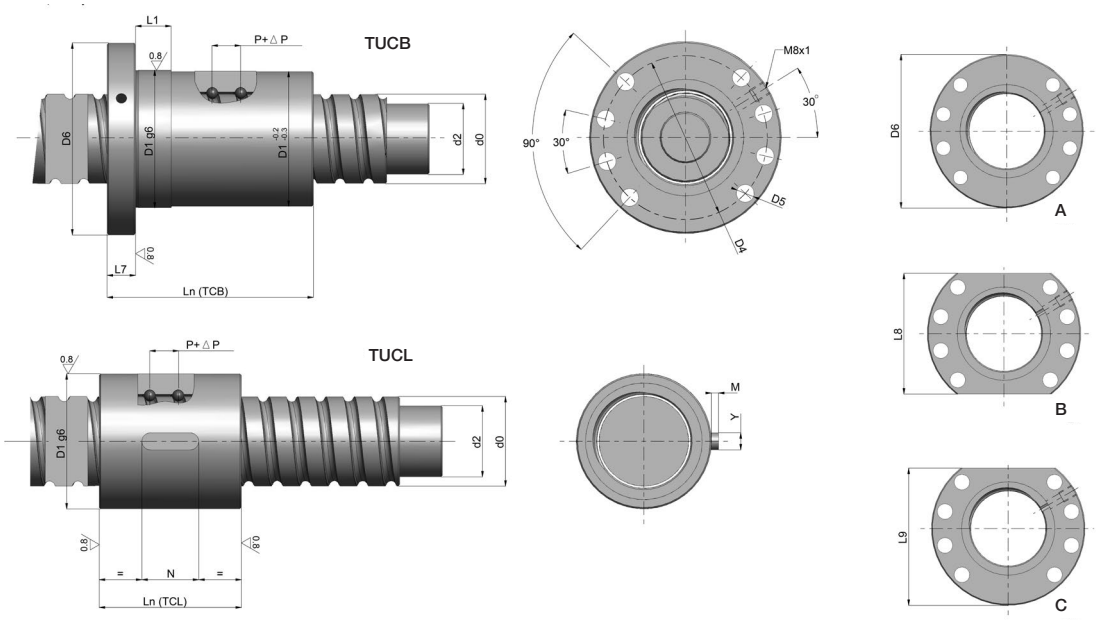
Types of COMPLEX nuts depending on application:

Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
COMPLEX	MACHINE TOOL High speed 5 axis, large size and combined machines tools, die mold processing machines, aeronautics and automotive work pieces and other applications with highly demanding conditions.	High dynamics Efficient rigidity (optimization of rigidity-torque relation) DN up to 210.000. -> For Highly demanding duty cycles improvement of machining times	YES	TD Double Nut (1 start)	U	25-120	10-80	5-12	High dynamic applications, Average load requirement
					B	50-160	12,7-25	9-19	High dynamic applications, Higher load requirement
				TD Double Nut (2 start)	U	32-120	20-80	6-12	High dynamic applications, Higher load requirement, without nut length limitation
					B	63-140	25-32	9-12	High dynamic applications, Extra high load requirement, without nut length limitation
				TUC Ultracompact Nut (2start)	U	32-100	20-120	6-9	High dynamic applications, high load requirement, with nut length limitation

COMPLEX Double Nut



COMPLEX Ultracompact nut



COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 25-10-5-2	1	25	10	4,762	20,8	2	18100	26000	680	670	89
TDB-U 25-10-5-3	1	25	10	4,762	20,8	3	25500	41800	1060	1030	109
TDB-U 25-10-5-4	1	25	10	4,762	20,8	4	33000	57600	1410	1370	129
TDB-U 25-12-5-2	1	25	12	4,762	20,8	2	18000	25900	680	660	97
TDB-U 25-12-5-3	1	25	12	4,762	20,8	3	25400	41700	1050	1020	121
TDB-U 25-15-5-2	1	25	15	4,762	20,8	2	17800	25800	670	660	107
TDB-U 25-15-5-3	1	25	15	4,762	20,8	3	25200	41400	1040	1020	137
TDB-U 25-16-5-2	1	25	16	4,762	20,8	2	17800	25700	670	660	111
TDB-U 25-20-5-2	1	25	20	4,762	20,8	2	18000	26300	680	670	125
TDB-U 25-25-5-2	1	25	25	4,762	20,8	2	17600	25900	650	650	141
TDB-U 32-10-6-2	1	32	10	6,35	26,5	2	28900	42500	830	800	106
TDB-U 32-10-6-3	1	32	10	6,35	26,5	3	41600	70300	1320	1260	126
TDB-U 32-10-6-4	1	32	10	6,35	26,5	4	53600	96500	1770	1700	146
TDB-U 32-10-6-5	1	32	10	6,35	26,5	5	65900	124300	2230	2140	166
TDB-U 32-10-6-6	1	32	10	6,35	26,5	6	77300	150400	2630	2520	186
TDB-U 32-10-6-7	1	32	10	6,35	26,5	7	88600	176600	3040	2910	206
TDB-U 32-12-6-2	1	32	12	6,35	26,5	2	28800	42400	830	800	108
TDB-U 32-12-6-3	1	32	12	6,35	26,5	3	41500	70200	1310	1270	132
TDB-U 32-12-6-4	1	32	12	6,35	26,5	4	53400	96300	1760	1700	156
TDB-U 32-12-6-5	1	32	12	6,35	26,5	5	65700	124000	2220	2140	180
TDB-U 32-12-6-6	1	32	12	6,35	26,5	6	77100	150100	2620	2530	204
TDB-U 32-15-6-2	1	32	15	6,35	26,5	2	29400	43900	850	830	125
TDB-U 32-15-6-3	1	32	15	6,35	26,5	3	41300	69900	1300	1260	155
TDB-U 32-15-6-4	1	32	15	6,35	26,5	4	53800	97500	1780	1730	185
TDB-U 32-15-6-5	1	32	15	6,35	26,5	5	65400	123500	2200	2140	205
TDB-U 32-16-6-2	1	32	16	6,35	26,5	2	29300	43800	850	820	130
TDB-U 32-16-6-3	1	32	16	6,35	26,5	3	41200	69800	1300	1260	162
TDB-U 32-16-6-4	1	32	16	6,35	26,5	4	53700	97400	1770	1730	194
TDB-U 32-20-6-2	1	32	20	6,35	26,5	2	29100	43500	830	820	131
TDB-U 32-20-6-3	1	32	20	6,35	26,5	3	40900	69300	1280	1250	171
TDB-U 32-25-6-2	1	32	25	6,35	26,5	2	28700	43100	820	800	155
TDB-U 32-25-6-3	1	32	25	6,35	26,5	3	41000	70300	1280	1260	201
TDB-U 32-32-6-2	1	32	32	6,35	26,5	2	28800	43900	820	810	177
TDB-U 40-10-6-2	1	40	10	6,35	34,5	2	33800	56500	1060	1000	107
TDB-U 40-10-6-3	1	40	10	6,35	34,5	3	48000	91400	1630	1530	127
TDB-U 40-10-6-4	1	40	10	6,35	34,5	4	61600	124700	2190	2060	147
TDB-U 40-10-6-5	1	40	10	6,35	34,5	5	74900	157900	2700	2540	167
TDB-U 40-10-6-6	1	40	10	6,35	34,5	6	88400	192800	3230	3050	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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	3,4 ~ 5
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	3,9 ~ 5,9
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	4,6 ~ 6,9
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	3,3 ~ 5
50	(45)	65 (58)	80 (71)	9	10	16	62 (55)	71 (63)	4 ~ 6
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,3 ~ 4,9
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	4,1 ~ 6,1
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,3 ~ 4,9
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,4 ~ 5,1
50	(45)	65 (58)	80 (71)	9	14	16	62 (55)	71 (63)	3,5 ~ 5,3
56		71	86	9	14	20	65	75,5	8,5 ~ 13
56		71	86	9	14	20	65	75,5	9,5 ~ 14
56		71	86	9	14	20	65	75,5	11 ~ 16
56		71	86	9	14	20	65	75,5	12 ~ 18
56		71	86	9	14	20	65	75,5	13 ~ 20
56		71	86	9	14	20	65	75,5	14 ~ 22
56		71	86	9	14	20	65	75,5	7,4 ~ 11
56		71	86	9	14	20	65	75,5	8,6 ~ 13
56		71	86	9	14	20	65	75,5	9,9 ~ 15
56		71	86	9	14	20	65	75,5	11 ~ 17
56		71	86	9	14	20	65	75,5	13 ~ 19
56		71	86	9	14	20	65	75,5	7,7 ~ 12
56		71	86	9	14	20	65	75,5	9,2 ~ 14
56		71	86	9	14	20	65	75,5	11 ~ 16
56		71	86	9	14	20	65	75,5	11 ~ 17
56		71	86	9	14	20	65	75,5	7,7 ~ 12
56		71	86	9	14	20	65	75,5	9,3 ~ 14
56		71	86	9	14	20	65	75,5	11 ~ 16
56		71	86	9	14	20	65	75,5	6,6 ~ 9,9
56		71	86	9	14	20	65	75,5	8,5 ~ 13
56		71	86	9	14	20	65	75,5	7,4 ~ 11
56		71	86	9	14	20	65	75,5	9,2 ~ 14
56		71	86	9	14	20	65	75,5	7,7 ~ 11
63		78	93	9	14	16	70	81,5	10 ~ 16
63		78	93	9	14	16	70	81,5	12 ~ 18
63		78	93	9	14	16	70	81,5	13 ~ 20
63		78	93	9	14	16	70	81,5	15 ~ 22
63		78	93	9	14	16	70	81,5	16 ~ 24

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 40-10-6-7	1	40	10	6,35	34,5	7	101200	226100	3710	3510	207
TDB-U 40-10-6-8	1	40	10	6,35	34,5	8	113700	259300	4170	3940	227
TDB-U 40-10-7-2	1	40	10	7,144	33,9	2	40500	66500	1170	1120	107
TDB-U 40-10-7-3	1	40	10	7,144	33,9	3	57100	106500	1810	1730	127
TDB-U 40-10-7-4	1	40	10	7,144	33,9	4	73700	146400	2410	2300	147
TDB-U 40-10-7-5	1	40	10	7,144	33,9	5	90600	188600	3040	2900	167
TDB-U 40-10-7-6	1	40	10	7,144	33,9	6	106400	228500	3600	3450	187
TDB-U 40-10-7-7	1	40	10	7,144	33,9	7	121800	268400	4170	3980	207
TDB-U 40-10-7-8	1	40	10	7,144	33,9	8	137000	308300	4670	4470	227
TDB-U 40-12-6-2	1	40	12	6,35	34,5	2	33800	56400	1060	1010	106
TDB-U 40-12-6-3	1	40	12	6,35	34,5	3	48000	91300	1620	1550	130
TDB-U 40-12-6-4	1	40	12	6,35	34,5	4	61500	124500	2180	2070	154
TDB-U 40-12-6-5	1	40	12	6,35	34,5	5	74800	157700	2690	2560	178
TDB-U 40-12-6-6	1	40	12	6,35	34,5	6	88300	192600	3220	3070	202
TDB-U 40-12-6-7	1	40	12	6,35	34,5	7	101000	225800	3700	3530	226
TDB-U 40-12-6-8	1	40	12	6,35	34,5	8	114000	260600	4190	3990	250
TDB-U 40-12-7-2	1	40	12	7,144	33,9	2	40400	66500	1170	1130	108
TDB-U 40-12-7-3	1	40	12	7,144	33,9	3	57000	106300	1800	1730	132
TDB-U 40-12-7-4	1	40	12	7,144	33,9	4	73500	146200	2400	2310	156
TDB-U 40-12-7-5	1	40	12	7,144	33,9	5	90400	188300	3030	2920	180
TDB-U 40-12-7-6	1	40	12	7,144	33,9	6	106200	228200	3590	3460	204
TDB-U 40-12-7-7	1	40	12	7,144	33,9	7	121600	268100	4150	4000	228
TDB-U 40-12-7-8	1	40	12	7,144	33,9	8	136800	307900	4660	4490	252
TDB-U 40-15-6-2	1	40	15	6,35	34,5	2	33700	56300	1050	1020	118
TDB-U 40-15-6-3	1	40	15	6,35	34,5	3	47800	91100	1620	1560	148
TDB-U 40-15-6-4	1	40	15	6,35	34,5	4	61300	124200	2170	2090	178
TDB-U 40-15-6-5	1	40	15	6,35	34,5	5	75100	159000	2700	2600	208
TDB-U 40-15-6-6	1	40	15	6,35	34,5	6	88000	192100	3200	3090	238
TDB-U 40-15-6-7	1	40	15	6,35	34,5	7	100700	225200	3680	3550	268
TDB-U 40-15-8-2	1	40	15	7,938	33,3	2	46100	73300	1160	1120	131
TDB-U 40-15-8-3	1	40	15	7,938	33,3	3	64700	116700	1770	1720	161
TDB-U 40-15-8-4	1	40	15	7,938	33,3	4	84300	162800	2420	2340	191
TDB-U 40-15-8-5	1	40	15	7,938	33,3	5	102500	206300	3000	2910	221
TDB-U 40-15-8-6	1	40	15	7,938	33,3	6	121200	252400	3580	3470	251
TDB-U 40-16-6-2	1	40	16	6,35	34,5	2	33600	56300	1050	1020	131
TDB-U 40-16-6-3	1	40	16	6,35	34,5	3	47700	91000	1610	1560	163
TDB-U 40-16-6-4	1	40	16	6,35	34,5	4	61200	124100	2160	2090	195
TDB-U 40-16-6-5	1	40	16	6,35	34,5	5	75000	158800	2700	2600	227

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	18 ~ 27
63		78	93	9	14	16	70	81,5	20 ~ 29
70		85	100	9	18	25	75	87,5	14 ~ 21
70		85	100	9	18	25	75	87,5	15 ~ 23
70		85	100	9	18	25	75	87,5	17 ~ 26
70		85	100	9	18	25	75	87,5	19 ~ 28
70		85	100	9	18	25	75	87,5	21 ~ 31
70		85	100	9	18	25	75	87,5	23 ~ 34
70		85	100	9	18	25	75	87,5	25 ~ 37
63		78	93	9	14	20	70	81,5	8,8 ~ 13
63		78	93	9	14	20	70	81,5	10 ~ 15
63		78	93	9	14	20	70	81,5	12 ~ 18
63		78	93	9	14	20	70	81,5	14 ~ 20
63		78	93	9	14	20	70	81,5	15 ~ 23
63		78	93	9	14	20	70	81,5	17 ~ 26
63		78	93	9	14	20	70	81,5	19 ~ 28
70		85	100	9	18	25	75	87,5	12 ~ 18
70		85	100	9	18	25	75	87,5	14 ~ 21
70		85	100	9	18	25	75	87,5	16 ~ 24
70		85	100	9	18	25	75	87,5	18 ~ 26
70		85	100	9	18	25	75	87,5	20 ~ 30
70		85	100	9	18	25	75	87,5	22 ~ 33
70		85	100	9	18	25	75	87,5	24 ~ 36
65	(63)	78	93	9	16	20	70	81,5	8,6 ~ 13
65	(63)	78	93	9	16	20	70	81,5	10 ~ 16
65	(63)	78	93	9	16	20	70	81,5	12 ~ 18
65	(63)	78	93	9	16	20	70	81,5	14 ~ 21
65	(63)	78	93	9	16	20	70	81,5	16 ~ 24
65	(63)	78	93	9	16	20	70	81,5	18 ~ 27
70		85	100	9	18	25	75	87,5	14 ~ 22
70		85	100	9	18	25	75	87,5	17 ~ 26
70		85	100	9	18	25	75	87,5	20 ~ 29
70		85	100	9	18	25	75	87,5	22 ~ 34
70		85	100	9	18	25	75	87,5	25 ~ 38
65	(63)	78	93	9	16	20	70	81,5	9,6 ~ 14
65	(63)	78	93	9	16	20	70	81,5	12 ~ 17
65	(63)	78	93	9	16	20	70	81,5	13 ~ 20
65	(63)	78	93	9	16	20	70	81,5	15 ~ 23

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 40-16-6-6	1	40	16	6,35	34,5	6	87900	191900	3200	3090	259
TDB-U 40-16-8-2	1	40	16	7,938	33,3	2	46000	73200	1150	1120	128
TDB-U 40-16-8-3	1	40	16	7,938	33,3	3	64700	116600	1770	1720	160
TDB-U 40-16-8-4	1	40	16	7,938	33,3	4	84200	162700	2420	2350	192
TDB-U 40-16-8-5	1	40	16	7,938	33,3	5	102400	206100	2990	2910	224
TDB-U 40-16-8-6	1	40	16	7,938	33,3	6	121100	252200	3570	3470	256
TDB-U 40-20-6-2	1	40	20	6,35	34,5	2	34100	57700	1070	1040	134
TUC-U 40-20-6-2		40	20	6,35	34,5	2	34100	57700	1070	1040	75
TDB-U 40-20-6-3	1	40	20	6,35	34,5	3	47500	90600	1600	1550	174
TUC-U 40-20-6-3		40	20	6,35	34,5	3	47500	90600	1600	1550	95
TDB-U 40-20-6-4	1	40	20	6,35	34,5	4	61400	125200	2170	2110	214
TUC-U 40-20-6-4		40	20	6,35	34,5	4	61400	125200	2170	2110	115
TDB-U 40-20-6-5	1	40	20	6,35	34,5	5	74600	158200	2670	2600	254
TUC-U 40-20-6-5		40	20	6,35	34,5	5	74600	158200	2670	2600	135
TDB-U 40-20-8-2	1	40	20	7,938	33,3	2	45800	72900	1140	1120	140
TDB-U 40-20-8-3	1	40	20	7,938	33,3	3	64300	116100	1750	1710	180
TDB-U 40-20-8-4	1	40	20	7,938	33,3	4	83800	162000	2400	2340	220
TDB-U 40-20-8-5	1	40	20	7,938	33,3	5	102700	207900	3000	2930	260
TDB-U 40-25-6-2	1	40	25	6,35	34,5	2	33800	57300	1060	1030	158
TUC-U 40-25-6-2		40	25	6,35	34,5	2	33800	57300	1060	1030	82
TDB-U 40-25-6-3	1	40	25	6,35	34,5	3	47700	91700	1600	1570	208
TUC-U 40-25-6-3		40	25	6,35	34,5	3	47700	91700	1600	1570	107
TDB-U 40-25-6-4	1	40	25	6,35	34,5	4	60900	124400	2140	2090	258
TUC-U 40-25-6-4		40	25	6,35	34,5	4	60900	124400	2140	2090	132
TDB-U 40-25-8-2	1	40	25	7,938	33,3	2	45400	72400	1130	1110	163
TUC-U 40-25-8-2		40	25	7,938	33,3	2	45400	72400	1130	1110	92
TDB-U 40-25-8-3	1	40	25	7,938	33,3	3	64800	118100	1770	1730	213
TUC-U 40-25-8-3		40	25	7,938	33,3	3	64800	118100	1770	1730	117
TDB-U 40-25-8-4	1	40	25	7,938	33,3	4	83100	161000	2360	2320	263
TUC-U 40-25-8-4		40	25	7,938	33,3	4	83100	161000	2360	2320	142
TDB-U 40-30-6-2	1	40	30	6,35	34,5	2	33500	56800	1040	1020	168
TUC-U 40-30-6-2		40	30	6,35	34,5	2	33500	56800	1040	1020	88
TDB-U 40-30-6-3	1	40	30	6,35	34,5	3	47200	90900	1580	1550	228
TUC-U 40-30-6-3		40	30	6,35	34,5	3	47200	90900	1580	1550	118
TDB-U 40-30-8-2	1	40	30	7,938	33,3	2	44900	71900	1110	1090	176
TUC-U 40-30-8-2		40	30	7,938	33,3	2	44900	71900	1110	1090	99
TDB-U 40-30-8-3	1	40	30	7,938	33,3	3	64100	117100	1740	1710	236
TUC-U 40-30-8-3		40	30	7,938	33,3	3	64100	117100	1740	1710	129

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
65	(63)	78	93	9	16	20	70	81,5	17 ~ 26
70		85	100	9	18	25	75	87,5	13 ~ 20
70		85	100	9	18	25	75	87,5	16 ~ 24
70		85	100	9	18	25	75	87,5	19 ~ 28
70		85	100	9	18	25	75	87,5	22 ~ 32
70		85	100	9	18	25	75	87,5	24 ~ 37
65	(63)	78	93	9	18	20	70	81,5	8,3 ~ 12
65	(63)	78	93	9	18	20	70	81,5	5,6 ~ 8,3
65	(63)	78	93	9	18	20	70	81,5	11 ~ 16
65	(63)	78	93	9	18	20	70	81,5	7 ~ 11
65	(63)	78	93	9	18	20	70	81,5	13 ~ 19
65	(63)	78	93	9	18	20	70	81,5	8,3 ~ 13
65	(63)	78	93	9	18	20	70	81,5	15 ~ 23
65	(63)	78	93	9	18	20	70	81,5	9,9 ~ 15
70		85	100	9	18	25	75	87,5	13 ~ 19
70		85	100	9	18	25	75	87,5	16 ~ 24
70		85	100	9	18	25	75	87,5	19 ~ 29
70		85	100	9	18	25	75	87,5	23 ~ 34
65	(63)	78	93	9	18	20	70	81,5	9,2 ~ 14
65	(63)	78	93	9	18	20	70	81,5	5,3 ~ 7,9
65	(63)	78	93	9	18	20	70	81,5	12 ~ 18
65	(63)	78	93	9	18	20	70	81,5	6,9 ~ 10
65	(63)	78	93	9	18	20	70	81,5	15 ~ 22
65	(63)	78	93	9	18	20	70	81,5	8,5 ~ 13
70		85	100	9	18	25	75	87,5	14 ~ 21
70		85	100	9	18	25	75	87,5	9,2 ~ 14
70		85	100	9	18	25	75	87,5	18 ~ 27
70		85	100	9	18	25	75	87,5	11 ~ 17
70		85	100	9	18	25	75	87,5	22 ~ 33
70		85	100	9	18	25	75	87,5	14 ~ 21
65	(63)	78	93	9	18	20	70	81,5	9 ~ 13
65	(63)	78	93	9	18	20	70	81,5	5,1 ~ 7,7
65	(63)	78	93	9	18	20	70	81,5	12 ~ 18
65	(63)	78	93	9	18	20	70	81,5	7 ~ 10
70		85	100	9	18	25	75	87,5	14 ~ 21
70		85	100	9	18	25	75	87,5	9 ~ 13
70		85	100	9	18	25	75	87,5	19 ~ 28
70		85	100	9	18	25	75	87,5	11 ~ 17

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 40-40-6-2	1	40	40	6,35	34,5	2	33200	57300	1020	1010	208
TUC-U 40-40-6-2		40	40	6,35	34,5	2	33200	57300	1020	1010	107
TDB-U 40-40-8-2	1	40	40	7,938	33,3	2	44900	73100	1100	1090	212
TUC-U 40-40-8-2		40	40	7,938	33,3	2	44900	73100	1100	1090	113
TDB-U 40-50-6-2	1	40	50	6,35	34,5	2	32800	57500	1000	990	240
TUC-U 40-50-6-2		40	50	6,35	34,5	2	32800	57500	1000	990	124
TDB-U 40-50-8-2	1	40	50	7,938	33,3	2	44600	74000	1090	1080	240
TUC-U 40-50-8-2		40	50	7,938	33,3	2	44600	74000	1090	1080	125
TDB-U 40-60-6-2	1	40	60	6,35	34,5	2	32200	57400	960	960	274
TUC-U 40-60-6-2		40	60	6,35	34,5	2	32200	57400	960	960	141
TDB-U 40-60-8-2	1	40	60	7,938	33,3	2	44000	74500	1060	1050	276
TUC-U 40-60-8-2		40	60	7,938	33,3	2	44000	74500	1060	1050	142
TDB-U 50-10-6-2	1	50	10	6,35	44,5	2	38900	74100	1310	1220	108
TDB-U 50-10-6-3	1	50	10	6,35	44,5	3	54100	116200	2000	1850	128
TDB-U 50-10-6-4	1	50	10	6,35	44,5	4	69900	159900	2660	2470	148
TDB-U 50-10-6-5	1	50	10	6,35	44,5	5	84800	202000	3290	3050	168
TDB-U 50-10-6-6	1	50	10	6,35	44,5	6	99400	244100	3900	3620	188
TDB-U 50-10-6-7	1	50	10	6,35	44,5	7	114200	287900	4510	4190	208
TDB-U 50-10-6-8	1	50	10	6,35	44,5	8	128200	330000	5070	4720	228
TDB-U 50-10-7-2	1	50	10	7,144	43,9	2	46800	87700	1490	1400	108
TDB-U 50-10-7-3	1	50	10	7,144	43,9	3	65000	137100	2210	2080	128
TDB-U 50-10-7-4	1	50	10	7,144	43,9	4	83900	188800	2970	2800	148
TDB-U 50-10-7-5	1	50	10	7,144	43,9	5	101800	238300	3660	3450	168
TDB-U 50-10-7-6	1	50	10	7,144	43,9	6	119900	290000	4380	4130	188
TDB-U 50-10-7-7	1	50	10	7,144	43,9	7	137700	341700	5050	4760	208
TDB-U 50-10-7-8	1	50	10	7,144	43,9	8	154500	391200	5670	5360	228
TDB-U 50-12-6-2	1	50	12	6,35	44,5	2	38900	74000	1310	1230	108
TDB-U 50-12-6-3	1	50	12	6,35	44,5	3	54100	116100	1990	1870	132
TDB-U 50-12-6-4	1	50	12	6,35	44,5	4	69800	159800	2660	2490	156
TDB-U 50-12-6-5	1	50	12	6,35	44,5	5	84700	201900	3290	3090	180
TDB-U 50-12-6-6	1	50	12	6,35	44,5	6	99300	243900	3890	3660	204
TDB-U 50-12-6-7	1	50	12	6,35	44,5	7	114100	287600	4500	4230	228
TDB-U 50-12-8-2	1	50	12	7,938	43,3	2	52600	93900	1430	1360	116
TDB-U 50-12-8-3	1	50	12	7,938	43,3	3	74700	151900	2200	2090	140
TDB-U 50-12-8-4	1	50	12	7,938	43,3	4	95800	207200	2920	2780	164
TDB-U 50-12-8-5	1	50	12	7,938	43,3	5	117400	265200	3680	3500	188
TDB-U 50-12-8-6	1	50	12	7,938	43,3	6	137600	320500	4360	4150	212
TDB-U 50-12-8-7	1	50	12	7,938	43,3	7	158200	378500	5050	4800	236

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	10 ~ 16
65	(63)	78	93	9	18	20	70	81,5	5,7 ~ 8,6
70		85	100	9	18	25	75	87,5	16 ~ 24
70		85	100	9	18	25	75	87,5	8,9 ~ 13
65	(63)	78	93	9	18	20	70	81,5	12 ~ 17
65	(63)	78	93	9	18	20	70	81,5	6,3 ~ 9,4
70		85	100	9	18	25	75	87,5	17 ~ 25
70		85	100	9	18	25	75	87,5	9 ~ 13
65	(63)	78	93	9	18	20	70	81,5	13 ~ 19
65	(63)	78	93	9	18	20	70	81,5	6,9 ~ 10
70		85	100	9	18	25	75	87,5	19 ~ 29
70		85	100	9	18	25	75	87,5	9,9 ~ 15
75		93	110	11	16	16	85	97,5	13 ~ 20
75		93	110	11	16	16	85	97,5	15 ~ 22
75		93	110	11	16	16	85	97,5	17 ~ 25
75		93	110	11	16	16	85	97,5	18 ~ 28
75		93	110	11	16	16	85	97,5	20 ~ 31
75		93	110	11	16	16	85	97,5	22 ~ 33
75		93	110	11	16	16	85	97,5	24 ~ 37
82		100	118	11	16/18	20	92	105	17 ~ 26
82		100	118	11	16/18	20	92	105	19 ~ 29
82		100	118	11	16/18	20	92	105	21 ~ 32
82		100	118	11	16/18	20	92	105	24 ~ 35
82		100	118	11	16/18	20	92	105	26 ~ 39
82		100	118	11	16/18	20	92	105	28 ~ 42
82		100	118	11	16/18	20	92	105	31 ~ 46
75		93	110	11	16	20	85	97,5	11 ~ 17
75		93	110	11	16	20	85	97,5	13 ~ 20
75		93	110	11	16	20	85	97,5	15 ~ 22
75		93	110	11	16	20	85	97,5	17 ~ 26
75		93	110	11	16	20	85	97,5	19 ~ 29
75		93	110	11	16	20	85	97,5	21 ~ 32
82		100	118	11	16	25	92	105	18 ~ 26
82		100	118	11	16	25	92	105	20 ~ 30
82		100	118	11	16	25	92	105	23 ~ 35
82		100	118	11	16	25	92	105	26 ~ 39
82		100	118	11	16	25	92	105	29 ~ 43
82		100	118	11	16	25	92	105	32 ~ 48

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 50-12-8-8	1	50	12	7,938	43,3	8	177600	433700	5670	5400	260
TDB-U 50-15-6-2	1	50	15	6,35	44,5	2	38800	73900	1310	1240	118
TDB-U 50-15-6-3	1	50	15	6,35	44,5	3	54500	117600	2010	1910	148
TDB-U 50-15-6-4	1	50	15	6,35	44,5	4	69700	159600	2650	2520	178
TDB-U 50-15-6-5	1	50	15	6,35	44,5	5	84600	201500	3280	3110	208
TDB-U 50-15-6-6	1	50	15	6,35	44,5	6	99600	245200	3910	3720	238
TDB-U 50-15-6-7	1	50	15	6,35	44,5	7	113800	287200	4490	4270	268
TDB-U 50-15-8-2	1	50	15	7,938	43,3	2	52500	93800	1430	1370	132
TDB-U 50-15-8-3	1	50	15	7,938	43,3	3	74600	151700	2190	2100	164
TDB-U 50-15-8-4	1	50	15	7,938	43,3	4	95700	206900	2920	2800	192
TDB-U 50-15-8-5	1	50	15	7,938	43,3	5	117100	264800	3670	3520	222
TDB-U 50-15-8-6	1	50	15	7,938	43,3	6	137300	320000	4350	4180	252
TDB-U 50-15-8-7	1	50	15	7,938	43,3	7	157900	377900	5040	4840	282
TDB-U 50-15-8-8	1	50	15	7,938	43,3	8	177200	433100	5650	5430	312
TDB-U 50-16-6-2	1	50	16	6,35	44,5	2	38800	73900	1310	1250	132
TDB-U 50-16-6-3	1	50	16	6,35	44,5	3	54400	117500	2010	1910	164
TDB-U 50-16-6-4	1	50	16	6,35	44,5	4	69600	159500	2640	2520	196
TDB-U 50-16-6-5	1	50	16	6,35	44,5	5	84500	201400	3270	3120	228
TDB-U 50-16-6-6	1	50	16	6,35	44,5	6	99500	245100	3900	3720	260
TDB-U 50-16-6-7	1	50	16	6,35	44,5	7	113700	287000	4480	4280	292
TDB-U 50-16-8-2	1	50	16	7,938	43,3	2	52500	93700	1430	1380	130
TDB-U 50-16-8-3	1	50	16	7,938	43,3	3	74500	151600	2190	2110	162
TDB-U 50-16-8-4	1	50	16	7,938	43,3	4	95600	206800	2910	2800	194
TDB-U 50-16-8-5	1	50	16	7,938	43,3	5	117000	264700	3660	3520	226
TDB-U 50-16-8-6	1	50	16	7,938	43,3	6	137200	319800	4340	4180	258
TDB-U 50-16-8-7	1	50	16	7,938	43,3	7	157700	377700	5030	4840	290
TDB-U 50-16-8-8	1	50	16	7,938	43,3	8	177100	432800	5650	5440	322
TDB-U 50-20-6-2	1	50	20	6,35	44,5	2	38600	73600	1300	1250	136
TUC-U 50-20-6-2		50	20	6,35	44,5	2	38600	73600	1300	1250	75
TDB-U 50-20-6-3	1	50	20	6,35	44,5	3	54200	117200	2000	1920	176
TUC-U 50-20-6-3		50	20	6,35	44,5	3	54200	117200	2000	1920	95
TDB-U 50-20-6-4	1	50	20	6,35	44,5	4	69400	159000	2630	2530	216
TUC-U 50-20-6-4		50	20	6,35	44,5	4	69400	159000	2630	2530	115
TDB-U 50-20-6-5	1	50	20	6,35	44,5	5	84600	202500	3280	3150	256
TUC-U 50-20-6-5		50	20	6,35	44,5	5	84600	202500	3280	3150	135
TDB-U 50-20-6-6	1	50	20	6,35	44,5	6	99100	244400	3880	3730	296
TUC-U 50-20-6-6		50	20	6,35	44,5	6	99100	244400	3880	3730	155
TDB-U 50-20-6-7	1	50	20	6,35	44,5	7	113800	287900	4480	4320	336

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
82		100	118	11	16	25	92	105	35 ~ 53
75		93	110	11	16	20	85	97,5	11 ~ 16
75		93	110	11	16	20	85	97,5	13 ~ 19
75		93	110	11	16	20	85	97,5	15 ~ 23
75		93	110	11	16	20	85	97,5	17 ~ 26
75		93	110	11	16	20	85	97,5	20 ~ 30
75		93	110	11	16	20	85	97,5	22 ~ 34
82		100	118	11	16	25	92	105	18 ~ 27
82		100	118	11	16	25	92	105	22 ~ 32
82		100	118	11	16	25	92	105	24 ~ 37
82		100	118	11	16	25	92	105	28 ~ 42
82		100	118	11	16	25	92	105	31 ~ 47
82		100	118	11	16	25	92	105	35 ~ 52
82		100	118	11	16	25	92	105	39 ~ 58
75		93	110	11	16	20	85	97,5	12 ~ 18
75		93	110	11	16	20	85	97,5	14 ~ 21
75		93	110	11	16	20	85	97,5	17 ~ 25
75		93	110	11	16	20	85	97,5	19 ~ 29
75		93	110	11	16	20	85	97,5	22 ~ 33
75		93	110	11	16	20	85	97,5	24 ~ 37
82		100	118	11	16	25	92	105	17 ~ 25
82		100	118	11	16	25	92	105	20 ~ 30
82		100	118	11	16	25	92	105	23 ~ 35
82		100	118	11	16	25	92	105	27 ~ 40
82		100	118	11	16	25	92	105	31 ~ 46
82		100	118	11	16	25	92	105	34 ~ 51
82		100	118	11	16	25	92	105	38 ~ 58
75		93	110	11	18	25	85	97,5	11 ~ 16
75		93	110	11	18	25	85	97,5	6,9 ~ 10
75		93	110	11	18	25	85	97,5	13 ~ 20
75		93	110	11	18	25	85	97,5	8,5 ~ 13
75		93	110	11	18	25	85	97,5	16 ~ 24
75		93	110	11	18	25	85	97,5	10 ~ 16
75		93	110	11	18	25	85	97,5	19 ~ 28
75		93	110	11	18	25	85	97,5	12 ~ 18
75		93	110	11	18	25	85	97,5	22 ~ 33
75		93	110	11	18	25	85	97,5	14 ~ 21
75		93	110	11	18	25	85	97,5	25 ~ 38

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 50-20-8-2	1	50	20	7,938	43,3	2	53300	96200	1460	1410	144
TDB-U 50-20-8-3	1	50	20	7,938	43,3	3	74300	151200	2180	2110	184
TDB-U 50-20-8-4	1	50	20	7,938	43,3	4	96100	209000	2930	2840	224
TDB-U 50-20-8-5	1	50	20	7,938	43,3	5	116600	263900	3640	3530	264
TDB-U 50-20-8-6	1	50	20	7,938	43,3	6	137500	321700	4360	4220	304
TDB-U 50-20-8-7	1	50	20	7,938	43,3	7	157200	376700	5000	4850	344
TDB-U 50-25-6-2	1	50	25	6,35	44,5	2	39000	75000	1320	1280	159
TUC-U 50-25-6-2		50	25	6,35	44,5	2	39000	75000	1320	1280	81
TDB-U 50-25-6-3	1	50	25	6,35	44,5	3	53900	116700	1980	1920	210
TUC-U 50-25-6-3		50	25	6,35	44,5	3	53900	116700	1980	1920	106
TDB-U 50-25-6-4	1	50	25	6,35	44,5	4	69500	160000	2630	2550	259
TUC-U 50-25-6-4		50	25	6,35	44,5	4	69500	160000	2630	2550	131
TDB-U 50-25-6-5	1	50	25	6,35	44,5	5	84200	201700	3250	3150	309
TUC-U 50-25-6-5		50	25	6,35	44,5	5	84200	201700	3250	3150	156
TDB-U 50-25-6-6	1	50	25	6,35	44,5	6	99000	245000	3870	3750	359
TUC-U 50-25-6-6		50	25	6,35	44,5	6	99000	245000	3870	3750	181
TDB-U 50-25-8-2	1	50	25	7,938	43,3	2	53000	95800	1450	1410	164
TUC-U 50-25-8-2		50	25	7,938	43,3	2	53000	95800	1450	1410	89
TDB-U 50-25-8-3	1	50	25	7,938	43,3	3	73900	150600	2160	2110	214
TUC-U 50-25-8-3		50	25	7,938	43,3	3	73900	150600	2160	2110	114
TDB-U 50-25-8-4	1	50	25	7,938	43,3	4	95600	208100	2910	2830	264
TUC-U 50-25-8-4		50	25	7,938	43,3	4	95600	208100	2910	2830	139
TDB-U 50-25-8-5	1	50	25	7,938	43,3	5	116800	265600	3650	3560	314
TUC-U 50-25-8-5		50	25	7,938	43,3	5	116800	265600	3650	3560	164
TDB-U 50-25-8-6	1	50	25	7,938	43,3	6	136800	320300	4320	4210	364
TUC-U 50-25-8-6		50	25	7,938	43,3	6	136800	320300	4320	4210	189
TDB-U 50-30-6-2	1	50	30	6,35	44,5	2	38700	74600	1300	1270	183
TUC-U 50-30-6-2		50	30	6,35	44,5	2	38700	74600	1300	1270	89
TDB-U 50-30-6-3	1	50	30	6,35	44,5	3	54100	117700	1990	1930	243
TUC-U 50-30-6-3		50	30	6,35	44,5	3	54100	117700	1990	1930	119
TDB-U 50-30-6-4	1	50	30	6,35	44,5	4	69000	159200	2600	2540	303
TUC-U 50-30-6-4		50	30	6,35	44,5	4	69000	159200	2600	2540	149
TDB-U 50-30-6-5	1	50	30	6,35	44,5	5	84100	202300	3240	3160	363
TUC-U 50-30-6-5		50	30	6,35	44,5	5	84100	202300	3240	3160	179
TDB-U 50-30-8-2	1	50	30	7,938	43,3	2	52700	95300	1430	1400	188
TUC-U 50-30-8-2		50	30	7,938	43,3	2	52700	95300	1430	1400	95
TDB-U 50-30-8-3	1	50	30	7,938	43,3	3	74200	152500	2170	2130	248
TUC-U 50-30-8-3		50	30	7,938	43,3	3	74200	152500	2170	2130	125

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
82		100	118	11	18	25	92	105	16 ~ 24
82		100	118	11	18	25	92	105	20 ~ 31
82		100	118	11	18	25	92	105	25 ~ 37
82		100	118	11	18	25	92	105	29 ~ 43
82		100	118	11	18	25	92	105	33 ~ 49
82		100	118	11	18	25	92	105	37 ~ 56
75		93	110	11	18	25	85	97,5	11 ~ 17
75		93	110	11	18	25	85	97,5	6,3 ~ 9,4
75		93	110	11	18	25	85	97,5	15 ~ 22
75		93	110	11	18	25	85	97,5	8,2 ~ 12
75		93	110	11	18	25	85	97,5	18 ~ 27
75		93	110	11	18	25	85	97,5	10 ~ 15
75		93	110	11	18	25	85	97,5	22 ~ 32
75		93	110	11	18	25	85	97,5	12 ~ 19
75		93	110	11	18	25	85	97,5	25 ~ 38
75		93	110	11	18	25	85	97,5	15 ~ 22
82		100	118	11	18	25	92	105	17 ~ 26
82		100	118	11	18	25	92	105	10 ~ 15
82		100	118	11	18	25	92	105	22 ~ 33
82		100	118	11	18	25	92	105	13 ~ 20
82		100	118	11	18	25	92	105	27 ~ 41
82		100	118	11	18	25	92	105	16 ~ 24
82		100	118	11	18	25	92	105	32 ~ 48
82		100	118	11	18	25	92	105	19 ~ 28
82		100	118	11	18	25	92	105	37 ~ 56
82		100	118	11	18	25	92	105	22 ~ 33
75		93	110	11	18	25	85	97,5	13 ~ 19
75		93	110	11	18	25	85	97,5	6,4 ~ 9,5
75		93	110	11	18	25	85	97,5	16 ~ 24
75		93	110	11	18	25	85	97,5	8,5 ~ 13
75		93	110	11	18	25	85	97,5	20 ~ 30
75		93	110	11	18	25	85	97,5	11 ~ 16
75		93	110	11	18	25	85	97,5	24 ~ 36
75		93	110	11	18	25	85	97,5	13 ~ 20
82		100	118	11	18	25	92	105	19 ~ 28
82		100	118	11	18	25	92	105	9,8 ~ 15
82		100	118	11	18	25	92	105	25 ~ 37
82		100	118	11	18	25	92	105	13 ~ 20

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 50-30-8-4	1	50	30	7,938	43,3	4	94900	207000	2870	2820	308
TUC-U 50-30-8-4		50	30	7,938	43,3	4	94900	207000	2870	2820	155
TDB-U 50-30-8-5	1	50	30	7,938	43,3	5	116000	264200	3610	3530	368
TUC-U 50-30-8-5		50	30	7,938	43,3	5	116000	264200	3610	3530	185
TDB-U 50-40-6-2	1	50	40	6,35	44,5	2	38600	75300	1290	1270	208
TUC-U 50-40-6-2		50	40	6,35	44,5	2	38600	75300	1290	1270	107
TDB-U 50-40-6-3	1	50	40	6,35	44,5	3	53700	117800	1960	1920	288
TUC-U 50-40-6-3		50	40	6,35	44,5	3	53700	117800	1960	1920	147
TDB-U 50-40-6-4	1	50	40	6,35	44,5	4	68800	160400	2580	2530	368
TUC-U 50-40-6-4		50	40	6,35	44,5	4	68800	160400	2580	2530	187
TDB-U 50-40-8-2	1	50	40	7,938	43,3	2	52800	96800	1430	1410	218
TUC-U 50-40-8-2		50	40	7,938	43,3	2	52800	96800	1430	1410	109
TDB-U 50-40-8-3	1	50	40	7,938	43,3	3	73900	153300	2150	2120	298
TUC-U 50-40-8-3		50	40	7,938	43,3	3	73900	153300	2150	2120	150
TDB-U 50-50-6-2	1	50	50	6,35	44,5	2	37800	74100	1250	1230	248
TUC-U 50-50-6-2		50	50	6,35	44,5	2	37800	74100	1250	1230	128
TDB-U 50-50-6-3	1	50	50	6,35	44,5	3	53000	117600	1920	1890	347
TUC-U 50-50-6-3		50	50	6,35	44,5	3	53000	117600	1920	1890	177
TDB-U 50-50-8-2	1	50	50	7,938	43,3	2	51700	95300	1380	1370	252
TUC-U 50-50-8-2		50	50	7,938	43,3	2	51700	95300	1380	1370	127
TDB-U 50-50-8-3	1	50	50	7,938	43,3	3	73200	153500	2110	2090	352
TUC-U 50-50-8-3		50	50	7,938	43,3	3	73200	153500	2110	2090	177
TDB-U 50-60-6-2	1	50	60	6,35	44,5	2	37400	74200	1220	1210	282
TUC-U 50-60-6-2		50	60	6,35	44,5	2	37400	74200	1220	1210	145
TDB-U 50-60-8-2	1	50	60	7,938	43,3	2	51400	96100	1360	1350	282
TUC-U 50-60-8-2		50	60	7,938	43,3	2	51400	96100	1360	1350	145
TDB-U 63-10-6-2	1	63	10	6,35	57,5	2	44400	97000	1650	1500	102
TDB-U 63-10-6-3	1	63	10	6,35	57,5	3	61500	151400	2450	2220	122
TDB-U 63-10-6-4	1	63	10	6,35	57,5	4	78300	204100	3230	2930	142
TDB-U 63-10-6-5	1	63	10	6,35	57,5	5	95200	258500	4020	3650	162
TDB-U 63-10-6-6	1	63	10	6,35	57,5	6	111800	313000	4770	4330	182
TDB-U 63-10-7-2	1	63	10	7,144	56,9	2	53100	113600	1820	1680	108
TDB-U 63-10-7-3	1	63	10	7,144	56,9	3	73600	177300	2720	2510	128
TDB-U 63-10-7-4	1	63	10	7,144	56,9	4	94700	243200	3630	3350	148
TDB-U 63-10-7-5	1	63	10	7,144	56,9	5	114900	306800	4490	4150	168
TDB-U 63-10-7-6	1	63	10	7,144	56,9	6	134600	370400	5330	4930	188
TDB-U 63-10-7-7	1	63	10	7,144	56,9	7	154500	436300	6150	5680	208
TDB-U 63-12-8-2	1	63	12	7,938	56,3	2	61200	125900	1810	1690	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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
82		100	118	11	18	25	92	105	30 ~ 46
82		100	118	11	18	25	92	105	17 ~ 25
82		100	118	11	18	25	92	105	36 ~ 54
82		100	118	11	18	25	92	105	20 ~ 30
75		93	110	11	18	25	85	97,5	13 ~ 19
75		93	110	11	18	25	85	97,5	7 ~ 10
75		93	110	11	18	25	85	97,5	18 ~ 27
75		93	110	11	18	25	85	97,5	9,7 ~ 15
75		93	110	11	18	25	85	97,5	23 ~ 34
75		93	110	11	18	25	85	97,5	13 ~ 19
82		100	118	11	18	25	92	105	20 ~ 30
82		100	118	11	18	25	92	105	9,9 ~ 15
82		100	118	11	18	25	92	105	27 ~ 41
82		100	118	11	18	25	92	105	14 ~ 21
75		93	110	11	18	25	85	97,5	15 ~ 22
75		93	110	11	18	25	85	97,5	8,1 ~ 12
75		93	110	11	18	25	85	97,5	21 ~ 31
75		93	110	11	18	25	85	97,5	11 ~ 17
82		100	118	11	18	25	92	105	22 ~ 33
82		100	118	11	18	25	92	105	11 ~ 17
82		100	118	11	18	25	92	105	31 ~ 47
82		100	118	11	18	25	92	105	16 ~ 24
75		93	110	11	18	25	85	97,5	16 ~ 25
75		93	110	11	18	25	85	97,5	8,8 ~ 13
82		100	118	11	18	25	92	105	24 ~ 36
82		100	118	11	18	25	92	105	12 ~ 19
90		108	125	11	18	16	95	110	15 ~ 22
90		108	125	11	18	16	95	110	17 ~ 26
90		108	125	11	18	16	95	110	19 ~ 29
90		108	125	11	18	16	95	110	21 ~ 32
90		108	125	11	18	16	95	110	24 ~ 36
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	21 ~ 32
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	24 ~ 36
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	27 ~ 40
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	29 ~ 44
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	32 ~ 48
95		115 (110)	135 (130)	13,5	20	25	100	117,5 (115)	35 ~ 53
95		115	135	13,5	20	25	100	117,5	22 ~ 32

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 63-12-8-3	1	63	12	7,938	56,3	3	84700	195800	2730	2540	140
TDB-U 63-12-8-4	1	63	12	7,938	56,3	4	109000	268500	3620	3380	164
TDB-U 63-12-8-5	1	63	12	7,938	56,3	5	132200	338500	4480	4170	188
TDB-U 63-12-8-6	1	63	12	7,938	56,3	6	155500	411200	5330	4970	212
TDB-U 63-12-8-7	1	63	12	7,938	56,3	7	178300	483900	6150	5740	236
TDB-U 63-12-8-8	1	63	12	7,938	56,3	8	200100	553800	6910	6460	260
TDB-B 63-12,7-9-2	1	63	12,7	9,525	55,2	2	76100	145500	1800	1690	127
TDB-B 63-12,7-9-3	1	63	12,7	9,525	55,2	3	107800	234400	2750	2580	153
TDB-B 63-12,7-9-4	1	63	12,7	9,525	55,2	4	138200	319300	3650	3430	178
TDB-B 63-12,7-9-5	1	63	12,7	9,525	55,2	5	169100	408200	4590	4310	204
TDB-B 63-12,7-9-6	1	63	12,7	9,525	55,2	6	191600	468800	5290	4970	242
TDB-B 63-12,7-9-7	1	63	12,7	9,525	55,2	7	221300	557700	6220	5840	267
TDB-B 63-12,7-9-8	1	63	12,7	9,525	55,2	8	248400	638500	7050	6630	292
TDB-B 63-12,7-9-9	1	63	12,7	9,525	55,2	9	277000	727400	7970	7490	318
TDB-B 63-12,7-9-10	1	63	12,7	9,525	55,2	10	305200	816300	8880	8340	343
TDB-U 63-15-8-2	1	63	15	7,938	56,3	2	61100	125700	1810	1710	135
TDB-U 63-15-8-3	1	63	15	7,938	56,3	3	84600	195600	2720	2570	165
TDB-U 63-15-8-4	1	63	15	7,938	56,3	4	108900	268300	3620	3420	195
TDB-U 63-15-8-5	1	63	15	7,938	56,3	5	132700	340900	4500	4250	225
TDB-U 63-15-8-6	1	63	15	7,938	56,3	6	155300	410800	5320	5030	255
TDB-U 63-15-8-7	1	63	15	7,938	56,3	7	178100	483400	6140	5810	285
TDB-B 63-15-9-2	1	63	15	9,525	55,2	2	77500	149400	1840	1740	132
TDB-B 63-15-9-3	1	63	15	9,525	55,2	3	107700	234200	2750	2600	162
TDB-B 63-15-9-4	1	63	15	9,525	55,2	4	139200	323100	3690	3490	192
TDB-B 63-15-9-5	1	63	15	9,525	55,2	5	168900	407900	4580	4340	222
TDB-B 63-15-9-6	1	63	15	9,525	55,2	6	191400	468400	5280	5010	267
TDB-B 63-15-9-7	1	63	15	9,525	55,2	7	221100	557300	6210	5890	297
TDB-B 63-15-9-8	1	63	15	9,525	55,2	8	250200	646100	7120	6760	327
TDB-B 63-15-9-9	1	63	15	9,525	55,2	9	276800	726900	7950	7550	357
TDB-B 63-15-9-10	1	63	15	9,525	55,2	10	304900	815700	8860	8410	387
TDB-U 63-16-8-2	1	63	16	7,938	56,3	2	61100	125700	1810	1710	140
TDB-U 63-16-8-3	1	63	16	7,938	56,3	3	84500	195500	2720	2580	172
TDB-U 63-16-8-4	1	63	16	7,938	56,3	4	108900	268200	3610	3430	204
TDB-U 63-16-8-5	1	63	16	7,938	56,3	5	132700	340800	4500	4270	236
TDB-U 63-16-8-6	1	63	16	7,938	56,3	6	155200	410600	5320	5040	268
TDB-U 63-16-8-7	1	63	16	7,938	56,3	7	178000	483300	6140	5830	300
TDB-U 63-16-9-2	1	63	16	9,525	55,2	2	77400	149400	1840	1760	146
TDB-U 63-16-9-3	1	63	16	9,525	55,2	3	107700	234100	2740	2620	178

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	25 ~ 37
95		115	135	13,5	20	25	100	117,5	29 ~ 43
95		115	135	13,5	20	25	100	117,5	32 ~ 48
95		115	135	13,5	20	25	100	117,5	36 ~ 54
95		115	135	13,5	20	25	100	117,5	40 ~ 60
95		115	135	13,5	20	25	100	117,5	44 ~ 66
100		120	140	13,5	35	25	105	122,5	36 ~ 54
100		120	140	13,5	35	25	105	122,5	41 ~ 62
100		120	140	13,5	35	25	105	122,5	46 ~ 69
100		120	140	13,5	35	25	105	122,5	51 ~ 76
100		120	140	13,5	35	25	105	122,5	62 ~ 93
100		120	140	13,5	35	25	105	122,5	66 ~ 100
100		120	140	13,5	35	25	105	122,5	71 ~ 107
100		120	140	13,5	35	25	105	122,5	76 ~ 114
100		120	140	13,5	35	25	105	122,5	81 ~ 121
95		115	135	13,5	20	25	100	117,5	23 ~ 34
95		115	135	13,5	20	25	100	117,5	27 ~ 40
95		115	135	13,5	20	25	100	117,5	31 ~ 47
95		115	135	13,5	20	25	100	117,5	35 ~ 53
95		115	135	13,5	20	25	100	117,5	40 ~ 59
95		115	135	13,5	20	25	100	117,5	44 ~ 66
100		120	140	13,5	35	25	105	122,5	33 ~ 49
100		120	140	13,5	35	25	105	122,5	38 ~ 58
100		120	140	13,5	35	25	105	122,5	44 ~ 66
100		120	140	13,5	35	25	105	122,5	49 ~ 74
100		120	140	13,5	35	25	105	122,5	62 ~ 92
100		120	140	13,5	35	25	105	122,5	67 ~ 100
100		120	140	13,5	35	25	105	122,5	72 ~ 108
100		120	140	13,5	35	25	105	122,5	78 ~ 117
100		120	140	13,5	35	25	105	122,5	83 ~ 125
95		115	135	13,5	20	25	100	117,5	23 ~ 35
95		115	135	13,5	20	25	100	117,5	27 ~ 41
95		115	135	13,5	20	25	100	117,5	32 ~ 47
95		115	135	13,5	20	25	100	117,5	36 ~ 54
95		115	135	13,5	20	25	100	117,5	41 ~ 61
95		115	135	13,5	20	25	100	117,5	45 ~ 68
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	32 ~ 48
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	38 ~ 57

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 63-16-9-4	1	63	16	9,525	55,2	4	139100	322900	3690	3520	210
TDB-U 63-16-9-5	1	63	16	9,525	55,2	5	168800	407700	4580	4370	242
TDB-U 63-16-9-6	1	63	16	9,525	55,2	6	198900	496500	5440	5200	274
TDB-U 63-16-9-7	1	63	16	9,525	55,2	7	227400	581300	6260	5980	306
TDB-U 63-16-9-8	1	63	16	9,525	55,2	8	256300	670100	7080	6760	338
TDB-U 63-20-8-2	1	63	20	7,938	56,3	2	61000	125500	1800	1730	164
TDB-U 63-20-8-3	1	63	20	7,938	56,3	3	84400	195200	2710	2600	204
TDB-U 63-20-8-4	1	63	20	7,938	56,3	4	108600	267700	3600	3450	244
TDB-U 63-20-8-5	1	63	20	7,938	56,3	5	132400	340200	4480	4300	284
TDB-U 63-20-8-6	1	63	20	7,938	56,3	6	154900	409900	5300	5080	324
TDB-U 63-20-8-7	1	63	20	7,938	56,3	7	177600	482400	6110	5860	364
TDB-U 63-20-9-2	1	63	20	9,525	55,2	2	77200	149100	1830	1770	169
TDB-U 63-20-9-3	1	63	20	9,525	55,2	3	107400	233700	2730	2630	209
TDB-U 63-20-9-4	1	63	20	9,525	55,2	4	138800	322400	3670	3540	249
TDB-U 63-20-9-5	1	63	20	9,525	55,2	5	168400	407000	4560	4400	289
TDB-U 63-20-9-6	1	63	20	9,525	55,2	6	198500	495700	5420	5230	329
TDB-U 63-20-9-7	1	63	20	9,525	55,2	7	226900	580300	6240	6010	369
TDB-U 63-20-9-8	1	63	20	9,525	55,2	8	255800	668900	7050	6800	409
TDB-U 63-20-11-2	1	63	20	11,113	54,1	2	93800	172500	1810	1740	150
TDB-U 63-20-11-3	1	63	20	11,113	54,1	3	131200	272600	2760	2650	190
TDB-U 63-20-11-4	1	63	20	11,113	54,1	4	170200	378300	3710	3560	230
TDB-U 63-20-11-5	1	63	20	11,113	54,1	5	208400	484000	4650	4470	270
TDB-U 63-20-11-6	1	63	20	11,113	54,1	6	244100	584100	5500	5290	310
TDB-U 63-20-11-7	1	63	20	11,113	54,1	7	280600	689800	6350	6110	350
TDB-U 63-20-11-8	1	63	20	11,113	54,1	8	314900	790000	7150	6880	390
TDB-U 63-25-8-2	1	63	25	7,938	56,3	2	60800	125100	1790	1730	164
TUC-U 63-25-8-2		63	25	7,938	56,3	2	60800	125100	1790	1730	89
TDB-U 63-25-8-3	1	63	25	7,938	56,3	3	84900	197400	2730	2640	214
TUC-U 63-25-8-3		63	25	7,938	56,3	3	84900	197400	2730	2640	114
TDB-U 63-25-8-4	1	63	25	7,938	56,3	4	108200	267000	3580	3460	264
TUC-U 63-25-8-4		63	25	7,938	56,3	4	108200	267000	3580	3460	139
TDB-U 63-25-8-5	1	63	25	7,938	56,3	5	131900	339300	4460	4310	314
TUC-U 63-25-8-5		63	25	7,938	56,3	5	131900	339300	4460	4310	164
TDB-U 63-25-8-6	1	63	25	7,938	56,3	6	155000	411600	5300	5130	364
TUC-U 63-25-8-6		63	25	7,938	56,3	6	155000	411600	5300	5130	189
TDB-U 63-25-9-2	1	63	25	9,525	55,2	2	77000	148700	1820	1770	172
TUC-U 63-25-9-2		63	25	9,525	55,2	2	77000	148700	1820	1770	97
TDB-U 63-25-9-3	1	63	25	9,525	55,2	3	107000	233100	2720	2640	222

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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)	43 ~ 65
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	49 ~ 74
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	55 ~ 83
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	62 ~ 92
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	68 ~ 102
95		115	135	13,5	20	25	100	117,5	25 ~ 37
95		115	135	13,5	20	25	100	117,5	30 ~ 45
95		115	135	13,5	20	25	100	117,5	35 ~ 53
95		115	135	13,5	20	25	100	117,5	40 ~ 60
95		115	135	13,5	20	25	100	117,5	46 ~ 69
95		115	135	13,5	20	25	100	117,5	51 ~ 77
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	34 ~ 51
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	41 ~ 61
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	47 ~ 71
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	54 ~ 82
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	62 ~ 92
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	69 ~ 104
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	77 ~ 115
105		125	145	13,5	25	25	110	127,5	38 ~ 57
105		125	145	13,5	25	25	110	127,5	46 ~ 69
105		125	145	13,5	25	25	110	127,5	54 ~ 82
105		125	145	13,5	25	25	110	127,5	63 ~ 94
105		125	145	13,5	25	25	110	127,5	72 ~ 108
105		125	145	13,5	25	25	110	127,5	81 ~ 122
105		125	145	13,5	25	25	110	127,5	91 ~ 136
95		115	135	13,5	20	25	100	117,5	21 ~ 32
95		115	135	13,5	20	25	100	117,5	13 ~ 19
95		115	135	13,5	20	25	100	117,5	27 ~ 41
95		115	135	13,5	20	25	100	117,5	16 ~ 24
95		115	135	13,5	20	25	100	117,5	33 ~ 50
95		115	135	13,5	20	25	100	117,5	20 ~ 30
95		115	135	13,5	20	25	100	117,5	40 ~ 60
95		115	135	13,5	20	25	100	117,5	23 ~ 35
95		115	135	13,5	20	25	100	117,5	46 ~ 69
95		115	135	13,5	20	25	100	117,5	27 ~ 41
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	30 ~ 45
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	19 ~ 28
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	38 ~ 57

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TUC-U 63-25-9-3		63	25	9,525	55,2	3	107000	233100	2720	2640	122
TDB-U 63-25-9-4	1	63	25	9,525	55,2	4	138400	321500	3650	3550	272
TUC-U 63-25-9-4		63	25	9,525	55,2	4	138400	321500	3650	3550	147
TDB-U 63-25-9-5	1	63	25	9,525	55,2	5	169000	409900	4580	4440	322
TUC-U 63-25-9-5		63	25	9,525	55,2	5	169000	409900	4580	4440	172
TDB-U 63-25-9-6	1	63	25	9,525	55,2	6	197800	494300	5390	5240	372
TDB-U 63-25-9-7	1	63	25	9,525	55,2	7	227100	582800	6240	6060	422
TDB-U 63-25-9-8	1	63	25	9,525	55,2	8	254900	667200	7020	6810	472
TDB-U 63-25-11-2	1	63	25	11,113	54,1	2	93500	172000	1800	1750	166
TDB-U 63-25-11-3	1	63	25	11,113	54,1	3	130700	271900	2740	2660	216
TDB-U 63-25-11-4	1	63	25	11,113	54,1	4	169700	377300	3690	3570	266
TDB-U 63-25-11-5	1	63	25	11,113	54,1	5	207700	482700	4620	4480	316
TDB-U 63-25-11-6	1	63	25	11,113	54,1	6	243300	582600	5470	5300	366
TDB-U 63-25-11-7	1	63	25	11,113	54,1	7	279700	688000	6310	6120	416
TDB-U 63-25-11-8	1	63	25	11,113	54,1	8	315300	793400	7160	6940	466
TDB-U 63-30-8-2	1	63	30	7,938	56,3	2	60500	124700	1780	1730	189
TUC-U 63-30-8-2		63	30	7,938	56,3	2	60500	124700	1780	1730	92
TDB-U 63-30-8-3	1	63	30	7,938	56,3	3	84500	196800	2710	2640	249
TUC-U 63-30-8-3		63	30	7,938	56,3	3	84500	196800	2710	2640	122
TDB-U 63-30-8-4	1	63	30	7,938	56,3	4	108500	268900	3590	3490	309
TUC-U 63-30-8-4		63	30	7,938	56,3	4	108500	268900	3590	3490	152
TDB-U 63-30-8-5	1	63	30	7,938	56,3	5	132000	340900	4460	4340	369
TUC-U 63-30-8-5		63	30	7,938	56,3	5	132000	340900	4460	4340	182
TDB-U 63-30-8-6	1	63	30	7,938	56,3	6	154400	410200	5270	5120	429
TUC-U 63-30-8-6		63	30	7,938	56,3	6	154400	410200	5270	5120	212
TDB-U 63-30-9-2	1	63	30	9,525	55,2	2	76700	148200	1810	1770	196
TUC-U 63-30-9-2		63	30	9,525	55,2	2	76700	148200	1810	1770	104
TDB-U 63-30-9-3	1	63	30	9,525	55,2	3	107800	236400	2740	2680	256
TUC-U 63-30-9-3		63	30	9,525	55,2	3	107800	236400	2740	2680	134
TDB-U 63-30-9-4	1	63	30	9,525	55,2	4	137800	320500	3630	3540	316
TUC-U 63-30-9-4		63	30	9,525	55,2	4	137800	320500	3630	3540	164
TDB-U 63-30-9-5	1	63	30	9,525	55,2	5	168300	408600	4550	4440	376
TUC-U 63-30-9-5		63	30	9,525	55,2	5	168300	408600	4550	4440	194
TDB-U 63-30-9-6	1	63	30	9,525	55,2	6	198100	496800	5400	5270	436
TDB-U 63-30-9-7	1	63	30	9,525	55,2	7	226200	580900	6200	6050	496
TDB-U 63-30-11-2	1	63	30	11,113	54,1	2	93100	171500	1790	1740	188
TDB-U 63-30-11-3	1	63	30	11,113	54,1	3	132000	276500	2770	2700	248
TDB-U 63-30-11-4	1	63	30	11,113	54,1	4	169000	376100	3660	3570	308

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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)	24 ~ 35
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	46 ~ 69
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	28 ~ 42
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	54 ~ 81
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	33 ~ 49
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	63 ~ 94
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	71 ~ 107
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	81 ~ 121
105		125	145	13,5	25	25	110	127,5	38 ~ 57
105		125	145	13,5	25	25	110	127,5	48 ~ 72
105		125	145	13,5	25	25	110	127,5	58 ~ 87
105		125	145	13,5	25	25	110	127,5	68 ~ 102
105		125	145	13,5	25	25	110	127,5	79 ~ 118
105		125	145	13,5	25	25	110	127,5	90 ~ 135
105		125	145	13,5	25	25	110	127,5	101 ~ 151
95		115	135	13,5	20	25	100	117,5	24 ~ 35
95		115	135	13,5	20	25	100	117,5	11 ~ 17
95		115	135	13,5	20	25	100	117,5	30 ~ 46
95		115	135	13,5	20	25	100	117,5	15 ~ 23
95		115	135	13,5	20	25	100	117,5	38 ~ 57
95		115	135	13,5	20	25	100	117,5	19 ~ 29
95		115	135	13,5	20	25	100	117,5	45 ~ 67
95		115	135	13,5	20	25	100	117,5	23 ~ 35
95		115	135	13,5	20	25	100	117,5	53 ~ 79
95		115	135	13,5	20	25	100	117,5	28 ~ 42
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	33 ~ 49
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	18 ~ 27
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	42 ~ 63
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	23 ~ 35
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	52 ~ 77
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	29 ~ 43
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	61 ~ 91
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	34 ~ 51
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	71 ~ 106
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	81 ~ 122
105		125	145	13,5	25	25	110	127,5	41 ~ 61
105		125	145	13,5	25	25	110	127,5	52 ~ 78
105		125	145	13,5	25	25	110	127,5	64 ~ 96

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 63-30-11-5	1	63	30	11,113	54,1	5	206800	481200	4590	4470	368
TDB-U 63-30-11-6	1	63	30	11,113	54,1	6	243800	586300	5480	5340	428
TDB-U 63-30-11-7	1	63	30	11,113	54,1	7	280000	691400	6320	6160	486
TDB-U 63-40-8-2	1	63	40	7,938	56,3	2	60700	126500	1780	1750	216
TUC-U 63-40-8-2		63	40	7,938	56,3	2	60700	126500	1780	1750	109
TDB-U 63-40-8-3	1	63	40	7,938	56,3	3	84400	197900	2700	2640	296
TUC-U 63-40-8-3		63	40	7,938	56,3	3	84400	197900	2700	2640	149
TDB-U 63-40-8-4	1	63	40	7,938	56,3	4	108100	269400	3560	3490	376
TUC-U 63-40-8-4		63	40	7,938	56,3	4	108100	269400	3560	3490	189
TDB-U 63-40-8-5	1	63	40	7,938	56,3	5	131300	340900	4420	4320	456
TUC-U 63-40-8-5		63	40	7,938	56,3	5	131300	340900	4420	4320	229
TDB-U 63-40-9-2	1	63	40	9,525	55,2	2	75800	147000	1780	1750	222
TUC-U 63-40-9-2		63	40	9,525	55,2	2	75800	147000	1780	1750	115
TDB-U 63-40-9-3	1	63	40	9,525	55,2	3	106700	234400	2700	2650	302
TUC-U 63-40-9-3		63	40	9,525	55,2	3	106700	234400	2700	2650	155
TDB-U 63-40-9-4	1	63	40	9,525	55,2	4	137500	321900	3610	3540	382
TUC-U 63-40-9-4		63	40	9,525	55,2	4	137500	321900	3610	3540	195
TDB-U 63-40-9-5	1	63	40	9,525	55,2	5	167600	409300	4520	4430	462
TUC-U 63-40-9-5		63	40	9,525	55,2	5	167600	409300	4520	4430	235
TDB-U 63-40-11-2	1	63	40	11,113	54,1	2	92100	170100	1760	1730	218
TDB-U 63-40-11-3	1	63	40	11,113	54,1	3	130600	274300	2730	2670	298
TDB-U 63-40-11-4	1	63	40	11,113	54,1	4	168800	378600	3650	3580	378
TDB-U 63-40-11-5	1	63	40	11,113	54,1	5	206200	482800	4560	4480	458
TDB-U 63-50-8-2	1	63	50	7,938	56,3	2	59900	125100	1740	1720	256
TUC-U 63-50-8-2		63	50	7,938	56,3	2	59900	125100	1740	1720	129
TDB-U 63-50-8-3	1	63	50	7,938	56,3	3	83200	195900	2640	2600	356
TUC-U 63-50-8-3		63	50	7,938	56,3	3	83200	195900	2640	2600	179
TDB-U 63-50-8-4	1	63	50	7,938	56,3	4	107400	269300	3520	3460	456
TUC-U 63-50-8-4		63	50	7,938	56,3	4	107400	269300	3520	3460	229
TDB-U 63-50-9-2	1	63	50	9,525	55,2	2	76200	149500	1790	1760	256
TUC-U 63-50-9-2		63	50	9,525	55,2	2	76200	149500	1790	1760	127
TDB-U 63-50-9-3	1	63	50	9,525	55,2	3	106500	236000	2680	2640	356
TUC-U 63-50-9-3		63	50	9,525	55,2	3	106500	236000	2680	2640	177
TDB-U 63-50-9-4	1	63	50	9,525	55,2	4	136700	322500	3570	3520	456
TUC-U 63-50-9-4		63	50	9,525	55,2	4	136700	322500	3570	3520	227
TDB-U 63-50-11-2	1	63	50	11,113	54,1	2	92900	173800	1770	1750	252
TDB-U 63-50-11-3	1	63	50	11,113	54,1	3	130600	277000	2720	2680	352
TDB-U 63-50-11-4	1	63	50	11,113	54,1	4	168200	380200	3620	3570	452

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
105		125	145	13,5	25	25	110	127,5	76 ~ 114
105		125	145	13,5	25	25	110	127,5	88 ~ 132
105		125	145	13,5	25	25	110	127,5	100 ~ 150
95		115	135	13,5	20	25	100	117,5	24 ~ 37
95		115	135	13,5	20	25	100	117,5	12 ~ 18
95		115	135	13,5	20	25	100	117,5	33 ~ 50
95		115	135	13,5	20	25	100	117,5	17 ~ 26
95		115	135	13,5	20	25	100	117,5	43 ~ 64
95		115	135	13,5	20	25	100	117,5	22 ~ 33
95		115	135	13,5	20	25	100	117,5	52 ~ 78
95		115	135	13,5	20	25	100	117,5	28 ~ 41
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	34 ~ 50
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	17 ~ 26
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	46 ~ 69
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	24 ~ 36
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	58 ~ 87
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	31 ~ 46
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	70 ~ 105
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	37 ~ 56
105		125	145	13,5	25	25	110	127,5	43 ~ 64
105		125	145	13,5	25	25	110	127,5	58 ~ 87
105		125	145	13,5	25	25	110	127,5	73 ~ 109
105		125	145	13,5	25	25	110	127,5	88 ~ 132
95		115	135	13,5	20	25	100	117,5	28 ~ 42
95		115	135	13,5	20	25	100	117,5	14 ~ 21
95		115	135	13,5	20	25	100	117,5	39 ~ 59
95		115	135	13,5	20	25	100	117,5	20 ~ 30
95		115	135	13,5	20	25	100	117,5	50 ~ 76
95		115	135	13,5	20	25	100	117,5	26 ~ 39
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	37 ~ 55
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	17 ~ 26
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	52 ~ 78
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	25 ~ 38
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	67 ~ 100
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	33 ~ 50
105		125	145	13,5	25	25	110	127,5	47 ~ 71
105		125	145	13,5	25	25	110	127,5	65 ~ 98
105		125	145	13,5	25	25	110	127,5	84 ~ 126

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 70-10-6-2	1	70	10	6,35	64,5	2	46900	109300	1810	1640	102
TDB-U 70-10-6-3	1	70	10	6,35	64,5	3	64600	169100	2690	2450	122
TDB-U 70-10-6-4	1	70	10	6,35	64,5	4	82500	228800	3560	3240	142
TDB-U 70-10-6-5	1	70	10	6,35	64,5	5	100000	288600	4380	3990	162
TDB-U 70-10-7-2	1	70	10	7,144	63,9	2	56000	127800	2010	1840	108
TDB-U 70-10-7-3	1	70	10	7,144	63,9	3	78100	200800	3020	2770	128
TDB-U 70-10-7-4	1	70	10	7,144	63,9	4	99600	271500	3980	3650	148
TDB-U 70-10-7-5	1	70	10	7,144	63,9	5	120700	342300	4910	4500	168
TDB-U 70-10-7-6	1	70	10	7,144	63,9	6	141900	415300	5840	5360	188
TDB-U 70-12-8-2	1	70	12	7,938	63,3	2	64400	140500	1990	1840	128
TDB-U 70-12-8-3	1	70	12	7,938	63,3	3	90100	222000	3010	2780	152
TDB-U 70-12-8-4	1	70	12	7,938	63,3	4	115000	300700	3960	3670	177
TDB-U 70-12-8-5	1	70	12	7,938	63,3	5	139500	379400	4910	4550	200
TDB-U 70-12-8-6	1	70	12	7,938	63,3	6	164100	460900	5860	5430	225
TDB-U 70-12-8-7	1	70	12	7,938	63,3	7	187500	539600	6710	6230	225
TDB-B 70-12,7-9-2	1	70	12,7	9,525	62,2	2	81700	166600	2020	1880	127
TDB-B 70-12,7-9-3	1	70	12,7	9,525	62,2	3	114500	264200	3050	2840	153
TDB-B 70-12,7-9-4	1	70	12,7	9,525	62,2	4	147200	361700	4070	3790	178
TDB-B 70-12,7-9-5	1	70	12,7	9,525	62,2	5	171800	430800	4850	4530	216
TDB-B 70-12,7-9-6	1	70	12,7	9,525	62,2	6	203400	528300	5860	5470	242
TDB-B 70-12,7-9-7	1	70	12,7	9,525	62,2	7	234300	625900	6860	6400	267
TDB-B 70-12,7-9-8	1	70	12,7	9,525	62,2	8	264600	723400	7850	7330	292
TDB-B 70-12,7-9-9	1	70	12,7	9,525	62,2	9	287500	792500	8610	8060	320
TDB-B 70-12,7-9-10	1	70	12,7	9,525	62,2	10	317000	890000	9570	8950	345
TDB-U 70-15-8-2	1	70	15	7,938	63,3	2	64400	140400	1980	1870	133
TDB-U 70-15-8-3	1	70	15	7,938	63,3	3	90000	221800	3000	2820	163
TDB-U 70-15-8-4	1	70	15	7,938	63,3	4	114900	300500	3960	3720	193
TDB-U 70-15-8-5	1	70	15	7,938	63,3	5	139300	379100	4900	4610	225
TDB-U 70-15-8-6	1	70	15	7,938	63,3	6	163900	460500	5850	5500	253
TDB-U 70-15-8-7	1	70	15	7,938	63,3	7	187300	539100	6700	6310	283
TDB-B 70-15-9-2	1	70	15	9,525	62,2	2	81600	166500	2020	1900	132
TDB-B 70-15-9-3	1	70	15	9,525	62,2	3	114400	264000	3040	2860	162
TDB-B 70-15-9-4	1	70	15	9,525	62,2	4	147100	361500	4060	3820	192
TDB-B 70-15-9-5	1	70	15	9,525	62,2	5	171700	430500	4840	4570	237
TDB-B 70-15-9-6	1	70	15	9,525	62,2	6	203200	528000	5850	5520	267
TDB-B 70-15-9-7	1	70	15	9,525	62,2	7	234100	625500	6850	6460	297
TDB-B 70-15-9-8	1	70	15	9,525	62,2	8	264400	722900	7840	7400	327
TDB-B 70-15-9-9	1	70	15	9,525	62,2	9	287300	792000	8600	8130	362

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	20	25	110 (100)	125 (115)	16 ~ 25
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	19 ~ 28
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	21 ~ 32
105	(95)	123 (113)	140 (130)	11	20	25	110 (100)	125 (115)	24 ~ 36
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	23 ~ 35
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	26 ~ 39
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	29 ~ 44
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	32 ~ 49
105	(100)	123 (118)	140 (135)	11	20	25	110 (105)	125 (120)	35 ~ 53
105		125	145	13,5	20	25	110	127,5	28 ~ 42
105		125	145	13,5	20	25	110	127,5	32 ~ 48
105		125	145	13,5	20	25	110	127,5	36 ~ 54
105		125	145	13,5	20	25	110	127,5	40 ~ 60
105		125	145	13,5	20	25	110	127,5	44 ~ 66
105		125	145	13,5	20	25	110	127,5	40 ~ 60
110		130	150	13,5	35	25	115	132,5	40 ~ 59
110		130	150	13,5	35	25	115	132,5	45 ~ 68
110		130	150	13,5	35	25	115	132,5	50 ~ 75
110		130	150	13,5	35	25	115	132,5	62 ~ 94
110		130	150	13,5	35	25	115	132,5	68 ~ 102
110		130	150	13,5	35	25	115	132,5	73 ~ 109
110		130	150	13,5	35	25	115	132,5	78 ~ 117
110		130	150	13,5	35	25	115	132,5	86 ~ 128
110		130	150	13,5	35	25	115	132,5	91 ~ 136
105		125	145	13,5	20	25	110	127,5	25 ~ 37
105		125	145	13,5	20	25	110	127,5	29 ~ 44
105		125	145	13,5	20	25	110	127,5	34 ~ 51
105		125	145	13,5	20	25	110	127,5	39 ~ 58
105		125	145	13,5	20	25	110	127,5	43 ~ 65
105		125	145	13,5	20	25	110	127,5	48 ~ 72
110		130	150	13,5	35	25	115	132,5	36 ~ 55
110		130	150	13,5	35	25	115	132,5	42 ~ 63
110		130	150	13,5	35	25	115	132,5	48 ~ 72
110		130	150	13,5	35	25	115	132,5	62 ~ 92
110		130	150	13,5	35	25	115	132,5	67 ~ 101
110		130	150	13,5	35	25	115	132,5	73 ~ 110
110		130	150	13,5	35	25	115	132,5	79 ~ 119
110		130	150	13,5	35	25	115	132,5	89 ~ 133

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-B 70-15-9-10	1	70	15	9,525	62,2	10	316700	889500	9550	9030	392
TDB-U 70-16-8-2	1	70	16	7,938	63,3	2	64300	140400	1980	1870	139
TDB-U 70-16-8-3	1	70	16	7,938	63,3	3	89900	221800	3000	2830	171
TDB-U 70-16-8-4	1	70	16	7,938	63,3	4	114800	300400	3950	3730	203
TDB-U 70-16-8-5	1	70	16	7,938	63,3	5	139300	379000	4900	4630	237
TDB-U 70-16-8-6	1	70	16	7,938	63,3	6	163800	460400	5840	5520	269
TDB-U 70-16-9-2	1	70	16	9,525	62,2	2	81600	166500	2020	1910	147
TDB-U 70-16-9-3	1	70	16	9,525	62,2	3	114300	263900	3040	2870	179
TDB-U 70-16-9-4	1	70	16	9,525	62,2	4	147000	361400	4060	3840	211
TDB-U 70-16-9-5	1	70	16	9,525	62,2	5	179100	458800	5040	4760	243
TDB-U 70-16-9-6	1	70	16	9,525	62,2	6	209400	552200	5940	5620	275
TDB-U 70-16-9-7	1	70	16	9,525	62,2	7	240100	649600	6840	6480	307
TDB-U 70-16-9-8	1	70	16	9,525	62,2	8	270200	747100	7730	7330	339
TDB-U 70-20-8-2	1	70	20	7,938	63,3	2	64200	140200	1980	1890	162
TDB-U 70-20-8-3	1	70	20	7,938	63,3	3	89800	221500	2990	2860	202
TDB-U 70-20-8-4	1	70	20	7,938	63,3	4	114600	299900	3940	3760	242
TDB-U 70-20-8-5	1	70	20	7,938	63,3	5	139700	381200	4920	4700	282
TDB-U 70-20-8-6	1	70	20	7,938	63,3	6	163500	459700	5830	5570	322
TDB-U 70-20-9-2	1	70	20	9,525	62,2	2	81400	166200	2010	1920	158
TDB-U 70-20-9-3	1	70	20	9,525	62,2	3	114100	263500	3030	2900	198
TDB-U 70-20-9-4	1	70	20	9,525	62,2	4	146800	360900	4050	3870	238
TDB-U 70-20-9-5	1	70	20	9,525	62,2	5	178800	458200	5020	4800	278
TDB-U 70-20-9-6	1	70	20	9,525	62,2	6	210000	555500	5960	5700	318
TDB-U 70-20-9-7	1	70	20	9,525	62,2	7	239600	648700	6820	6530	358
TDB-U 70-20-9-8	1	70	20	9,525	62,2	8	269700	746000	7710	7380	398
TDB-U 70-25-8-2	1	70	25	7,938	63,3	2	64000	139800	1970	1900	164
TUC-U 70-25-8-2		70	25	7,938	63,3	2	64000	139800	1970	1900	87
TDB-U 70-25-8-3	1	70	25	7,938	63,3	3	89500	221000	2980	2870	214
TUC-U 70-25-8-3		70	25	7,938	63,3	3	89500	221000	2980	2870	112
TDB-U 70-25-8-4	1	70	25	7,938	63,3	4	114300	299300	3920	3780	264
TUC-U 70-25-8-4		70	25	7,938	63,3	4	114300	299300	3920	3780	137
TDB-U 70-25-8-5	1	70	25	7,938	63,3	5	139300	380400	4900	4720	314
TUC-U 70-25-8-5		70	25	7,938	63,3	5	139300	380400	4900	4720	162
TDB-U 70-25-8-6	1	70	25	7,938	63,3	6	163100	458700	5800	5590	364
TUC-U 70-25-8-6		70	25	7,938	63,3	6	163100	458700	5800	5590	187
TDB-U 70-25-9-2	1	70	25	9,525	62,2	2	81200	165900	2000	1930	174
TUC-U 70-25-9-2		70	25	9,525	62,2	2	81200	165900	2000	1930	97
TDB-U 70-25-9-3	1	70	25	9,525	62,2	3	113800	263000	3020	2910	224

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
110		130	150	13,5	35	25	115	132,5	95 ~ 142
105		125	145	13,5	20	25	110	127,5	25 ~ 38
105		125	145	13,5	20	25	110	127,5	30 ~ 45
105		125	145	13,5	20	25	110	127,5	35 ~ 52
105		125	145	13,5	20	25	110	127,5	40 ~ 60
105		125	145	13,5	20	25	110	127,5	45 ~ 67
110		130	150	13,5	25	25	115	132,5	36 ~ 54
110		130	150	13,5	25	25	115	132,5	42 ~ 63
110		130	150	13,5	25	25	115	132,5	48 ~ 72
110		130	150	13,5	25	25	115	132,5	54 ~ 82
110		130	150	13,5	25	25	115	132,5	61 ~ 92
110		130	150	13,5	25	25	115	132,5	68 ~ 103
110		130	150	13,5	25	25	115	132,5	76 ~ 113
105		125	145	13,5	20	25	110	127,5	27 ~ 40
105		125	145	13,5	20	25	110	127,5	32 ~ 49
105		125	145	13,5	20	25	110	127,5	38 ~ 57
105		125	145	13,5	20	25	110	127,5	44 ~ 66
105		125	145	13,5	20	25	110	127,5	50 ~ 75
110		130	150	13,5	25	25	115	132,5	34 ~ 51
110		130	150	13,5	25	25	115	132,5	41 ~ 62
110		130	150	13,5	25	25	115	132,5	48 ~ 73
110		130	150	13,5	25	25	115	132,5	56 ~ 84
110		130	150	13,5	25	25	115	132,5	64 ~ 96
110		130	150	13,5	25	25	115	132,5	73 ~ 109
110		130	150	13,5	25	25	115	132,5	81 ~ 121
105		125	145	13,5	20	25	110	127,5	23 ~ 35
105		125	145	13,5	20	25	110	127,5	13 ~ 20
105		125	145	13,5	20	25	110	127,5	30 ~ 45
105		125	145	13,5	20	25	110	127,5	17 ~ 26
105		125	145	13,5	20	25	110	127,5	37 ~ 56
105		125	145	13,5	20	25	110	127,5	21 ~ 32
105		125	145	13,5	20	25	110	127,5	44 ~ 66
105		125	145	13,5	20	25	110	127,5	25 ~ 38
105		125	145	13,5	20	25	110	127,5	51 ~ 76
105		125	145	13,5	20	25	110	127,5	29 ~ 44
110		130	150	13,5	25	25	115	132,5	34 ~ 50
110		130	150	13,5	25	25	115	132,5	21 ~ 31
110		130	150	13,5	25	25	115	132,5	42 ~ 64

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TUC-U 70-25-9-3		70	25	9,525	62,2	3	113800	263000	3020	2910	122
TDB-U 70-25-9-4	1	70	25	9,525	62,2	4	146400	360100	4030	3890	274
TUC-U 70-25-9-4		70	25	9,525	62,2	4	146400	360100	4030	3890	147
TDB-U 70-25-9-5	1	70	25	9,525	62,2	5	178200	457200	5000	4820	324
TUC-U 70-25-9-5		70	25	9,525	62,2	5	178200	457200	5000	4820	172
TDB-U 70-25-9-6	1	70	25	9,525	62,2	6	209400	554300	5930	5730	374
TDB-U 70-25-9-7	1	70	25	9,525	62,2	7	240000	651400	6830	6590	424
TDB-U 70-30-8-2	1	70	30	7,938	63,3	2	64700	142300	1990	1930	190
TUC-U 70-30-8-2		70	30	7,938	63,3	2	64700	142300	1990	1930	93
TDB-U 70-30-8-3	1	70	30	7,938	63,3	3	89200	220400	2960	2870	250
TUC-U 70-30-8-3		70	30	7,938	63,3	3	89200	220400	2960	2870	123
TDB-U 70-30-8-4	1	70	30	7,938	63,3	4	114600	301300	3940	3810	310
TUC-U 70-30-8-4		70	30	7,938	63,3	4	114600	301300	3940	3810	153
TDB-U 70-30-8-5	1	70	30	7,938	63,3	5	138800	379400	4870	4720	370
TUC-U 70-30-8-5		70	30	7,938	63,3	5	138800	379400	4870	4720	183
TDB-U 70-30-9-2	1	70	30	9,525	62,2	2	80900	165400	1990	1930	196
TUC-U 70-30-9-2		70	30	9,525	62,2	2	80900	165400	1990	1930	103
TDB-U 70-30-9-3	1	70	30	9,525	62,2	3	113400	262300	3000	2910	256
TUC-U 70-30-9-3		70	30	9,525	62,2	3	113400	262300	3000	2910	133
TDB-U 70-30-9-4	1	70	30	9,525	62,2	4	145900	359100	4010	3890	316
TUC-U 70-30-9-4		70	30	9,525	62,2	4	145900	359100	4010	3890	163
TDB-U 70-30-9-5	1	70	30	9,525	62,2	5	177600	456000	4970	4830	376
TUC-U 70-30-9-5		70	30	9,525	62,2	5	177600	456000	4970	4830	193
TDB-U 70-30-9-6	1	70	30	9,525	62,2	6	208700	552800	5900	5730	436
TDB-U 70-30-9-7	1	70	30	9,525	62,2	7	239100	649600	6790	6590	496
TDB-U 70-40-8-2	1	70	40	7,938	63,3	2	64100	141300	1970	1920	218
TUC-U 70-40-8-2		70	40	7,938	63,3	2	64100	141300	1970	1920	110
TDB-U 70-40-8-3	1	70	40	7,938	63,3	3	89200	221700	2950	2890	298
TUC-U 70-40-8-3		70	40	7,938	63,3	3	89200	221700	2950	2890	150
TDB-U 70-40-8-4	1	70	40	7,938	63,3	4	113600	299200	3880	3790	378
TUC-U 70-40-8-4		70	40	7,938	63,3	4	113600	299200	3880	3790	190
TDB-U 70-40-8-5	1	70	40	7,938	63,3	5	138300	379600	4830	4720	458
TUC-U 70-40-8-5		70	40	7,938	63,3	5	138300	379600	4830	4720	230
TDB-U 70-40-9-2	1	70	40	9,525	62,2	2	81500	168300	2010	1960	224
TUC-U 70-40-9-2		70	40	9,525	62,2	2	81500	168300	2010	1960	114
TDB-U 70-40-9-3	1	70	40	9,525	62,2	3	113600	264500	3000	2930	304
TUC-U 70-40-9-3		70	40	9,525	62,2	3	113600	264500	3000	2930	154
TDB-U 70-40-9-4	1	70	40	9,525	62,2	4	145700	360700	3990	3900	384

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	26 ~ 39
110		130	150	13,5	25	25	115	132,5	51 ~ 77
110		130	150	13,5	25	25	115	132,5	31 ~ 46
110		130	150	13,5	25	25	115	132,5	60 ~ 91
110		130	150	13,5	25	25	115	132,5	36 ~ 54
110		130	150	13,5	25	25	115	132,5	70 ~ 105
110		130	150	13,5	25	25	115	132,5	80 ~ 120
105		125	145	13,5	20	25	110	127,5	26 ~ 39
105		125	145	13,5	20	25	110	127,5	13 ~ 19
105		125	145	13,5	20	25	110	127,5	34 ~ 51
105		125	145	13,5	20	25	110	127,5	17 ~ 26
105		125	145	13,5	20	25	110	127,5	42 ~ 63
105		125	145	13,5	20	25	110	127,5	22 ~ 32
105		125	145	13,5	20	25	110	127,5	50 ~ 75
105		125	145	13,5	20	25	110	127,5	26 ~ 39
110		130	150	13,5	25	25	115	132,5	36 ~ 54
110		130	150	13,5	25	25	115	132,5	20 ~ 29
110		130	150	13,5	25	25	115	132,5	46 ~ 70
110		130	150	13,5	25	25	115	132,5	25 ~ 38
110		130	150	13,5	25	25	115	132,5	57 ~ 85
110		130	150	13,5	25	25	115	132,5	31 ~ 47
110		130	150	13,5	25	25	115	132,5	67 ~ 101
110		130	150	13,5	25	25	115	132,5	37 ~ 56
110		130	150	13,5	25	25	115	132,5	78 ~ 118
110		130	150	13,5	25	25	115	132,5	90 ~ 135
105		125	145	13,5	20	25	110	127,5	27 ~ 41
105		125	145	13,5	20	25	110	127,5	14 ~ 20
105		125	145	13,5	20	25	110	127,5	37 ~ 56
105		125	145	13,5	20	25	110	127,5	19 ~ 29
105		125	145	13,5	20	25	110	127,5	48 ~ 72
105		125	145	13,5	20	25	110	127,5	25 ~ 38
105		125	145	13,5	20	25	110	127,5	58 ~ 87
105		125	145	13,5	20	25	110	127,5	31 ~ 46
110		130	150	13,5	25	25	115	132,5	37 ~ 56
110		130	150	13,5	25	25	115	132,5	18 ~ 27
110		130	150	13,5	25	25	115	132,5	51 ~ 76
110		130	150	13,5	25	25	115	132,5	26 ~ 38
110		130	150	13,5	25	25	115	132,5	64 ~ 96

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TUC-U 70-40-9-4		70	40	9,525	62,2	4	145700	360700	3990	3900	194
TDB-U 70-40-9-5	1	70	40	9,525	62,2	5	177100	456900	4940	4840	464
TUC-U 70-40-9-5		70	40	9,525	62,2	5	177100	456900	4940	4840	234
TDB-U 70-50-8-2	1	70	50	7,938	63,3	2	63400	140100	1930	1900	258
TUC-U 70-50-8-2		70	50	7,938	63,3	2	63400	140100	1930	1900	130
TDB-U 70-50-8-3	1	70	50	7,938	63,3	3	88200	219800	2900	2850	358
TUC-U 70-50-8-3		70	50	7,938	63,3	3	88200	219800	2900	2850	180
TDB-U 70-50-8-4	1	70	50	7,938	63,3	4	113000	299400	3840	3770	458
TUC-U 70-50-8-4		70	50	7,938	63,3	4	113000	299400	3840	3770	230
TDB-U 70-50-9-2	1	70	50	9,525	62,2	2	80600	166900	1970	1940	258
TUC-U 70-50-9-2		70	50	9,525	62,2	2	80600	166900	1970	1940	128
TDB-U 70-50-9-3	1	70	50	9,525	62,2	3	112300	262300	2950	2900	358
TUC-U 70-50-9-3		70	50	9,525	62,2	3	112300	262300	2950	2900	178
TDB-U 70-50-9-4	1	70	50	9,525	62,2	4	145100	361700	3960	3890	458
TUC-U 70-50-9-4		70	50	9,525	62,2	4	145100	361700	3960	3890	228
TDB-U 80-10-7-2	1	80	10	7,144	73,9	2	60200	149000	2260	2030	108
TDB-U 80-10-7-3	1	80	10	7,144	73,9	3	83200	231500	3380	3040	128
TDB-U 80-10-7-4	1	80	10	7,144	73,9	4	106300	314000	4450	4010	148
TDB-U 80-10-7-5	1	80	10	7,144	73,9	5	128500	394200	5490	4950	168
TDB-U 80-10-7-6	1	80	10	7,144	73,9	6	150700	476800	6500	5870	188
TDB-U 80-12-8-2	1	80	12	7,938	73,3	2	69300	163800	2260	2090	130
TDB-U 80-12-8-3	1	80	12	7,938	73,3	3	95700	254200	3340	3090	154
TDB-U 80-12-8-4	1	80	12	7,938	73,3	4	122900	347500	4450	4120	178
TDB-U 80-12-8-5	1	80	12	7,938	73,3	5	148900	437900	5500	5090	202
TDB-U 80-12-8-6	1	80	12	7,938	73,3	6	174400	528300	6510	6030	226
TDB-U 80-12-9-2	1	80	12	9,525	72,2	2	88700	196300	2290	2100	126
TDB-U 80-12-9-3	1	80	12	9,525	72,2	3	123100	306800	3420	3150	150
TDB-U 80-12-9-4	1	80	12	9,525	72,2	4	157600	417200	4560	4200	174
TDB-U 80-12-9-5	1	80	12	9,525	72,2	5	191400	527600	5620	5180	198
TDB-U 80-12-9-6	1	80	12	9,525	72,2	6	224500	638000	6670	6150	222
TDB-U 80-12-9-7	1	80	12	9,525	72,2	7	256900	748500	7690	7100	246
TDB-U 80-15-8-2	1	80	15	7,938	73,3	2	69200	163700	2260	2120	133
TDB-U 80-15-8-3	1	80	15	7,938	73,3	3	95600	254100	3340	3140	165
TDB-U 80-15-8-4	1	80	15	7,938	73,3	4	122800	347300	4450	4180	195
TDB-U 80-15-8-5	1	80	15	7,938	73,3	5	148800	437600	5490	5160	223
TDB-U 80-15-8-6	1	80	15	7,938	73,3	6	174300	527900	6500	6110	255
TDB-U 80-15-9-2	1	80	15	9,525	72,2	2	88600	196200	2280	2140	142
TDB-U 80-15-9-3	1	80	15	9,525	72,2	3	123000	306600	3420	3200	172

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	33 ~ 50
110		130	150	13,5	25	25	115	132,5	78 ~ 117
110		130	150	13,5	25	25	115	132,5	41 ~ 61
105		125	145	13,5	20	25	110	127,5	31 ~ 47
105		125	145	13,5	20	25	110	127,5	16 ~ 24
105		125	145	13,5	20	25	110	127,5	44 ~ 66
105		125	145	13,5	20	25	110	127,5	23 ~ 34
105		125	145	13,5	20	25	110	127,5	56 ~ 84
105		125	145	13,5	20	25	110	127,5	29 ~ 44
110		130	150	13,5	25	25	115	132,5	41 ~ 62
110		130	150	13,5	25	25	115	132,5	19 ~ 29
110		130	150	13,5	25	25	115	132,5	58 ~ 87
110		130	150	13,5	25	25	115	132,5	28 ~ 42
110		130	150	13,5	25	25	115	132,5	74 ~ 111
110		130	150	13,5	25	25	115	132,5	37 ~ 55
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	27 ~ 40
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	30 ~ 45
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	33 ~ 50
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	37 ~ 55
115	(110)	135 (130)	155 (150)	13,5	20	16	120 (115)	137,5 (132,5)	40 ~ 61
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	33 ~ 49
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	37 ~ 56
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	41 ~ 62
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	46 ~ 69
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	51 ~ 76
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	40 ~ 60
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	46 ~ 69
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	51 ~ 77
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	58 ~ 86
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	64 ~ 96
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	70 ~ 105
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	28 ~ 42
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	34 ~ 51
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	39 ~ 58
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	44 ~ 65
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	50 ~ 75
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	40 ~ 61
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	47 ~ 70

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 80-15-9-4	1	80	15	9,525	72,2	4	157400	416900	4550	4260	202
TDB-U 80-15-9-5	1	80	15	9,525	72,2	5	191200	527300	5610	5250	232
TDB-U 80-15-9-6	1	80	15	9,525	72,2	6	224300	637700	6660	6240	262
TDB-U 80-15-9-7	1	80	15	9,525	72,2	7	256700	748000	7680	7200	292
TDB-U 80-16-8-2	1	80	16	7,938	73,3	2	69200	163700	2260	2130	141
TDB-U 80-16-8-3	1	80	16	7,938	73,3	3	95600	254000	3340	3150	173
TDB-U 80-16-8-4	1	80	16	7,938	73,3	4	122800	347200	4450	4190	205
TDB-U 80-16-8-5	1	80	16	7,938	73,3	5	148800	437500	5490	5180	237
TDB-U 80-16-9-2	1	80	16	9,525	72,2	2	88600	196200	2280	2140	147
TDB-U 80-16-9-3	1	80	16	9,525	72,2	3	122900	306500	3420	3210	179
TDB-U 80-16-9-4	1	80	16	9,525	72,2	4	157400	416800	4550	4270	211
TDB-U 80-16-9-5	1	80	16	9,525	72,2	5	191200	527200	5610	5270	243
TDB-U 80-16-9-6	1	80	16	9,525	72,2	6	224200	637500	6660	6270	275
TDB-U 80-16-9-7	1	80	16	9,525	72,2	7	256600	747800	7670	7220	307
TDB-B 80-16-12-2	1	80	16	12,7	71	2	128300	258600	2380	2240	144
TDB-B 80-16-12-3	1	80	16	12,7	71	3	180900	413800	3620	3400	176
TDB-B 80-16-12-4	1	80	16	12,7	71	4	233400	568900	4850	4560	208
TDB-B 80-16-12-5	1	80	16	12,7	71	5	284700	724100	6070	5700	240
TDB-B 80-16-12-6	1	80	16	12,7	71	6	332900	871900	7180	6750	272
TDB-B 80-16-12-7	1	80	16	12,7	71	7	369200	975300	8110	7640	320
TDB-B 80-16-12-8	1	80	16	12,7	71	8	419500	1137900	9360	8810	352
TDB-B 80-16-12-9	1	80	16	12,7	71	9	465300	1285600	10490	9880	384
TDB-B 80-16-12-10	1	80	16	12,7	71	10	514000	1448200	11730	11040	416
TDB-U 80-20-9-2	1	80	20	9,525	72,2	2	88500	195900	2280	2170	158
TDB-U 80-20-9-3	1	80	20	9,525	72,2	3	122700	306200	3410	3240	198
TDB-U 80-20-9-4	1	80	20	9,525	72,2	4	157200	416400	4540	4320	238
TDB-U 80-20-9-5	1	80	20	9,525	72,2	5	190900	526600	5600	5320	278
TDB-U 80-20-9-6	1	80	20	9,525	72,2	6	223900	636800	6640	6330	318
TDB-U 80-20-9-7	1	80	20	9,525	72,2	7	256300	747000	7660	7290	358
TDB-U 80-20-11-2	1	80	20	11,113	71,1	2	107600	225700	2280	2160	158
TDB-U 80-20-11-3	1	80	20	11,113	71,1	3	151700	361200	3460	3290	198
TDB-U 80-20-11-4	1	80	20	11,113	71,1	4	194100	491000	4590	4360	238
TDB-U 80-20-11-5	1	80	20	11,113	71,1	5	235800	620800	5680	5390	278
TDB-U 80-20-11-6	1	80	20	11,113	71,1	6	277900	756200	6760	6420	318
TDB-U 80-20-11-7	1	80	20	11,113	71,1	7	317800	886000	7790	7410	358
TDB-U 80-20-11-8	1	80	20	11,113	71,1	8	358200	1021400	8790	8360	398
TDB-U 80-20-12-2	1	80	20	12,7	71	2	128200	258300	2380	2270	180
TDB-U 80-20-12-3	1	80	20	12,7	71	3	180700	413300	3610	3450	220

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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)	54 ~ 80
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	61 ~ 91
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	68 ~ 102
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	76 ~ 114
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	29 ~ 44
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	35 ~ 52
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	40 ~ 60
125	(115)	145 (135)	165 (155)	13,5	25	25	130 (120)	147,5 (137,5)	46 ~ 68
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	40 ~ 61
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	47 ~ 71
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	54 ~ 82
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	62 ~ 93
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	70 ~ 104
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	78 ~ 116
130		150	170	13,5	40	25	135	152,5	69 ~ 104
130		150	170	13,5	40	25	135	152,5	79 ~ 118
130		150	170	13,5	40	25	135	152,5	88 ~ 132
130		150	170	13,5	40	25	135	152,5	98 ~ 147
130		150	170	13,5	40	25	135	152,5	109 ~ 163
130		150	170	13,5	40	25	135	152,5	133 ~ 199
130		150	170	13,5	40	25	135	152,5	142 ~ 212
130		150	170	13,5	40	25	135	152,5	152 ~ 228
130		150	170	13,5	40	25	135	152,5	161 ~ 241
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	38 ~ 57
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	47 ~ 70
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	55 ~ 82
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	64 ~ 96
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	73 ~ 109
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	82 ~ 123
125		145	165	13,5	25	25	130	147,5	51 ~ 77
125		145	165	13,5	25	25	130	147,5	61 ~ 92
125		145	165	13,5	25	25	130	147,5	72 ~ 108
125		145	165	13,5	25	25	130	147,5	83 ~ 124
125		145	165	13,5	25	25	130	147,5	94 ~ 141
125		145	165	13,5	25	25	130	147,5	106 ~ 158
125		145	165	13,5	25	25	130	147,5	118 ~ 176
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	71 ~ 107
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	83 ~ 125

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 80-20-12-4	1	80	20	12,7	71	4	233100	568400	4840	4620	260
TDB-U 80-20-12-5	1	80	20	12,7	71	5	284300	723400	6060	5780	300
TDB-U 80-20-12-6	1	80	20	12,7	71	6	334400	878400	7220	6890	340
TDB-U 80-20-12-7	1	80	20	12,7	71	7	381600	1026000	8270	7900	380
TDB-U 80-20-12-8	1	80	20	12,7	71	8	429700	1181000	9330	8920	420
TDB-U 80-25-9-2	1	80	25	9,525	72,2	2	88300	195600	2270	2180	176
TUC-U 80-25-9-2		80	25	9,525	72,2	2	88300	195600	2270	2180	96
TDB-U 80-25-9-3	1	80	25	9,525	72,2	3	122500	305600	3400	3260	226
TUC-U 80-25-9-3		80	25	9,525	72,2	3	122500	305600	3400	3260	121
TDB-U 80-25-9-4	1	80	25	9,525	72,2	4	156800	415700	4520	4340	276
TUC-U 80-25-9-4		80	25	9,525	72,2	4	156800	415700	4520	4340	146
TDB-U 80-25-9-5	1	80	25	9,525	72,2	5	190500	525700	5580	5360	326
TUC-U 80-25-9-5		80	25	9,525	72,2	5	190500	525700	5580	5360	171
TDB-U 80-25-9-6	1	80	25	9,525	72,2	6	224400	639800	6660	6400	376
TDB-U 80-25-9-7	1	80	25	9,525	72,2	7	256600	749900	7670	7380	426
TDB-U 80-25-11-2	1	80	25	11,113	71,1	2	107300	225400	2270	2180	198
TDB-U 80-25-11-3	1	80	25	11,113	71,1	3	151300	360600	3450	3310	248
TDB-U 80-25-11-4	1	80	25	11,113	71,1	4	193700	490100	4580	4390	298
TDB-U 80-25-11-5	1	80	25	11,113	71,1	5	236700	625400	5700	5470	348
TDB-U 80-25-11-6	1	80	25	11,113	71,1	6	277300	754900	6740	6470	398
TDB-U 80-25-11-7	1	80	25	11,113	71,1	7	318400	890100	7810	7500	448
TDB-U 80-25-11-8	1	80	25	11,113	71,1	8	357500	1019700	8760	8420	498
TDB-U 80-25-12-2	1	80	25	12,7	71	2	127900	257900	2370	2280	208
TDB-U 80-25-12-3	1	80	25	12,7	71	3	180300	412700	3600	3470	258
TDB-U 80-25-12-4	1	80	25	12,7	71	4	232600	567400	4820	4640	308
TDB-U 80-25-12-5	1	80	25	12,7	71	5	283700	722200	6040	5810	358
TDB-U 80-25-12-6	1	80	25	12,7	71	6	333700	877000	7190	6930	408
TDB-U 80-25-12-7	1	80	25	12,7	71	7	382600	1031700	8300	8000	458
TDB-U 80-25-12-8	1	80	25	12,7	71	8	430600	1186500	9360	9020	508
TDB-U 80-30-9-2	1	80	30	9,525	72,2	2	88000	195200	2260	2180	198
TUC-U 80-30-9-2		80	30	9,525	72,2	2	88000	195200	2260	2180	103
TDB-U 80-30-9-3	1	80	30	9,525	72,2	3	122200	305000	3380	3270	258
TUC-U 80-30-9-3		80	30	9,525	72,2	3	122200	305000	3380	3270	133
TDB-U 80-30-9-4	1	80	30	9,525	72,2	4	156400	414800	4500	4350	318
TUC-U 80-30-9-4		80	30	9,525	72,2	4	156400	414800	4500	4350	163
TDB-U 80-30-9-5	1	80	30	9,525	72,2	5	191000	528700	5590	5410	378
TUC-U 80-30-9-5		80	30	9,525	72,2	5	191000	528700	5590	5410	193
TDB-U 80-30-9-6	1	80	30	9,525	72,2	6	223800	638500	6630	6420	438

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	25	25	140 (135)	157,5 (152,5)	95 ~ 143
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	107 ~ 161
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	120 ~ 180
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	134 ~ 201
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	148 ~ 223
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	39 ~ 58
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	23 ~ 34
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	49 ~ 73
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	29 ~ 43
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	59 ~ 88
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	34 ~ 52
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	70 ~ 104
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	41 ~ 61
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	80 ~ 120
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	91 ~ 137
125		145	165	13,5	25	25	130	147,5	61 ~ 92
125		145	165	13,5	25	25	130	147,5	74 ~ 110
125		145	165	13,5	25	25	130	147,5	86 ~ 130
125		145	165	13,5	25	25	130	147,5	99 ~ 149
125		145	165	13,5	25	25	130	147,5	113 ~ 170
125		145	165	13,5	25	25	130	147,5	126 ~ 189
125		145	165	13,5	25	25	130	147,5	141 ~ 211
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	77 ~ 116
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	93 ~ 139
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	108 ~ 162
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	123 ~ 184
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	139 ~ 208
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	155 ~ 233
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	172 ~ 259
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	41 ~ 62
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	22 ~ 33
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	53 ~ 80
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	29 ~ 43
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	65 ~ 98
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	35 ~ 53
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	77 ~ 116
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	42 ~ 64
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	90 ~ 134

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 80-30-11-2	1	80	30	11,113	71,1	2	107100	224900	2260	2180	194
TDB-U 80-30-11-3	1	80	30	11,113	71,1	3	150900	359800	3440	3320	254
TDB-U 80-30-11-4	1	80	30	11,113	71,1	4	193200	489200	4560	4400	314
TDB-U 80-30-11-5	1	80	30	11,113	71,1	5	236100	624100	5680	5490	374
TDB-U 80-30-11-6	1	80	30	11,113	71,1	6	276600	753400	6710	6490	434
TDB-U 80-30-11-7	1	80	30	11,113	71,1	7	317600	888300	7780	7520	494
TDB-U 80-30-12-2	1	80	30	12,7	71	2	127600	257400	2360	2290	208
TDB-U 80-30-12-3	1	80	30	12,7	71	3	179900	411900	3590	3470	268
TDB-U 80-30-12-4	1	80	30	12,7	71	4	232000	566300	4800	4650	328
TDB-U 80-30-12-5	1	80	30	12,7	71	5	283000	720800	6010	5820	388
TDB-U 80-30-12-6	1	80	30	12,7	71	6	332800	875200	7160	6940	448
TDB-U 80-30-12-7	1	80	30	12,7	71	7	381600	1029700	8270	8010	508
TDB-U 80-30-12-8	1	80	30	12,7	71	8	429500	1184200	9320	9040	568
TDB-U 80-40-9-2	1	80	40	9,525	72,2	2	87400	194200	2230	2180	228
TUC-U 80-40-9-2		80	40	9,525	72,2	2	87400	194200	2230	2180	114
TDB-U 80-40-9-3	1	80	40	9,525	72,2	3	122400	307500	3390	3300	308
TUC-U 80-40-9-3		80	40	9,525	72,2	3	122400	307500	3390	3300	154
TDB-U 80-40-9-4	1	80	40	9,525	72,2	4	156400	416700	4500	4380	388
TUC-U 80-40-9-4		80	40	9,525	72,2	4	156400	416700	4500	4380	194
TDB-U 80-40-9-5	1	80	40	9,525	72,2	5	189700	526000	5530	5400	468
TUC-U 80-40-9-5		80	40	9,525	72,2	5	189700	526000	5530	5400	234
TDB-U 80-40-11-2	1	80	40	11,113	71,1	2	108100	229300	2290	2230	243
TDB-U 80-40-11-3	1	80	40	11,113	71,1	3	149900	358000	3400	3310	323
TDB-U 80-40-11-4	1	80	40	11,113	71,1	4	193400	492300	4560	4440	403
TDB-U 80-40-11-5	1	80	40	11,113	71,1	5	235900	626500	5670	5520	483
TDB-U 80-40-11-6	1	80	40	11,113	71,1	6	276100	755200	6690	6520	563
TDB-U 80-40-12-2	1	80	40	12,7	71	2	129200	263500	2400	2340	254
TDB-U 80-40-12-3	1	80	40	12,7	71	3	180800	417200	3610	3520	334
TDB-U 80-40-12-4	1	80	40	12,7	71	4	232500	570900	4810	4700	414
TDB-U 80-40-12-5	1	80	40	12,7	71	5	283100	724600	6010	5870	494
TDB-U 80-40-12-6	1	80	40	12,7	71	6	332600	878300	7150	6980	574
TDB-U 80-50-9-2	1	80	50	9,525	72,2	2	87900	197000	2250	2200	262
TUC-U 80-50-9-2		80	50	9,525	72,2	2	87900	197000	2250	2200	130
TDB-U 80-50-9-3	1	80	50	9,525	72,2	3	121400	305500	3340	3280	362
TUC-U 80-50-9-3		80	50	9,525	72,2	3	121400	305500	3340	3280	180
TDB-U 80-50-9-4	1	80	50	9,525	72,2	4	156000	418000	4470	4380	462
TUC-U 80-50-9-4		80	50	9,525	72,2	4	156000	418000	4470	4380	230
TDB-U 80-50-11-2	1	80	50	11,113	71,1	2	107200	227900	2260	2210	264

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	53 ~ 79
125		145	165	13,5	25	25	130	147,5	67 ~ 101
125		145	165	13,5	25	25	130	147,5	82 ~ 123
125		145	165	13,5	25	25	130	147,5	97 ~ 146
125		145	165	13,5	25	25	130	147,5	113 ~ 170
125		145	165	13,5	25	25	130	147,5	129 ~ 193
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	70 ~ 104
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	88 ~ 132
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	106 ~ 159
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	124 ~ 186
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	143 ~ 215
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	163 ~ 244
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	183 ~ 275
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	44 ~ 65
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	21 ~ 31
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	59 ~ 88
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	29 ~ 43
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	74 ~ 111
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	37 ~ 56
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	90 ~ 135
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	46 ~ 70
125		145	165	13,5	25	25	130	147,5	62 ~ 93
125		145	165	13,5	25	25	130	147,5	81 ~ 122
125		145	165	13,5	25	25	130	147,5	100 ~ 150
125		145	165	13,5	25	25	130	147,5	119 ~ 179
125		145	165	13,5	25	25	130	147,5	140 ~ 210
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	81 ~ 122
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	105 ~ 158
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	130 ~ 195
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	154 ~ 231
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	179 ~ 269
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	48 ~ 72
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	22 ~ 34
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	67 ~ 100
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	33 ~ 49
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	85 ~ 128
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	43 ~ 64
125		145	165	13,5	25	25	130	147,5	62 ~ 94

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 80-50-11-3	1	80	50	11,113	71,1	3	150200	361200	3400	3330	364
TDB-U 80-50-11-4	1	80	50	11,113	71,1	4	193200	494600	4540	4450	464
TDB-U 80-50-12-2	1	80	50	12,7	71	2	128100	261800	2370	2320	274
TDB-U 80-50-12-3	1	80	50	12,7	71	3	179400	414600	3560	3490	374
TDB-U 80-50-12-4	1	80	50	12,7	71	4	230600	567300	4750	4660	474
TDB-U 100-10-7-2	1	100	10	7,144	93,9	2	67300	191400	2790	2410	109
TDB-U 100-10-7-3	1	100	10	7,144	93,9	3	92100	292900	4070	3520	129
TDB-U 100-10-7-4	1	100	10	7,144	93,9	4	117600	396700	5380	4660	149
TDB-U 100-12-8-2	1	100	12	7,938	93,3	2	77600	210500	2760	2500	128
TDB-U 100-12-8-3	1	100	12	7,938	93,3	3	106700	324400	4080	3690	152
TDB-U 100-12-8-4	1	100	12	7,938	93,3	4	136000	438200	5360	4860	176
TDB-U 100-12-9-2	1	100	12	9,525	92,2	2	99500	251600	2820	2530	127
TDB-U 100-12-9-3	1	100	12	9,525	92,2	3	137800	391900	4180	3760	151
TDB-U 100-12-9-4	1	100	12	9,525	92,2	4	175400	528000	5490	4950	175
TDB-U 100-12-9-5	1	100	12	9,525	92,2	5	213100	668300	6810	6140	199
TDB-U 100-12-9-6	1	100	12	9,525	92,2	6	250000	808500	8080	7300	223
TDB-U 100-15-8-2	1	100	15	7,938	93,3	2	77600	210500	2760	2550	134
TDB-U 100-15-8-3	1	100	15	7,938	93,3	3	106600	324200	4070	3760	164
TDB-U 100-15-8-4	1	100	15	7,938	93,3	4	135900	438000	5360	4950	194
TDB-U 100-15-9-2	1	100	15	9,525	92,2	2	99500	251500	2810	2580	142
TDB-U 100-15-9-3	1	100	15	9,525	92,2	3	137700	391700	4170	3830	172
TDB-U 100-15-9-4	1	100	15	9,525	92,2	4	175300	527800	5490	5050	202
TDB-U 100-15-9-5	1	100	15	9,525	92,2	5	213000	668000	6800	6260	232
TDB-U 100-16-8-2	1	100	16	7,938	93,3	2	77600	210400	2760	2560	140
TDB-U 100-16-8-3	1	100	16	7,938	93,3	3	106600	324200	4070	3780	172
TDB-U 100-16-8-4	1	100	16	7,938	93,3	4	135900	437900	5360	4970	206
TDB-U 100-16-9-2	1	100	16	9,525	92,2	2	99500	251500	2810	2600	146
TDB-U 100-16-9-3	1	100	16	9,525	92,2	3	137700	391700	4170	3850	178
TDB-U 100-16-9-4	1	100	16	9,525	92,2	4	175200	527700	5480	5070	210
TDB-U 100-16-9-5	1	100	16	9,525	92,2	5	213000	667900	6800	6290	242
TDB-U 100-16-12-2	1	100	16	12,7	91	2	146400	336200	2930	2690	160
TDB-U 100-16-12-3	1	100	16	12,7	91	3	204500	530400	4470	4100	192
TDB-U 100-16-12-4	1	100	16	12,7	91	4	262600	724700	5910	5430	224
TDB-U 100-16-12-5	1	100	16	12,7	91	5	317800	911400	7290	6710	256
TDB-U 100-16-12-6	1	100	16	12,7	91	6	373500	1105700	8670	7980	288
TDB-U 100-16-12-7	1	100	16	12,7	91	7	428100	1299900	10000	9210	320
TDB-U 100-16-12-8	1	100	16	12,7	91	8	481700	1494200	11280	10400	352
TDB-U 100-20-9-2	1	100	20	9,525	92,2	2	99400	251300	2810	2630	160

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	86 ~ 129
125		145	165	13,5	25	25	130	147,5	109 ~ 164
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	83 ~ 124
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	113 ~ 170
135	(130)	155 (150)	175 (170)	13,5	25	25	140 (135)	157,5 (152,5)	144 ~ 216
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	33 ~ 50
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	38 ~ 56
135	(130)	155 (150)	175 (170)	13,5	22	16	140 (135)	157,5 (152,5)	42 ~ 63
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	39 ~ 59
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	45 ~ 67
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	50 ~ 75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	50 ~ 75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	57 ~ 85
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	64 ~ 96
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	72 ~ 107
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	79 ~ 119
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	35 ~ 52
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	41 ~ 62
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	48 ~ 72
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	50 ~ 74
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	58 ~ 87
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	66 ~ 100
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	75 ~ 113
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	35 ~ 53
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	42 ~ 63
150	(135)	176 (155)	202 (175)	17,5 (13,5)	30	25	155 (140)	178,5 (157,5)	50 ~ 75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	49 ~ 74
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	58 ~ 87
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	67 ~ 100
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	76 ~ 114
150		176	202	17,5	30	25	155	178,5	85 ~ 127
150		176	202	17,5	30	25	155	178,5	95 ~ 143
150		176	202	17,5	30	25	155	178,5	108 ~ 162
150		176	202	17,5	30	25	155	178,5	121 ~ 181
150		176	202	17,5	30	25	155	178,5	134 ~ 200
150		176	202	17,5	30	25	155	178,5	147 ~ 221
150		176	202	17,5	30	25	155	178,5	162 ~ 242
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	48 ~ 72

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 100-20-9-3	1	100	20	9,525	92,2	3	137600	391400	4160	3910	200
TDB-U 100-20-9-4	1	100	20	9,525	92,2	4	175100	527400	5480	5140	240
TDB-U 100-20-9-5	1	100	20	9,525	92,2	5	212800	667500	6790	6380	280
TDB-U 100-20-12-2	1	100	20	12,7	91	2	146300	336000	2920	2730	181
TDB-U 100-20-12-3	1	100	20	12,7	91	3	204300	530100	4460	4170	221
TDB-U 100-20-12-4	1	100	20	12,7	91	4	262400	724200	5910	5520	261
TDB-U 100-20-12-5	1	100	20	12,7	91	5	317500	910800	7280	6810	301
TDB-U 100-20-12-6	1	100	20	12,7	91	6	373200	1104900	8660	8100	341
TDB-U 100-20-12-7	1	100	20	12,7	91	7	427700	1299000	9990	9350	381
TDB-U 100-20-12-8	1	100	20	12,7	91	8	481200	1493100	11260	10550	381
TDB-U 100-20-15-2	1	100	20	15,875	87	2	196700	413400	2730	2570	168
TDB-U 100-20-15-3	1	100	20	15,875	87	3	279300	668700	4190	3930	208
TDB-U 100-20-15-4	1	100	20	15,875	87	4	358200	911800	5570	5230	248
TDB-U 100-20-15-5	1	100	20	15,875	87	5	438600	1167100	7010	6570	288
TDB-U 100-20-15-6	1	100	20	15,875	87	6	514200	1410300	8310	7800	328
TDB-U 100-20-15-7	1	100	20	15,875	87	7	591100	1665600	9630	9040	368
TDB-U 100-20-15-8	1	100	20	15,875	87	8	663800	1908700	10810	10160	408
TDB-U 100-25-9-2	1	100	25	9,525	92,2	2	99200	251100	2800	2660	178
TUC-U 100-25-9-2		100	25	9,525	92,2	2	99200	251100	2800	2660	95
TDB-U 100-25-9-3	1	100	25	9,525	92,2	3	137400	391000	4160	3950	228
TUC-U 100-25-9-3		100	25	9,525	92,2	3	137400	391000	4160	3950	120
TDB-U 100-25-9-4	1	100	25	9,525	92,2	4	174800	526800	5460	5190	278
TUC-U 100-25-9-4		100	25	9,525	92,2	4	174800	526800	5460	5190	145
TDB-U 100-25-9-5	1	100	25	9,525	92,2	5	212500	666700	6770	6440	328
TUC-U 100-25-9-5		100	25	9,525	92,2	5	212500	666700	6770	6440	170
TDB-U 100-25-12-2	1	100	25	12,7	91	2	146100	335600	2920	2760	194
TDB-U 100-25-12-3	1	100	25	12,7	91	3	204000	529500	4450	4210	244
TDB-U 100-25-12-4	1	100	25	12,7	91	4	262000	723400	5890	5580	294
TDB-U 100-25-12-5	1	100	25	12,7	91	5	318800	917300	7320	6930	344
TDB-U 100-25-12-6	1	100	25	12,7	91	6	372700	1103800	8640	8190	394
TDB-U 100-25-12-7	1	100	25	12,7	91	7	427100	1297700	9970	9450	444
TDB-U 100-25-15-2	1	100	25	15,875	87	2	196400	412900	2730	2590	186
TDB-U 100-25-15-3	1	100	25	15,875	87	3	278900	668000	4180	3970	236
TDB-U 100-25-15-4	1	100	25	15,875	87	4	357700	910900	5560	5280	286
TDB-U 100-25-15-5	1	100	25	15,875	87	5	438000	1165900	6990	6640	336
TDB-U 100-25-15-6	1	100	25	15,875	87	6	513500	1408800	8300	7880	386
TDB-U 100-25-15-7	1	100	25	15,875	87	7	590300	1663800	9610	9130	436
TDB-U 100-25-15-8	1	100	25	15,875	87	8	662900	1906700	10790	10260	486

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	58 ~ 87
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	69 ~ 103
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	80 ~ 120
150		176	202	17,5	30	25	155	178,5	88 ~ 132
150		176	202	17,5	30	25	155	178,5	102 ~ 153
150		176	202	17,5	30	25	155	178,5	117 ~ 176
150		176	202	17,5	30	25	155	178,5	133 ~ 200
150		176	202	17,5	30	25	155	178,5	149 ~ 224
150		176	202	17,5	30	25	155	178,5	166 ~ 249
150		176	202	17,5	30	25	155	178,5	152 ~ 227
160		186	212	17,5	30	40	165	188,5	107 ~ 160
160		186	212	17,5	30	40	165	188,5	126 ~ 189
160		186	212	17,5	30	40	165	188,5	147 ~ 220
160		186	212	17,5	30	40	165	188,5	166 ~ 249
160		186	212	17,5	30	40	165	188,5	188 ~ 282
160		186	212	17,5	30	40	165	188,5	210 ~ 316
160		186	212	17,5	30	40	165	188,5	235 ~ 353
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	48 ~ 72
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	27 ~ 40
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	61 ~ 91
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	34 ~ 51
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	74 ~ 111
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	42 ~ 63
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	87 ~ 130
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	49 ~ 74
150		176	202	17,5	30	25	155	178,5	85 ~ 128
150		176	202	17,5	30	25	155	178,5	103 ~ 154
150		176	202	17,5	30	25	155	178,5	122 ~ 183
150		176	202	17,5	30	25	155	178,5	141 ~ 211
150		176	202	17,5	30	25	155	178,5	161 ~ 242
150		176	202	17,5	30	25	155	178,5	182 ~ 273
160		186	212	17,5	30	40	165	188,5	104 ~ 155
160		186	212	17,5	30	40	165	188,5	126 ~ 190
160		186	212	17,5	30	40	165	188,5	151 ~ 226
160		186	212	17,5	30	40	165	188,5	174 ~ 260
160		186	212	17,5	30	40	165	188,5	199 ~ 299
160		186	212	17,5	30	40	165	188,5	225 ~ 337
160		186	212	17,5	30	40	165	188,5	253 ~ 380

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 100-30-9-2	1	100	30	9,525	92,2	2	99100	250700	2790	2680	196
TUC-U 100-30-9-2		100	30	9,525	92,2	2	99100	250700	2790	2680	102
TDB-U 100-30-9-3	1	100	30	9,525	92,2	3	137200	390500	4140	3970	256
TUC-U 100-30-9-3		100	30	9,525	92,2	3	137200	390500	4140	3970	132
TDB-U 100-30-9-4	1	100	30	9,525	92,2	4	175400	530200	5490	5260	316
TUC-U 100-30-9-4		100	30	9,525	92,2	4	175400	530200	5490	5260	162
TDB-U 100-30-9-5	1	100	30	9,525	92,2	5	212100	665800	6760	6480	376
TUC-U 100-30-9-5		100	30	9,525	92,2	5	212100	665800	6760	6480	192
TDB-U 100-30-12-2	1	100	30	12,7	91	2	145800	335200	2910	2780	212
TDB-U 100-30-12-3	1	100	30	12,7	91	3	203700	528800	4440	4240	272
TDB-U 100-30-12-4	1	100	30	12,7	91	4	261600	722500	5880	5610	332
TDB-U 100-30-12-5	1	100	30	12,7	91	5	318300	916200	7300	6980	392
TDB-U 100-30-12-6	1	100	30	12,7	91	6	373700	1109800	8670	8290	452
TDB-U 100-30-12-7	1	100	30	12,7	91	7	426400	1296000	9940	9510	512
TDB-U 100-30-15-2	1	100	30	15,875	87	2	199900	424500	2790	2680	228
TDB-U 100-30-15-3	1	100	30	15,875	87	3	278400	667100	4170	3990	288
TDB-U 100-30-15-4	1	100	30	15,875	87	4	360300	921800	5610	5370	348
TDB-U 100-30-15-5	1	100	30	15,875	87	5	437300	1164400	6980	6680	408
TDB-U 100-30-15-6	1	100	30	15,875	87	6	515600	1419100	8340	7990	468
TDB-U 100-30-15-7	1	100	30	15,875	87	7	589300	1661700	9580	9180	528
TDB-U 100-40-9-2	1	100	40	9,525	92,2	2	98600	249900	2770	2690	247
TUC-U 100-40-9-2		100	40	9,525	92,2	2	98600	249900	2770	2690	115
TDB-U 100-40-9-3	1	100	40	9,525	92,2	3	136600	389200	4110	3980	327
TUC-U 100-40-9-3		100	40	9,525	92,2	3	136600	389200	4110	3980	155
TDB-U 100-40-9-4	1	100	40	9,525	92,2	4	174700	528400	5450	5280	407
TUC-U 100-40-9-4		100	40	9,525	92,2	4	174700	528400	5450	5280	195
TDB-U 100-40-9-5	1	100	40	9,525	92,2	5	212000	667700	6750	6540	487
TUC-U 100-40-9-5		100	40	9,525	92,2	5	212000	667700	6750	6540	235
TDB-U 100-40-12-2	1	100	40	12,7	91	2	145200	334100	2890	2790	256
TDB-U 100-40-12-3	1	100	40	12,7	91	3	202800	527100	4410	4260	336
TDB-U 100-40-12-4	1	100	40	12,7	91	4	260500	720200	5840	5640	416
TDB-U 100-40-12-5	1	100	40	12,7	91	5	316900	913200	7250	7010	496
TDB-U 100-40-12-6	1	100	40	12,7	91	6	372200	1106200	8620	8330	576
TDB-U 100-50-9-2	1	100	50	9,525	92,2	2	99100	252900	2790	2720	268
TUC-U 100-50-9-2		100	50	9,525	92,2	2	99100	252900	2790	2720	133
TDB-U 100-50-9-3	1	100	50	9,525	92,2	3	136700	391600	4120	4010	368
TUC-U 100-50-9-3		100	50	9,525	92,2	3	136700	391600	4120	4010	183
TDB-U 100-50-9-4	1	100	50	9,525	92,2	4	174600	530200	5440	5300	468

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	50 ~ 75
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	26 ~ 39
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	65 ~ 97
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	34 ~ 52
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	79 ~ 119
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	43 ~ 64
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	95 ~ 142
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	52 ~ 78
150		176	202	17,5	30	25	155	178,5	88 ~ 132
150		176	202	17,5	30	25	155	178,5	109 ~ 164
150		176	202	17,5	30	25	155	178,5	132 ~ 199
150		176	202	17,5	30	25	155	178,5	155 ~ 233
150		176	202	17,5	30	25	155	178,5	179 ~ 268
150		176	202	17,5	30	25	155	178,5	204 ~ 306
160		186	212	17,5	30	40	165	188,5	123 ~ 185
160		186	212	17,5	30	40	165	188,5	151 ~ 227
160		186	212	17,5	30	40	165	188,5	178 ~ 267
160		186	212	17,5	30	40	165	188,5	206 ~ 308
160		186	212	17,5	30	40	165	188,5	233 ~ 350
160		186	212	17,5	30	40	165	188,5	264 ~ 396
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	60 ~ 90
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	26 ~ 39
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	79 ~ 119
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	36 ~ 54
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	98 ~ 148
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	47 ~ 70
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	118 ~ 177
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	57 ~ 86
150		176	202	17,5	30	25	155	178,5	102 ~ 152
150		176	202	17,5	30	25	155	178,5	131 ~ 196
150		176	202	17,5	30	25	155	178,5	161 ~ 242
150		176	202	17,5	30	25	155	178,5	192 ~ 288
150		176	202	17,5	30	25	155	178,5	223 ~ 335
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	61 ~ 91
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	28 ~ 43
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	84 ~ 126
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	41 ~ 62
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	107 ~ 161

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TUC-U 100-50-9-4		100	50	9,525	92,2	4	174600	530200	5440	5300	233
TDB-U 100-50-12-2	1	100	50	12,7	91	2	146600	340100	2930	2850	280
TDB-U 100-50-12-3	1	100	50	12,7	91	3	203600	532300	4430	4310	380
TDB-U 100-50-12-4	1	100	50	12,7	91	4	260800	724600	5840	5680	480
TDB-U 100-50-12-5	1	100	50	12,7	91	5	316900	916800	7250	7050	580
TDB-U 120-16-12-3	1	120	16	12,7	111	3	224300	647200	5230	4690	193
TDB-U 120-16-12-4	1	120	16	12,7	111	4	285700	872900	6870	6170	225
TDB-U 120-16-12-5	1	120	16	12,7	111	5	347500	1106200	8510	7640	257
TDB-U 120-16-12-6	1	120	16	12,7	111	6	407900	1339500	10100	9080	289
TDB-U 120-16-12-7	1	120	16	12,7	111	7	465600	1565300	11580	10430	321
TDB-U 120-20-12-2	1	120	20	12,7	111	2	161500	413700	3490	3190	182
TDB-U 120-20-12-3	1	120	20	12,7	111	3	224200	646900	5230	4780	222
TDB-U 120-20-12-4	1	120	20	12,7	111	4	285500	872500	6870	6290	262
TDB-U 120-20-12-5	1	120	20	12,7	111	5	347300	1105700	8510	7800	302
TDB-U 120-20-12-6	1	120	20	12,7	111	6	407700	1338900	10090	9260	342
TDB-U 120-20-15-2	1	120	20	15,875	107	2	219900	515500	3290	3030	170
TDB-U 120-20-15-3	1	120	20	15,875	107	3	309400	822300	5000	4600	210
TDB-U 120-20-15-4	1	120	20	15,875	107	4	395800	1116900	6570	6050	250
TDB-U 120-20-15-5	1	120	20	15,875	107	5	483300	1423700	8200	7550	290
TDB-U 120-20-15-6	1	120	20	15,875	107	6	566200	1718300	9760	8990	330
TDB-U 120-20-15-7	1	120	20	15,875	107	7	647300	2012900	11190	10330	370
TDB-U 120-20-15-8	1	120	20	15,875	107	8	729600	2319700	12640	11670	410
TDB-U 120-25-12-2	1	120	25	12,7	111	2	161300	413400	3480	3240	196
TDB-U 120-25-12-3	1	120	25	12,7	111	3	224000	646400	5220	4860	246
TDB-U 120-25-12-4	1	120	25	12,7	111	4	285200	871900	6860	6390	296
TDB-U 120-25-12-5	1	120	25	12,7	111	5	346900	1104900	8490	7920	346
TDB-U 120-25-12-6	1	120	25	12,7	111	6	407300	1337900	10080	9400	396
TDB-U 120-25-15-2	1	120	25	15,875	107	2	219700	515100	3290	3080	188
TDB-U 120-25-15-3	1	120	25	15,875	107	3	309100	821700	4990	4660	238
TDB-U 120-25-15-4	1	120	25	15,875	107	4	395400	1116100	6560	6140	288
TDB-U 120-25-15-5	1	120	25	15,875	107	5	482900	1422700	8190	7660	338
TDB-U 120-25-15-6	1	120	25	15,875	107	6	565600	1717000	9740	9120	388
TDB-U 120-25-15-7	1	120	25	15,875	107	7	649300	2023600	11240	10530	438
TDB-U 120-30-12-2	1	120	30	12,7	111	2	161200	413000	3480	3270	214
TDB-U 120-30-12-3	1	120	30	12,7	111	3	223700	645800	5210	4910	274
TDB-U 120-30-12-4	1	120	30	12,7	111	4	286500	878600	6900	6500	334
TDB-U 120-30-12-5	1	120	30	12,7	111	5	346500	1103900	8480	7990	394
TDB-U 120-30-12-6	1	120	30	12,7	111	6	406800	1336700	10060	9490	454

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	54 ~ 81
150		176	202	17,5	30	25	155	178,5	105 ~ 157
150		176	202	17,5	30	25	155	178,5	142 ~ 212
150		176	202	17,5	30	25	155	178,5	180 ~ 270
150		176	202	17,5	30	25	155	178,5	218 ~ 327
170		196	222	17,5	30	25	175	198,5	114 ~ 171
170		196	222	17,5	30	25	175	198,5	129 ~ 194
170		196	222	17,5	30	25	175	198,5	144 ~ 216
170		196	222	17,5	30	25	175	198,5	160 ~ 239
170		196	222	17,5	30	25	175	198,5	177 ~ 265
170		196	222	17,5	30	25	175	198,5	105 ~ 157
170		196	222	17,5	30	25	175	198,5	122 ~ 183
170		196	222	17,5	30	25	175	198,5	140 ~ 210
170		196	222	17,5	30	25	175	198,5	159 ~ 238
170		196	222	17,5	30	25	175	198,5	178 ~ 267
180		206	232	17,5	30	40	185	208,5	128 ~ 191
180		206	232	17,5	30	40	185	208,5	150 ~ 225
180		206	232	17,5	30	40	185	208,5	176 ~ 263
180		206	232	17,5	30	40	185	208,5	200 ~ 299
180		206	232	17,5	30	40	185	208,5	225 ~ 337
180		206	232	17,5	30	40	185	208,5	253 ~ 380
180		206	232	17,5	30	40	185	208,5	281 ~ 422
170		196	222	17,5	30	25	175	198,5	102 ~ 153
170		196	222	17,5	30	25	175	198,5	123 ~ 185
170		196	222	17,5	30	25	175	198,5	146 ~ 220
170		196	222	17,5	30	25	175	198,5	170 ~ 254
170		196	222	17,5	30	25	175	198,5	193 ~ 290
180		206	232	17,5	30	40	185	208,5	123 ~ 185
180		206	232	17,5	30	40	185	208,5	150 ~ 225
180		206	232	17,5	30	40	185	208,5	180 ~ 270
180		206	232	17,5	30	40	185	208,5	208 ~ 312
180		206	232	17,5	30	40	185	208,5	238 ~ 357
180		206	232	17,5	30	40	185	208,5	269 ~ 403
170		196	222	17,5	30	25	175	198,5	105 ~ 158
170		196	222	17,5	30	25	175	198,5	131 ~ 197
170		196	222	17,5	30	25	175	198,5	158 ~ 237
170		196	222	17,5	30	25	175	198,5	187 ~ 280
170		196	222	17,5	30	25	175	198,5	215 ~ 322

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX, TD Double Nut (1start), TUC Ultracompact 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]
TDB-U 120-30-15-2	1	120	30	15,875	107	2	219400	514600	3280	3100	229
TDB-U 120-30-15-3	1	120	30	15,875	107	3	308700	821000	4980	4710	289
TDB-U 120-30-15-4	1	120	30	15,875	107	4	395000	1115100	6550	6190	349
TDB-U 120-30-15-5	1	120	30	15,875	107	5	482300	1421400	8180	7730	409
TDB-U 120-30-15-6	1	120	30	15,875	107	6	564900	1715500	9720	9200	469
TDB-U 120-40-12-2	1	120	40	12,7	111	2	160700	412100	3460	3310	258
TDB-U 120-40-12-3	1	120	40	12,7	111	3	223100	644300	5190	4960	338
TDB-U 120-40-12-4	1	120	40	12,7	111	4	285700	876600	6870	6560	418
TDB-U 120-40-12-5	1	120	40	12,7	111	5	347100	1108900	8490	8120	498
TDB-U 120-50-12-2	1	120	50	12,7	111	2	160100	410900	3440	3320	284
TDB-U 120-50-12-3	1	120	50	12,7	111	3	222200	642500	5150	4970	384
TDB-U 120-50-12-4	1	120	50	12,7	111	4	284600	874000	6820	6580	484
TDB-U 140-16-12-2	1	140	16	12,7	131	2	174800	491700	3990	3480	161
TDB-U 140-16-12-3	1	140	16	12,7	131	3	240100	756400	5920	5170	193
TDB-U 140-16-12-4	1	140	16	12,7	131	4	307400	1028700	7810	6830	225
TDB-U 140-16-12-5	1	140	16	12,7	131	5	373400	1301000	9690	8480	257
TDB-U 140-16-12-6	1	140	16	12,7	131	6	436600	1565800	11460	10050	289
TDB-U 140-20-12-2	1	140	20	12,7	131	2	174700	491500	3990	3570	169
TDB-U 140-20-12-3	1	140	20	12,7	131	3	240000	756200	5910	5300	209
TDB-U 140-20-12-4	1	140	20	12,7	131	4	307300	1028400	7800	7000	249
TDB-U 140-20-12-5	1	140	20	12,7	131	5	373300	1300600	9680	8690	289
TDB-U 140-20-15-2	1	140	20	15,875	127	2	240000	617800	3780	3410	172
TDB-U 140-20-15-3	1	140	20	15,875	127	3	335500	976100	5720	5150	212
TDB-U 140-20-15-4	1	140	20	15,875	127	4	428400	1322100	7530	6800	252
TDB-U 140-20-15-5	1	140	20	15,875	127	5	519600	1668100	9330	8430	292
TDB-U 140-20-15-6	1	140	20	15,875	127	6	611300	2026400	11140	10060	332
TDB-U 140-20-15-7	1	140	20	15,875	127	7	698600	2372400	12760	11550	372
TDB-U 140-25-15-2	1	140	25	15,875	127	2	239800	617500	3770	3470	190
TDB-U 140-25-15-3	1	140	25	15,875	127	3	335300	975600	5710	5250	240
TDB-U 140-25-15-4	1	140	25	15,875	127	4	428100	1321400	7520	6930	290
TDB-U 140-25-15-5	1	140	25	15,875	127	5	519200	1667100	9320	8590	340
TDB-U 140-25-15-6	1	140	25	15,875	127	6	610800	2025300	11120	10250	390
TDB-U 160-20-15-2	1	160	20	15,875	147	2	257800	720200	4300	3790	172
TDB-U 160-20-15-3	1	160	20	15,875	147	3	358700	1130000	6420	5660	212
TDB-U 160-20-15-4	1	160	20	15,875	147	4	457400	1527400	8460	7470	252
TDB-U 160-20-15-5	1	160	20	15,875	147	5	554300	1924700	10440	9240	292
TDB-U 160-20-15-6	1	160	20	15,875	147	6	651400	2334500	12430	11000	332
TDB-U 160-25-15-2	1	160	25	15,875	147	2	257600	719900	4300	3880	190
TDB-U 160-25-15-3	1	160	25	15,875	147	3	358500	1129500	6410	5790	240
TDB-U 160-25-15-4	1	160	25	15,875	147	4	457100	1526700	8450	7650	290
TDB-U 160-25-15-5	1	160	25	15,875	147	5	554000	1923900	10430	9450	340

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
180		206	232	17,5	30	40	185	208,5	147 ~ 221
180		206	232	17,5	30	40	185	208,5	178 ~ 268
180		206	232	17,5	30	40	185	208,5	212 ~ 319
180		206	232	17,5	30	40	185	208,5	245 ~ 367
180		206	232	17,5	30	40	185	208,5	279 ~ 418
170		196	222	17,5	30	25	175	198,5	121 ~ 182
170		196	222	17,5	30	25	175	198,5	156 ~ 234
170		196	222	17,5	30	25	175	198,5	192 ~ 288
170		196	222	17,5	30	25	175	198,5	229 ~ 344
170		196	222	17,5	30	25	175	198,5	127 ~ 190
170		196	222	17,5	30	25	175	198,5	171 ~ 257
170		196	222	17,5	30	25	175	198,5	216 ~ 325
190		216	242	17,5	30	40	195	218,5	116 ~ 175
190		216	242	17,5	30	40	195	218,5	133 ~ 199
190		216	242	17,5	30	40	195	218,5	149 ~ 224
190		216	242	17,5	30	40	195	218,5	166 ~ 249
190		216	242	17,5	30	40	195	218,5	185 ~ 277
190		216	242	17,5	30	40	195	218,5	107 ~ 160
190		216	242	17,5	30	40	195	218,5	127 ~ 191
190		216	242	17,5	30	40	195	218,5	148 ~ 222
190		216	242	17,5	30	40	195	218,5	169 ~ 254
200		226	252	17,5	30	40	205	228,5	151 ~ 226
200		226	252	17,5	30	40	205	228,5	177 ~ 265
200		226	252	17,5	30	40	205	228,5	205 ~ 308
200		226	252	17,5	30	40	205	228,5	234 ~ 351
200		226	252	17,5	30	40	205	228,5	263 ~ 394
200		226	252	17,5	30	40	205	228,5	295 ~ 443
200		226	252	17,5	30	40	205	228,5	145 ~ 218
200		226	252	17,5	30	40	205	228,5	176 ~ 264
200		226	252	17,5	30	40	205	228,5	210 ~ 315
200		226	252	17,5	30	40	205	228,5	243 ~ 365
200		226	252	17,5	30	40	205	228,5	277 ~ 415
220		246	272	17,5	30	40	225	248,5	170 ~ 254
220		246	272	17,5	30	40	225	248,5	200 ~ 300
220		246	272	17,5	30	40	225	248,5	232 ~ 348
220		246	272	17,5	30	40	225	248,5	266 ~ 398
220		246	272	17,5	30	40	225	248,5	299 ~ 448
220		246	272	17,5	30	40	225	248,5	164 ~ 245
220		246	272	17,5	30	40	225	248,5	200 ~ 300
220		246	272	17,5	30	40	225	248,5	237 ~ 356
220		246	272	17,5	30	40	225	248,5	276 ~ 414

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX TD Double nut, 2 starts

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]
TDB(2S)-U 40-20-6-2	2	40	20	6,35	34,5	2	52900	96100	1740	1670	142
TDB(2S)-U 40-20-6-3	2	40	20	6,35	34,5	3	73700	151000	2600	2490	182
TDB(2S)-U 40-20-6-4	2	40	20	6,35	34,5	4	95300	208700	3530	3380	222
TDB(2S)-U 40-20-6-5	2	40	20	6,35	34,5	5	115700	263600	4350	4160	262
TDB(2S)-U 40-25-6-2	2	40	25	6,35	34,5	2	52400	95500	1720	1660	162
TDB(2S)-U 40-25-6-3	2	40	25	6,35	34,5	3	73900	152800	2610	2520	212
TDB(2S)-U 40-25-6-4	2	40	25	6,35	34,5	4	94500	207300	3490	3360	262
TDB(2S)-U 40-25-8-2	2	40	25	7,938	33,3	2	70400	120700	1840	1780	179
TDB(2S)-U 40-25-8-3	2	40	25	7,938	33,3	3	100500	196800	2880	2790	229
TDB(2S)-U 40-25-8-4	2	40	25	7,938	33,3	4	128900	268300	3850	3730	279
TDB(2S)-U 40-30-6-2	2	40	30	6,35	34,5	2	51900	94700	1690	1640	168
TDB(2S)-U 40-30-6-3	2	40	30	6,35	34,5	3	73200	151500	2570	2490	228
TDB(2S)-U 40-30-8-2	2	40	30	7,938	33,3	2	69700	119800	1810	1760	190
TDB(2S)-U 40-30-8-3	2	40	30	7,938	33,3	3	99500	195200	2830	2760	250
TDB(2S)-U 40-40-6-2	2	40	40	6,35	34,5	2	51600	95500	1670	1630	206
TDB(2S)-U 40-40-8-2	2	40	40	7,938	33,3	2	69700	121900	1800	1760	218
TDB(2S)-U 50-20-6-2	2	50	20	6,35	44,5	2	59900	122700	2110	1990	142
TDB(2S)-U 50-20-6-3	2	50	20	6,35	44,5	3	84200	195300	3250	3060	182
TDB(2S)-U 50-20-6-4	2	50	20	6,35	44,5	4	107600	265000	4280	4020	222
TDB(2S)-U 50-20-6-5	2	50	20	6,35	44,5	5	131300	337600	5330	5020	262
TDB(2S)-U 50-20-6-6	2	50	20	6,35	44,5	6	153800	407300	6310	5940	302
TDB(2S)-U 50-20-6-7	2	50	20	6,35	44,5	7	176500	479800	7290	6870	342
TDB(2S)-U 50-25-6-2	2	50	25	6,35	44,5	2	60500	125000	2140	2040	159
TDB(2S)-U 50-25-6-3	2	50	25	6,35	44,5	3	83700	194400	3220	3070	210
TDB(2S)-U 50-25-6-4	2	50	25	6,35	44,5	4	107800	266700	4280	4070	259
TDB(2S)-U 50-25-6-5	2	50	25	6,35	44,5	5	130600	336100	5290	5030	309
TDB(2S)-U 50-25-6-6	2	50	25	6,35	44,5	6	153700	408300	6300	6000	359
TDB(2S)-U 50-25-8-2	2	50	25	7,938	43,3	2	82300	159700	2350	2260	174
TDB(2S)-U 50-25-8-3	2	50	25	7,938	43,3	3	114600	251000	3510	3380	224
TDB(2S)-U 50-25-8-4	2	50	25	7,938	43,3	4	148300	346800	4730	4540	274
TDB(2S)-U 50-25-8-5	2	50	25	7,938	43,3	5	181200	442600	5930	5700	324
TDB(2S)-U 50-25-8-6	2	50	25	7,938	43,3	6	212200	533900	7030	6750	374
TDB(2S)-U 50-25-9-2	2	50	25	9,525	42,2	2	101500	184200	2290	2210	188
TDB(2S)-U 50-25-9-3	2	50	25	9,525	42,2	3	145700	302700	3610	3480	238
TDB(2S)-U 50-25-9-4	2	50	25	9,525	42,2	4	187400	414500	4800	4620	288
TDB(2S)-U 50-25-9-5	2	50	25	9,525	42,2	5	228300	526400	5970	5760	338
TDB(2S)-U 50-25-9-6	2	50	25	9,525	42,2	6	270100	644800	7210	6950	388
TDB(2S)-U 50-30-6-2	2	50	30	6,35	44,5	2	60100	124400	2120	2030	181

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	12 ~ 18
65	(63)	78	93	9	18	20	70	81,5	15 ~ 22
65	(63)	78	93	9	18	20	70	81,5	17 ~ 26
65	(63)	78	93	9	18	20	70	81,5	20 ~ 31
65	(63)	78	93	9	18	20	70	81,5	12 ~ 19
65	(63)	78	93	9	18	20	70	81,5	16 ~ 24
65	(63)	78	93	9	18	20	70	81,5	19 ~ 28
70		85	100	9	18	25	75	87,5	19 ~ 28
70		85	100	9	18	25	75	87,5	23 ~ 35
70		85	100	9	18	25	75	87,5	28 ~ 42
65	(63)	78	93	9	18	20	70	81,5	12 ~ 17
65	(63)	78	93	9	18	20	70	81,5	15 ~ 23
70		85	100	9	18	25	75	87,5	18 ~ 27
70		85	100	9	18	25	75	87,5	23 ~ 35
65	(63)	78	93	9	18	20	70	81,5	13 ~ 19
70		85	100	9	18	25	75	87,5	19 ~ 29
75		93	110	11	18	25	85	97,5	15 ~ 22
75		93	110	11	18	25	85	97,5	18 ~ 27
75		93	110	11	18	25	85	97,5	22 ~ 33
75		93	110	11	18	25	85	97,5	25 ~ 38
75		93	110	11	18	25	85	97,5	29 ~ 44
75		93	110	11	18	25	85	97,5	33 ~ 50
75		93	110	11	18	25	85	97,5	15 ~ 23
75		93	110	11	18	25	85	97,5	19 ~ 29
75		93	110	11	18	25	85	97,5	23 ~ 35
75		93	110	11	18	25	85	97,5	28 ~ 42
75		93	110	11	18	25	85	97,5	32 ~ 48
82		100	118	11	18	25	92	105	23 ~ 34
82		100	118	11	18	25	92	105	29 ~ 43
82		100	118	11	18	25	92	105	35 ~ 52
82		100	118	11	18	25	92	105	40 ~ 60
82		100	118	11	18	25	92	105	47 ~ 70
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	29 ~ 43
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	35 ~ 53
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	43 ~ 65
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	51 ~ 77
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	59 ~ 88
75		93	110	11	18	25	85	97,5	16 ~ 25

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX TD Double nut, 2 starts

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]
TDB(2S)-U 50-30-6-3	2	50	30	6,35	44,5	3	83900	196200	3230	3100	241
TDB(2S)-U 50-30-6-4	2	50	30	6,35	44,5	4	107000	265300	4230	4060	301
TDB(2S)-U 50-30-6-5	2	50	30	6,35	44,5	5	130400	337100	5270	5060	361
TDB(2S)-U 50-30-8-2	2	50	30	7,938	43,3	2	81700	158900	2330	2250	192
TDB(2S)-U 50-30-8-3	2	50	30	7,938	43,3	3	115200	254200	3530	3420	252
TDB(2S)-U 50-30-8-4	2	50	30	7,938	43,3	4	147300	345000	4680	4530	312
TDB(2S)-U 50-30-8-5	2	50	30	7,938	43,3	5	180000	440400	5870	5680	372
TDB(2S)-U 50-30-9-2	2	50	30	9,525	42,2	2	100900	183300	2270	2200	207
TDB(2S)-U 50-30-9-3	2	50	30	9,525	42,2	3	144700	301100	3580	3470	267
TDB(2S)-U 50-30-9-4	2	50	30	9,525	42,2	4	186200	412400	4750	4600	327
TDB(2S)-U 50-30-9-5	2	50	30	9,525	42,2	5	228700	530300	5980	5800	387
TDB(2S)-U 50-40-6-2	2	50	40	6,35	44,5	2	60000	125500	2100	2040	206
TDB(2S)-U 50-40-6-3	2	50	40	6,35	44,5	3	83300	196400	3180	3090	286
TDB(2S)-U 50-40-6-4	2	50	40	6,35	44,5	4	106700	267300	4200	4070	366
TDB(2S)-U 50-40-8-2	2	50	40	7,938	43,3	2	81900	161400	2330	2270	212
TDB(2S)-U 50-40-8-3	2	50	40	7,938	43,3	3	114700	255500	3500	3410	292
TDB(2S)-U 50-40-8-4	2	50	40	7,938	43,3	4	147400	349600	4670	4550	370
TDB(2S)-U 50-40-9-2	2	50	40	9,525	42,2	2	101600	187500	2280	2230	220
TDB(2S)-U 50-40-9-3	2	50	40	9,525	42,2	3	142400	297400	3480	3410	300
TDB(2S)-U 50-40-9-4	2	50	40	9,525	42,2	4	185100	413800	4690	4590	380
TDB(2S)-U 50-50-6-2	2	50	50	6,35	44,5	2	58700	123500	2030	1980	247
TDB(2S)-U 50-50-6-3	2	50	50	6,35	44,5	3	82300	195900	3120	3040	346
TDB(2S)-U 50-50-8-2	2	50	50	7,938	43,3	2	80200	158800	2250	2210	246
TDB(2S)-U 50-50-8-3	2	50	50	7,938	43,3	3	113600	255900	3440	3370	346
TDB(2S)-U 50-50-9-2	2	50	50	9,525	42,2	2	99600	184600	2210	2170	242
TDB(2S)-U 50-50-9-3	2	50	50	9,525	42,2	3	141600	299100	3440	3380	342
TDB(2S)-U 63-25-8-2	2	63	25	7,938	56,3	2	94300	208600	2910	2760	170
TDB(2S)-U 63-25-8-3	2	63	25	7,938	56,3	3	131700	329100	4450	4200	220
TDB(2S)-U 63-25-8-4	2	63	25	7,938	56,3	4	167900	445000	5830	5510	270
TDB(2S)-U 63-25-8-5	2	63	25	7,938	56,3	5	204600	565500	7250	6870	320
TDB(2S)-U 63-25-8-6	2	63	25	7,938	56,3	6	240500	686000	8630	8170	370
TDB(2S)-U 63-25-9-2	2	63	25	9,525	55,2	2	119400	247800	2970	2830	186
TDB(2S)-U 63-25-9-3	2	63	25	9,525	55,2	3	166100	388500	4430	4220	236
TDB(2S)-U 63-25-9-4	2	63	25	9,525	55,2	4	214700	535900	5950	5660	286
TDB(2S)-U 63-25-9-5	2	63	25	9,525	55,2	5	262200	683200	7460	7100	336
TDB(2S)-U 63-25-9-6	2	63	25	9,525	55,2	6	306900	823900	8780	8370	386
TDB(2S)-U 63-25-9-7	2	63	25	9,525	55,2	7	352400	971300	10160	9690	436
TDB(2S)-U 63-25-9-8	2	63	25	9,525	55,2	8	395500	1111900	11420	10890	486

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	21 ~ 31
75		93	110	11	18	25	85	97,5	26 ~ 38
75		93	110	11	18	25	85	97,5	30 ~ 45
82		100	118	11	18	25	92	105	24 ~ 37
82		100	118	11	18	25	92	105	31 ~ 46
82		100	118	11	18	25	92	105	38 ~ 57
82		100	118	11	18	25	92	105	44 ~ 67
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	31 ~ 47
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	39 ~ 59
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	48 ~ 72
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	57 ~ 85
75		93	110	11	18	25	85	97,5	16 ~ 23
75		93	110	11	18	25	85	97,5	21 ~ 32
75		93	110	11	18	25	85	97,5	27 ~ 40
82		100	118	11	18	25	92	105	24 ~ 36
82		100	118	11	18	25	92	105	32 ~ 49
82		100	118	11	18	25	92	105	39 ~ 59
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	30 ~ 45
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	41 ~ 61
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	51 ~ 77
75		93	110	11	18	25	85	97,5	18 ~ 26
75		93	110	11	18	25	85	97,5	24 ~ 36
82		100	118	11	18	25	92	105	26 ~ 39
82		100	118	11	18	25	92	105	36 ~ 54
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	33 ~ 49
90	(85)	108 (103)	125 (120)	11	20	25	95 (90)	110 (105)	45 ~ 68
95		115	135	13,5	20	25	100	117,5	28 ~ 43
95		115	135	13,5	20	25	100	117,5	35 ~ 52
95		115	135	13,5	20	25	100	117,5	43 ~ 64
95		115	135	13,5	20	25	100	117,5	50 ~ 75
95		115	135	13,5	20	25	100	117,5	58 ~ 87
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	40 ~ 60
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	50 ~ 75
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	59 ~ 88
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	68 ~ 102
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	79 ~ 118
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	89 ~ 134
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	101 ~ 151

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX TD Double nut, 2 starts

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]
TDB(2S)-U 63-30-8-2	2	63	30	7,938	56,3	2	93900	207900	2890	2760	185
TDB(2S)-U 63-30-8-3	2	63	30	7,938	56,3	3	131100	328000	4420	4210	245
TDB(2S)-U 63-30-8-4	2	63	30	7,938	56,3	4	168400	448100	5840	5580	305
TDB(2S)-U 63-30-8-5	2	63	30	7,938	56,3	5	204900	568200	7260	6930	365
TDB(2S)-U 63-30-8-6	2	63	30	7,938	56,3	6	239500	683700	8570	8190	425
TDB(2S)-U 63-30-9-2	2	63	30	9,525	55,2	2	118900	247000	2950	2830	206
TDB(2S)-U 63-30-9-3	2	63	30	9,525	55,2	3	167300	393900	4470	4290	266
TDB(2S)-U 63-30-9-4	2	63	30	9,525	55,2	4	213800	534100	5910	5670	326
TDB(2S)-U 63-30-9-5	2	63	30	9,525	55,2	5	261100	681000	7410	7110	386
TDB(2S)-U 63-30-9-6	2	63	30	9,525	55,2	6	307300	827900	8790	8440	446
TDB(2S)-U 63-30-9-7	2	63	30	9,525	55,2	7	350900	968100	10090	9700	506
TDB(2S)-U 63-40-8-2	2	63	40	7,938	56,3	2	94200	210800	2900	2800	210
TDB(2S)-U 63-40-8-3	2	63	40	7,938	56,3	3	130900	329900	4400	4240	290
TDB(2S)-U 63-40-8-4	2	63	40	7,938	56,3	4	167700	449000	5800	5600	370
TDB(2S)-U 63-40-8-5	2	63	40	7,938	56,3	5	203800	568100	7190	6950	450
TDB(2S)-U 63-40-9-2	2	63	40	9,525	55,2	2	117700	245000	2900	2810	222
TDB(2S)-U 63-40-9-3	2	63	40	9,525	55,2	3	165500	390700	4390	4260	302
TDB(2S)-U 63-40-9-4	2	63	40	9,525	55,2	4	213300	536400	5880	5700	382
TDB(2S)-U 63-40-9-5	2	63	40	9,525	55,2	5	260000	682100	7350	7130	462
TDB(2S)-U 63-50-8-2	2	63	50	7,938	56,3	2	93000	208600	2840	2760	250
TDB(2S)-U 63-50-8-3	2	63	50	7,938	56,3	3	129200	326500	4300	4180	350
TDB(2S)-U 63-50-8-4	2	63	50	7,938	56,3	4	166600	448900	5730	5570	450
TDB(2S)-U 63-50-9-2	2	63	50	9,525	55,2	2	118200	249100	2910	2840	246
TDB(2S)-U 63-50-9-3	2	63	50	9,525	55,2	3	165200	393300	4370	4260	346
TDB(2S)-U 63-50-9-4	2	63	50	9,525	55,2	4	212200	537500	5820	5680	446
TDB(2S)-U 70-25-8-2	2	70	25	7,938	63,3	2	99300	233100	3200	3020	166
TDB(2S)-U 70-25-8-3	2	70	25	7,938	63,3	3	138900	368300	4850	4560	216
TDB(2S)-U 70-25-8-4	2	70	25	7,938	63,3	4	177300	498800	6380	6010	266
TDB(2S)-U 70-25-8-5	2	70	25	7,938	63,3	5	216100	634000	7970	7510	316
TDB(2S)-U 70-25-8-6	2	70	25	7,938	63,3	6	253000	764500	9440	8900	366
TDB(2S)-U 70-25-9-2	2	70	25	9,525	62,2	2	126000	276500	3260	3070	186
TDB(2S)-U 70-25-9-3	2	70	25	9,525	62,2	3	176600	438300	4910	4630	236
TDB(2S)-U 70-25-9-4	2	70	25	9,525	62,2	4	227100	600100	6560	6180	286
TDB(2S)-U 70-25-9-5	2	70	25	9,525	62,2	5	276600	762000	8140	7680	336
TDB(2S)-U 70-25-9-6	2	70	25	9,525	62,2	6	325000	923800	9660	9120	386
TDB(2S)-U 70-25-9-7	2	70	25	9,525	62,2	7	372300	1085600	11110	10500	436
TDB(2S)-U 70-30-8-2	2	70	30	7,938	63,3	2	100300	237100	3240	3080	186
TDB(2S)-U 70-30-8-3	2	70	30	7,938	63,3	3	138400	367300	4820	4580	246

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	30 ~ 46
95		115	135	13,5	20	25	100	117,5	38 ~ 57
95		115	135	13,5	20	25	100	117,5	47 ~ 70
95		115	135	13,5	20	25	100	117,5	55 ~ 82
95		115	135	13,5	20	25	100	117,5	64 ~ 96
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	42 ~ 63
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	53 ~ 79
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	64 ~ 96
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	75 ~ 112
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	86 ~ 129
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	99 ~ 148
95		115	135	13,5	20	25	100	117,5	29 ~ 44
95		115	135	13,5	20	25	100	117,5	39 ~ 59
95		115	135	13,5	20	25	100	117,5	50 ~ 75
95		115	135	13,5	20	25	100	117,5	60 ~ 90
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	41 ~ 61
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	54 ~ 81
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	67 ~ 101
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	81 ~ 121
95		115	135	13,5	20	25	100	117,5	33 ~ 49
95		115	135	13,5	20	25	100	117,5	45 ~ 67
95		115	135	13,5	20	25	100	117,5	57 ~ 86
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	43 ~ 64
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	59 ~ 89
105	(100)	125 (120)	145 (140)	13,5	20	25	110 (105)	127,5 (122,5)	75 ~ 113
105		125	145	13,5	20	25	110	127,5	31 ~ 47
105		125	145	13,5	20	25	110	127,5	39 ~ 58
105		125	145	13,5	20	25	110	127,5	47 ~ 71
105		125	145	13,5	20	25	110	127,5	55 ~ 83
105		125	145	13,5	20	25	110	127,5	64 ~ 96
110		130	150	13,5	25	25	115	132,5	45 ~ 68
110		130	150	13,5	25	25	115	132,5	55 ~ 83
110		130	150	13,5	25	25	115	132,5	65 ~ 98
110		130	150	13,5	25	25	115	132,5	76 ~ 114
110		130	150	13,5	25	25	115	132,5	88 ~ 131
110		130	150	13,5	25	25	115	132,5	100 ~ 150
105		125	145	13,5	20	25	110	127,5	34 ~ 50
105		125	145	13,5	20	25	110	127,5	43 ~ 64

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX TD Double nut, 2 starts

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]
TDB(2S)-U 70-30-8-4	2	70	30	7,938	63,3	4	177800	502100	6400	6090	306
TDB(2S)-U 70-30-8-5	2	70	30	7,938	63,3	5	215400	632300	7920	7540	366
TDB(2S)-U 70-30-9-2	2	70	30	9,525	62,2	2	125600	275700	3240	3090	204
TDB(2S)-U 70-30-9-3	2	70	30	9,525	62,2	3	176000	437100	4880	4650	264
TDB(2S)-U 70-30-9-4	2	70	30	9,525	62,2	4	226300	598500	6520	6210	324
TDB(2S)-U 70-30-9-5	2	70	30	9,525	62,2	5	275600	759900	8090	7710	384
TDB(2S)-U 70-30-9-6	2	70	30	9,525	62,2	6	323800	921300	9600	9150	444
TDB(2S)-U 70-30-9-7	2	70	30	9,525	62,2	7	371100	1082700	11050	10540	504
TDB(2S)-U 70-40-8-2	2	70	40	7,938	63,3	2	99400	235500	3200	3080	212
TDB(2S)-U 70-40-8-3	2	70	40	7,938	63,3	3	138300	369400	4810	4630	292
TDB(2S)-U 70-40-8-4	2	70	40	7,938	63,3	4	176300	498700	6310	6080	372
TDB(2S)-U 70-40-8-5	2	70	40	7,938	63,3	5	214500	632600	7860	7580	452
TDB(2S)-U 70-40-9-2	2	70	40	9,525	62,2	2	126500	280600	3270	3150	220
TDB(2S)-U 70-40-9-3	2	70	40	9,525	62,2	3	176200	440900	4880	4710	300
TDB(2S)-U 70-40-9-4	2	70	40	9,525	62,2	4	226000	601200	6500	6260	380
TDB(2S)-U 70-40-9-5	2	70	40	9,525	62,2	5	274900	761600	8050	7760	460
TDB(2S)-U 70-50-8-2	2	70	50	7,938	63,3	2	98300	233500	3140	3050	252
TDB(2S)-U 70-50-8-3	2	70	50	7,938	63,3	3	136800	366300	4720	4580	352
TDB(2S)-U 70-50-8-4	2	70	50	7,938	63,3	4	175400	499000	6260	6070	452
TDB(2S)-U 70-50-9-2	2	70	50	9,525	62,2	2	125100	278200	3210	3120	248
TDB(2S)-U 70-50-9-3	2	70	50	9,525	62,2	3	174300	437200	4800	4660	348
TDB(2S)-U 70-50-9-4	2	70	50	9,525	62,2	4	225200	602800	6450	6260	448
TDB(2S)-U 80-25-9-2	2	80	25	9,525	72,2	2	137000	326000	3690	3460	184
TDB(2S)-U 80-25-9-3	2	80	25	9,525	72,2	3	190000	509400	5530	5180	234
TDB(2S)-U 80-25-9-4	2	80	25	9,525	72,2	4	243300	692800	7360	6900	284
TDB(2S)-U 80-25-9-5	2	80	25	9,525	72,2	5	295600	876200	9070	8510	334
TDB(2S)-U 80-25-9-6	2	80	25	9,525	72,2	6	348200	1066400	10840	10170	384
TDB(2S)-U 80-25-9-7	2	80	25	9,525	72,2	7	398200	1249800	12480	11720	434
TDB(2S)-U 80-30-9-2	2	80	30	9,525	72,2	2	136600	325400	3680	3480	202
TDB(2S)-U 80-30-9-3	2	80	30	9,525	72,2	3	189500	508400	5510	5220	262
TDB(2S)-U 80-30-9-4	2	80	30	9,525	72,2	4	242700	691400	7330	6940	322
TDB(2S)-U 80-30-9-5	2	80	30	9,525	72,2	5	296300	881200	9100	8630	382
TDB(2S)-U 80-30-9-6	2	80	30	9,525	72,2	6	347200	1064200	10790	10240	442
TDB(2S)-U 80-40-9-2	2	80	40	9,525	72,2	2	135700	323700	3640	3490	220
TDB(2S)-U 80-40-9-3	2	80	40	9,525	72,2	3	189900	512500	5510	5290	300
TDB(2S)-U 80-40-9-4	2	80	40	9,525	72,2	4	242600	694600	7320	7020	380
TDB(2S)-U 80-40-9-5	2	80	40	9,525	72,2	5	294300	876600	9000	8650	460
TDB(2S)-U 80-50-9-2	2	80	50	9,525	72,2	2	136400	328300	3660	3540	252

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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	52 ~ 78
105		125	145	13,5	20	25	110	127,5	61 ~ 92
110		130	150	13,5	25	25	115	132,5	47 ~ 70
110		130	150	13,5	25	25	115	132,5	58 ~ 87
110		130	150	13,5	25	25	115	132,5	70 ~ 105
110		130	150	13,5	25	25	115	132,5	82 ~ 124
110		130	150	13,5	25	25	115	132,5	95 ~ 143
110		130	150	13,5	25	25	115	132,5	109 ~ 163
105		125	145	13,5	20	25	110	127,5	33 ~ 49
105		125	145	13,5	20	25	110	127,5	44 ~ 66
105		125	145	13,5	20	25	110	127,5	56 ~ 84
105		125	145	13,5	20	25	110	127,5	67 ~ 101
110		130	150	13,5	25	25	115	132,5	45 ~ 67
110		130	150	13,5	25	25	115	132,5	60 ~ 90
110		130	150	13,5	25	25	115	132,5	75 ~ 112
110		130	150	13,5	25	25	115	132,5	90 ~ 135
105		125	145	13,5	20	25	110	127,5	37 ~ 55
105		125	145	13,5	20	25	110	127,5	50 ~ 75
105		125	145	13,5	20	25	110	127,5	64 ~ 96
110		130	150	13,5	25	25	115	132,5	48 ~ 72
110		130	150	13,5	25	25	115	132,5	66 ~ 99
110		130	150	13,5	25	25	115	132,5	83 ~ 125
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	52 ~ 78
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	64 ~ 95
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	75 ~ 113
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	88 ~ 132
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	100 ~ 150
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	114 ~ 171
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	54 ~ 80
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	67 ~ 100
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	80 ~ 120
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	94 ~ 141
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	109 ~ 163
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	53 ~ 79
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	69 ~ 104
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	86 ~ 129
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	104 ~ 156
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	55 ~ 83

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

COMPLEX TD Double nut, 2 starts

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]*
TDB(2S)-U 80-50-9-3	2	80	50	9,525	72,2	3	188300	509100	5440	5260	352
TDB(2S)-U 80-50-9-4	2	80	50	9,525	72,2	4	242100	696700	7280	7050	452
TDB(2S)-U 100-25-9-2	2	100	25	9,525	92,2	2	154000	418400	4560	4200	182
TDB(2S)-U 100-25-9-3	2	100	25	9,525	92,2	3	213200	651600	6760	6230	232
TDB(2S)-U 100-25-9-4	2	100	25	9,525	92,2	4	271300	878000	8890	8200	282
TDB(2S)-U 100-25-9-5	2	100	25	9,525	92,2	5	329700	1111200	11030	10170	332
TDB(2S)-U 100-30-9-2	2	100	30	9,525	92,2	2	153700	417900	4550	4240	196
TDB(2S)-U 100-30-9-3	2	100	30	9,525	92,2	3	212800	650800	6740	6290	256
TDB(2S)-U 100-30-9-4	2	100	30	9,525	92,2	4	272200	883700	8930	8340	316
TDB(2S)-U 100-30-9-5	2	100	30	9,525	92,2	5	329100	1109700	10990	10280	376
TDB(2S)-U 100-40-9-2	2	100	40	9,525	92,2	2	153000	416500	4520	4290	237
TDB(2S)-U 100-40-9-3	2	100	40	9,525	92,2	3	211900	648600	6700	6360	317
TDB(2S)-U 100-40-9-4	2	100	40	9,525	92,2	4	271000	880700	8870	8430	397
TDB(2S)-U 100-40-9-5	2	100	40	9,525	92,2	5	329000	1112800	10980	10440	477
TDB(2S)-U 100-50-9-2	2	100	50	9,525	92,2	2	153800	421500	4540	4350	258
TDB(2S)-U 100-50-9-3	2	100	50	9,525	92,2	3	212200	652600	6700	6430	358
TDB(2S)-U 100-50-9-4	2	100	50	9,525	92,2	4	270900	883700	8850	8500	458

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TUC
$D_{1,std}$	$D_{1,min}$	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)	76 ~ 114
125	(120)	145 (140)	165 (160)	13,5	25	25	130 (125)	147,5 (142,5)	96 ~ 144
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	65 ~ 97
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	79 ~ 119
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	94 ~ 141
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	109 ~ 164
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	64 ~ 96
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	81 ~ 121
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	97 ~ 146
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	115 ~ 173
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	74 ~ 111
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	95 ~ 142
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	116 ~ 174
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	137 ~ 206
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	70 ~ 105
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	96 ~ 143
150	(140)	176 (166)	202 (192)	17,5	30	25	155 (145)	178,5 (168,5)	121 ~ 181

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.
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.

COMPLEX TDA Double assymetric nut, vertical axes without counterweight with medium loads and low speed, W axes

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	$C_{a,I}/C_{a,P}$ *[kN]*	$C_{oa,I}/C_{oa,P}$ *[kN]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
HDL TDA-B 63-16-12-6	1	63	16	12,7	53	6+3	321/177	753/376	4590	4350	224
HDL TDA-B 63-16-12-7	1	63	16	12,7	53	7+3	368/177	884/379	5030	4760	240
HDL TDA-B 63-16-12-8	1	63	16	12,7	53	8+3	400/172	966/362	5430	5150	264
HDL TDA-B 63-16-12-9	1	63	16	12,7	53	9+3	445/173	1096/365	5890	5580	280
HDL TDA-B 63-16-12-10	1	63	16	12,7	53	10+3	490/174	1227/368	6340	6020	296
HDL TDA-B 63-16-12-11	1	63	16	12,7	53	11+3	538/176	1375/375	6800	6460	312
HDL TDA-B 63-16-12-12	1	63	16	12,7	53	12+3	581/176	1506/376	7250	6880	328
HDL TDA-B 63-16-12-13	1	63	16	12,7	53	13+3	624/177	1637/378	7690	7300	344
HDL TDA-B 63-16-12-14	1	63	16	12,7	53	14+3	666/177	1767/379	8070	7670	354
HDL TDA-B 80-16-12-6	1	80	16	12,7	70	6+3	367/202	972/486	5660	5260	224
HDL TDA-B 80-16-12-7	1	80	16	12,7	70	7+3	409/198	1097/470	6190	5770	248
HDL TDA-B 80-16-12-8	1	80	16	12,7	70	8+3	461/198	1263/474	6700	6240	264
HDL TDA-B 80-16-12-9	1	80	16	12,7	70	9+3	512/199	1430/477	7270	6780	280
HDL TDA-B 80-16-12-10	1	80	16	12,7	70	10+3	562/200	1596/479	7820	7300	296
HDL TDA-B 80-16-12-11	1	80	16	12,7	70	11+3	616/201	1779/485	8390	7830	312
HDL TDA-B 80-16-12-12	1	80	16	12,7	70	12+3	664/202	1945/486	8940	8350	328
HDL TDA-B 80-16-12-13	1	80	16	12,7	70	13+3	703/199	2069/478	9470	8850	347
HDL TDA-B 80-16-12-14	1	80	16	12,7	70	14+3	753/200	2244/481	10030	9370	363
HDL TDA-B 80-16-12-15	1	80	16	12,7	70	15+3	796/200	2394/479	10470	9800	379
HDL TDA-B 80-20-15-6	1	80	20	15,875	67,1	6+3	503/277	1260/630	5790	5500	275
HDL TDA-B 80-20-15-7	1	80	20	15,875	67,1	7+3	575/278	1477/633	6340	6030	295
HDL TDA-B 80-20-15-8	1	80	20	15,875	67,1	8+3	629/271	1626/610	6890	6560	325
HDL TDA-B 80-20-15-9	1	80	20	15,875	67,1	9+3	699/272	1843/614	7460	7100	345
HDL TDA-B 80-20-15-10	1	80	20	15,875	67,1	10+3	768/273	2059/618	8020	7640	365
HDL TDA-B 80-20-15-11	1	80	20	15,875	67,1	11+3	836/274	2276/621	8510	8100	385
HDL TDA-B 80-20-15-12	1	80	20	15,875	67,1	12+3	910/276	2520/630	9150	8720	405
HDL TDA-B 80-20-15-13	1	80	20	15,875	67,1	13+3	976/277	2737/632	9630	9180	425
HDL TDA-B 80-20-15-14	1	80	20	15,875	67,1	14+3	1042/277	2954/633	10180	9710	445
HDL TDA-B 80-20-15-15	1	80	20	15,875	67,1	15+3	1088/273	3089/618	10740	10240	467
HDL TDA-B 80-25-19-6	1	80	25	19,05	64,1	6+3	640/353	1533/766	6090	5870	337
HDL TDA-B 80-25-19-7	1	80	25	19,05	64,1	7+3	731/353	1791/768	6670	6430	362
HDL TDA-B 80-25-19-8	1	80	25	19,05	64,1	8+3	825/355	2070/776	7210	6950	387
HDL TDA-B 80-25-19-9	1	80	25	19,05	64,1	9+3	886/345	2229/743	7760	7480	425
HDL TDA-B 80-25-19-10	1	80	25	19,05	64,1	10+3	978/347	2508/752	8480	8180	450
HDL TDA-B 80-25-19-11	1	80	25	19,05	64,1	11+3	1069/350	2786/760	9100	8770	475
HDL TDA-B 80-25-19-12	1	80	25	19,05	64,1	12+3	1158/351	3065/766	9620	9280	488
HDL TDA-U 100-16-12-6	1	100	16	12,7	90	6+3	413/227	1236/618	6850	6220	240
HDL TDA-U 100-16-12-7	1	100	16	12,7	90	7+3	472/228	1446/620	7470	6790	256

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TDA	Mass to move	
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]	M_{100rpm} [kg]	M_{50rpm} [kg]
110		130	150	13,5	40	25	115	132,5	207	3900	5400
110		130	150	13,5	40	25	115	132,5	218	4700	6300
110		130	150	13,5	40	25	115	132,5	248	5200	6900
110		130	150	13,5	40	25	115	132,5	258	5900	7800
110		130	150	13,5	40	25	115	132,5	269	6600	8600
110		130	150	13,5	40	25	115	132,5	280	7300	9500
110		130	150	13,5	40	25	115	132,5	292	7900	10300
110		130	150	13,5	40	25	115	132,5	304	8600	11100
110		130	150	13,5	40	25	115	132,5	307	9200	11900
130		150	170	13,5	40	25	135	152,5	258	4500	6200
130		150	170	13,5	40	25	135	152,5	294	5200	7000
130		150	170	13,5	40	25	135	152,5	309	6000	8000
130		150	170	13,5	40	25	135	152,5	321	6800	9000
130		150	170	13,5	40	25	135	152,5	334	7500	9900
130		150	170	13,5	40	25	135	152,5	348	8300	10900
130		150	170	13,5	40	25	135	152,5	363	9000	11800
130		150	170	13,5	40	25	135	152,5	384	9600	12500
130		150	170	13,5	40	25	135	152,5	399	10400	13400
130		150	170	13,5	40	25	135	152,5	418	11000	14200
140		166	192	17,5	45	25	145	168,5	399	6100	8500
140		166	192	17,5	45	25	145	168,5	420	7300	9900
140		166	192	17,5	45	25	145	168,5	476	8200	10900
140		166	192	17,5	45	25	145	168,5	496	9300	12200
140		166	192	17,5	45	25	145	168,5	518	10300	13500
140		166	192	17,5	45	25	145	168,5	545	11300	14700
140		166	192	17,5	45	25	145	168,5	563	12400	16100
140		166	192	17,5	45	25	145	168,5	592	13400	17300
140		166	192	17,5	45	25	145	168,5	615	14400	18600
140		166	192	17,5	45	25	145	168,5	643	15100	19400
150		176	202	17,5	50	40	155	178,5	582	7800	10800
150		176	202	17,5	50	40	155	178,5	613	9300	12600
150		176	202	17,5	50	40	155	178,5	651	10700	14300
150		176	202	17,5	50	40	155	178,5	734	11700	15500
150		176	202	17,5	50	40	155	178,5	755	13100	17200
150		176	202	17,5	50	40	155	178,5	786	14500	18900
150		176	202	17,5	50	40	155	178,5	803	15800	20500
150		176	202	17,5	30	25	155	178,5	317	5000	7000
150		176	202	17,5	30	25	155	178,5	335	6000	8100

SHUTON-IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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

*Masses indicated on a single VERTICAL AXIS WITHOUT counterweight for a life of 50000 hours (≈6 years) in OPERATION at 95% reliability with an average rotation speed of 100rpm and 50rpm depending on the column. For other average operating speeds, or ball screws with counterweight, or ball screws in parallel, consult SHUTON-IPIRANGA.

COMPLEX TDA Double assymetric nut, vertical axes without counterweight with medium loads and low speed, W axes

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*	$C_{a,I}/C_{a,P}$ *[kN]*	$C_{oa,I}/C_{oa,P}$ *[kN]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
HDL TDA-U 100-16-12-8	1	100	16	12,7	90	8+3	531/228	1664/624	8100	7370	272
HDL TDA-B 100-16-12-9	1	100	16	12,7	90	9+3	565/220	1765/588	8740	8010	283
HDL TDA-B 100-16-12-10	1	100	16	12,7	90	10+3	625/222	1992/598	9470	8680	299
HDL TDA-B 100-16-12-11	1	100	16	12,7	90	11+3	678/222	2194/598	10090	9260	315
HDL TDA-B 100-16-12-12	1	100	16	12,7	90	12+3	737/224	2421/605	10800	9910	331
HDL TDA-B 100-16-12-13	1	100	16	12,7	90	13+3	775/220	2555/590	11240	10340	348
HDL TDA-B 100-16-12-14	1	100	16	12,7	90	14+3	834/222	2791/598	11970	11000	364
HDL TDA-B 100-16-12-15	1	100	16	12,7	90	15+3	886/222	2992/598	12650	11640	380
HDL TDA-U 100-20-15-6	1	100	20	15,875	87,1	6+3	567/312	1594/797	7010	6550	268
HDL TDA-U 100-20-15-7	1	100	20	15,875	87,1	7+3	652/315	1883/807	7710	7210	288
HDL TDA-U 100-20-15-8	1	100	20	15,875	87,1	8+3	732/315	2158/809	8310	7770	308
HDL TDA-U 100-20-15-9	1	100	20	15,875	87,1	9+3	814/316	2446/815	8910	8350	328
HDL TDA-U 100-20-15-10	1	100	20	15,875	87,1	10+3	892/317	2721/816	9380	8800	348
HDL TDA-B 100-20-15-11	1	100	20	15,875	87,1	11+3	935/306	2845/776	10330	9720	389
HDL TDA-B 100-20-15-12	1	100	20	15,875	87,1	12+3	1005/305	3092/773	10890	10250	409
HDL TDA-B 100-20-15-13	1	100	20	15,875	87,1	13+3	1083/307	3381/780	11700	11000	429
HDL TDA-B 100-20-15-14	1	100	20	15,875	87,1	14+3	1161/309	3669/786	12390	11660	449
HDL TDA-B 100-20-15-15	1	100	20	15,875	87,1	15+3	1237/310	3958/792	13080	12310	467
HDL TDA-B 100-25-19-6	1	100	25	19,05	84,1	6+3	728/401	1944/972	7440	7090	337
HDL TDA-B 100-25-19-7	1	100	25	19,05	84,1	7+3	835/403	2288/981	8120	7740	362
HDL TDA-B 100-25-19-8	1	100	25	19,05	84,1	8+3	911/392	2511/942	8740	8350	400
HDL TDA-B 100-25-19-9	1	100	25	19,05	84,1	9+3	1020/396	2876/959	9570	9140	425
HDL TDA-B 100-25-19-10	1	100	25	19,05	84,1	10+3	1117/397	3200/960	10260	9800	450
HDL TDA-B 100-25-19-11	1	100	25	19,05	84,1	11+3	1222/400	3564/972	11070	10570	475
HDL TDA-B 100-25-19-12	1	100	25	19,05	84,1	12+3	1317/400	3888/972	11750	11220	498
HDL TDA-B 100-25-19-13	1	100	25	19,05	84,1	13+3	1420/402	4253/981	12450	11900	523
HDL TDA-B 100-25-19-14	1	100	25	19,05	84,1	14+3	1512/402	4577/981	13040	12470	548
HDL TDA-B 100-25-19-15	1	100	25	19,05	84,1	15+3	1582/396	4800/960	13750	13150	568
HDL TDA-U 120-16-12-6	1	120	16	12,7	110	6+3	450/248	1490/745	7950	7020	241
HDL TDA-U 120-16-12-7	1	120	16	12,7	110	7+3	516/249	1753/751	8710	7710	257
HDL TDA-B 120-16-12-8	1	120	16	12,7	110	8+3	559/240	1905/715	9470	8460	267
HDL TDA-B 120-16-12-9	1	120	16	12,7	110	9+3	621/241	2159/720	10260	9170	283
HDL TDA-B 120-16-12-10	1	120	16	12,7	110	10+3	674/239	2371/711	10910	9770	300
HDL TDA-B 120-16-12-11	1	120	16	12,7	110	11+3	732/239	2608/711	11590	10400	316
HDL TDA-B 120-16-12-12	1	120	16	12,7	110	12+3	795/241	2879/720	12510	11220	332
HDL TDA-B 120-16-12-13	1	120	16	12,7	110	13+3	846/240	3091/713	13190	11840	349
HDL TDA-B 120-16-12-14	1	120	16	12,7	110	14+3	905/241	3345/717	13900	12490	365
HDL TDA-B 120-16-12-15	1	120	16	12,7	110	15+3	963/241	3599/720	14750	13250	381

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TDA	Mass to move	
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]	M_{100rpm} [kg]	M_{50rpm} [kg]
150		176	202	17,5	30	25	155	178,5	353	6900	9200
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	407	7500	9900
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	421	8400	11000
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	440	9200	12000
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	455	10000	13000
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	483	10600	13800
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	499	11500	14800
155	(150)	181 (176)	207 (202)	17,5	40	25	160 (155)	183,5 (178,5)	516	12300	15800
160		186	212	17,5	30	40	165	188,5	422	6900	9600
160		186	212	17,5	30	40	165	188,5	449	8300	11200
160		186	212	17,5	30	40	165	188,5	484	9500	12700
160		186	212	17,5	30	40	165	188,5	519	10800	14200
160		186	212	17,5	30	40	165	188,5	563	12000	15700
165	(160)	191 (186)	217 (212)	17,5	45	40	170 (165)	193,5 (188,5)	682	12600	16500
165	(160)	191 (186)	217 (212)	17,5	45	40	170 (165)	193,5 (188,5)	716	13700	17800
165	(160)	191 (186)	217 (212)	17,5	45	40	170 (165)	193,5 (188,5)	736	14800	19200
165	(160)	191 (186)	217 (212)	17,5	45	40	170 (165)	193,5 (188,5)	763	16000	20700
165	(160)	191 (186)	217 (212)	17,5	45	40	170 (165)	193,5 (188,5)	787	17100	22100
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	712	8900	12300
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	754	10600	14300
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	861	11900	15800
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	891	13500	17800
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	933	15000	19600
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	966	16500	21600
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	1005	17900	23300
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	1050	19500	25200
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	1105	20800	26900
175	(170)	201 (196)	227 (222)	17,5	50	40	180 (175)	203,5 (198,5)	1142	21900	28300
170		196	222	17,5	30	25	175	198,5	381	5500	7600
170		196	222	17,5	30	25	175	198,5	400	6600	8900
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	463	7300	9700
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	480	8200	10900
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	508	9000	11800
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	532	9900	12900
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	546	10800	14100
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	573	11600	15000
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	597	12500	16100
175	(170)	201 (196)	227 (222)	17,5	40	40	180 (175)	203,5 (198,5)	615	13300	17200

SHUTON-IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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

*Masses indicated on a single VERTICAL AXIS WITHOUT counterweight for a life of 50000 hours (≈6 years) in OPERATION at 95% reliability with an average rotation speed of 100rpm and 50rpm depending on the column. For other average operating speeds, or ball screws with counterweight, or ball screws in parallel, consult SHUTON-IPIRANGA.

COMPLEX TDA Double assymetric nut, vertical axes without counterweight with medium loads and low speed, W axes

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	$C_{a,t}/C_{a,P}$ [kN]	$C_{oa,t}/C_{oa,P}$ [kN]	$R_{b/t}$ [N/µm]	R_{nut} [N/µm]	$L_{n,std}$ [mm]
HDL TDA-U 120-20-15-6	1	120	20	15,875	107,1	6+3	624/344	1942/971	8220	7530	270
HDL TDA-U 120-20-15-7	1	120	20	15,875	107,1	7+3	714/344	2275/975	8960	8220	290
HDL TDA-U 120-20-15-8	1	120	20	15,875	107,1	8+3	804/346	2621/983	9710	8920	310
HDL TDA-B 120-20-15-9	1	120	20	15,875	107,1	9+3	871/339	2857/952	10590	9770	345
HDL TDA-B 120-20-15-10	1	120	20	15,875	107,1	10+3	962/342	3218/965	11430	10560	365
HDL TDA-B 120-20-15-11	1	120	20	15,875	107,1	11+3	1027/336	3454/942	12070	11160	389
HDL TDA-B 120-20-15-12	1	120	20	15,875	107,1	12+3	1110/337	3786/947	12850	11890	409
HDL TDA-B 120-20-15-13	1	120	20	15,875	107,1	13+3	1193/338	4119/951	13730	12700	429
HDL TDA-B 120-20-15-14	1	120	20	15,875	107,1	14+3	1274/339	4452/954	14500	13420	449
HDL TDA-B 120-20-15-15	1	120	20	15,875	107,1	15+3	1362/341	4827/965	15310	14170	467
HDL TDA-U 120-25-19-6	1	120	25	19,05	104,1	6+3	806/444	2376/1188	8730	8190	327
HDL TDA-U 120-25-19-7	1	120	25	19,05	104,1	7+3	922/445	2785/1194	9540	8960	352
HDL TDA-U 120-25-19-8	1	120	25	19,05	104,1	8+3	1041/448	3216/1206	10350	9720	377
HDL TDA-U 120-25-19-9	1	120	25	19,05	104,1	9+3	1153/448	3625/1208	11030	10380	402
HDL TDA-U 120-25-19-10	1	120	25	19,05	104,1	10+3	1268/450	4055/1217	11690	11020	427
HDL TDA-B 120-25-19-11	1	120	25	19,05	104,1	11+3	1351/442	4342/1184	13030	12290	475
HDL TDA-B 120-25-19-12	1	120	25	19,05	104,1	12+3	1459/443	4752/1188	13800	13020	498
HDL TDA-B 120-25-19-13	1	120	25	19,05	104,1	13+3	1540/436	5038/1163	14570	13760	518
HDL TDA-B 120-25-19-14	1	120	25	19,05	104,1	14+3	1650/439	5468/1172	15430	14580	543
HDL TDA-B 120-25-19-15	1	120	25	19,05	104,1	15+3	1759/441	5898/1180	16300	15400	568
HDL TDA-U 140-20-15-6	1	140	20	15,875	127,1	6+3	674/371	2290/1145	9390	8420	272
HDL TDA-U 140-20-15-7	1	140	20	15,875	127,1	7+3	770/372	2680/1149	10220	9190	292
HDL TDA-B 140-20-15-8	1	140	20	15,875	127,1	8+3	849/365	2988/1120	11170	10170	325
HDL TDA-B 140-20-15-9	1	140	20	15,875	127,1	9+3	929/361	3309/1103	12000	10940	349
HDL TDA-B 140-20-15-10	1	140	20	15,875	127,1	10+3	1018/362	3686/1106	12870	11740	369
HDL TDA-B 140-20-15-11	1	140	20	15,875	127,1	11+3	1114/364	4104/1119	13870	12650	389
HDL TDA-B 140-20-15-12	1	140	20	15,875	127,1	12+3	1201/365	4481/1120	14720	13440	409
HDL TDA-B 140-20-15-13	1	140	20	15,875	127,1	13+3	1278/362	4802/1108	15510	14170	425
HDL TDA-B 140-20-15-14	1	140	20	15,875	127,1	14+3	1365/363	5193/1113	16500	15080	445
HDL TDA-B 140-20-15-15	1	140	20	15,875	127,1	15+3	1452/364	5584/1117	17370	15870	463
HDL TDA-U 140-25-19-6	1	140	25	19,05	124,1	6+3	874/482	2808/1404	9980	9220	328
HDL TDA-U 140-25-19-7	1	140	25	19,05	124,1	7+3	998/482	3282/1407	10850	10040	353
HDL TDA-U 140-25-19-8	1	140	25	19,05	124,1	8+3	1124/483	3778/1417	11780	10920	378
HDL TDA-B 140-25-19-9	1	140	25	19,05	124,1	9+3	1219/474	4129/1376	12840	11980	425
HDL TDA-B 140-25-19-10	1	140	25	19,05	124,1	10+3	1342/476	4624/1387	13880	12960	450
HDL TDA-B 140-25-19-11	1	140	25	19,05	124,1	11+3	1431/468	4954/1351	14550	13600	470
HDL TDA-B 140-25-19-12	1	140	25	19,05	124,1	12+3	1550/471	5450/1362	15660	14630	484
HDL TDA-B 140-25-19-13	1	140	25	19,05	124,1	13+3	1668/473	5945/1372	16630	15550	518

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TDA	Mass to move	
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]	M_{100rpm} [kg]	M_{50rpm} [kg]
180		206	232	17,5	30	40	185	208,5	505	7600	10500
180		206	232	17,5	30	40	185	208,5	541	9100	12300
180		206	232	17,5	30	40	185	208,5	579	10500	14000
185		211	237	17,5	45	40	190	213,5	724	11500	15200
185		211	237	17,5	45	40	190	213,5	752	12900	16900
185		211	237	17,5	45	40	190	213,5	808	13900	18100
185		211	237	17,5	45	40	190	213,5	841	15100	19600
185		211	237	17,5	45	40	190	213,5	868	16400	21200
185		211	237	17,5	45	40	190	213,5	902	17600	22700
185		211	237	17,5	45	40	190	213,5	932	18900	24300
190		216	242	17,5	40	40	195	218,5	864	9800	13600
190		216	242	17,5	40	40	195	218,5	910	11700	15800
190		216	242	17,5	40	40	195	218,5	960	13600	18100
190		216	242	17,5	40	40	195	218,5	1022	15300	20200
190		216	242	17,5	40	40	195	218,5	1090	17000	22300
195	(190)	221 (216)	247 (242)	17,5	50	40	200 (195)	223,5 (218,5)	1138	18300	23800
195	(190)	221 (216)	247 (242)	17,5	50	40	200 (195)	223,5 (218,5)	1188	19900	25800
195	(190)	224 (219)	253 (248)	20	50	40	200 (195)	226,5 (221,5)	1236	21100	27300
195	(190)	224 (219)	253 (248)	20	50	40	200 (195)	226,5 (221,5)	1284	22700	29400
195	(190)	224 (219)	253 (248)	20	50	40	200 (195)	226,5 (221,5)	1334	24300	31400
200		226	252	17,5	30	40	205	228,5	589	8200	11400
200		226	252	17,5	30	40	205	228,5	631	9800	13200
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	802	11100	14700
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	860	12300	16200
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	897	13600	17900
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	927	15100	19700
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	967	16400	21300
210	(205)	236 (231)	262 (257)	17,5	45	40	215 (210)	238,5 (233,5)	1004	17500	22700
210	(205)	239 (234)	268 (263)	20	45	40	215 (210)	241,5 (236,5)	1035	18800	24300
210	(205)	239 (234)	268 (263)	20	45	40	215 (210)	241,5 (236,5)	1071	20100	25900
210		236	262	17,5	30	40	215	238,5	1002	10700	14700
210		236	262	17,5	30	40	215	238,5	1059	12700	17100
210		236	262	17,5	30	40	215	238,5	1114	14600	19500
220	(215)	246 (241)	272 (267)	17,5	50	40	225 (220)	248,5 (243,5)	1215	16100	21300
220	(215)	246 (241)	272 (267)	17,5	50	40	225 (220)	248,5 (243,5)	1261	18000	23600
220	(215)	249 (244)	278 (273)	20	50	40	225 (220)	251,5 (246,5)	1337	19400	25200
220	(215)	249 (244)	278 (273)	20	50	40	225 (220)	251,5 (246,5)	1308	21100	27400
220	(215)	252 (247)	284 (279)	22	50	40	225 (220)	254,5 (249,5)	1426	22900	29600

SHUTON-IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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

*Masses indicated on a single VERTICAL AXIS WITHOUT counterweight for a life of 50000 hours (≈6 years) in OPERATION at 95% reliability with an average rotation speed of 100rpm and 50rpm depending on the column. For other average operating speeds, or ball screws with counterweight, or ball screws in parallel, consult SHUTON-IPIRANGA.

COMPLEX TDA Double assymetric nut, vertical axes without counterweight with medium loads and low speed, W axes

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*	$C_{a,I}/C_{a,P}$ *[kN]*	$C_{oa,I}/C_{oa,P}$ *[kN]*	$R_{b/t}$ *[N/µm]*	R_{nut} *[N/µm]*	$L_{n,std}$ *[mm]*
HDL TDA-B 140-25-19-14	1	140	25	19,05	124,1	14+3	1785/474	6441/1380	17610	16470	543
HDL TDA-B 140-25-19-15	1	140	25	19,05	124,1	15+3	1900/476	6936/1387	18590	17380	568
HDL TDA-U 160-20-15-6	1	160	20	15,875	147,1	6+3	718/395	2637/1319	10470	9190	272
HDL TDA-B 160-20-15-7	1	160	20	15,875	147,1	7+3	787/380	2904/1244	11250	10060	309
HDL TDA-B 160-20-15-8	1	160	20	15,875	147,1	8+3	891/383	3367/1263	12370	11060	329
HDL TDA-B 160-20-15-9	1	160	20	15,875	147,1	9+3	993/386	3830/1277	13460	12040	349
HDL TDA-B 160-20-15-10	1	160	20	15,875	147,1	10+3	1069/380	4152/1246	14270	12790	365
HDL TDA-B 160-20-15-11	1	160	20	15,875	147,1	11+3	1166/381	4601/1255	15260	13690	385
HDL TDA-B 160-20-15-12	1	160	20	15,875	147,1	12+3	1271/386	5106/1277	16420	14730	405
HDL TDA-B 160-20-15-13	1	160	20	15,875	147,1	13+3	1351/383	5471/1262	17260	15500	427
HDL TDA-B 160-20-15-14	1	160	20	15,875	147,1	14+3	1440/383	5892/1263	18280	16420	447
HDL TDA-B 160-20-15-15	1	160	20	15,875	147,1	15+3	1539/386	6383/1277	19360	17390	465
HDL TDA-U 160-25-19-6	1	160	25	19,05	144,1	6+3	930/512	3219/1609	11110	10110	329
HDL TDA-U 160-25-19-7	1	160	25	19,05	144,1	7+3	1065/514	3779/1620	12180	11090	354
HDL TDA-B 160-25-19-8	1	160	25	19,05	144,1	8+3	1171/504	4194/1573	13310	12240	400
HDL TDA-B 160-25-19-9	1	160	25	19,05	144,1	9+3	1275/496	4610/1537	14110	13000	420
HDL TDA-B 160-25-19-10	1	160	25	19,05	144,1	10+3	1404/499	5170/1551	15350	14150	445
HDL TDA-B 160-25-19-11	1	160	25	19,05	144,1	11+3	1531/501	5731/1563	16450	15170	470
HDL TDA-B 160-25-19-12	1	160	25	19,05	144,1	12+3	1657/503	6292/1573	17550	16180	484
HDL TDA-B 160-25-19-13	1	160	25	19,05	144,1	13+3	1760/499	6728/1553	18480	17060	523
HDL TDA-B 160-25-19-14	1	160	25	19,05	144,1	14+3	1886/501	7309/1566	19570	18070	548
HDL TDA-B 160-25-19-15	1	160	25	19,05	144,1	15+3	2012/504	7891/1578	20670	19090	573

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TDA	Mass to move	
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]	M_{100rpm} [kg]	M_{50rpm} [kg]
220	(215)	252 (247)	284 (279)	22	50	40	225 (220)	254,5 (249,5)	1482	24600	31800
220	(215)	252 (247)	284 (279)	22	50	40	225 (220)	254,5 (249,5)	1539	26300	33900
220		246	272	17,5	30	40	225	248,5	671	8800	12100
230		256	282	17,5	45	40	235	258,5	913	10000	13500
230		256	282	17,5	45	40	235	258,5	942	11600	15500
230		256	282	17,5	45	40	235	258,5	974	13200	17400
230		256	282	17,5	45	40	235	258,5	1016	14300	18800
230		256	282	17,5	45	40	235	258,5	1058	15800	20600
230		259	288	20	45	40	235	261,5	1091	17300	22500
230		259	288	20	45	40	235	261,5	1153	18500	24000
230		262	294	22	45	40	235	264,5	1193	19800	25600
230		262	294	22	45	40	235	264,5	1228	21300	27500
230		256	282	17,5	30	40	235	258,5	1147	11400	15700
230		256	282	17,5	30	40	235	258,5	1203	13500	18300
240	(235)	266 (261)	292 (287)	17,5	50	40	245 (240)	268,5 (263,5)	1319	15300	20300
240	(235)	269 (264)	298 (293)	20	50	40	245 (240)	271,5 (266,5)	1397	16900	22300
240	(235)	269 (264)	298 (293)	20	50	40	245 (240)	271,5 (266,5)	1440	18800	24700
240	(235)	272 (267)	304 (299)	22	50	40	245 (240)	274,5 (269,5)	1499	20700	27000
240	(235)	272 (267)	304 (299)	22	50	40	245 (240)	274,5 (269,5)	1482	22600	29300
240	(235)	272 (267)	304 (299)	22	50	40	245 (240)	274,5 (269,5)	1652	24100	31200
240	(235)	272 (267)	304 (299)	22	50	40	245 (240)	274,5 (269,5)	1715	26000	33600
240	(235)	272 (267)	304 (299)	22	50	40	245 (240)	274,5 (269,5)	1780	27900	35900

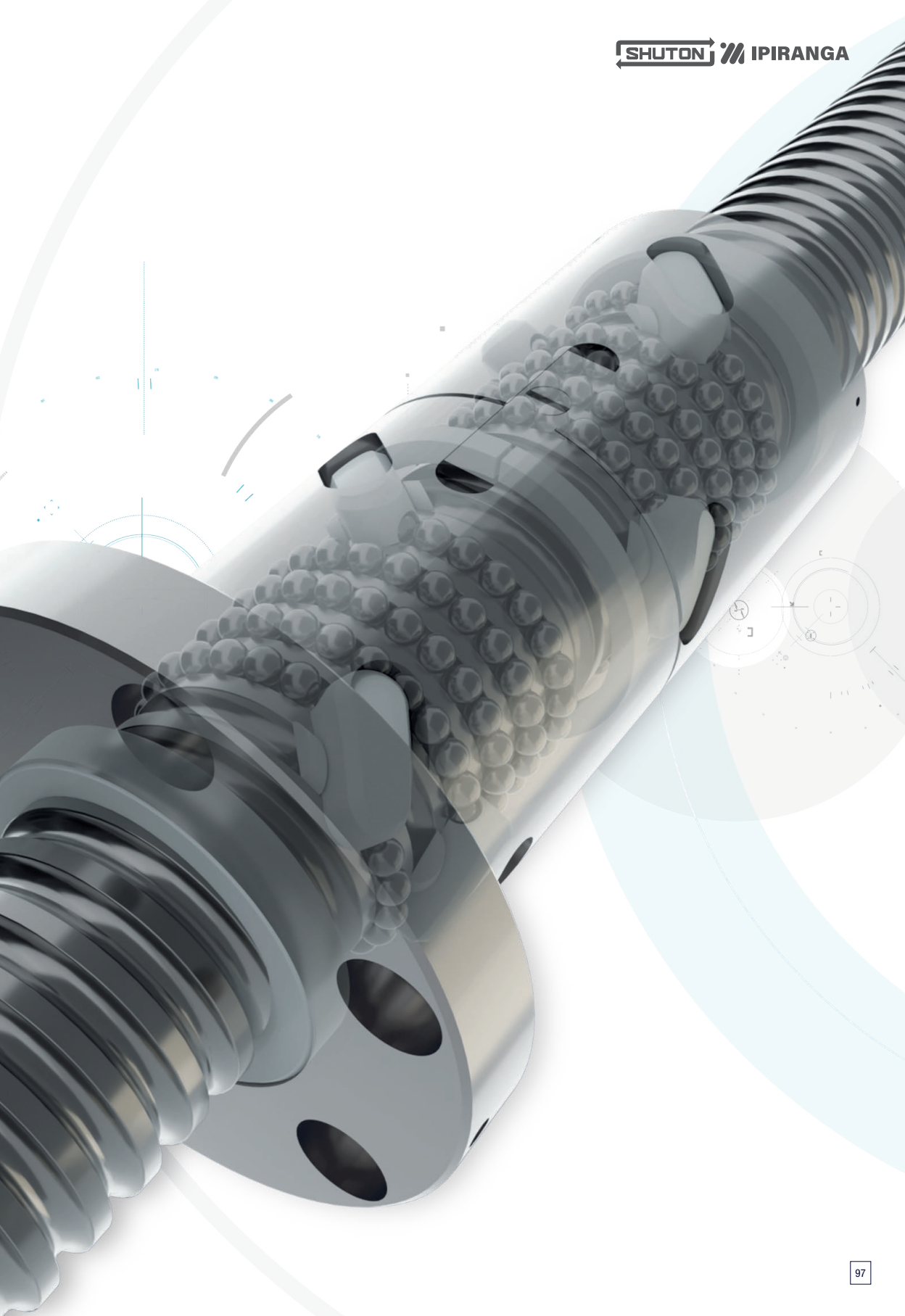
SHUTON-IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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

*Masses indicated on a single VERTICAL AXIS WITHOUT counterweight for a life of 50000 hours (≈6 years) in OPERATION at 95% reliability with an average rotation speed of 100rpm and 50rpm depending on the column. For other average operating speeds, or ball screws with counterweight, or ball screws in parallel, consult SHUTON-IPIRANGA.

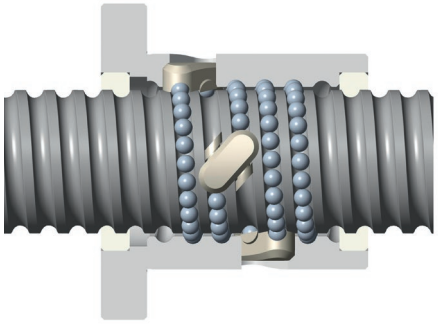
PRIME TECHNOLOGY

Fine-lead high precision ball screws for precise positioning and average dynamics demand applications, such as grinding machines and EDM machines that ensure smooth rotation in short strokes.



PRIME TECHNOLOGY

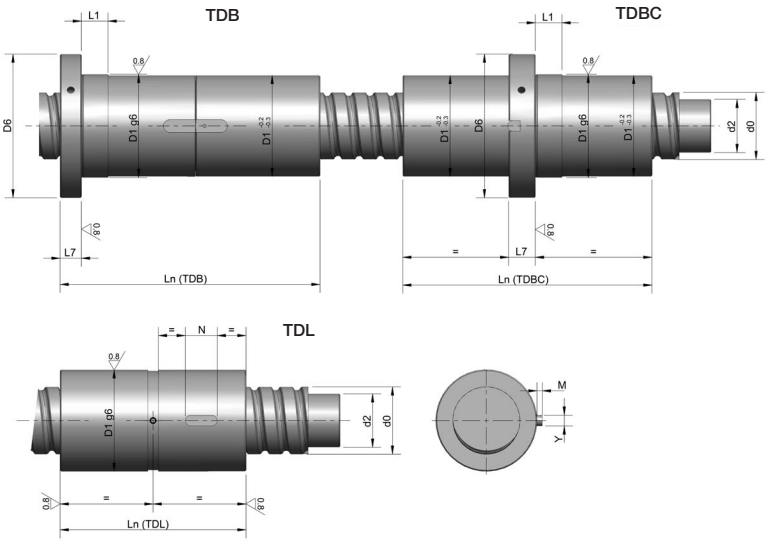
S-type recirculation system



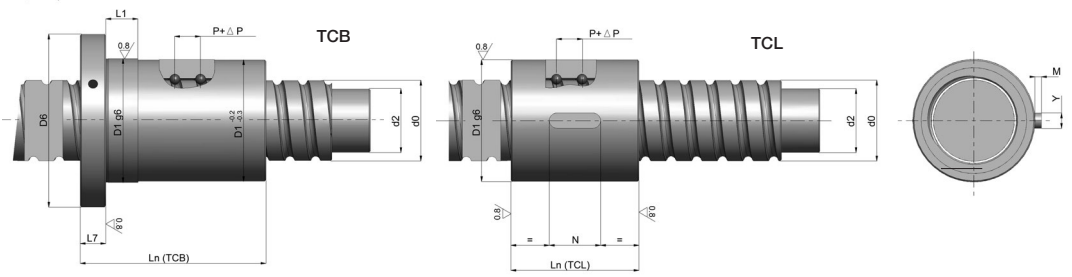
Types of PRIME nuts depending on application:

Technology	Sectors	Features	Preload	Nut type	Recirc.	Diameter	Pitch	Ball size	Application
PRIME	Machine tool Grinding machines EDM machines	High precision ball screws DN of 100.000 → For precise positioning and average dynamics demand	YES	TC Compact Nut (1 start)	S	20-100	5-20	3-9	General Machine tool application, with short nut length. Improved T9
				TD Double Nut (1 start)					General Machine tool application. Possibility of greater circuit quantity

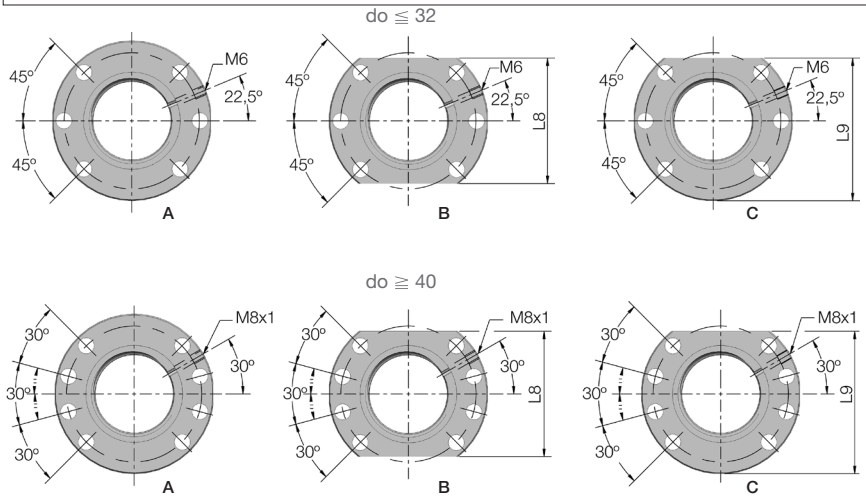
PRIME Double nut



PRIME Compact nut



Flange design



PRIME, TD Double Nut, TC Compact 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]
TCB-S 20-5-3-2	1	20	5	3,175	17,8	2	8800	13400	460	430	57
TDB-S 20-5-3-2	1	20	5	3,175	17,8	2	8800	13400	460	430	66
TCB-S 20-5-3-3	1	20	5	3,175	17,8	3	12000	20400	680	650	68
TDB-S 20-5-3-3	1	20	5	3,175	17,8	3	12000	20400	680	650	79
TDB-S 20-5-3-4	1	20	5	3,175	17,8	4	15300	27600	920	870	89
TDB-S 20-5-3-5	1	20	5	3,175	17,8	5	18500	35100	1160	1110	96
TDB-S 20-5-3-6	1	20	5	3,175	17,8	6	21800	42700	1410	1350	109
TCB-S 20-5-4-2	1	20	5	3,969	17	2	11900	16600	460	430	58
TDB-S 20-5-4-2	1	20	5	3,969	17	2	11900	16600	460	430	66
TCB-S 20-5-4-3	1	20	5	3,969	17	3	16100	24900	660	620	68
TDB-S 20-5-4-3	1	20	5	3,969	17	3	16100	24900	660	620	78
TDB-S 20-5-4-4	1	20	5	3,969	17	4	20300	33200	860	820	89
TDB-S 20-5-4-5	1	20	5	3,969	17	5	24400	41500	1070	1010	99
TDB-S 20-5-4-6	1	20	5	3,969	17	6	28500	49800	1270	1200	109
TCB-S 25-5-3-2	1	25	5	3,175	22,8	2	10000	17500	570	530	57
TDB-S 25-5-3-2	1	25	5	3,175	22,8	2	10000	17500	570	530	66
TCB-S 25-5-3-3	1	25	5	3,175	22,8	3	13600	26700	850	790	68
TDB-S 25-5-3-3	1	25	5	3,175	22,8	3	13600	26700	850	790	78
TCB-S 25-5-3-4	1	25	5	3,175	22,8	4	17300	36200	1150	1070	79
TDB-S 25-5-3-4	1	25	5	3,175	22,8	4	17300	36200	1150	1070	88
TDB-S 25-5-3-5	1	25	5	3,175	22,8	5	21000	45900	1450	1360	98
TDB-S 25-5-3-6	1	25	5	3,175	22,8	6	24700	55900	1770	1660	110
TCB-S 25-5-4-2	1	25	5	3,969	22	2	13800	22000	580	530	58
TDB-S 25-5-4-2	1	25	5	3,969	22	2	13800	22000	580	530	66
TCB-S 25-5-4-3	1	25	5	3,969	22	3	18600	33000	840	770	68
TDB-S 25-5-4-3	1	25	5	3,969	22	3	18600	33000	840	770	78
TCB-S 25-5-4-4	1	25	5	3,969	22	4	23500	44100	1100	1020	79
TDB-S 25-5-4-4	1	25	5	3,969	22	4	23500	44100	1100	1020	89
TDB-S 25-5-4-5	1	25	5	3,969	22	5	28300	55100	1360	1260	99
TDB-S 25-5-4-6	1	25	5	3,969	22	6	33000	66100	1620	1490	109
TCB-S 32-5-3-2	1	32	5	3,175	29,8	2	11300	23400	720	660	57
TDB-S 32-5-3-2	1	32	5	3,175	29,8	2	11300	23400	720	660	73
TCB-S 32-5-3-3	1	32	5	3,175	29,8	3	15500	35600	1080	990	68
TDB-S 32-5-3-3	1	32	5	3,175	29,8	3	15500	35600	1080	990	86
TCB-S 32-5-3-4	1	32	5	3,175	29,8	4	19700	48200	1450	1330	79
TDB-S 32-5-3-4	1	32	5	3,175	29,8	4	19700	48200	1450	1330	96
TCB-S 32-5-3-5	1	32	5	3,175	29,8	5	23900	61100	1840	1690	89
TDB-S 32-5-3-5	1	32	5	3,175	29,8	5	23900	61100	1840	1690	107

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
36		47	58	6,6	12	10	44	51	1,6 ~ 2,5
36		47	58	6,6	10	10	44	51	2 ~ 3,1
36		47	58	6,6	12	10	44	51	1,9 ~ 2,9
36		47	58	6,6	10	10	44	51	2,4 ~ 3,7
36		47	58	6,6	10	10	44	51	2,7 ~ 4,1
36		47	58	6,6	10	10	44	51	2,8 ~ 4,3
36		47	58	6,6	10	10	44	51	3,2 ~ 4,8
36		47	58	6,6	12	10	44	51	2,2 ~ 3,4
36		47	58	6,6	10	10	44	51	2,7 ~ 4,1
36		47	58	6,6	12	10	44	51	2,6 ~ 3,9
36		47	58	6,6	10	10	44	51	3,2 ~ 4,8
36		47	58	6,6	10	10	44	51	3,6 ~ 5,4
36		47	58	6,6	10	10	44	51	3,9 ~ 5,9
36		47	58	6,6	10	10	44	51	4,3 ~ 6,4
40		51	62	6,6	12	10	48	55	2 ~ 3
40		51	62	6,6	10	10	48	55	2,5 ~ 3,7
40		51	62	6,6	12	10	48	55	2,4 ~ 3,6
40		51	62	6,6	10	10	48	55	2,9 ~ 4,4
40		51	62	6,6	12	10	48	55	2,7 ~ 4,1
40		51	62	6,6	10	10	48	55	3,2 ~ 4,8
40		51	62	6,6	10	10	48	55	3,5 ~ 5,3
40		51	62	6,6	10	10	48	55	4 ~ 6
40		51	62	6,6	12	10	48	55	2,7 ~ 4,1
40		51	62	6,6	10	10	48	55	3,3 ~ 5
40		51	62	6,6	12	10	48	55	3,1 ~ 4,7
40		51	62	6,6	10	10	48	55	3,9 ~ 5,8
40		51	62	6,6	12	10	48	55	3,6 ~ 5,4
40		51	62	6,6	10	10	48	55	4,3 ~ 6,5
40		51	62	6,6	10	10	48	55	4,7 ~ 7,1
40		51	62	6,6	10	10	48	55	5,1 ~ 7,7
50		65	80	9	12	10	62	71	2,5 ~ 3,8
50		65	80	9	12	10	62	71	3,6 ~ 5,4
50		65	80	9	12	10	62	71	3 ~ 4,4
50		65	80	9	12	10	62	71	4,2 ~ 6,3
50		65	80	9	12	10	62	71	3,4 ~ 5,1
50		65	80	9	12	10	62	71	4,6 ~ 6,9
50		65	80	9	12	10	62	71	3,8 ~ 5,7
50		65	80	9	12	10	62	71	5 ~ 7,6

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TCB-S 32-5-3-6	1	32	5	3,175	29,8	6	28100	74300	2240	2070	100
TDB-S 32-5-3-6	1	32	5	3,175	29,8	6	28100	74300	2240	2070	117
TCB-S 32-5-3-7	1	32	5	3,175	29,8	7	32200	87900	2650	2460	111
TDB-S 32-5-3-7	1	32	5	3,175	29,8	7	32200	87900	2650	2460	127
TCB-S 32-5-3-8	1	32	5	3,175	29,8	8	36100	100400	3010	2800	119
TDB-S 32-5-3-8	1	32	5	3,175	29,8	8	36100	100400	3010	2800	137
TCB-S 32-5-4-2	1	32	5	3,969	29	2	16000	30200	760	680	58
TDB-S 32-5-4-2	1	32	5	3,969	29	2	16000	30200	760	680	74
TCB-S 32-5-4-3	1	32	5	3,969	29	3	21600	45300	1100	990	68
TDB-S 32-5-4-3	1	32	5	3,969	29	3	21600	45300	1100	990	85
TCB-S 32-5-4-4	1	32	5	3,969	29	4	27300	60400	1430	1290	79
TDB-S 32-5-4-4	1	32	5	3,969	29	4	27300	60400	1430	1290	96
TCB-S 32-5-4-5	1	32	5	3,969	29	5	33000	75500	1770	1600	89
TDB-S 32-5-4-5	1	32	5	3,969	29	5	33000	75500	1770	1600	107
TCB-S 32-5-4-6	1	32	5	3,969	29	6	38500	90600	2110	1910	100
TDB-S 32-5-4-6	1	32	5	3,969	29	6	38500	90600	2110	1910	117
TCB-S 32-5-4-7	1	32	5	3,969	29	7	43900	105700	2440	2210	111
TDB-S 32-5-4-7	1	32	5	3,969	29	7	43900	105700	2440	2210	127
TCB-S 32-5-4-8	1	32	5	3,969	29	8	49200	120800	2770	2510	119
TDB-S 32-5-4-8	1	32	5	3,969	29	8	49200	120800	2770	2510	137
TCB-S 32-6-4-2	1	32	6	3,969	29,2	2	16100	30300	760	690	65
TDB-S 32-6-4-2	1	32	6	3,969	29,2	2	16100	30300	760	690	80
TCB-S 32-6-4-3	1	32	6	3,969	29,2	3	21900	46200	1130	1040	78
TDB-S 32-6-4-3	1	32	6	3,969	29,2	3	21900	46200	1130	1040	94
TCB-S 32-6-4-4	1	32	6	3,969	29,2	4	27800	62500	1510	1400	87
TDB-S 32-6-4-4	1	32	6	3,969	29,2	4	27800	62500	1510	1400	107
TCB-S 32-6-4-5	1	32	6	3,969	29,2	5	33800	79100	1920	1770	103
TDB-S 32-6-4-5	1	32	6	3,969	29,2	5	33800	79100	1920	1770	120
TCB-S 32-6-4-6	1	32	6	3,969	29,2	6	39700	96200	2330	2160	115
TDB-S 32-6-4-6	1	32	6	3,969	29,2	6	39700	96200	2330	2160	132
TCB-S 32-10-6-2	1	32	10	6,35	27,6	2	26000	39100	640	600	97
TDB-S 32-10-6-2	1	32	10	6,35	27,6	2	26000	39100	640	600	117
TCB-S 32-10-6-3	1	32	10	6,35	27,6	3	35300	59300	940	880	112
TDB-S 32-10-6-3	1	32	10	6,35	27,6	3	35300	59300	940	880	137
TDB-S 32-10-6-4	1	32	10	6,35	27,6	4	44900	79800	1250	1180	157
TDB-S 32-10-6-5	1	32	10	6,35	27,6	5	54500	100600	1570	1490	177
TDB-S 32-10-6-6	1	32	10	6,35	27,6	6	63900	121900	1900	1800	205
TCB-S 40-5-3-2	1	40	5	3,175	37,8	2	12600	30000	890	790	59

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	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	4,2 ~ 6,4
50		65	80	9	12	10	62	71	5,4 ~ 8,1
50		65	80	9	12	10	62	71	4,7 ~ 7
50		65	80	9	12	10	62	71	5,8 ~ 8,7
50		65	80	9	12	10	62	71	4,9 ~ 7,4
50		65	80	9	12	10	62	71	6,2 ~ 9,3
50		65	80	9	12	10	62	71	3,4 ~ 5,1
50		65	80	9	12	10	62	71	4,9 ~ 7,3
50		65	80	9	12	10	62	71	3,8 ~ 5,8
50		65	80	9	12	10	62	71	5,4 ~ 8,2
50		65	80	9	12	10	62	71	4,4 ~ 6,6
50		65	80	9	12	10	62	71	6 ~ 9
50		65	80	9	12	10	62	71	4,9 ~ 7,3
50		65	80	9	12	10	62	71	6,5 ~ 9,8
50		65	80	9	12	10	62	71	5,4 ~ 8,1
50		65	80	9	12	10	62	71	7 ~ 11
50		65	80	9	12	10	62	71	6 ~ 8,9
50		65	80	9	12	10	62	71	7,5 ~ 11
50		65	80	9	12	10	62	71	6,2 ~ 9,4
50		65	80	9	12	10	62	71	7,9 ~ 12
50		65	80	9	12	10	62	71	3,7 ~ 5,6
50		65	80	9	12	10	62	71	5 ~ 7,6
50		65	80	9	12	10	62	71	4,4 ~ 6,6
50		65	80	9	12	10	62	71	5,8 ~ 8,7
50		65	80	9	12	10	62	71	4,7 ~ 7
50		65	80	9	12	10	62	71	6,5 ~ 9,7
50		65	80	9	12	10	62	71	5,6 ~ 8,4
50		65	80	9	12	10	62	71	7,1 ~ 11
50		65	80	9	12	10	62	71	6,2 ~ 9,3
50		65	80	9	12	10	62	71	7,7 ~ 12
50		65	80	9	14	16	62	71	8,8 ~ 13
50		65	80	9	14	16	62	71	12 ~ 17
50		65	80	9	14	16	62	71	9,9 ~ 15
50		65	80	9	14	16	62	71	13 ~ 20
50		65	80	9	14	16	62	71	15 ~ 23
50		65	80	9	14	16	62	71	17 ~ 25
50		65	80	9	14	16	62	71	20 ~ 30
63		78	93	9	14	10	70	81,5	3,3 ~ 4,9

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 40-5-3-2	1	40	5	3,175	37,8	2	12600	30000	890	790	77
TCB-S 40-5-3-3	1	40	5	3,175	37,8	3	17200	45700	1320	1190	70
TDB-S 40-5-3-3	1	40	5	3,175	37,8	3	17200	45700	1320	1190	88
TCB-S 40-5-3-4	1	40	5	3,175	37,8	4	21900	61900	1780	1610	81
TDB-S 40-5-3-4	1	40	5	3,175	37,8	4	21900	61900	1780	1610	99
TCB-S 40-5-3-5	1	40	5	3,175	37,8	5	26500	78500	2250	2050	91
TDB-S 40-5-3-5	1	40	5	3,175	37,8	5	26500	78500	2250	2050	109
TCB-S 40-5-3-6	1	40	5	3,175	37,8	6	31200	95500	2750	2510	103
TDB-S 40-5-3-6	1	40	5	3,175	37,8	6	31200	95500	2750	2510	119
TCB-S 40-5-3-7	1	40	5	3,175	37,8	7	35800	112900	3250	2980	113
TDB-S 40-5-3-7	1	40	5	3,175	37,8	7	35800	112900	3250	2980	130
TCB-S 40-5-3-8	1	40	5	3,175	37,8	8	40100	129000	3690	3390	124
TDB-S 40-5-3-8	1	40	5	3,175	37,8	8	40100	129000	3690	3390	140
TCB-S 40-5-4-2	1	40	5	3,969	37	2	17800	38400	920	810	60
TDB-S 40-5-4-2	1	40	5	3,969	37	2	17800	38400	920	810	77
TCB-S 40-5-4-3	1	40	5	3,969	37	3	24000	57600	1330	1180	70
TDB-S 40-5-4-3	1	40	5	3,969	37	3	24000	57600	1330	1180	88
TCB-S 40-5-4-4	1	40	5	3,969	37	4	30300	76900	1750	1550	81
TDB-S 40-5-4-4	1	40	5	3,969	37	4	30300	76900	1750	1550	99
TCB-S 40-5-4-5	1	40	5	3,969	37	5	36500	96100	2160	1920	91
TDB-S 40-5-4-5	1	40	5	3,969	37	5	36500	96100	2160	1920	110
TCB-S 40-5-4-6	1	40	5	3,969	37	6	42600	115300	2560	2290	102
TDB-S 40-5-4-6	1	40	5	3,969	37	6	42600	115300	2560	2290	120
TCB-S 40-5-4-7	1	40	5	3,969	37	7	48600	134500	2970	2650	113
TDB-S 40-5-4-7	1	40	5	3,969	37	7	48600	134500	2970	2650	130
TCB-S 40-5-4-8	1	40	5	3,969	37	8	54500	153700	3370	3010	124
TDB-S 40-5-4-8	1	40	5	3,969	37	8	54500	153700	3370	3010	140
TCB-S 40-6-4-2	1	40	6	3,969	37,2	2	17800	38600	920	830	67
TDB-S 40-6-4-2	1	40	6	3,969	37,2	2	17800	38600	920	830	83
TCB-S 40-6-4-3	1	40	6	3,969	37,2	3	24200	58800	1370	1240	79
TDB-S 40-6-4-3	1	40	6	3,969	37,2	3	24200	58800	1370	1240	97
TCB-S 40-6-4-4	1	40	6	3,969	37,2	4	30800	79500	1840	1680	91
TDB-S 40-6-4-4	1	40	6	3,969	37,2	4	30800	79500	1840	1680	110
TCB-S 40-6-4-5	1	40	6	3,969	37,2	5	37400	100700	2330	2130	105
TDB-S 40-6-4-5	1	40	6	3,969	37,2	5	37400	100700	2330	2130	122
TCB-S 40-6-4-6	1	40	6	3,969	37,2	6	44000	122400	2840	2610	117
TDB-S 40-6-4-6	1	40	6	3,969	37,2	6	44000	122400	2840	2610	135
TCB-S 40-8-5-2	1	40	8	4,762	36,7	2	22600	45200	910	830	82

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
63		78	93	9	14	10	70	81,5	4,8 ~ 7,2
63		78	93	9	14	10	70	81,5	3,8 ~ 5,7
63		78	93	9	14	10	70	81,5	5,4 ~ 8
63		78	93	9	14	10	70	81,5	4,4 ~ 6,5
63		78	93	9	14	10	70	81,5	5,9 ~ 8,9
63		78	93	9	14	10	70	81,5	4,8 ~ 7,2
63		78	93	9	14	10	70	81,5	6,4 ~ 9,5
63		78	93	9	14	10	70	81,5	5,4 ~ 8,2
63		78	93	9	14	10	70	81,5	6,8 ~ 10
63		78	93	9	14	10	70	81,5	5,9 ~ 8,9
63		78	93	9	14	10	70	81,5	7,4 ~ 11
63		78	93	9	14	10	70	81,5	6,5 ~ 9,7
63		78	93	9	14	10	70	81,5	7,8 ~ 12
63		78	93	9	14	10	70	81,5	4,4 ~ 6,6
63		78	93	9	14	10	70	81,5	6,4 ~ 9,6
63		78	93	9	14	10	70	81,5	4,9 ~ 7,4
63		78	93	9	14	10	70	81,5	7,1 ~ 11
63		78	93	9	14	10	70	81,5	5,6 ~ 8,4
63		78	93	9	14	10	70	81,5	7,7 ~ 12
63		78	93	9	14	10	70	81,5	6,2 ~ 9,3
63		78	93	9	14	10	70	81,5	8,4 ~ 13
63		78	93	9	14	10	70	81,5	6,9 ~ 10
63		78	93	9	14	10	70	81,5	9 ~ 13
63		78	93	9	14	10	70	81,5	7,5 ~ 11
63		78	93	9	14	10	70	81,5	9,5 ~ 14
63		78	93	9	14	10	70	81,5	8,2 ~ 12
63		78	93	9	14	10	70	81,5	10 ~ 15
63		78	93	9	14	10	70	81,5	4,8 ~ 7,2
63		78	93	9	14	10	70	81,5	6,5 ~ 9,8
63		78	93	9	14	10	70	81,5	5,5 ~ 8,2
63		78	93	9	14	10	70	81,5	7,5 ~ 11
63		78	93	9	14	10	70	81,5	6,2 ~ 9,3
63		78	93	9	14	10	70	81,5	8,3 ~ 12
63		78	93	9	14	10	70	81,5	7,1 ~ 11
63		78	93	9	14	10	70	81,5	9 ~ 13
63		78	93	9	14	10	70	81,5	7,8 ~ 12
63		78	93	9	14	10	70	81,5	9,8 ~ 15
63		78	93	9	14	10	70	81,5	6,6 ~ 9,9

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 40-8-5-2	1	40	8	4,762	36,7	2	22600	45200	910	830	99
TCB-S 40-8-5-3	1	40	8	4,762	36,7	3	30800	68600	1350	1240	99
TDB-S 40-8-5-3	1	40	8	4,762	36,7	3	30800	68600	1350	1240	117
TCB-S 40-8-5-4	1	40	8	4,762	36,7	4	39100	92700	1800	1670	115
TDB-S 40-8-5-4	1	40	8	4,762	36,7	4	39100	92700	1800	1670	134
TCB-S 40-8-5-5	1	40	8	4,762	36,7	5	47500	117300	2280	2110	132
TDB-S 40-8-5-5	1	40	8	4,762	36,7	5	47500	117300	2280	2110	150
TDB-S 40-8-5-6	1	40	8	4,762	36,7	6	55800	142400	2760	2570	169
TDB-S 40-8-5-7	1	40	8	4,762	36,7	7	64000	168100	3260	3050	185
TCB-S 40-10-6-2	1	40	10	6,35	35,6	2	30100	52000	810	760	101
TDB-S 40-10-6-2	1	40	10	6,35	35,6	2	30100	52000	810	760	119
TCB-S 40-10-6-3	1	40	10	6,35	35,6	3	40900	78800	1200	1120	123
TDB-S 40-10-6-3	1	40	10	6,35	35,6	3	40900	78800	1200	1120	139
TCB-S 40-10-6-4	1	40	10	6,35	35,6	4	52000	106000	1600	1500	138
TDB-S 40-10-6-4	1	40	10	6,35	35,6	4	52000	106000	1600	1500	164
TCB-S 40-10-6-5	1	40	10	6,35	35,6	5	63100	133700	2010	1880	161
TDB-S 40-10-6-5	1	40	10	6,35	35,6	5	63100	133700	2010	1880	184
TDB-S 40-10-6-6	1	40	10	6,35	35,6	6	74000	161800	2420	2270	205
TDB-S 40-10-6-7	1	40	10	6,35	35,6	7	84800	190400	2850	2680	227
TDB-S 40-10-6-8	1	40	10	6,35	35,6	8	95000	217700	3230	3040	248
TCB-S 40-10-7-2	1	40	10	7,144	33,9	2	38200	65100	970	910	103
TDB-S 40-10-7-2	1	40	10	7,144	33,9	2	38200	65100	970	910	119
TCB-S 40-10-7-3	1	40	10	7,144	33,9	3	51800	98400	1420	1330	123
TDB-S 40-10-7-3	1	40	10	7,144	33,9	3	51800	98400	1420	1330	142
TCB-S 40-10-7-4	1	40	10	7,144	33,9	4	65800	132100	1880	1780	144
TDB-S 40-10-7-4	1	40	10	7,144	33,9	4	65800	132100	1880	1780	164
TDB-S 40-10-7-5	1	40	10	7,144	33,9	5	79600	166400	2350	2220	185
TDB-S 40-10-7-6	1	40	10	7,144	33,9	6	93300	201100	2830	2680	205
TDB-S 40-10-7-7	1	40	10	7,144	33,9	7	106800	236300	3320	3150	225
TDB-S 40-10-7-8	1	40	10	7,144	33,9	8	119700	270000	3770	3570	246
TCB-S 40-12-6-2	1	40	12	6,35	35,6	2	30100	51900	810	760	114
TDB-S 40-12-6-2	1	40	12	6,35	35,6	2	30100	51900	810	760	123
TCB-S 40-12-6-3	1	40	12	6,35	35,6	3	40900	78700	1200	1130	138
TDB-S 40-12-6-3	1	40	12	6,35	35,6	3	40900	78700	1200	1130	151
TCB-S 40-12-6-4	1	40	12	6,35	35,6	4	51900	105900	1590	1510	156
TDB-S 40-12-6-4	1	40	12	6,35	35,6	4	51900	105900	1590	1510	175
TDB-S 40-12-6-5	1	40	12	6,35	35,6	5	63000	133500	2000	1900	200
TDB-S 40-12-6-6	1	40	12	6,35	35,6	6	73900	161600	2420	2290	227

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
63		78	93	9	14	10	70	81,5	8,8 ~ 13
63		78	93	9	14	10	70	81,5	7,9 ~ 12
63		78	93	9	14	10	70	81,5	10 ~ 15
63		78	93	9	14	10	70	81,5	9,1 ~ 14
63		78	93	9	14	10	70	81,5	11 ~ 17
63		78	93	9	14	10	70	81,5	10 ~ 16
63		78	93	9	14	10	70	81,5	13 ~ 19
63		78	93	9	14	10	70	81,5	14 ~ 21
63		78	93	9	14	10	70	81,5	15 ~ 23
63		78	93	9	18	16	70	81,5	11 ~ 17
63		78	93	9	14	16	70	81,5	15 ~ 22
63		78	93	9	18	16	70	81,5	14 ~ 21
63		78	93	9	14	16	70	81,5	17 ~ 25
63		78	93	9	18	16	70	81,5	15 ~ 22
63		78	93	9	14	16	70	81,5	20 ~ 29
63		78	93	9	18	16	70	81,5	18 ~ 26
63		78	93	9	14	16	70	81,5	22 ~ 32
63		78	93	9	14	16	70	81,5	24 ~ 36
63		78	93	9	14	16	70	81,5	26 ~ 39
63		78	93	9	14	16	70	81,5	29 ~ 43
63		78	93	9	18	16	70	81,5	13 ~ 20
63		78	93	9	14	16	70	81,5	16 ~ 24
63		78	93	9	18	16	70	81,5	15 ~ 23
63		78	93	9	14	16	70	81,5	19 ~ 28
63		78	93	9	18	16	70	81,5	17 ~ 26
63		78	93	9	14	16	70	81,5	21 ~ 32
63		78	93	9	14	16	70	81,5	23 ~ 35
63		78	93	9	14	16	70	81,5	25 ~ 38
63		78	93	9	14	16	70	81,5	27 ~ 41
63		78	93	9	14	16	70	81,5	30 ~ 44
63		78	93	9	18	20	70	81,5	12 ~ 19
63		78	93	9	14	20	70	81,5	14 ~ 21
63		78	93	9	18	20	70	81,5	15 ~ 22
63		78	93	9	14	20	70	81,5	17 ~ 25
63		78	93	9	18	20	70	81,5	16 ~ 24
63		78	93	9	14	20	70	81,5	19 ~ 29
63		78	93	9	14	20	70	81,5	22 ~ 33
63		78	93	9	14	20	70	81,5	25 ~ 37

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TCB-S 40-16-6-2	1	40	16	6,35	35,6	2	28600	48100	710	670	122
TDB-S 40-16-6-2	1	40	16	6,35	35,6	2	28600	48100	710	670	145
TCB-S 40-16-6-3	1	40	16	6,35	35,6	3	38600	72200	1020	970	159
TDB-S 40-16-6-3	1	40	16	6,35	35,6	3	38600	72200	1020	970	180
TDB-S 40-16-6-4	1	40	16	6,35	35,6	4	48700	96200	1340	1280	217
TDB-S 40-16-6-5	1	40	16	6,35	35,6	5	58700	120300	1660	1580	251
TCB-S 40-20-6-2	1	40	20	6,35	35,6	2	29500	50700	740	710	135
TDB-S 40-20-6-2	1	40	20	6,35	35,6	2	29500	50700	740	710	160
TDB-S 40-20-6-3	1	40	20	6,35	35,6	3	39900	76100	1070	1030	204
TDB-S 40-20-6-4	1	40	20	6,35	35,6	4	50400	101500	1400	1350	253
TCB-S 50-5-3-2	1	50	5	3,175	47,8	2	13900	38400	1080	940	63
TDB-S 50-5-3-2	1	50	5	3,175	47,8	2	13900	38400	1080	940	77
TCB-S 50-5-3-3	1	50	5	3,175	47,8	3	19000	58400	1610	1410	74
TDB-S 50-5-3-3	1	50	5	3,175	47,8	3	19000	58400	1610	1410	90
TCB-S 50-5-3-4	1	50	5	3,175	47,8	4	24200	79100	2170	1910	83
TDB-S 50-5-3-4	1	50	5	3,175	47,8	4	24200	79100	2170	1910	101
TCB-S 50-5-3-5	1	50	5	3,175	47,8	5	29300	100300	2740	2430	95
TDB-S 50-5-3-5	1	50	5	3,175	47,8	5	29300	100300	2740	2430	111
TCB-S 50-5-3-6	1	50	5	3,175	47,8	6	34400	122000	3340	2980	107
TDB-S 50-5-3-6	1	50	5	3,175	47,8	6	34400	122000	3340	2980	121
TCB-S 50-5-4-2	1	50	5	3,969	47	2	19800	49400	1130	960	64
TDB-S 50-5-4-2	1	50	5	3,969	47	2	19800	49400	1130	960	79
TCB-S 50-5-4-3	1	50	5	3,969	47	3	26700	74100	1630	1400	74
TDB-S 50-5-4-3	1	50	5	3,969	47	3	26700	74100	1630	1400	90
TCB-S 50-5-4-4	1	50	5	3,969	47	4	33700	98800	2140	1840	85
TDB-S 50-5-4-4	1	50	5	3,969	47	4	33700	98800	2140	1840	101
TCB-S 50-5-4-5	1	50	5	3,969	47	5	40600	123500	2640	2280	95
TDB-S 50-5-4-5	1	50	5	3,969	47	5	40600	123500	2640	2280	112
TCB-S 50-5-4-6	1	50	5	3,969	47	6	47400	148200	3140	2710	106
TDB-S 50-5-4-6	1	50	5	3,969	47	6	47400	148200	3140	2710	122
TCB-S 50-6-4-2	1	50	6	3,969	47,2	2	19800	49600	1130	990	71
TDB-S 50-6-4-2	1	50	6	3,969	47,2	2	19800	49600	1130	990	86
TCB-S 50-6-4-3	1	50	6	3,969	47,2	3	26900	75500	1680	1480	83
TDB-S 50-6-4-3	1	50	6	3,969	47,2	3	26900	75500	1680	1480	100
TCB-S 50-6-4-4	1	50	6	3,969	47,2	4	34300	102100	2260	2000	96
TDB-S 50-6-4-4	1	50	6	3,969	47,2	4	34300	102100	2260	2000	112
TCB-S 50-6-4-5	1	50	6	3,969	47,2	5	41600	129400	2860	2550	109
TDB-S 50-6-4-5	1	50	6	3,969	47,2	5	41600	129400	2860	2550	124

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
63		78	93	9	18	20	70	81,5	12 ~ 18
63		78	93	9	16	20	70	81,5	15 ~ 23
63		78	93	9	18	20	70	81,5	16 ~ 24
63		78	93	9	16	20	70	81,5	19 ~ 28
63		78	93	9	16	20	70	81,5	23 ~ 34
63		78	93	9	16	20	70	81,5	26 ~ 39
63		78	93	9	18	20	70	81,5	12 ~ 19
63		78	93	9	18	20	70	81,5	16 ~ 24
63		78	93	9	18	20	70	81,5	20 ~ 30
63		78	93	9	18	20	70	81,5	25 ~ 38
75		93	110	11	18	10	85	97,5	4,4 ~ 6,7
75		93	110	11	16	10	85	97,5	6 ~ 8,9
75		93	110	11	18	10	85	97,5	5,1 ~ 7,7
75		93	110	11	16	10	85	97,5	6,8 ~ 10
75		93	110	11	18	10	85	97,5	5,6 ~ 8,4
75		93	110	11	16	10	85	97,5	7,5 ~ 11
75		93	110	11	18	10	85	97,5	6,3 ~ 9,5
75		93	110	11	16	10	85	97,5	8,1 ~ 12
75		93	110	11	18	10	85	97,5	7,1 ~ 11
75		93	110	11	16	10	85	97,5	8,6 ~ 13
75		93	110	11	18	10	85	97,5	6 ~ 9
75		93	110	11	16	10	85	97,5	8,2 ~ 12
75		93	110	11	18	10	85	97,5	6,7 ~ 10
75		93	110	11	16	10	85	97,5	9 ~ 13
75		93	110	11	18	10	85	97,5	7,5 ~ 11
75		93	110	11	16	10	85	97,5	9,8 ~ 15
75		93	110	11	18	10	85	97,5	8,1 ~ 12
75		93	110	11	16	10	85	97,5	11 ~ 16
75		93	110	11	18	10	85	97,5	8,9 ~ 13
75		93	110	11	16	10	85	97,5	11 ~ 17
75		93	110	11	18	10	85	97,5	6,4 ~ 9,7
75		93	110	11	16	10	85	97,5	8,5 ~ 13
75		93	110	11	18	10	85	97,5	7,3 ~ 11
75		93	110	11	16	10	85	97,5	9,6 ~ 14
75		93	110	11	18	10	85	97,5	8,3 ~ 12
75		93	110	11	16	10	85	97,5	10 ~ 16
75		93	110	11	18	10	85	97,5	9,2 ~ 14
75		93	110	11	16	10	85	97,5	11 ~ 17

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TCB-S 50-6-4-6	1	50	6	3,969	47,2	6	48900	157300	3480	3120	122
TDB-S 50-6-4-6	1	50	6	3,969	47,2	6	48900	157300	3480	3120	136
TCB-S 50-8-5-2	1	50	8	4,762	46,7	2	25500	58900	1130	1010	87
TDB-S 50-8-5-2	1	50	8	4,762	46,7	2	25500	58900	1130	1010	102
TCB-S 50-8-5-3	1	50	8	4,762	46,7	3	34600	89500	1670	1500	103
TDB-S 50-8-5-3	1	50	8	4,762	46,7	3	34600	89500	1670	1500	120
TCB-S 50-8-5-4	1	50	8	4,762	46,7	4	44100	120800	2240	2030	120
TDB-S 50-8-5-4	1	50	8	4,762	46,7	4	44100	120800	2240	2030	136
TCB-S 50-8-5-5	1	50	8	4,762	46,7	5	53500	152900	2830	2570	136
TDB-S 50-8-5-5	1	50	8	4,762	46,7	5	53500	152900	2830	2570	152
TCB-S 50-8-5-6	1	50	8	4,762	46,7	6	62800	185600	3440	3130	153
TDB-S 50-8-5-6	1	50	8	4,762	46,7	6	62800	185600	3440	3130	169
TCB-S 50-10-6-2	1	50	10	6,35	44,5	2	38900	74100	1340	1240	101
TDB-S 50-10-6-2	1	50	10	6,35	44,5	2	38900	74100	1340	1240	122
TCB-S 50-10-6-3	1	50	10	6,35	44,5	3	52600	111100	1940	1800	123
TDB-S 50-10-6-3	1	50	10	6,35	44,5	3	52600	111100	1940	1800	146
TCB-S 50-10-6-4	1	50	10	6,35	44,5	4	66400	148200	2540	2360	138
TDB-S 50-10-6-4	1	50	10	6,35	44,5	4	66400	148200	2540	2360	167
TCB-S 50-10-6-5	1	50	10	6,35	44,5	5	80000	185200	3130	2910	163
TDB-S 50-10-6-5	1	50	10	6,35	44,5	5	80000	185200	3130	2910	188
TCB-S 50-10-6-6	1	50	10	6,35	44,5	6	93400	222200	3720	3470	185
TDB-S 50-10-6-6	1	50	10	6,35	44,5	6	93400	222200	3720	3470	209
TDB-S 50-10-6-7	1	50	10	6,35	44,5	7	106500	259300	4310	4020	229
TDB-S 50-10-6-8	1	50	10	6,35	44,5	8	119400	296300	4890	4560	250
TCB-S 50-10-7-2	1	50	10	7,144	43,9	2	43000	83600	1190	1100	103
TDB-S 50-10-7-2	1	50	10	7,144	43,9	2	43000	83600	1190	1100	121
TCB-S 50-10-7-3	1	50	10	7,144	43,9	3	58300	126300	1750	1620	123
TDB-S 50-10-7-3	1	50	10	7,144	43,9	3	58300	126300	1750	1620	144
TCB-S 50-10-7-4	1	50	10	7,144	43,9	4	73900	169600	2320	2150	144
TDB-S 50-10-7-4	1	50	10	7,144	43,9	4	73900	169600	2320	2150	166
TDB-S 50-10-7-5	1	50	10	7,144	43,9	5	89400	213600	2900	2700	187
TDB-S 50-10-7-6	1	50	10	7,144	43,9	6	104800	258100	3490	3250	207
TDB-S 50-10-7-7	1	50	10	7,144	43,9	7	119900	303200	4080	3820	227
TDB-S 50-10-7-8	1	50	10	7,144	43,9	8	134400	346500	4640	4340	248
TDB-S 50-10-7-9	1	50	10	7,144	43,9	9	148600	389900	5190	4850	271
TDB-S 50-10-7-10	1	50	10	7,144	43,9	10	162700	433200	5740	5370	293
TCB-S 50-12-8-2	1	50	12	7,938	44,5	2	46300	83900	1020	930	119
TDB-S 50-12-8-2	1	50	12	7,938	44,5	2	46300	83900	1020	930	136

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	18	10	85	97,5	10 ~ 15
75		93	110	11	16	10	85	97,5	12 ~ 18
75		93	110	11	18	10	85	97,5	8,9 ~ 13
75		93	110	11	16	10	85	97,5	11 ~ 17
75		93	110	11	18	10	85	97,5	10 ~ 15
75		93	110	11	16	10	85	97,5	13 ~ 19
75		93	110	11	18	10	85	97,5	12 ~ 18
75		93	110	11	16	10	85	97,5	14 ~ 21
75		93	110	11	18	10	85	97,5	13 ~ 20
75		93	110	11	16	10	85	97,5	16 ~ 24
75		93	110	11	18	10	85	97,5	15 ~ 22
75		93	110	11	16	10	85	97,5	17 ~ 26
75		93	110	11	18	16	85	97,5	12 ~ 18
75		93	110	11	16	16	85	97,5	16 ~ 24
75		93	110	11	18	16	85	97,5	14 ~ 21
75		93	110	11	16	16	85	97,5	18 ~ 28
75		93	110	11	18	16	85	97,5	15 ~ 23
75		93	110	11	16	16	85	97,5	21 ~ 31
75		93	110	11	18	16	85	97,5	18 ~ 27
75		93	110	11	16	16	85	97,5	23 ~ 34
75		93	110	11	18	16	85	97,5	20 ~ 30
75		93	110	11	16	16	85	97,5	25 ~ 37
75		93	110	11	16	16	85	97,5	27 ~ 40
75		93	110	11	16	16	85	97,5	29 ~ 43
75		93	110	11	18	16	85	97,5	16 ~ 24
75		93	110	11	16	16	85	97,5	20 ~ 30
75		93	110	11	18	16	85	97,5	18 ~ 28
75		93	110	11	16	16	85	97,5	23 ~ 35
75		93	110	11	18	16	85	97,5	21 ~ 32
75		93	110	11	16	16	85	97,5	26 ~ 39
75		93	110	11	16	16	85	97,5	29 ~ 43
75		93	110	11	16	16	85	97,5	31 ~ 47
75		93	110	11	16	16	85	97,5	34 ~ 51
75		93	110	11	16	16	85	97,5	37 ~ 55
75		93	110	11	16	16	85	97,5	40 ~ 59
75		93	110	11	16	16	85	97,5	43 ~ 64
75		93	110	11	18	20	85	97,5	21 ~ 31
75		93	110	11	16	20	85	97,5	26 ~ 38

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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%.

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PRIME, TD Double Nut, TC Compact 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]
TCB-S 50-12-8-3	1	50	12	7,938	44,5	3	62900	127000	1500	1380	146
TDB-S 50-12-8-3	1	50	12	7,938	44,5	3	62900	127000	1500	1380	167
TCB-S 50-12-8-4	1	50	12	7,938	44,5	4	79900	170700	1990	1840	165
TDB-S 50-12-8-4	1	50	12	7,938	44,5	4	79900	170700	1990	1840	192
TCB-S 50-12-8-5	1	50	12	7,938	44,5	5	96800	215100	2500	2310	192
TDB-S 50-12-8-5	1	50	12	7,938	44,5	5	96800	215100	2500	2310	216
TDB-S 50-12-8-6	1	50	12	7,938	44,5	6	113500	260200	3010	2790	241
TDB-S 50-12-8-7	1	50	12	7,938	44,5	7	130000	305900	3530	3280	264
TDB-S 50-12-8-8	1	50	12	7,938	44,5	8	145700	349600	4010	3720	289
TCB-S 50-15-8-2	1	50	15	7,938	44,5	2	46200	83800	1020	950	121
TDB-S 50-15-8-2	1	50	15	7,938	44,5	2	46200	83800	1020	950	154
TCB-S 50-15-8-3	1	50	15	7,938	44,5	3	62800	126800	1490	1400	159
TDB-S 50-15-8-3	1	50	15	7,938	44,5	3	62800	126800	1490	1400	193
TCB-S 50-15-8-4	1	50	15	7,938	44,5	4	79700	170400	1990	1860	192
TDB-S 50-15-8-4	1	50	15	7,938	44,5	4	79700	170400	1990	1860	221
TDB-S 50-15-8-5	1	50	15	7,938	44,5	5	96600	214800	2490	2330	253
TDB-S 50-15-8-6	1	50	15	7,938	44,5	6	113200	259800	3000	2820	284
TDB-S 50-15-8-7	1	50	15	7,938	44,5	7	129700	305400	3520	3310	314
TCB-S 50-16-8-2	1	50	16	7,938	44,5	2	46200	83800	1020	950	122
TDB-S 50-16-8-2	1	50	16	7,938	44,5	2	46200	83800	1020	950	152
TCB-S 50-16-8-3	1	50	16	7,938	44,5	3	62700	126700	1490	1400	172
TDB-S 50-16-8-3	1	50	16	7,938	44,5	3	62700	126700	1490	1400	190
TDB-S 50-16-8-4	1	50	16	7,938	44,5	4	79700	170300	1980	1870	224
TDB-S 50-16-8-5	1	50	16	7,938	44,5	5	96500	214700	2490	2340	257
TDB-S 50-16-8-6	1	50	16	7,938	44,5	6	113200	259600	3000	2830	290
TDB-S 50-16-8-7	1	50	16	7,938	44,5	7	129600	305300	3520	3320	322
TCB-S 50-20-8-2	1	50	20	7,938	44,5	2	44100	78300	900	850	141
TDB-S 50-20-8-2	1	50	20	7,938	44,5	2	44100	78300	900	850	180
TDB-S 50-20-8-3	1	50	20	7,938	44,5	3	59600	117500	1300	1230	222
TDB-S 50-20-8-4	1	50	20	7,938	44,5	4	75300	156600	1700	1610	265
TDB-S 50-20-8-5	1	50	20	7,938	44,5	5	90800	195800	2100	1990	303
TCB-S 63-5-3-2	1	63	5	3,175	60,8	2	15400	49200	1320	1100	64
TDB-S 63-5-3-2	1	63	5	3,175	60,8	2	15400	49200	1320	1100	81
TCB-S 63-5-3-3	1	63	5	3,175	60,8	3	21000	74900	1970	1650	75
TDB-S 63-5-3-3	1	63	5	3,175	60,8	3	21000	74900	1970	1650	92
TCB-S 63-5-3-4	1	63	5	3,175	60,8	4	26700	101400	2650	2240	83
TDB-S 63-5-3-4	1	63	5	3,175	60,8	4	26700	101400	2650	2240	103
TCB-S 63-5-3-5	1	63	5	3,175	60,8	5	32400	128600	3350	2860	96

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
75		93	110	11	18	20	85	97,5	26 ~ 38
75		93	110	11	16	20	85	97,5	31 ~ 47
75		93	110	11	18	20	85	97,5	28 ~ 42
75		93	110	11	16	20	85	97,5	36 ~ 54
75		93	110	11	18	20	85	97,5	33 ~ 49
75		93	110	11	16	20	85	97,5	40 ~ 59
75		93	110	11	16	20	85	97,5	44 ~ 66
75		93	110	11	16	20	85	97,5	47 ~ 71
75		93	110	11	16	20	85	97,5	52 ~ 77
75		93	110	11	18	20	85	97,5	19 ~ 28
75		93	110	11	16	20	85	97,5	27 ~ 41
75		93	110	11	18	20	85	97,5	26 ~ 38
75		93	110	11	16	20	85	97,5	34 ~ 51
75		93	110	11	18	20	85	97,5	31 ~ 47
75		93	110	11	16	20	85	97,5	38 ~ 58
75		93	110	11	16	20	85	97,5	44 ~ 66
75		93	110	11	16	20	85	97,5	49 ~ 73
75		93	110	11	16	20	85	97,5	53 ~ 80
75		93	110	11	18	20	85	97,5	18 ~ 28
75		93	110	11	16	20	85	97,5	26 ~ 39
75		93	110	11	18	20	85	97,5	28 ~ 42
75		93	110	11	16	20	85	97,5	32 ~ 48
75		93	110	11	16	20	85	97,5	38 ~ 57
75		93	110	11	16	20	85	97,5	43 ~ 65
75		93	110	11	16	20	85	97,5	48 ~ 73
75		93	110	11	16	20	85	97,5	53 ~ 80
75		93	110	11	20	20	85	97,5	21 ~ 31
75		93	110	11	18	20	85	97,5	30 ~ 44
75		93	110	11	18	20	85	97,5	36 ~ 54
75		93	110	11	18	20	85	97,5	43 ~ 65
75		93	110	11	18	20	85	97,5	49 ~ 73
90		108	125	11	18	16	95	110	5,7 ~ 8,5
90		108	125	11	18	16	95	110	8 ~ 12
90		108	125	11	18	16	95	110	6,5 ~ 9,8
90		108	125	11	18	16	95	110	8,8 ~ 13
90		108	125	11	18	16	95	110	6,9 ~ 10
90		108	125	11	18	16	95	110	9,6 ~ 14
90		108	125	11	18	16	95	110	8 ~ 12

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]*
TDB-S 63-5-3-5	1	63	5	3,175	60,8	5	32400	128600	3350	2860	113
TCB-S 63-5-3-6	1	63	5	3,175	60,8	6	38000	156400	4080	3510	107
TDB-S 63-5-3-6	1	63	5	3,175	60,8	6	38000	156400	4080	3510	123
TCB-S 63-5-4-2	1	63	5	3,969	60	2	21800	63100	1370	1120	64
TDB-S 63-5-4-2	1	63	5	3,969	60	2	21800	63100	1370	1120	81
TCB-S 63-5-4-3	1	63	5	3,969	60	3	29400	94700	1990	1630	74
TDB-S 63-5-4-3	1	63	5	3,969	60	3	29400	94700	1990	1630	92
TCB-S 63-5-4-4	1	63	5	3,969	60	4	37200	126200	2600	2150	85
TDB-S 63-5-4-4	1	63	5	3,969	60	4	37200	126200	2600	2150	103
TCB-S 63-5-4-5	1	63	5	3,969	60	5	44800	157800	3220	2660	95
TDB-S 63-5-4-5	1	63	5	3,969	60	5	44800	157800	3220	2660	114
TCB-S 63-5-4-6	1	63	5	3,969	60	6	52300	189300	3820	3160	106
TDB-S 63-5-4-6	1	63	5	3,969	60	6	52300	189300	3820	3160	124
TCB-S 63-8-5-2	1	63	8	4,762	59,7	2	28000	74600	1360	1180	87
TDB-S 63-8-5-2	1	63	8	4,762	59,7	2	28000	74600	1360	1180	104
TCB-S 63-8-5-3	1	63	8	4,762	59,7	3	38100	113400	2020	1770	103
TDB-S 63-8-5-3	1	63	8	4,762	59,7	3	38100	113400	2020	1770	123
TCB-S 63-8-5-4	1	63	8	4,762	59,7	4	48400	153100	2710	2380	120
TDB-S 63-8-5-4	1	63	8	4,762	59,7	4	48400	153100	2710	2380	138
TCB-S 63-8-5-5	1	63	8	4,762	59,7	5	58700	193700	3420	3020	136
TDB-S 63-8-5-5	1	63	8	4,762	59,7	5	58700	193700	3420	3020	155
TCB-S 63-8-5-6	1	63	8	4,762	59,7	6	68900	235200	4150	3680	153
TDB-S 63-8-5-6	1	63	8	4,762	59,7	6	68900	235200	4150	3680	173
TCB-S 63-10-6-2	1	63	10	6,35	57,5	2	43800	95300	1650	1490	108
TDB-S 63-10-6-2	1	63	10	6,35	57,5	2	43800	95300	1650	1490	124
TCB-S 63-10-6-3	1	63	10	6,35	57,5	3	59200	142900	2380	2160	127
TDB-S 63-10-6-3	1	63	10	6,35	57,5	3	59200	142900	2380	2160	148
TCB-S 63-10-6-4	1	63	10	6,35	57,5	4	74800	190500	3120	2840	142
TDB-S 63-10-6-4	1	63	10	6,35	57,5	4	74800	190500	3120	2840	169
TCB-S 63-10-6-5	1	63	10	6,35	57,5	5	90100	238100	3860	3510	167
TDB-S 63-10-6-5	1	63	10	6,35	57,5	5	90100	238100	3860	3510	184
TCB-S 63-10-6-6	1	63	10	6,35	57,5	6	105200	285800	4590	4180	189
TDB-S 63-10-6-6	1	63	10	6,35	57,5	6	105200	285800	4590	4180	211
TCB-S 63-10-6-7	1	63	10	6,35	57,5	7	119900	333400	5310	4840	214
TDB-S 63-10-6-7	1	63	10	6,35	57,5	7	119900	333400	5310	4840	231
TCB-S 63-10-6-8	1	63	10	6,35	57,5	8	134400	381000	6030	5500	236
TDB-S 63-10-6-8	1	63	10	6,35	57,5	8	134400	381000	6030	5500	252
TCB-S 63-10-7-2	1	63	10	7,144	56,9	2	49100	111200	1510	1350	107

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	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	10 ~ 15
90		108	125	11	18	16	95	110	8,8 ~ 13
90		108	125	11	18	16	95	110	11 ~ 16
90		108	125	11	18	16	95	110	7,5 ~ 11
90		108	125	11	18	16	95	110	11 ~ 16
90		108	125	11	18	16	95	110	8,3 ~ 12
90		108	125	11	18	16	95	110	12 ~ 17
90		108	125	11	18	16	95	110	9,3 ~ 14
90		108	125	11	18	16	95	110	13 ~ 19
90		108	125	11	18	16	95	110	10 ~ 15
90		108	125	11	18	16	95	110	14 ~ 20
90		108	125	11	18	16	95	110	11 ~ 17
90		108	125	11	18	16	95	110	14 ~ 22
90		108	125	11	18	16	95	110	11 ~ 17
90		108	125	11	18	16	95	110	14 ~ 22
90		108	125	11	18	16	95	110	13 ~ 19
90		108	125	11	18	16	95	110	17 ~ 25
90		108	125	11	18	16	95	110	15 ~ 22
90		108	125	11	18	16	95	110	18 ~ 27
90		108	125	11	18	16	95	110	16 ~ 25
90		108	125	11	18	16	95	110	20 ~ 30
90		108	125	11	18	16	95	110	18 ~ 27
90		108	125	11	18	16	95	110	22 ~ 33
90		108	125	11	22	16	95	110	16 ~ 24
90		108	125	11	18	16	95	110	20 ~ 30
90		108	125	11	22	16	95	110	18 ~ 28
90		108	125	11	18	16	95	110	23 ~ 35
90		108	125	11	22	16	95	110	20 ~ 29
90		108	125	11	18	16	95	110	26 ~ 39
90		108	125	11	22	16	95	110	23 ~ 35
90		108	125	11	18	16	95	110	27 ~ 41
90		108	125	11	22	16	95	110	26 ~ 39
90		108	125	11	18	16	95	110	31 ~ 47
90		108	125	11	22	16	95	110	30 ~ 44
90		108	125	11	18	16	95	110	34 ~ 50
90		108	125	11	22	16	95	110	32 ~ 49
90		108	125	11	18	16	95	110	36 ~ 54
90		108	125	11	22	16	95	110	21 ~ 31

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 63-10-7-2	1	63	10	7,144	56,9	2	49100	111200	1510	1350	123
TCB-S 63-10-7-3	1	63	10	7,144	56,9	3	66500	168000	2210	2000	127
TDB-S 63-10-7-3	1	63	10	7,144	56,9	3	66500	168000	2210	2000	146
TCB-S 63-10-7-4	1	63	10	7,144	56,9	4	84400	225600	2940	2660	148
TDB-S 63-10-7-4	1	63	10	7,144	56,9	4	84400	225600	2940	2660	168
TDB-S 63-10-7-5	1	63	10	7,144	56,9	5	102000	284100	3670	3330	189
TDB-S 63-10-7-6	1	63	10	7,144	56,9	6	119500	343300	4420	4020	209
TDB-S 63-10-7-7	1	63	10	7,144	56,9	7	136700	403200	5180	4720	229
TDB-S 63-10-7-8	1	63	10	7,144	56,9	8	153200	460800	5880	5370	250
TDB-S 63-10-7-9	1	63	10	7,144	56,9	9	169500	518400	6570	6010	273
TDB-S 63-10-7-10	1	63	10	7,144	56,9	10	185500	576000	7270	6640	295
TDB-S 63-10-7-11	1	63	10	7,144	56,9	11	201300	633600	7960	7280	318
TDB-S 63-10-7-12	1	63	10	7,144	56,9	12	216900	691200	8650	7910	340
TCB-S 63-12-8-2	1	63	12	7,938	57,5	2	54300	115000	1330	1200	123
TDB-S 63-12-8-2	1	63	12	7,938	57,5	2	54300	115000	1330	1200	140
TCB-S 63-12-8-3	1	63	12	7,938	57,5	3	73700	174000	1960	1770	150
TDB-S 63-12-8-3	1	63	12	7,938	57,5	3	73700	174000	1960	1770	169
TCB-S 63-12-8-4	1	63	12	7,938	57,5	4	93500	233900	2600	2360	165
TDB-S 63-12-8-4	1	63	12	7,938	57,5	4	93500	233900	2600	2360	188
TCB-S 63-12-8-5	1	63	12	7,938	57,5	5	113300	294700	3260	2970	200
TDB-S 63-12-8-5	1	63	12	7,938	57,5	5	113300	294700	3260	2970	219
TCB-S 63-12-8-6	1	63	12	7,938	57,5	6	132800	356500	3930	3590	223
TDB-S 63-12-8-6	1	63	12	7,938	57,5	6	132800	356500	3930	3590	243
TCB-S 63-12-8-7	1	63	12	7,938	57,5	7	152100	419100	4610	4220	249
TDB-S 63-12-8-7	1	63	12	7,938	57,5	7	152100	419100	4610	4220	268
TDB-S 63-12-8-8	1	63	12	7,938	57,5	8	170500	478900	5240	4790	293
TCB-S 63-16-8-2	1	63	16	7,938	57,5	2	54200	114900	1330	1230	126
TDB-S 63-16-8-2	1	63	16	7,938	57,5	2	54200	114900	1330	1230	156
TCB-S 63-16-8-3	1	63	16	7,938	57,5	3	73500	173800	1950	1810	175
TDB-S 63-16-8-3	1	63	16	7,938	57,5	3	73500	173800	1950	1810	194
TCB-S 63-16-8-4	1	63	16	7,938	57,5	4	93400	233600	2590	2410	209
TDB-S 63-16-8-4	1	63	16	7,938	57,5	4	93400	233600	2590	2410	228
TCB-S 63-16-8-5	1	63	16	7,938	57,5	5	113100	294400	3250	3030	242
TDB-S 63-16-8-5	1	63	16	7,938	57,5	5	113100	294400	3250	3030	262
TDB-S 63-16-8-6	1	63	16	7,938	57,5	6	132600	356000	3920	3660	300
TDB-S 63-16-8-7	1	63	16	7,938	57,5	7	151800	418500	4600	4300	327
TDB-S 63-16-8-8	1	63	16	7,938	57,5	8	170200	478300	5220	4880	360
TCB-S 63-20-8-2	1	63	20	7,938	57,5	2	54100	114700	1320	1240	145

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	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	26 ~ 38
90		108	125	11	22	16	95	110	24 ~ 36
90		108	125	11	18	16	95	110	29 ~ 44
90		108	125	11	22	16	95	110	27 ~ 40
90		108	125	11	18	16	95	110	33 ~ 49
90		108	125	11	18	16	95	110	36 ~ 54
90		108	125	11	18	16	95	110	39 ~ 58
90		108	125	11	18	16	95	110	42 ~ 63
90		108	125	11	18	16	95	110	45 ~ 67
90		108	125	11	18	16	95	110	49 ~ 73
90		108	125	11	18	16	95	110	52 ~ 78
90		108	125	11	18	16	95	110	56 ~ 84
90		108	125	11	18	16	95	110	59 ~ 89
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	27 ~ 40
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	33 ~ 49
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	32 ~ 48
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	39 ~ 58
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	34 ~ 50
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	42 ~ 62
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	42 ~ 63
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	49 ~ 73
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	46 ~ 69
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	53 ~ 80
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	51 ~ 77
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	58 ~ 87
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	63 ~ 94
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	23 ~ 35
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	33 ~ 49
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	35 ~ 52
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	40 ~ 61
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	41 ~ 62
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	47 ~ 70
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	47 ~ 71
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	54 ~ 80
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	61 ~ 92
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	66 ~ 99
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	72 ~ 108
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	26 ~ 39

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 63-20-8-2	1	63	20	7,938	57,5	2	54100	114700	1320	1240	178
TCB-S 63-20-8-3	1	63	20	7,938	57,5	3	73400	173500	1950	1830	209
TDB-S 63-20-8-3	1	63	20	7,938	57,5	3	73400	173500	1950	1830	225
TCB-S 63-20-8-4	1	63	20	7,938	57,5	4	93200	233200	2590	2440	250
TDB-S 63-20-8-4	1	63	20	7,938	57,5	4	93200	233200	2590	2440	268
TDB-S 63-20-8-5	1	63	20	7,938	57,5	5	112800	293900	3240	3060	310
TDB-S 63-20-8-6	1	63	20	7,938	57,5	6	132300	355400	3900	3690	351
TDB-S 63-20-8-7	1	63	20	7,938	57,5	7	151500	417800	4580	4340	391
TCB-S 70-10-6-2	1	70	10	6,35	64,5	2	46900	109300	1850	1670	109
TDB-S 70-10-6-2	1	70	10	6,35	64,5	2	46900	109300	1850	1670	125
TCB-S 70-10-6-3	1	70	10	6,35	64,5	3	63300	163900	2670	2430	129
TDB-S 70-10-6-3	1	70	10	6,35	64,5	3	63300	163900	2670	2430	148
TCB-S 70-10-6-4	1	70	10	6,35	64,5	4	80000	218600	3500	3190	150
TDB-S 70-10-6-4	1	70	10	6,35	64,5	4	80000	218600	3500	3190	170
TCB-S 70-10-6-5	1	70	10	6,35	64,5	5	96400	273200	4330	3940	170
TDB-S 70-10-6-5	1	70	10	6,35	64,5	5	96400	273200	4330	3940	191
TCB-S 70-10-6-6	1	70	10	6,35	64,5	6	112500	327900	5140	4690	192
TDB-S 70-10-6-6	1	70	10	6,35	64,5	6	112500	327900	5140	4690	211
TCB-S 70-10-6-7	1	70	10	6,35	64,5	7	128300	382500	5960	5440	214
TDB-S 70-10-6-7	1	70	10	6,35	64,5	7	128300	382500	5960	5440	231
TCB-S 70-10-6-8	1	70	10	6,35	64,5	8	143800	437100	6760	6180	236
TDB-S 70-10-6-8	1	70	10	6,35	64,5	8	143800	437100	6760	6180	252
TCB-S 70-10-7-2	1	70	10	7,144	63,9	2	51600	125000	1660	1500	107
TDB-S 70-10-7-2	1	70	10	7,144	63,9	2	51600	125000	1660	1500	125
TCB-S 70-10-7-3	1	70	10	7,144	63,9	3	69900	188900	2430	2210	127
TDB-S 70-10-7-3	1	70	10	7,144	63,9	3	69900	188900	2430	2210	148
TCB-S 70-10-7-4	1	70	10	7,144	63,9	4	88700	253700	3230	2940	148
TDB-S 70-10-7-4	1	70	10	7,144	63,9	4	88700	253700	3230	2940	170
TDB-S 70-10-7-5	1	70	10	7,144	63,9	5	107300	319400	4040	3680	191
TDB-S 70-10-7-6	1	70	10	7,144	63,9	6	125600	386000	4860	4440	211
TDB-S 70-10-7-7	1	70	10	7,144	63,9	7	143700	453400	5690	5220	231
TDB-S 70-10-7-8	1	70	10	7,144	63,9	8	161000	518200	6470	5930	252
TDB-S 70-10-7-9	1	70	10	7,144	63,9	9	178100	582900	7230	6640	275
TDB-S 70-10-7-10	1	70	10	7,144	63,9	10	195000	647700	8000	7340	297
TCB-S 70-12-8-2	1	70	12	7,938	64,5	2	56100	125700	1430	1280	123
TDB-S 70-12-8-2	1	70	12	7,938	64,5	2	56100	125700	1430	1280	140
TCB-S 70-12-8-3	1	70	12	7,938	64,5	3	76100	190100	2100	1890	148
TDB-S 70-12-8-3	1	70	12	7,938	64,5	3	76100	190100	2100	1890	168

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	35 ~ 53
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	40 ~ 61
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	45 ~ 67
95	(90)	115 (108)	135 (125)	13,5 (11)	22	25	100 (95)	117,5 (110)	48 ~ 72
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	53 ~ 80
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	61 ~ 91
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	69 ~ 103
95	(90)	115 (108)	135 (125)	13,5 (11)	20	25	100 (95)	117,5 (110)	76 ~ 114
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	18 ~ 27
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	22 ~ 34
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	21 ~ 31
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	26 ~ 39
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	23 ~ 35
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	29 ~ 43
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	26 ~ 39
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	32 ~ 47
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	29 ~ 44
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	34 ~ 51
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	32 ~ 48
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	37 ~ 55
105	(95)	123 (113)	140 (130)	11	22	16	110 (100)	125 (115)	35 ~ 53
105	(95)	123 (113)	140 (130)	11	18	16	110 (100)	125 (115)	39 ~ 59
105	(95)	125 (115)	145 (135)	13,5	22	16	110 (100)	127,5 (117,5)	23 ~ 35
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	29 ~ 43
105	(95)	125 (115)	145 (135)	13,5	22	16	110 (100)	127,5 (117,5)	26 ~ 39
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	33 ~ 50
105	(95)	125 (115)	145 (135)	13,5	22	16	110 (100)	127,5 (117,5)	30 ~ 44
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	37 ~ 55
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	40 ~ 60
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	43 ~ 65
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	47 ~ 70
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	50 ~ 75
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	54 ~ 81
105	(95)	125 (115)	145 (135)	13,5	20	16	110 (100)	127,5 (117,5)	58 ~ 87
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	30 ~ 45
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	36 ~ 54
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	35 ~ 53
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	43 ~ 64

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TCB-S 70-12-8-4	1	70	12	7,938	64,5	4	96700	255500	2790	2520	172
TDB-S 70-12-8-4	1	70	12	7,938	64,5	4	96700	255500	2790	2520	194
TCB-S 70-12-8-5	1	70	12	7,938	64,5	5	117000	321900	3490	3170	197
TDB-S 70-12-8-5	1	70	12	7,938	64,5	5	117000	321900	3490	3170	219
TCB-S 70-12-8-6	1	70	12	7,938	64,5	6	137200	389300	4210	3830	223
TDB-S 70-12-8-6	1	70	12	7,938	64,5	6	137200	389300	4210	3830	244
TCB-S 70-12-8-7	1	70	12	7,938	64,5	7	157100	457700	4940	4500	249
TDB-S 70-12-8-7	1	70	12	7,938	64,5	7	157100	457700	4940	4500	268
TDB-S 70-12-8-8	1	70	12	7,938	64,5	8	176100	523100	5610	5110	293
TCB-S 70-16-8-2	1	70	16	7,938	64,5	2	56000	125500	1420	1310	126
TDB-S 70-16-8-2	1	70	16	7,938	64,5	2	56000	125500	1420	1310	157
TCB-S 70-16-8-3	1	70	16	7,938	64,5	3	76000	189900	2090	1930	176
TDB-S 70-16-8-3	1	70	16	7,938	64,5	3	76000	189900	2090	1930	194
TCB-S 70-16-8-4	1	70	16	7,938	64,5	4	96500	255200	2780	2580	210
TDB-S 70-16-8-4	1	70	16	7,938	64,5	4	96500	255200	2780	2580	229
TCB-S 70-16-8-5	1	70	16	7,938	64,5	5	116900	321600	3490	3240	243
TDB-S 70-16-8-5	1	70	16	7,938	64,5	5	116900	321600	3490	3240	262
TDB-S 70-16-8-6	1	70	16	7,938	64,5	6	137000	388900	4200	3910	295
TDB-S 70-16-8-7	1	70	16	7,938	64,5	7	156900	457200	4930	4590	327
TDB-S 70-16-8-8	1	70	16	7,938	64,5	8	175800	522500	5600	5220	361
TCB-S 70-20-8-2	1	70	20	7,938	64,5	2	55900	125400	1420	1330	145
TDB-S 70-20-8-2	1	70	20	7,938	64,5	2	55900	125400	1420	1330	178
TCB-S 70-20-8-3	1	70	20	7,938	64,5	3	75900	189600	2090	1960	208
TDB-S 70-20-8-3	1	70	20	7,938	64,5	3	75900	189600	2090	1960	225
TCB-S 70-20-8-4	1	70	20	7,938	64,5	4	96400	254900	2770	2610	250
TDB-S 70-20-8-4	1	70	20	7,938	64,5	4	96400	254900	2770	2610	268
TDB-S 70-20-8-5	1	70	20	7,938	64,5	5	116700	321100	3480	3270	310
TDB-S 70-20-8-6	1	70	20	7,938	64,5	6	136700	388400	4190	3950	352
TDB-S 70-20-8-7	1	70	20	7,938	64,5	7	156600	456600	4920	4640	392
TDB-S 70-20-8-8	1	70	20	7,938	64,5	8	175500	521800	5580	5280	433
TCB-S 80-10-6-2	1	80	10	6,35	74,5	2	50200	126900	2090	1850	109
TDB-S 80-10-6-2	1	80	10	6,35	74,5	2	50200	126900	2090	1850	132
TCB-S 80-10-6-3	1	80	10	6,35	74,5	3	67800	190400	3030	2700	129
TDB-S 80-10-6-3	1	80	10	6,35	74,5	3	67800	190400	3030	2700	145
TCB-S 80-10-6-4	1	80	10	6,35	74,5	4	85600	253800	3960	3540	142
TDB-S 80-10-6-4	1	80	10	6,35	74,5	4	85600	253800	3960	3540	165
TCB-S 80-10-6-5	1	80	10	6,35	74,5	5	103200	317300	4890	4370	167
TDB-S 80-10-6-5	1	80	10	6,35	74,5	5	103200	317300	4890	4370	192

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	40 ~ 60
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	49 ~ 73
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	46 ~ 68
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	54 ~ 81
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	51 ~ 77
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	59 ~ 89
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	57 ~ 86
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	65 ~ 97
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	70 ~ 105
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	26 ~ 39
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	37 ~ 55
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	39 ~ 58
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	45 ~ 67
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	46 ~ 69
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	53 ~ 79
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	53 ~ 80
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	60 ~ 89
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	66 ~ 100
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	73 ~ 110
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	80 ~ 121
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	29 ~ 44
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	39 ~ 59
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	44 ~ 67
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	50 ~ 75
105	(95)	125 (115)	145 (135)	13,5	22	25	110 (100)	127,5 (117,5)	53 ~ 80
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	59 ~ 88
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	68 ~ 102
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	77 ~ 115
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	85 ~ 127
105	(95)	125 (115)	145 (135)	13,5	20	25	110 (100)	127,5 (117,5)	93 ~ 140
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	21 ~ 31
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	27 ~ 41
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	23 ~ 35
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	28 ~ 42
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	24 ~ 36
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	31 ~ 47
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	28 ~ 43
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	36 ~ 54

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TCB-S 80-10-6-6	1	80	10	6,35	74,5	6	120400	380700	5820	5200	189
TDB-S 80-10-6-6	1	80	10	6,35	74,5	6	120400	380700	5820	5200	214
TCB-S 80-10-6-7	1	80	10	6,35	74,5	7	137300	444200	6730	6030	214
TDB-S 80-10-6-7	1	80	10	6,35	74,5	7	137300	444200	6730	6030	234
TCB-S 80-10-6-8	1	80	10	6,35	74,5	8	153900	507600	7650	6850	236
TDB-S 80-10-6-8	1	80	10	6,35	74,5	8	153900	507600	7650	6850	254
TCB-S 80-10-7-2	1	80	10	7,144	73,9	2	54500	143600	1850	1640	107
TDB-S 80-10-7-2	1	80	10	7,144	73,9	2	54500	143600	1850	1640	130
TCB-S 80-10-7-3	1	80	10	7,144	73,9	3	73900	216900	2720	2420	127
TDB-S 80-10-7-3	1	80	10	7,144	73,9	3	73900	216900	2720	2420	153
TCB-S 80-10-7-4	1	80	10	7,144	73,9	4	93700	291300	3610	3220	148
TDB-S 80-10-7-4	1	80	10	7,144	73,9	4	93700	291300	3610	3220	175
TDB-S 80-10-7-5	1	80	10	7,144	73,9	5	113400	366700	4510	4040	196
TDB-S 80-10-7-6	1	80	10	7,144	73,9	6	132700	443100	5430	4880	216
TDB-S 80-10-7-7	1	80	10	7,144	73,9	7	151800	520500	6360	5730	236
TDB-S 80-10-7-8	1	80	10	7,144	73,9	8	170200	594800	7220	6510	257
TDB-S 80-10-7-9	1	80	10	7,144	73,9	9	188200	669200	8080	7290	280
TDB-S 80-10-7-10	1	80	10	7,144	73,9	10	206000	743500	8930	8060	302
TCB-S 80-12-8-2	1	80	12	7,938	74,5	2	60100	146600	1620	1450	123
TDB-S 80-12-8-2	1	80	12	7,938	74,5	2	60100	146600	1620	1450	145
TCB-S 80-12-8-3	1	80	12	7,938	74,5	3	81500	221700	2380	2140	150
TDB-S 80-12-8-3	1	80	12	7,938	74,5	3	81500	221700	2380	2140	171
TCB-S 80-12-8-4	1	80	12	7,938	74,5	4	103500	298000	3160	2860	169
TDB-S 80-12-8-4	1	80	12	7,938	74,5	4	103500	298000	3160	2860	193
TCB-S 80-12-8-5	1	80	12	7,938	74,5	5	125300	375500	3960	3590	197
TDB-S 80-12-8-5	1	80	12	7,938	74,5	5	125300	375500	3960	3590	221
TCB-S 80-12-8-6	1	80	12	7,938	74,5	6	146800	454100	4780	4340	223
TDB-S 80-12-8-6	1	80	12	7,938	74,5	6	146800	454100	4780	4340	245
TCB-S 80-12-8-7	1	80	12	7,938	74,5	7	168100	533800	5610	5100	250
TDB-S 80-12-8-7	1	80	12	7,938	74,5	7	168100	533800	5610	5100	273
TDB-S 80-12-8-8	1	80	12	7,938	74,5	8	188400	610000	6360	5800	298
TCB-S 80-16-8-2	1	80	16	7,938	74,5	2	60000	146500	1620	1490	126
TDB-S 80-16-8-2	1	80	16	7,938	74,5	2	60000	146500	1620	1490	161
TCB-S 80-16-8-3	1	80	16	7,938	74,5	3	81400	221500	2380	2190	175
TDB-S 80-16-8-3	1	80	16	7,938	74,5	3	81400	221500	2380	2190	196
TCB-S 80-16-8-4	1	80	16	7,938	74,5	4	103300	297800	3160	2920	209
TDB-S 80-16-8-4	1	80	16	7,938	74,5	4	103300	297800	3160	2920	237
TCB-S 80-16-8-5	1	80	16	7,938	74,5	5	125100	375200	3950	3670	242

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	32 ~ 48
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	39 ~ 59
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	36 ~ 54
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	42 ~ 63
115	(105)	135 (125)	155 (145)	13,5	22	16	120 (110)	137,5 (127,5)	40 ~ 60
115	(105)	135 (125)	155 (145)	13,5	25	16	120 (110)	137,5 (127,5)	45 ~ 68
115	(105)	145 (125)	165 (145)	13,5	22	16	120 (110)	142,5 (127,5)	26 ~ 39
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	35 ~ 52
115	(105)	145 (125)	165 (145)	13,5	22	16	120 (110)	142,5 (127,5)	30 ~ 45
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	39 ~ 59
115	(105)	145 (125)	165 (145)	13,5	22	16	120 (110)	142,5 (127,5)	34 ~ 50
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	44 ~ 66
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	48 ~ 72
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	51 ~ 77
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	55 ~ 82
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	59 ~ 88
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	63 ~ 95
115	(105)	145 (125)	165 (145)	13,5	25	16	120 (110)	142,5 (127,5)	68 ~ 101
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	34 ~ 50
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	43 ~ 65
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	40 ~ 61
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	50 ~ 74
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	44 ~ 66
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	54 ~ 82
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	51 ~ 77
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	62 ~ 93
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	58 ~ 87
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	67 ~ 101
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	65 ~ 97
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	75 ~ 112
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	81 ~ 121
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	29 ~ 44
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	43 ~ 64
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	43 ~ 65
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	51 ~ 77
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	52 ~ 77
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	62 ~ 94
125	(105)	145 (125)	165 (145)	13,5	22	25	130 (110)	147,5 (127,5)	59 ~ 89

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 80-16-8-5	1	80	16	7,938	74,5	5	125100	375200	3950	3670	270
TDB-S 80-16-8-6	1	80	16	7,938	74,5	6	146700	453700	4770	4430	300
TDB-S 80-16-8-7	1	80	16	7,938	74,5	7	167900	533300	5600	5210	334
TDB-S 80-16-8-8	1	80	16	7,938	74,5	8	188200	609500	6350	5920	365
TCB-S 80-20-9-2	1	80	20	9,525	73,3	2	76500	172800	1620	1510	148
TDB-S 80-20-9-2	1	80	20	9,525	73,3	2	76500	172800	1620	1510	187
TCB-S 80-20-9-3	1	80	20	9,525	73,3	3	103700	261100	2370	2220	211
TDB-S 80-20-9-3	1	80	20	9,525	73,3	3	103700	261100	2370	2220	233
TCB-S 80-20-9-4	1	80	20	9,525	73,3	4	131600	350500	3150	2950	253
TDB-S 80-20-9-4	1	80	20	9,525	73,3	4	131600	350500	3150	2950	277
TDB-S 80-20-9-5	1	80	20	9,525	73,3	5	159300	441200	3940	3690	319
TDB-S 80-20-9-6	1	80	20	9,525	73,3	6	186600	533000	4740	4450	360
TDB-S 80-20-9-7	1	80	20	9,525	73,3	7	213600	626000	5550	5220	400
TDB-S 80-20-9-8	1	80	20	9,525	73,3	8	239400	715400	6300	5930	442
TCB-S 100-10-6-2	1	100	10	6,35	94,5	2	55100	158700	2500	2130	109
TDB-S 100-10-6-2	1	100	10	6,35	94,5	2	55100	158700	2500	2130	129
TCB-S 100-10-6-3	1	100	10	6,35	94,5	3	74400	238100	3620	3100	130
TDB-S 100-10-6-3	1	100	10	6,35	94,5	3	74400	238100	3620	3100	152
TCB-S 100-10-6-4	1	100	10	6,35	94,5	4	94000	317400	4740	4070	142
TDB-S 100-10-6-4	1	100	10	6,35	94,5	4	94000	317400	4740	4070	167
TCB-S 100-10-6-5	1	100	10	6,35	94,5	5	113300	396800	5860	5040	167
TDB-S 100-10-6-5	1	100	10	6,35	94,5	5	113300	396800	5860	5040	195
TCB-S 100-10-6-6	1	100	10	6,35	94,5	6	132200	476200	6970	6000	189
TDB-S 100-10-6-6	1	100	10	6,35	94,5	6	132200	476200	6970	6000	216
TCB-S 100-10-6-7	1	100	10	6,35	94,5	7	150700	555500	8060	6950	214
TDB-S 100-10-6-7	1	100	10	6,35	94,5	7	150700	555500	8060	6950	236
TCB-S 100-10-6-8	1	100	10	6,35	94,5	8	169000	634900	9160	7900	236
TDB-S 100-10-6-8	1	100	10	6,35	94,5	8	169000	634900	9160	7900	257
TCB-S 100-10-7-2	1	100	10	7,144	93,9	2	60700	185100	2280	1920	110
TDB-S 100-10-7-2	1	100	10	7,144	93,9	2	60700	185100	2280	1920	130
TCB-S 100-10-7-3	1	100	10	7,144	93,9	3	82200	279700	3340	2840	130
TDB-S 100-10-7-3	1	100	10	7,144	93,9	3	82200	279700	3340	2840	153
TCB-S 100-10-7-4	1	100	10	7,144	93,9	4	104200	375600	4430	3790	151
TDB-S 100-10-7-4	1	100	10	7,144	93,9	4	104200	375600	4430	3790	175
TDB-S 100-10-7-5	1	100	10	7,144	93,9	5	126000	472800	5540	4760	196
TDB-S 100-10-7-6	1	100	10	7,144	93,9	6	147500	571300	6670	5750	216
TDB-S 100-10-7-7	1	100	10	7,144	93,9	7	168700	671000	7810	6770	236
TDB-S 100-10-7-8	1	100	10	7,144	93,9	8	189100	766800	8870	7690	257

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	70 ~ 105
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	77 ~ 115
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	85 ~ 127
125	(105)	145 (125)	165 (145)	13,5	25	25	130 (110)	147,5 (127,5)	92 ~ 138
125	(110)	145 (130)	165 (150)	13,5	22	25	130 (115)	147,5 (132,5)	41 ~ 61
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	59 ~ 88
125	(110)	145 (130)	165 (150)	13,5	22	25	130 (115)	147,5 (132,5)	63 ~ 94
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	73 ~ 109
125	(110)	145 (130)	165 (150)	13,5	22	25	130 (115)	147,5 (132,5)	75 ~ 112
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	86 ~ 129
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	98 ~ 147
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	110 ~ 164
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	121 ~ 181
125	(110)	145 (130)	165 (150)	13,5	25	25	130 (115)	147,5 (132,5)	133 ~ 200
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	26 ~ 38
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	33 ~ 50
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	29 ~ 44
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	38 ~ 57
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	30 ~ 45
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	39 ~ 59
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	35 ~ 53
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	46 ~ 69
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	40 ~ 60
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	50 ~ 75
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	45 ~ 68
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	53 ~ 80
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	49 ~ 74
135	(125)	155 (145)	175 (165)	13,5	22	16	140 (130)	157,5 (147,5)	57 ~ 86
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	34 ~ 51
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	43 ~ 65
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	38 ~ 57
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	49 ~ 73
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	43 ~ 64
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	54 ~ 81
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	59 ~ 88
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	63 ~ 94
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	67 ~ 101
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	72 ~ 108

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.

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.

PRIME, TD Double Nut, TC Compact 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]
TDB-S 100-10-7-9	1	100	10	7,144	93,9	9	209200	862700	9930	8610	280
TDB-S 100-10-7-10	1	100	10	7,144	93,9	10	228900	958500	10970	9520	302
TCB-S 100-12-8-2	1	100	12	7,938	94,5	2	66800	188500	1980	1730	131
TDB-S 100-12-8-2	1	100	12	7,938	94,5	2	66800	188500	1980	1730	151
TCB-S 100-12-8-3	1	100	12	7,938	94,5	3	90700	285000	2920	2560	156
TDB-S 100-12-8-3	1	100	12	7,938	94,5	3	90700	285000	2920	2560	179
TCB-S 100-12-8-4	1	100	12	7,938	94,5	4	115100	383100	3880	3410	181
TDB-S 100-12-8-4	1	100	12	7,938	94,5	4	115100	383100	3880	3410	198
TCB-S 100-12-8-5	1	100	12	7,938	94,5	5	139400	482600	4860	4290	205
TDB-S 100-12-8-5	1	100	12	7,938	94,5	5	139400	482600	4860	4290	223
TCB-S 100-12-8-6	1	100	12	7,938	94,5	6	163300	583600	5860	5180	231
TDB-S 100-12-8-6	1	100	12	7,938	94,5	6	163300	583600	5860	5180	247
TCB-S 100-12-8-7	1	100	12	7,938	94,5	7	187000	686100	6870	6100	258
TDB-S 100-12-8-7	1	100	12	7,938	94,5	7	187000	686100	6870	6100	279
TDB-S 100-12-8-8	1	100	12	7,938	94,5	8	209600	784100	7800	6930	304
TCB-S 100-16-8-2	1	100	16	7,938	94,5	2	66800	188400	1980	1780	134
TDB-S 100-16-8-2	1	100	16	7,938	94,5	2	66800	188400	1980	1780	166
TCB-S 100-16-8-3	1	100	16	7,938	94,5	3	90600	284900	2910	2630	184
TDB-S 100-16-8-3	1	100	16	7,938	94,5	3	90600	284900	2910	2630	204
TCB-S 100-16-8-4	1	100	16	7,938	94,5	4	115000	382900	3870	3510	218
TDB-S 100-16-8-4	1	100	16	7,938	94,5	4	115000	382900	3870	3510	243
TCB-S 100-16-8-5	1	100	16	7,938	94,5	5	139300	482400	4850	4410	250
TDB-S 100-16-8-5	1	100	16	7,938	94,5	5	139300	482400	4850	4410	272
TDB-S 100-16-8-6	1	100	16	7,938	94,5	6	163200	583300	5850	5330	304
TDB-S 100-16-8-7	1	100	16	7,938	94,5	7	186900	685700	6860	6270	337
TDB-S 100-16-8-8	1	100	16	7,938	94,5	8	209400	783600	7790	7120	370
TCB-S 100-20-9-2	1	100	20	9,525	93,3	2	86200	225400	2010	1840	157
TDB-S 100-20-9-2	1	100	20	9,525	93,3	2	86200	225400	2010	1840	192
TCB-S 100-20-9-3	1	100	20	9,525	93,3	3	116900	340500	2950	2710	219
TDB-S 100-20-9-3	1	100	20	9,525	93,3	3	116900	340500	2950	2710	239
TCB-S 100-20-9-4	1	100	20	9,525	93,3	4	148400	457200	3920	3600	262
TDB-S 100-20-9-4	1	100	20	9,525	93,3	4	148400	457200	3920	3600	282
TDB-S 100-20-9-5	1	100	20	9,525	93,3	5	179500	575400	4900	4510	324
TDB-S 100-20-9-6	1	100	20	9,525	93,3	6	210300	695100	5900	5440	366
TDB-S 100-20-9-7	1	100	20	9,525	93,3	7	240700	816300	6910	6380	406
TDB-S 100-20-9-8	1	100	20	9,525	93,3	8	269700	932900	7840	7250	447

- 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,pr: Rigidity of the balls contact zone for an external force 10% of Ca. See page 47. 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 TD/TC
$D_{1,std}$	$D_{1,min}$	D_4	D_6	D_5	L_7	L_1	L_8	L_9	Q_{Gr} [cm^3]
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	77 ~ 116
135	(125)	176 (145)	202 (165)	13,5	25	16	140 (130)	171 (147,5)	83 ~ 124
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	46 ~ 68
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	56 ~ 85
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	53 ~ 79
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	65 ~ 98
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	60 ~ 90
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	69 ~ 104
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	67 ~ 100
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	77 ~ 115
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	75 ~ 112
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	83 ~ 125
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	83 ~ 125
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	95 ~ 142
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	102 ~ 153
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	40 ~ 60
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	55 ~ 83
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	58 ~ 86
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	67 ~ 101
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	67 ~ 101
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	79 ~ 119
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	76 ~ 115
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	87 ~ 130
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	96 ~ 144
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	105 ~ 158
150	(125)	176 (145)	202 (165)	17,5 (13,5)	30	25	155 (130)	178,5 (147,5)	115 ~ 172
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	55 ~ 82
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	75 ~ 112
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	81 ~ 121
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	92 ~ 138
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	96 ~ 144
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	107 ~ 161
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	122 ~ 183
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	137 ~ 205
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	150 ~ 225
150	(130)	176 (150)	202 (170)	17,5 (13,5)	30	25	155 (135)	178,5 (152,5)	164 ~ 247

SHUTON·IPIRANGA advises to use the dimensions of the tables, although it is possible to manufacture ball screw with other dimensions.
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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