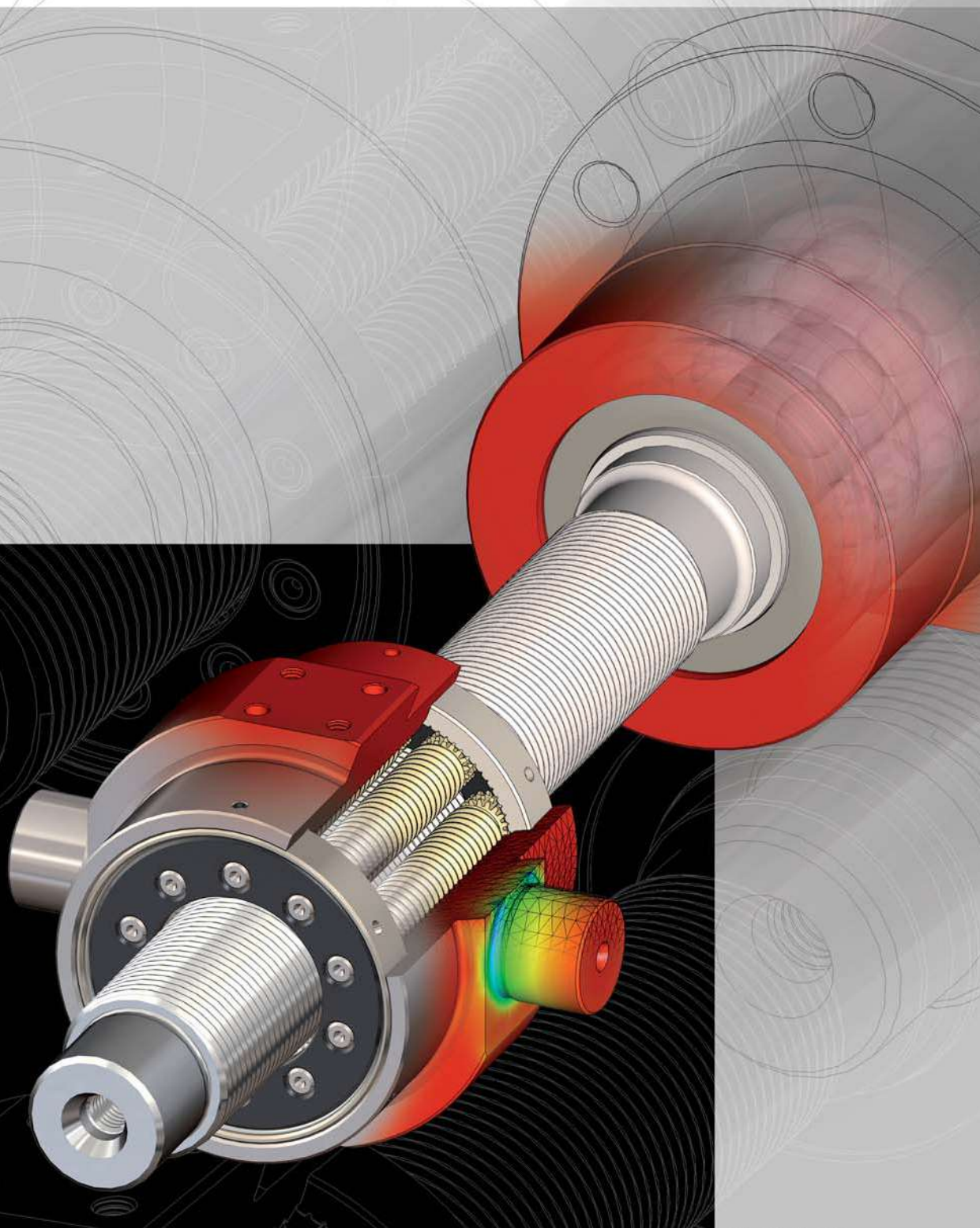
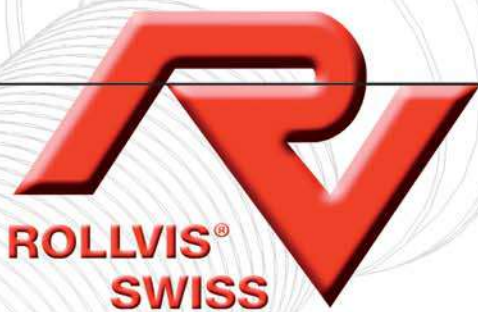


# SATELLITE ROLLER SCREWS



catalogue 2019





# SATELLITE ROLLER SCREWS



Established in 1970, ROLLVIS SA quickly started to focus exclusively on design, manufacturing and marketing of satellite roller screws under the trademark «Rollvis swiss». Our products represent today the reference for high performance linear motion applications. Our factory is equipped with the most powerful machines to achieve to lowest tolerances on roller screws from very small quantities to larger batches. Following a continuous improvement path, Rollvis SA never stopped in investing in new manufacturing technologies and skills in business park of Plan-les-Ouates in Geneva. The Rollvis high tech spirit and the scale of the company have always been preserved to ensure the best reactivity, flexibility and support to customer requirements. Five decades of experience combined with the latest technologies enable Rollvis screws to be the preferred choice in many demanding or complex applications for industrial, aerospace or defense applications and for any segment where the best is required.



Roller screw expertise for aeronautics, space and Defense industry



Optronics and Mechatronics  
Lifting Equipment and positioning systems  
Special machines



Aircrafts  
Helicopters  
Unmanned vehicles  
Launchers  
Flight controls



Satellites  
Telescops  
Landing gears  
Actuators  
Defense









# Contents

To ensure that Rollvis roller screws always get benefits of the latest technologies, we have setup a new Research & Development department with a highly qualified team, the most recent softwares and technologies in manufacturing, control & testing. Products & Processes are permanently optimized to make Rollvis screws one of the best on the market regarding reliability, performance and availability. Production and Quality systems are organized according to the latest ISO and EN standards. Testimonials from many high end customers praise Rollvis screws for the outstanding quality. With a global presence on all continents through subsidiaries or high tech distributor partners, we offer support and deliver our solutions wherever you are.

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## Preferred range

 Screw RV range	de 22 à 39
 Screw HRV range	de 40 à 45
 Screw RVI range	de 46 à 51
 Screw RVR range	de 52 à 57
 Screw RVD range	de 58 à 63
 Bearing units BU	de 64 à 68

RV Range

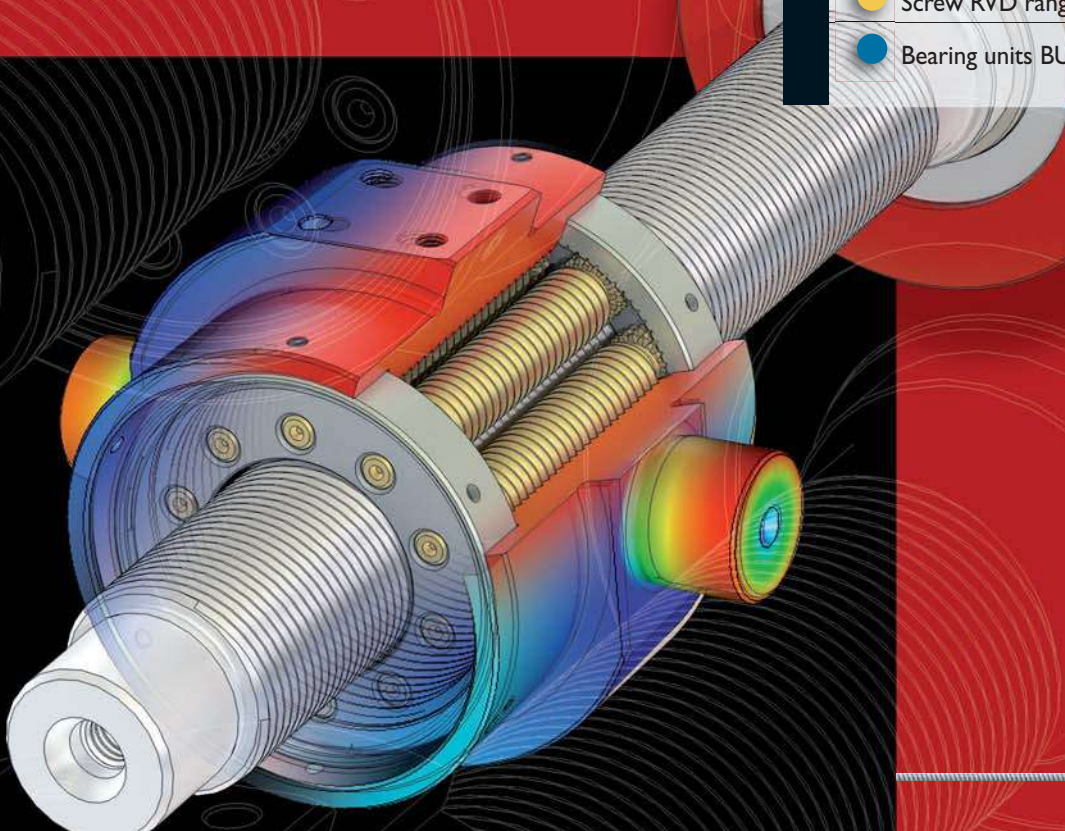
HRV Range

RVI Range

RVR Range

RVD Range

Bearing units BU



**ROLLVIS satellite roller screws** are used to transform rotary movements into linear movements and vice versa. The rolling elements are threaded rollers between the screw and the nut. The high number of points of contact enables satellite roller screws to support very heavy loads. The ROLLVIS range comprises satellite roller screws with no recirculation (types **RV** and **HRV**), inverted roller screws (type **RVI**), Differential roller screws (type **RVD**) and screws with recirculating rollers (type **RVR**). Bearing units are also proposed to equip the different roller screw designs.

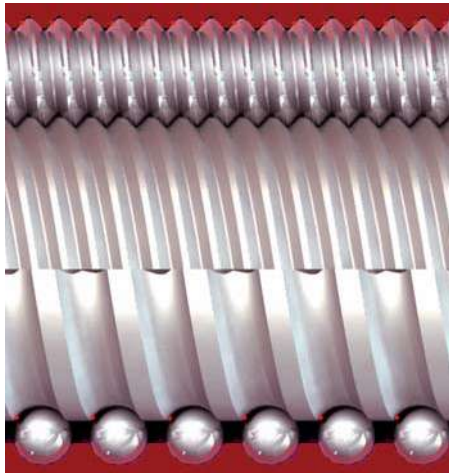
## Satellite roller screws compared to ball screws

Satellite roller screws mainly differentiate from ball screws because the load transfer elements are threaded rollers instead of balls. **the load transfer elements are threaded rollers.** The main advantage of satellite roller screws is that they have a much higher number of contact points and the thread profile is virtually equivalent to a very large ball diameter.

### Load capacity and lifespan

The main advantage of roller screws compared to ball screws is that their admissible static and dynamic load capacities are higher.

The rolling function is ensured by threaded rollers instead of balls and the load is spread over a higher number of points of contact.



### Speed & acceleration

**Satellite roller screws can rotate much faster and support much greater acceleration.**

RV satellite roller screws are designed so that the rollers are not recirculating. This means the mechanism can up to twice the rotation speed of a ball screw. Acceleration can reach up to 3g.

### Lead & pitch

**Planetary roller screws can be designed with much smaller leads than ball screws to ball screws.**

The lead of roller screws (axial travel per turn) can be very small. It is typically limited to 1mm for small diameters of RV and cannot be reduced below a certain limit because threads require to be multi-starts. The thread pitch is defined as a function of the lead divided by the number of starts. RVR recirculating screws are single or double starts which give a pitch equal or at least half the lead. RVD differential screws could have lead down to few hundredths or tenths of mm if needed. Leads can have decimal values and the flexibility often enable direct drive. This is an advantage compared to ball screws. The lead can be chosen and realised without any geometrical changes of both the screw shaft and the nut body, which allows updates with minor changes while keeping very high load capacities. In a ball screw the minimum lead will be limited by the size of the ball that can fit in the thread. Small leads mean then small balls and very small capacity ratings consequently.

### Rigidity & strength

The high number of contact points and the geometry of the contacts give a satellite roller screw greater rigidity and shock tolerance than a ball screw.

## Advantages of the Rollvis satellite roller screws

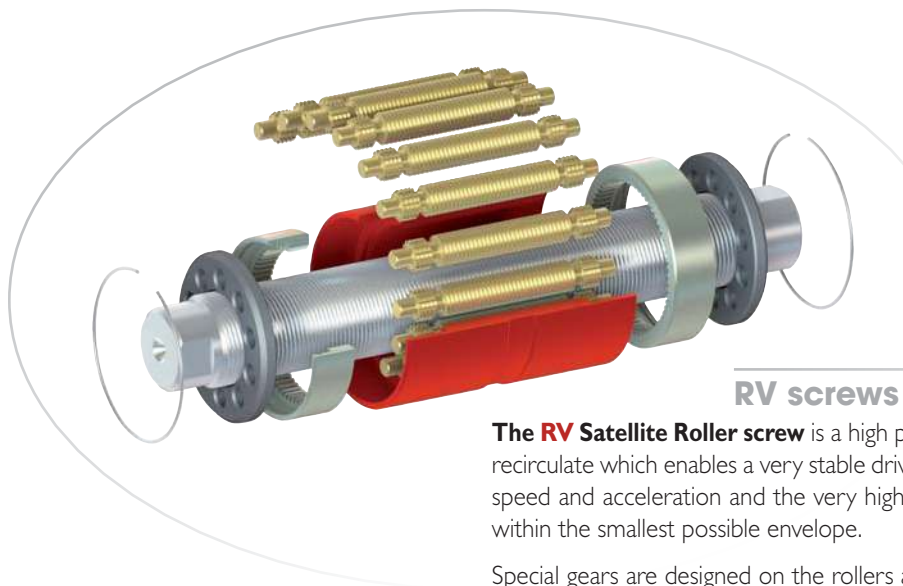
- High axial load capacity
- Accuracy greater than  $6 \mu\text{m}/300 \text{ mm}$
- Long lifespan
- High rotation speed (RV systems)
- High efficiency
- Small leads (from 0.25 mm) with wide diameters (system RVR)
- No backlash
- Thin leads (to 0.02 mm) with medium diameters (system RVD)
- Extremely high rigidity
- Fast acceleration and deceleration
- High reliability
- Easy customization
- Available in standard or Stainless materials

## Examples of applications

Rollvis roller screws have successfully equipped many application segments such as:

- Machine tools
- Space (rockets and satellites)
- Medical
- Laser machines
- Measuring machines
- Defence (tanks, cannons, missiles, etc.)
- Chemical industry
- Injection moulding machines
- Specific machines (benders)
- Oil industry
- Optical
- Car industry
- Robotics
- Nuclear industry
- Telescopes
- Graphics
- Aeronautics (aeroplanes and helicopters)

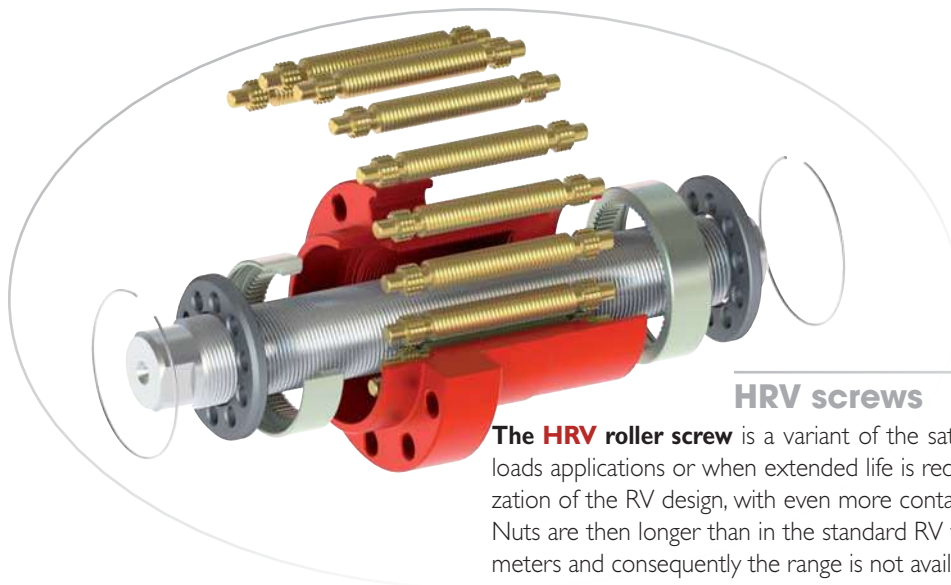




## RV screws

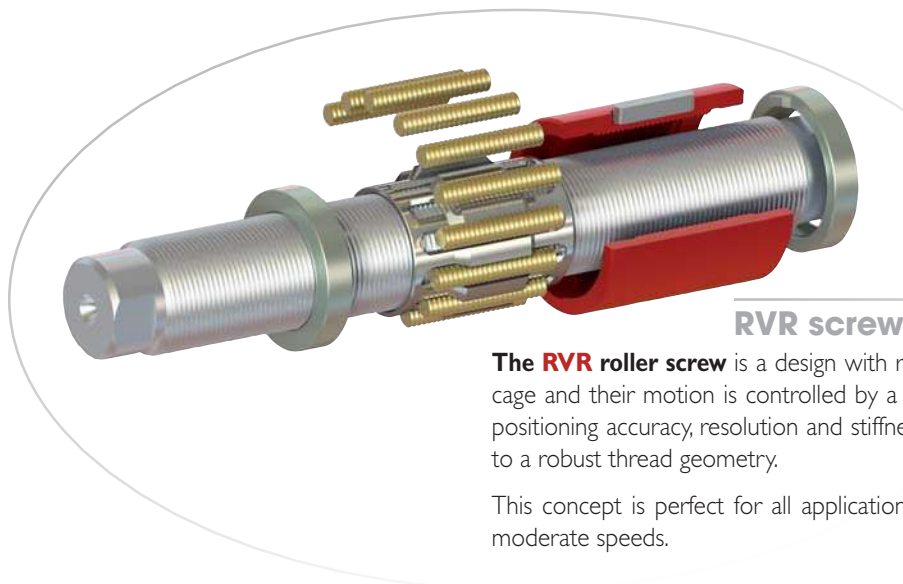
The **RV Satellite Roller screw** is a high precision and robust assembly where rollers do not recirculate which enables a very stable driving torque. The screw can be used under very high speed and acceleration and the very high capacity ratings give an extended and reliable life within the smallest possible envelope.

Special gears are designed on the rollers and nut to maintain a good kinematics even in the most severe conditions.



## HRV screws

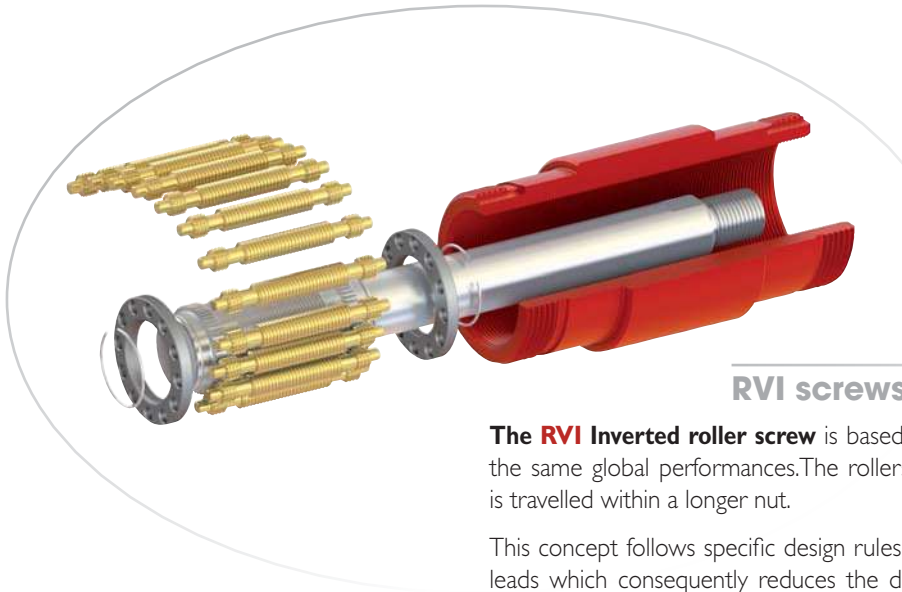
The **HRV roller screw** is a variant of the satellite roller screw RV designed for very high loads applications or when extended life is required. This design is based on specific optimization of the RV design, with even more contacts in the assembly and a new thread profile. Nuts are then longer than in the standard RV version. HRV series is designed for larger diameters and consequently the range is not available in split nut or with internal preload. Only standard or reduced backlash options are available.



## RVR screws

The **RVR roller screw** is a design with recirculating rollers. The rollers are guided within a cage and their motion is controlled by a set of cams. This design combines extremely high positioning accuracy, resolution and stiffness while capacity ratings are at the highest thanks to a robust thread geometry.

This concept is perfect for all applications that need a very high accuracy under small or moderate speeds.

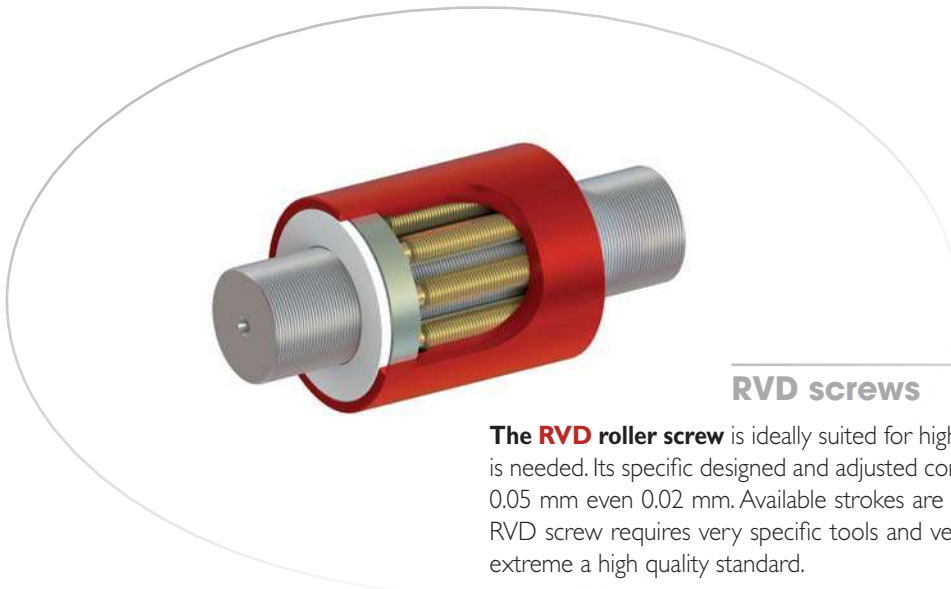


### RVI screws

The **RVI Inverted roller screw** is based on the same principle as the RV design and has the same global performances. The rollers do not move axially along the shaft and stroke is travelled within a longer nut.

This concept follows specific design rules which enable higher capacity ratings with smaller leads which consequently reduces the driving torque, optimizes compactness and makes a direct guiding of the shaft possible.

The gears are designed between the rollers and the shaft and give a very smooth and stable synchronization of the rolling.



### RVD screws

The **RVD roller screw** is ideally suited for high precision applications, when a high accuracy is needed. Its specific designed and adjusted components allow extremely thin leads of up to 0.05 mm even 0.02 mm. Available strokes are relatively smaller for this type of roller screw. RVD screw requires very specific tools and very high manufacturing accuracy to ensure an extreme a high quality standard.

Example → **RV 2 1 0 / 30.5. R 3.350/230 6YY ---**

**Design** **RV** = Satellite rollers screws  
**HRV** = High capacity roller screws  
**RVR** = Recirculating roller screws  
**RVI** = Inverted roller screws  
**RVD** = Differential roller screws

**Nut types** **1** = Single nut  
**2** = Split nut  
**3** = Double nut  
**4** = Preloaded nut with oversized rollers

**Nut design** **1** = Cylindrical nut  
**6** = Nut with flange at one end  
**7** = Nut with central flange  
**8** = Special nut design

**Seal** **0** = without wipers  
**1** = with wipers (possibility to order only one wiper)

**Screw diameter  $d_0$**  in mm

**Nominal lead P** indication en mm

**Thread direction** **R** = right hand thread  
**L** = left hand thread  
**B** = 1 right hand thread and 1 left hand thread

**Thread accuracy\*** **G1** = 6  $\mu\text{m}/300$  mm  
**G3** = 12  $\mu\text{m}/300$  mm  
**G5** = 23  $\mu\text{m}/300$  mm

**Total screw shaft length / threaded length** - in mm

**This model number is defined by Rollvis**

\* refer to page 6 and ISO 3408-3 for thread accuracy details.

# Accuracy

Satellite roller screws are divided into tolerance classes based as defined in **ISO 3408-3** (ball screws). The determining factor is the lead error  $V_{300p}$  referred to a thread length of 300 mm.

The table opposite shows the tolerance classes:

Tolerance class	$V_{300p}$
<b>G1</b>	6 $\mu\text{m}/300\text{ mm}$
<b>G3</b>	12 $\mu\text{m}/300\text{ mm}$
<b>G5</b>	23 $\mu\text{m}/300\text{ mm}$

Positioning satellite roller screws are supplied in tolerance classes **G1**, **G3** and **G5**. Higher accuracy classes can be manufactured on demand.

## Lead accuracy symbols according to ISO 3408-3

- P → nominal lead
- $e_0$  → difference between required lead and nominal lead
- $V_{300p}$  → difference between actual and nominal lead over 300 mm
- $e_p$  → difference between actual and nominal lead over a length  $L_u$
- $V_{up}$  → travel variation over a length  $L_u$
- $V_{2\pi p}$  → travel variation over one revolution
- $L_u$  → effective travel

## Lead error

The lead error  $e_p$  relative to effective travel  $L_u$  is calculated for the transport satellite roller screw by the following formula:

$$e_p = 2 \cdot \frac{L_u}{1000} \cdot V_{300p}$$

Lead errors  $e_p$  for positioning satellite roller screws are shown in the table opposite. For tolerance classes **G1** and **G3**, the lead and torque diagrams are supplied with the screws.

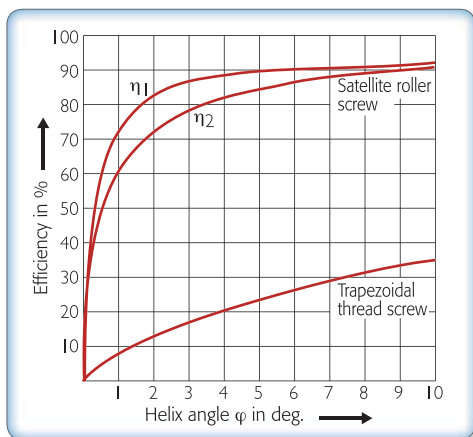
Lead is checked by a 3D measuring machine.

$L_u$		$E_p$ in microns for tolerance class up to		
From	to	G1	G3	G5
	315 mm	6	12	23
315 mm	400 mm	7	13	25
400 mm	500 mm	8	15	27
500 mm	630 mm	9	16	30
630 mm	800 mm	10	18	35
800 mm	1000 mm	11	21	40
1000 mm	1250 mm	13	24	46
1250 mm	1600 mm	15	29	54
1600 mm	2000 mm			65
2000 mm	2500 mm			77
2500 mm	3150 mm			93

# Efficiency

The power effectiveness of the roller screw is defined by the efficiency. It represents the thermal power dissipated at the various contact interfaces. This efficiency is of importance for motor torque calculation. Thus efficiency is essentially determined by the thread's geometry of the components, which will generate the sliding level. Lubrication, speed, level of load, surface finishing, etc... will also have an impact on the efficiency. There are two different values of efficiency depending on how the screw is used, in a direct or indirect mode:

- Direct efficiency  $\eta_1$  corresponds to the efficiency of the mechanism when the rotation is converted into a translation motion.
- Indirect efficiency  $\eta_2$  corresponds to the efficiency of the mechanism when a translation motion is converted into a rotation.

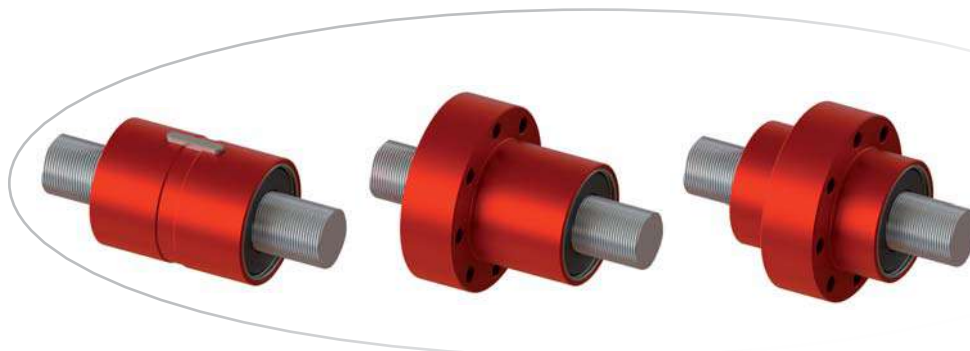


Rollvis satellite roller screws achieve high rates of mechanical efficiency. The figure shows efficiency rates  $\eta_1$  and  $\eta_2$  as a function of the helix angle. The efficiency of a trapezoidal thread screw (sliding screws) is shown for comparison. Satellite roller screws, unlike friction screws, are not self-locking.

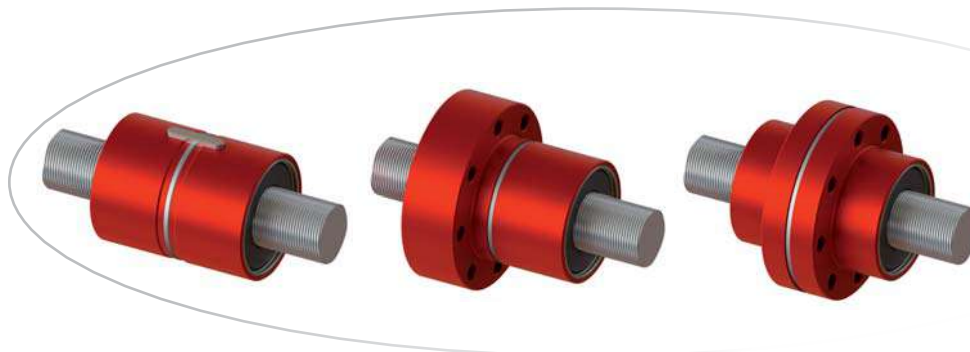


## Nut geometry and shape

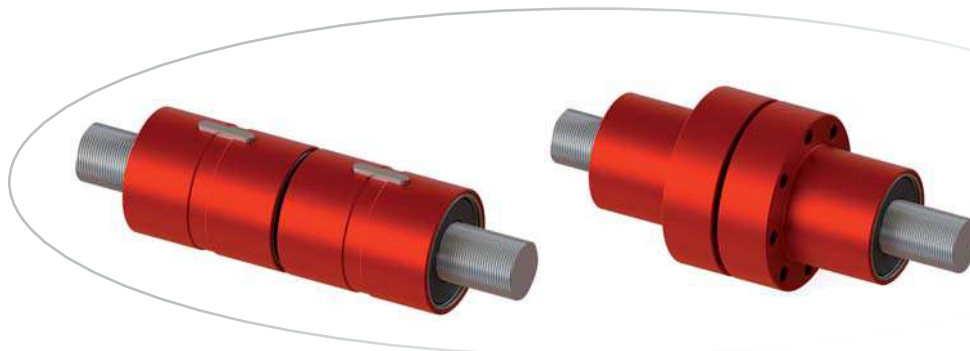
Single nuts have low axial backlash. This version can also be manufactured with zero backlash or even with a light preload. The split cylindrical nut is preloaded by clamping the two halves of the nut in a housing. A precision spacer ring is mounted between the two halves to maintain the required level of preloading. Split nuts with a flange at one end have a spacer ring designed to hold the halves apart. The halves are aligned by a parallel key. Double nuts are preloaded in the same way as split nuts. Cylindrical nut types and central flanged ones are then usually preloaded in compression whereas side flanged nuts are preloaded in tension.



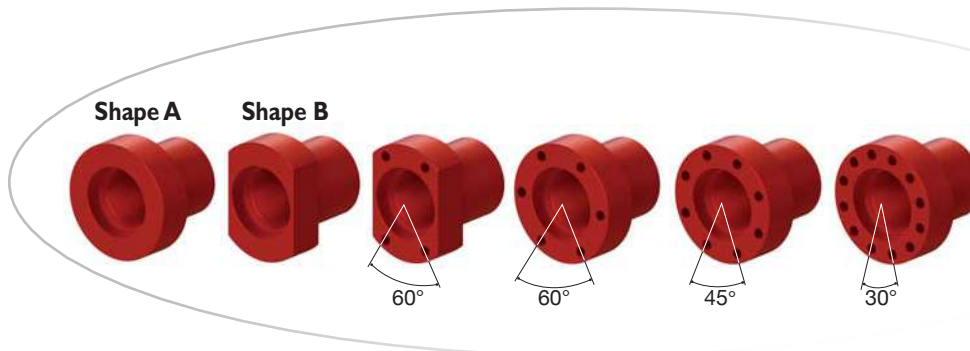
**SINGLE NUTS:**  
Nuts in one piece with axial backlash  
Wipers (on request)



**SPLIT NUTS:**  
Nuts in two pieces, preloaded, without backlash  
Same dimensions as single nuts  
Reduced load capacities  
Wipers (on request)

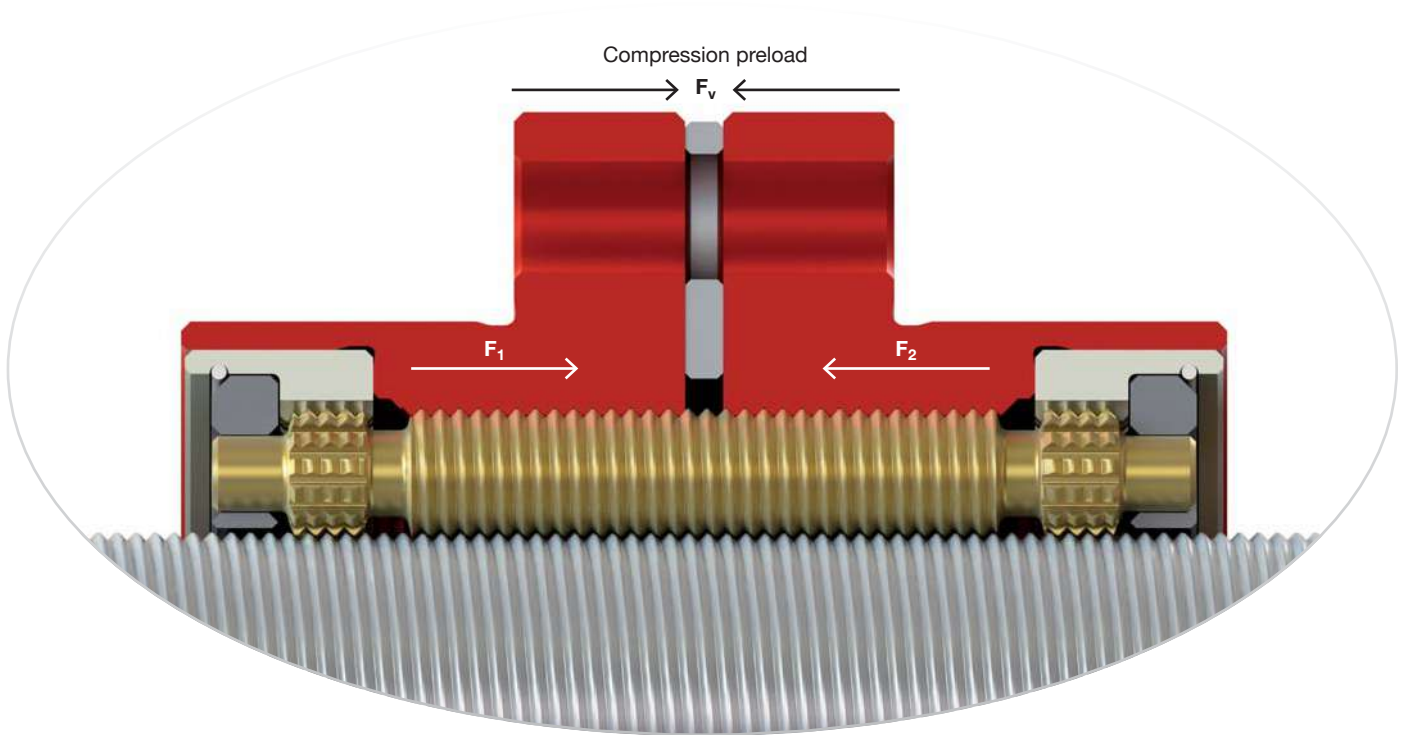


**DOUBLE NUTS:**  
Two single nuts, preloaded, without backlash  
Same load capacities as single nuts  
About twice as long as single nuts  
Wipers (on request)



**FLANGE SHAPES**  
Examples of typical flange shapes

Nut's geometry can be customised as per customer's specific needs.



Preloaded nuts are used to eliminate backlash and increase rigidity.

Preload level should be carefully calculated to achieve the highest stiffness while keeping efficiency high and life the longest. (see figure above).

When considering preloaded nuts, the calculation of the equivalent mean load has to take into account the preload level  $F_v$  in case some preload is still active when the screw is exposed to external loads ( $F_1 \dots F_n$ ). This may yield to new individual loads ( $F_{1v} \dots F_{nv}$ ).

When no backlash is required for all operating loads, the preload  $F_v$  must be selected according to the maximum load  $F_{max}$ .

$$F_v = \frac{F_{max}}{2,83} \text{ [N]}$$

If a satellite roller screw only needs to be backlash-free for a specific load, preload  $F_v$  should be selected according to the corresponding load  $F_n$ .

$$F_v = \frac{F_n}{2,83} \text{ [N]}$$

Recommended nominal preload is otherwise defined in the product table pages of this catalog (for preloaded split nuts or single nuts).

## Resulting load depending on preload $F_v$

An axial load on a preloaded nut system increases the load of one of the halves and relieves the other from the preloading force. The resulting load can be estimated by the following equations:

Loaded half of nut:

$$F_{nv(1)} = F_v + 0,65 \cdot F_n \text{ [N] si } F_n < 2,83 \cdot F_v \text{ [N]}$$

$$F_{nv(1)} = F_n \text{ [N] si } F_n \geq 2,83 \cdot F_v \text{ [N]}$$

Relieved half of nut:

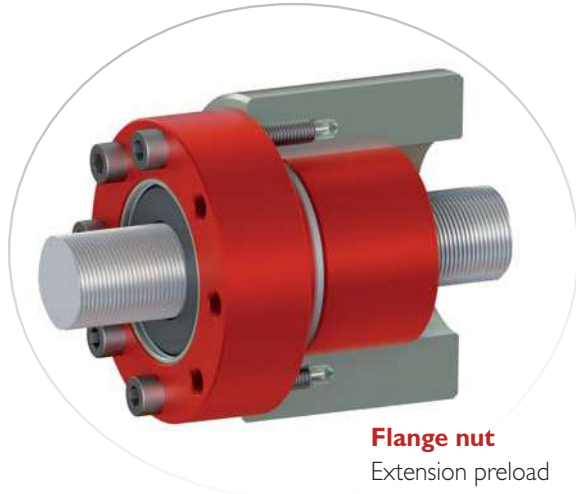
$$F_{nv(2)} = F_v - 0,35 \cdot F_n \text{ [N] si } F_n < 2,83 \cdot F_v \text{ [N]}$$

$$F_{nv(2)} = 0 \text{ [N] si } F_n \geq 2,83 \cdot F_v \text{ [N]}$$

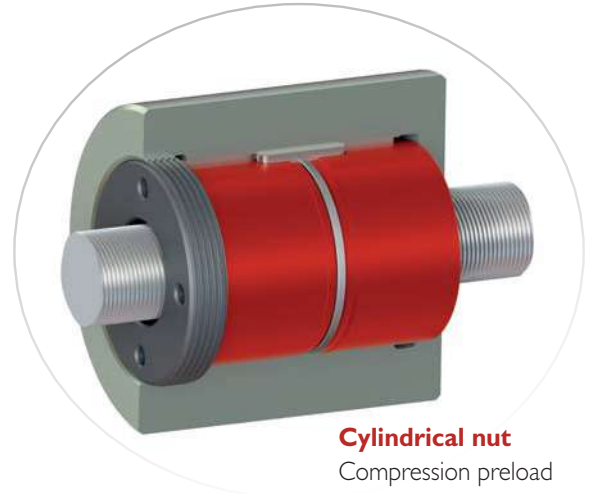
$F_1 \dots F_n$	[N]	: individual loads
$F_v$	[N]	: preload force
$F_{nv}$	[N]	: load resulting from the individual load and preload
$F_{ma}$	[N]	: equivalent mean load taking into account preload



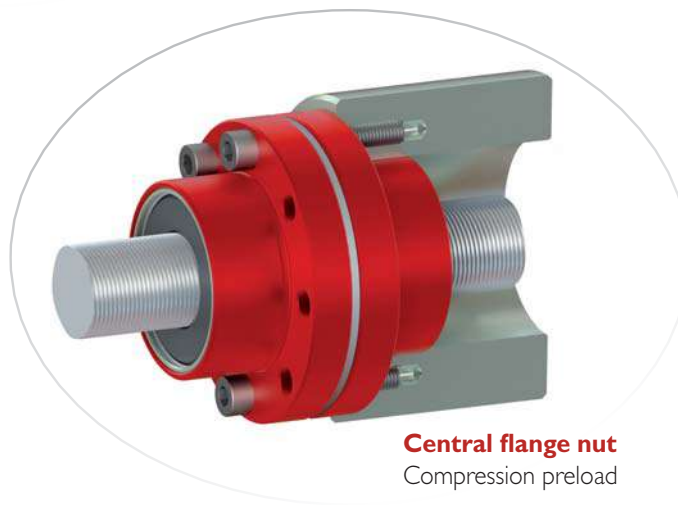
## Preloading with rigid spacer (thickness calibrated by Rollvis SA)



**Flange nut**  
Extension preload

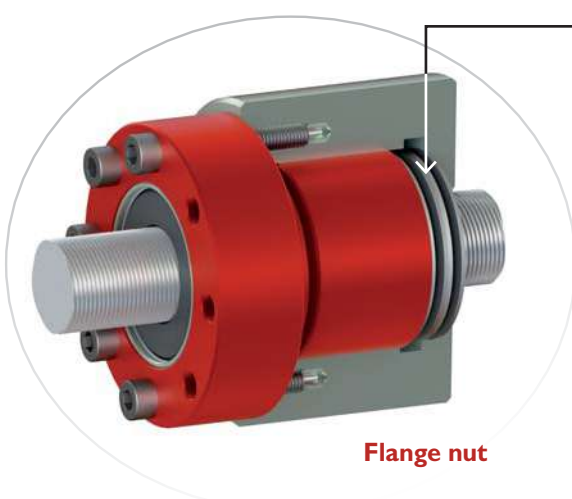


**Cylindrical nut**  
Compression preload



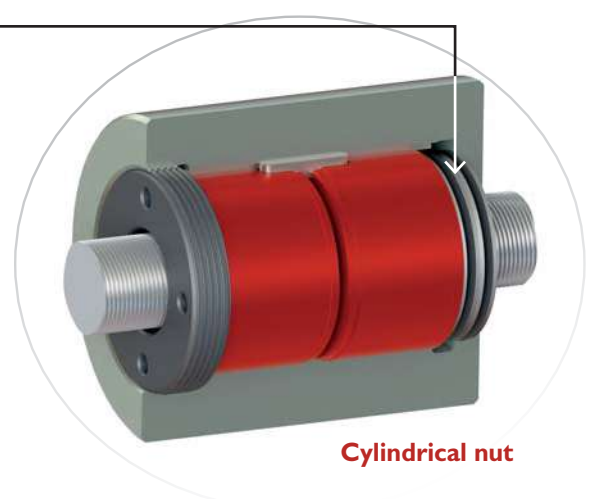
**Central flange nut**  
Compression preload

## Preloading with elastic washers



**Flange nut**

Elastic washers



**Cylindrical nut**

Elastic preload makes it easier to calibrate the level. However this type of preload gives an asymmetrical behaviour depending on the direction of the external load (whether path goes through the spring washer or not). Consult Rollvis for more details.

## Preloading with oversized rollers

No change compared to regular single nuts for the mounting. The preload is set internally at the factory and is independent from external tightening.

# Mean speed and equivalent mean load



For variable speed and load, lifespan should be calculated with mean values  $n_m$  et  $F_m$ .

For variable speed and constant load with speed  $n$ , the mean speed  $n_m$  is used (figure below).

$$n_m = \frac{q_1}{100} \cdot n_1 + \frac{q_2}{100} \cdot n_2 + \dots [\text{min}^{-1}]$$



The mean load is actually an equivalent cubic mean load. For a variable load at constant speed, the mean load  $F_m$  is used (figure below).

$$F_m = \sqrt[3]{F_1^3 \cdot \frac{q_1}{100} + F_2^3 \cdot \frac{q_2}{100} + \dots [N]}$$

For a variable load at variable speed, the mean load  $F_m$  is used.

$$F_m = \sqrt[3]{F_1^3 \cdot \frac{q_1}{100} \cdot \frac{n_1}{n_m} + F_2^3 \cdot \frac{q_2}{100} \cdot \frac{n_2}{n_m} + \dots [N]}$$



← For a variable linear load at constant speed, the mean load  $F_m$  is used (figure below).

$$F_m = \frac{F_{\min} + 2 \cdot F_{\max}}{3} [N]$$

$n_m$	[min <sup>-1</sup> ]	: mean speed
$n_1 \dots n_n$	[min <sup>-1</sup> ]	: individual speeds
$q_1 \dots q_n$	[%]	: time percentage
$F_m$	[N]	: mean load
$F ; F_1 \dots F_n ; F_{\min} ; F_{\max}$	[N]	: actual forces



# Nominal lifespan

The nominal lifespan  $L_{10}$  or  $L_h$  of a satellite roller screw corresponds to the possible achievable life considering rolling fatigue failure mode. It is evaluated with a 90% probability of survival.

If greater reliability is required, the nominal lifespan  $L_{10}$  or  $L_h$  must be multiplied by the reliability factor  $f_r$  (*table opposite*).

Reliability %	$f_r$
90	1
95	0,62
96	0,53
97	0,44
98	0,33
99	0,21

updated lifetime, respectively

$$L_n = L_{10} \cdot f_r \quad [\text{revolutions}]$$

$$L_{hn} = L_h \cdot f_r \quad [\text{h}]$$

## Nominal lifespan of single nuts (with backlash or internal preload with oversized rollers)

The nominal lifespan of single nuts is calculated with the following formula:

$$L_{10} = \left( \frac{C}{F_m} \right)^3 \cdot 10^6 \quad [\text{revolutions}]$$

or

$$L_h = \frac{L_{10}}{n_m \cdot 60} \quad [\text{h}]$$

The required dynamic load capacity as a function of the expected life time, can be calculated as follow:

$$C = F_m \cdot \sqrt[3]{\frac{L_{10}}{10^6}} \quad [\text{N}]$$

The lifespan in actual machine hours  $L_{hN}$  can be calculated considering the ratio between the roller screw life and the utilisation factor of the screw in the machine.

$$L_{hN} = \frac{L_h}{f_N} \quad [\text{h}]$$

## Nominal lifespan of preloaded nuts

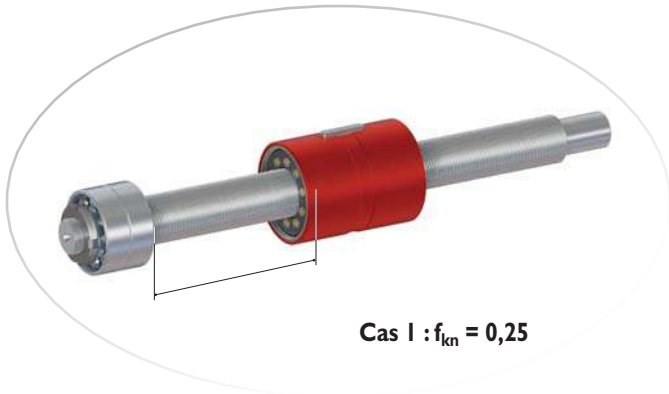
For preloaded nuts, it is first necessary to calculate the lifespan of each half of the nut with the corresponding dynamic load capacity  $C$  and the mean axial load  $F_{ma}$  (including preload). The total lifespan  $L_{10}$  of the preloaded nut is obtained with the two lifespan values  $L_{10(1)}$  and  $L_{10(2)}$  (in revolutions).

$$L_{10(1)} = \left( \frac{C}{F_{ma(1)}} \right)^3 \cdot 10^6 \quad [\text{revolutions}]$$

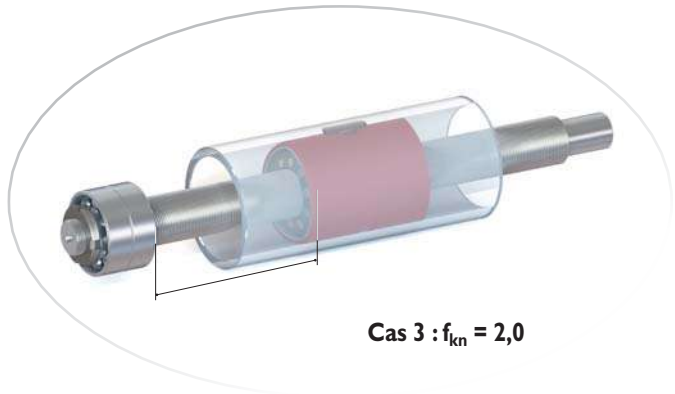
$$L_{10(2)} = \left( \frac{C}{F_{ma(2)}} \right)^3 \cdot 10^6 \quad [\text{revolutions}]$$

$$L_{10} = \left( L_{10(1)}^{-10/9} + L_{10(2)}^{-10/9} \right)^{-9/10} \quad [\text{revolutions}]$$

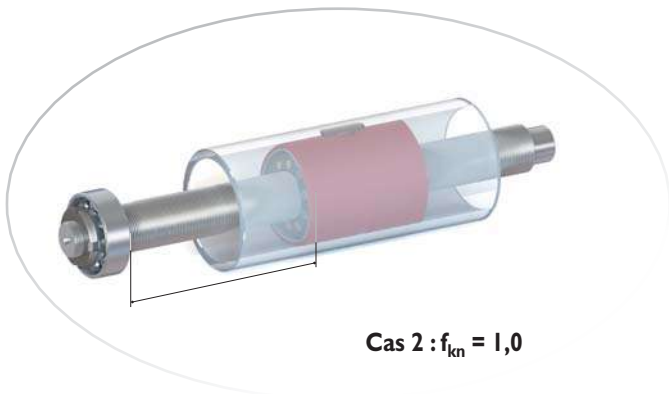
$L_n$ [revolutions]	: modified lifespan (revolutions)	$C$ [N]	: dynamic load capacity
$L_{hn}$ [h]	: modified lifespan (hours)	$F_m$ [N]	: mean load (single nut with backlash)
$L_{10}$ [revolutions]	: nominal lifespan (revolutions)	$F_{ma}$ [N]	: mean load (preloaded nut)
$L_h$ [h]	: nominal lifespan (hours)	$n_m$ [min <sup>-1</sup> ]	: mean speed
$L_{hN}$ [h]	: lifetime in actual hours	$f_N$ [-]	: utilisation factor
$f_r$ [-]	: reliability factor		



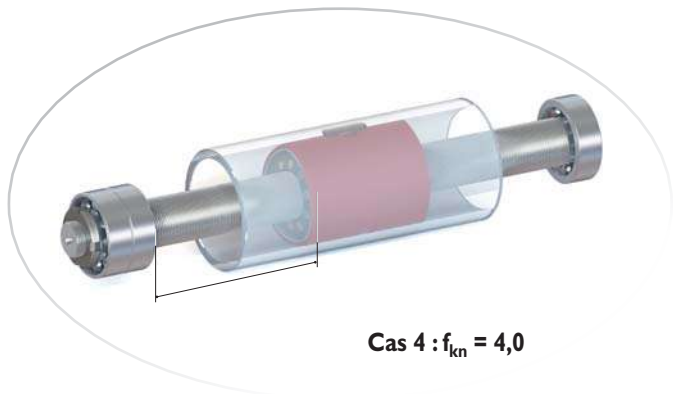
Cas 1 :  $f_{kn} = 0,25$



Cas 3 :  $f_{kn} = 2,0$



Cas 2 :  $f_{kn} = 1,0$



Cas 4 :  $f_{kn} = 4,0$

## Satellite roller screw rigidity

The overall rigidity  $C_{ges}$  of a satellite roller screw is the combination of the following individual rigidity values:

$C_{me}$ nut rigidity	$C_L$ bearing rigidity
$C_{Sp}$ screw rigidity	$C_u$ rigidity of the surrounding construction

## Permissible buckling force $F_{knzul}$

Permissible buckling force can be calculated with the following formula:

$$F_{knzul} = 0,8 \cdot 101,6 \cdot f_{kn} \cdot \frac{d_0^4}{L^2} \quad [\text{kN}]$$

0.8 corresponds to the safety factor :  $= \frac{1}{1,25}$

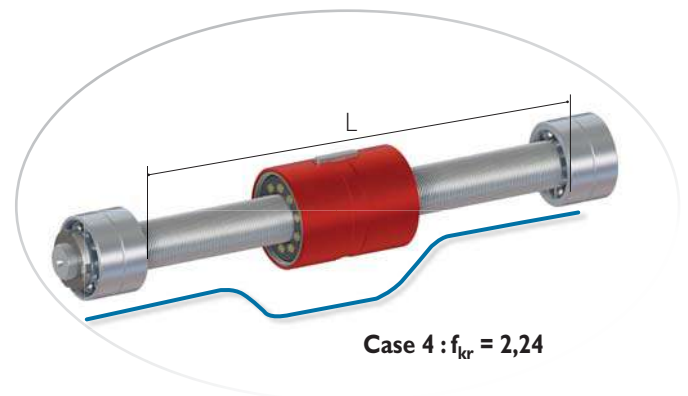
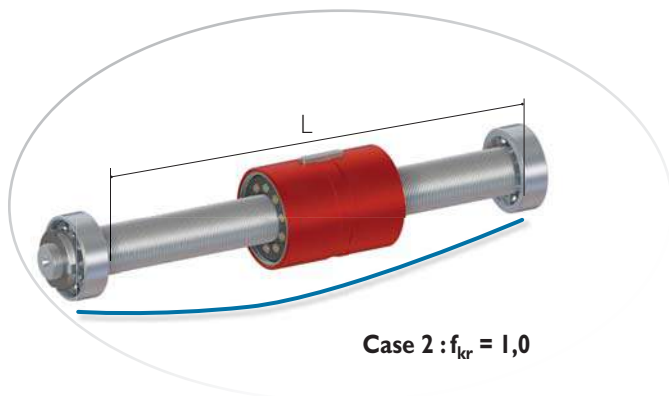
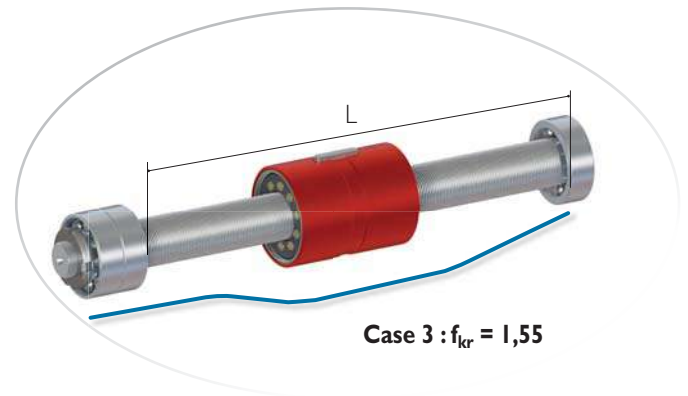
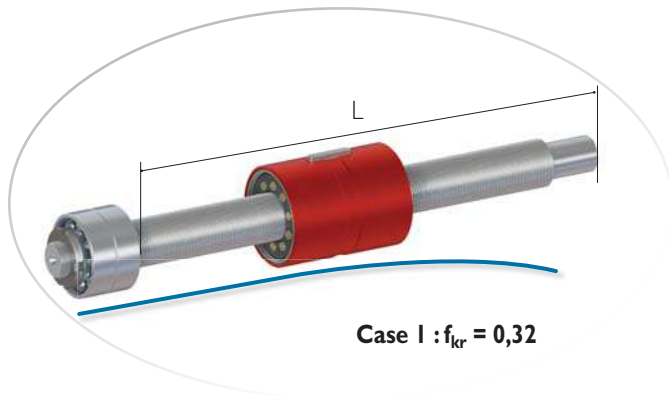
## Screw rigidity $C_S$

Screw rigidity  $C_S$  can be calculated with the following simplified formula:

$$C_S = 164 \cdot \frac{d_0^2}{L} \quad [\text{N}/\mu\text{m}]$$

$F_v$ [N]	: preloading force	$f_m$ [-]	: correction factor
$F_n$ [N]	: axial load	$L$ [mm]	: free screw length
$C_{me}$ [N/ $\mu\text{m}$ ]	: nut rigidity	$d_0$ [mm]	: nominal diameter of screw
$C_S$ [N/ $\mu\text{m}$ ]	: screw rigidity	$F_{knzul}$ [N]	: permissible buckling force
$f_k$ [N <sup>2/3</sup> / $\mu\text{m}$ ]	: rigidity factor	$f_{kn}$ [-]	: correction factor for bearing type





## Permissible rotation speed and axial load

Satellite roller screws are restricted by the internal configuration of the nut, the bearings at the end of the screw and the critical number of revolutions  $n_{kr}$  due to flexural vibration.

The max permissible speed  $n$  correspond to a never exceed speed. It is also called the limit speed. The lowest speed between  $n$  and  $n_{kr}$  has to be considered as the recommended max speed.

RV :  $d_0 \cdot n \leq 160'000$   
 RVR :  $d_0 \cdot n \leq 32'000$   
 RVI :  $d_0 \cdot n \leq 160'000$   
 RVD :  $d_0 \cdot n \leq 100'000$

## Critical speed $n_{kr}$ with axial load $F_n = 0$

Critical speed corresponds to the first natural frequency in bending. It is mainly depending on the limit conditions, but can also be influenced by the axial load which can give some stiffness variations.

When the correct screw end bearings are selected, their maximum speed will have no effect on the desired speed. Bearings mount give to the screw shaft a mount correction factor  $f_{kr}$  that is then used to calculate the corresponding critical speed. (*above figures*).

The calculation is based on the assumption that satellite roller screw nuts provide no guidance and the bearings at the screw end are considered rigid in the radial direction.

$$n_{kr} = 108 \cdot 10^6 \cdot d_0 \cdot \frac{1}{L^2} \quad [\text{min}^{-1}]$$

The permissible critical speed can be calculated by taking the bearing type into account:

$$n_{krzul} = 0,8 \cdot n_{kr} \cdot f_{kr} \quad [\text{min}^{-1}]$$

$n$  [min<sup>-1</sup>] : rotation speed

$n_{kr}$  [min<sup>-1</sup>] : critical rotation speed

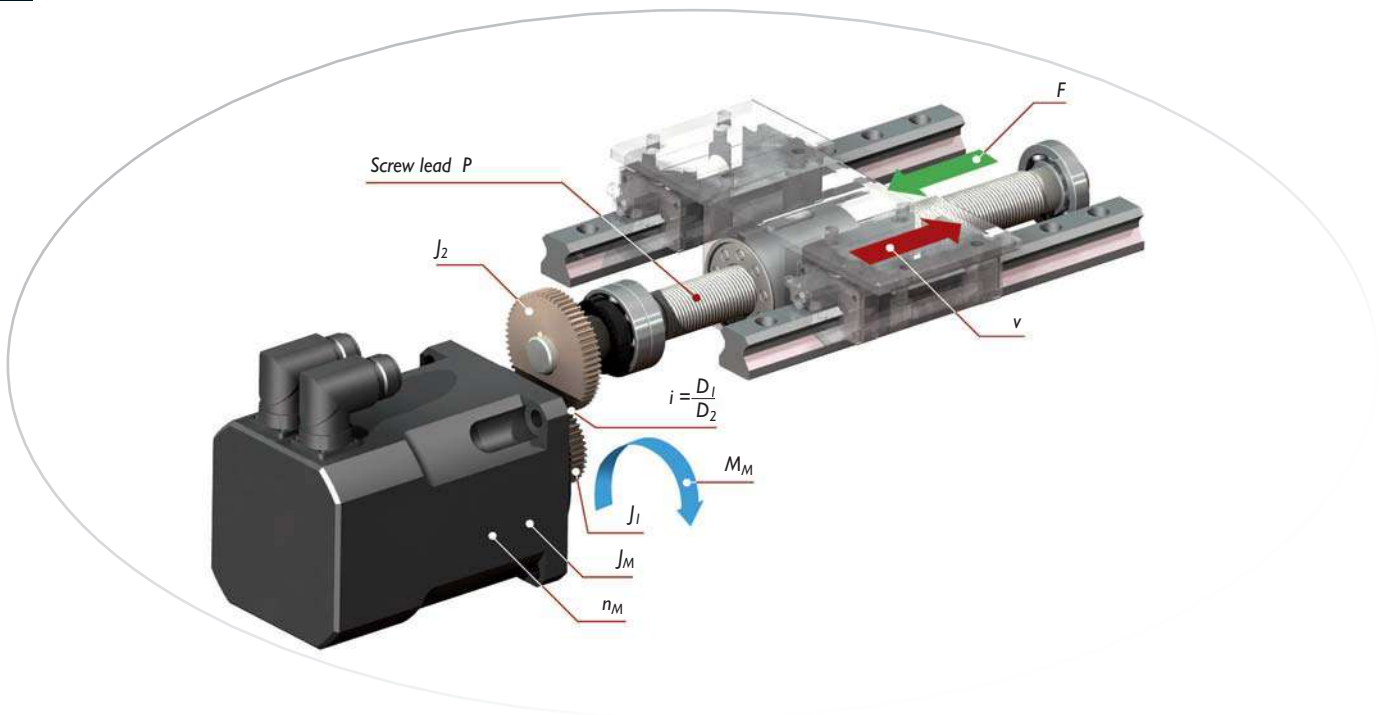
$n_{krzul}$  [min<sup>-1</sup>] : permissible critical rotation speed

$L$  [mm] : free screw length

$d_0$  [mm] : nominal diameter of screw

$f_{kr}$  [-] : correction factor for bearing type

0,8 [-] : safety factor



## Driving torque

All the values for motor rating can be calculated with the formulas below.

Note that the load-free torque  $M_v$  must be taken into account for preloaded nuts (based on the preload force  $F_v$ ).

For single nuts with backlash, the formula is:  $M_v = 0$  [Nm]

## Motor driving torque $M_M$ at constant speed

Load-free torque

$$M_v = \frac{F_v \cdot P \cdot i \cdot c}{2000 \cdot \pi} \quad [\text{Nm}]$$

Direct torque («ascent load torque»)

$$M_{L1} = \frac{P \cdot i \cdot F}{2000 \cdot \pi \cdot \eta_1} \quad [\text{Nm}]$$

Indirect torque («Descent load torque»)

The frictional forces of the guide slideway must be taken into account in feed force  $F$ .  
Corresponds to the braking torque

$$M_{L2} = \frac{P \cdot i \cdot F \cdot \eta_2}{2000 \cdot \pi} \quad [\text{Nm}]$$

Motor driving torque

If, as is possible in «Descent» mode, the motor driving torque is negative, the motor must have a brake.

$$M_M = (M_v + M_{L1,2} + M_R \cdot i) \quad [\text{Nm}]$$

Motor driving power

$$P_M = \frac{M_M \cdot n_M}{9,55} \quad [\text{W}]$$

$d$  [mm] : external diameter of screw  
 $d_0$  [mm] : nominal diameter of the screw  
 $d_B$  [mm] : diameter of the bore of the screw shaft  
 $d_2$  [mm] : core diameter of screw  
 $P$  [mm] : screw lead  
 $L$  [mm] : length of satellite roller screw  
 $m_T$  [kg] : mass to move  
 $D_1$  [mm] : diameter of driving wheel  
 $D_2$  [mm] : diameter of driven wheel  
 $i$  [-] : reduction ratio  
 $F$  [N] : feed force

$F_v$  [N] : preloading force  
 $F_a$  [N] : acceleration force  
 $M_v$  [Nm] : load-free torque  
 $M_{L1}$  [Nm] : «ascent» load torque at constant speed  
 $M_{L2}$  [Nm] : «descent» load torque at constant speed  
 $M_M$  [Nm] : motor driving torque  
 $M_{La}$  [Nm] : load torque on acceleration  
 $M_B$  [Nm] : acceleration torque  
 $M_{Ma}$  [Nm] : motor driving torque on acceleration  
 $M_R$  [Nm] : frictional torque of screw bearings



## Motor driving torque $M_{Ma}$ with acceleration

The rotary moment of inertia of screw  $J_R$  can be approximated with the formulae below.  
Please contact Rollvis Engineering if you need exact figures of roller screw moment of inertia.

Load torque	$M_{La} = \frac{P \cdot i \cdot (F + F_a)}{2000 \cdot \pi \cdot \eta_1}$	[Nm]
Moment of inertia (translation)	$J_T = m_T \cdot \left( \frac{P}{2 \cdot \pi} \right)^2 \cdot 10^{-6}$	[kgm <sup>2</sup> ]
Screw moment of inertia (rotation)	$J_R = 7.66 \cdot L \cdot (d_0^4 - d_B^4) \cdot 10^{-13}$	[kgm <sup>2</sup> ] (for steel)
Sum of reduced moments of inertia	$J = J_M + J_1 + i^2 (J_R + J_T + J_2)$	[kgm <sup>2</sup> ]
Motor speed	$n_M = \frac{v \cdot 6 \cdot 10^4}{P \cdot i}$	[Min <sup>-1</sup> ]
Acceleration torque $M_B = f(n_M)$	$M_B = \frac{n_M \cdot J}{9.55 \cdot t_B \cdot \eta}$	[Nm]
Acceleration torque $M_B = f(s_B)$	$M_B = \frac{4 \cdot \pi \cdot s_B \cdot J}{P \cdot i \cdot t_B^2 \cdot \eta}$	[Nm]
Acceleration time $t_B = f(n_M)$	$t_B = \frac{n_M \cdot J}{9.55 \cdot M_B \cdot \eta}$	[s]
Acceleration time $t_B = f(s_B)$	$t_B = \sqrt{\frac{4 \cdot \pi \cdot s_B \cdot J}{P \cdot i \cdot M_B \cdot \eta}}$	[s]
Rotation speed reached after acceleration	$n_M = \frac{120 \cdot s_B}{P \cdot i \cdot t_B}$	[Min <sup>-1</sup> ]
Linear stroke travelled during acceleration	$s_B = \frac{n_M \cdot t_B \cdot P \cdot i}{120}$	[mm]
Motor driving torque	$M_{Ma} = (M_v + M_{La} + M_R \cdot i + M_B)$	[Nm]
Motor driving power	$P_{Ma} = \frac{M_{ma} \cdot n_M}{9.55}$	[W]

$J_M$  [kgm<sup>2</sup>] : moment of inertia of motor

$J_R$  [kgm<sup>2</sup>] : rotary moment of inertia of screw

$J_T$  [kgm<sup>2</sup>] : translatory moment of inertia of screw

$J$  [kgm<sup>2</sup>] : moment of inertia

$J_1$  [kgm<sup>2</sup>] : moment of inertia of driving wheel

$J_2$  [kgm<sup>2</sup>] : moment of inertia of driven wheel

$P_M$  [W] : driving power of motor at constant speed

$P_{Ma}$  [W] : driving power of motor on acceleration

$s_B$  [mm] : acceleration path

$t_B$  [s] : acceleration time

$v$  [m/s] : speed rate

$n_M$  [min<sup>-1</sup>] : rotation speed of motor

$\eta$  [-] : mechanical efficiency of gearing

$\eta_1$  [-] : mechanical efficiency of satellite roller screw  
for « ascent »  $\eta_1 = 0,71 \dots 0,89$

$\eta_2$  [-] : mechanical efficiency of satellite roller screw  
for « descent »  $\eta_2 = 0,61 \dots 0,85$

$c$  [-] : coefficient of friction referred to preloading  
 $c = 0,1 \dots 0,5$

(for efficiencies  $\eta_1 + \eta_2$  see page 6)

# Calculation example

## Satellite roller screws RV 20 x 5

Nominal diameter :  $d_0 = 20$  mm  
 Lead :  $P = 5$  mm  
 Nut : split nut (EF), preloaded  
 Mounting position : horizontal  
 Load direction : both sides  
 Rapid mode : one side, opposite to working load

N°	Operating mode	Time percentage q [%]	Rotation speed n [min <sup>-1</sup> ]	Axial load F <sub>n</sub> [N]
1	Peak load	q <sub>1</sub> = 5	n <sub>1</sub> = 15	F <sub>1</sub> = 8300
2	Roughing feed	q <sub>2</sub> = 40	n <sub>2</sub> = 110	F <sub>2</sub> = 4500
3	Finishing feed	q <sub>3</sub> = 50	n <sub>3</sub> = 70	F <sub>3</sub> = 4200
4	Rapid	q <sub>4</sub> = 5	n <sub>4</sub> = 1700	F <sub>4</sub> = 1150

## Mean speed

$$n_m = \frac{5}{100} \cdot 15 + \frac{40}{100} \cdot 110 + \frac{50}{100} \cdot 70 + \frac{5}{100} \cdot 1700 = 165 \text{ min}^{-1}$$

## Preloading

For instance, preload is 1484 kN for this nut.  
 (This level of preload has been defined by Rollvis engineering department as a function of the application conditions)

$$F_v = \frac{4200}{2.83} = 1484 \text{ N}$$

## Load on nut half 1

Nut half 1 is loaded in operating modes 1, 2 and 3.  
 As  $F_1, F_2$  and  $F_3 \geq 2.83 F_v$ ;

$$F_{nv} = F_n \text{ et ainsi } \begin{matrix} F_{1v} = 8300 \text{ N} \\ F_{2v} = 4500 \text{ N} \\ F_{3v} = 4200 \text{ N} \end{matrix}$$

Nut half 1 is only partly loaded in operating mode 4.  
 As  $F_4 = 1150 \text{ N} < 2.83 F_v$ ;

$$F_{4v} = 1484 - 0.35 \cdot 1150 = 1082 \text{ N}$$

## Load on nut half 2

Half nut 2 is loaded in operating mode 4.  
 Half nut 2 is not loaded in operating modes 1, 2 and 3.

$$F_{1v} = F_{2v} = F_{3v} = 0$$

As  $F_4 < 2.83 \cdot F_v$ , on a :

$$F_{4v} = 1484 + 0.65 \cdot 1150 = 2232 \text{ N}$$

## Charge Mean load

$$\text{Nut 1 } F_{ma(1)} = \sqrt[3]{8300^3 \cdot \frac{15}{165} \cdot \frac{5}{100} + 4500^3 \cdot \frac{110}{165} \cdot \frac{40}{100} + 4200^3 \cdot \frac{70}{165} \cdot \frac{50}{100} + 1082^3 \cdot \frac{1700}{165} \cdot \frac{5}{100}} = 3511 \text{ N}$$

$$\text{Nut 2 } F_{ma(2)} = \sqrt[3]{2232^3 \cdot \frac{1700}{165} \cdot \frac{5}{100}} = 1789 \text{ N}$$

## Lifespan

Dynamic load capacity of a nut C = 23 400 N

$$\text{Half nut 1 } L_{10(1)} = \left( \frac{23400}{3511} \right)^3 \cdot 10^6 = 296 \cdot 10^6 \text{ revolutions}$$

$$\text{Half nut 2 } L_{10(2)} = \left( \frac{23400}{1789} \right)^3 \cdot 10^6 = 2237 \cdot 10^6 \text{ revolutions}$$

## Total lifespan

$$L_{10} = [(296 \cdot 10^6)^{-10/9} + (2237 \cdot 10^6)^{-10/9}]^{-9/10}$$
$$L_{10} = 270 \cdot 10^6 \text{ revolutions}$$

Lifespan in hours (with utilisation factor  $f_N = 0.6$ )

$$L_{hN} = \frac{270 \cdot 10^6}{165 \cdot 0.6 \cdot 60} = 45\,450 \text{ h}$$

## Satellite roller screw rigidity

Free length between fixed bearing and nut  $l = 1000 \text{ mm}$   
Nominal diameter of screw  $d_1 = 20 \text{ mm}$

$$C_S = 164 \cdot \frac{20^2}{1000} = 66 \text{ N}/\mu\text{m}$$

## Bearing rigidity

$$C_1 = 850 \text{ N}/\mu\text{m} \text{ ("refer to bearing catalogs")}$$

## Driving torque

Driving torque  $M_M$  is calculated for the peak load of  $F_1 = 8300 \text{ N}$ .

The screw is directly driven by the motor ( $i = 1$ ):

Load-free torque:  $M_V = \frac{1484 \cdot 5 \cdot 1 \cdot 0.43}{2000 \cdot \pi} = 0.5 \text{ Nm}$

Load torque:  $M_{L1} = \frac{5 \cdot 1 \cdot 8300}{2000 \cdot \pi \cdot 0.87} = 7.6 \text{ Nm}$

Frictional torque of bearings:  $M_R = 0.2 \text{ Nm (admitted)}$

Peak driving torque of motor at constant speed:  $M_{Mmax} = 0.5 + 7.6 + 0.2 = 8.3 \text{ Nm}$

Motor driving power reaches its peak in rapid mode with  $F_4 = 1150 \text{ N}$ .

Moment en Load torque:  $M_{L4} = \frac{5 \cdot 1 \cdot 1150}{2000 \cdot \pi \cdot 0.87} = 1.05 \text{ Nm}$

Peak driving power of motor at constant speed:  $P_{Mmax} = \frac{(1.05 + 0.5 + 0.2) \cdot 1700}{9.55} = 312 \text{ W}$



Lubricants used for satellite roller screws are generally the same as for ball bearings. Oil or grease can both be used, depending on the application conditions and how maintenance is managed. Without specific request from customer, Rollvis use its standard grease. As a function of customer's application, we are able to define and offer the most appropriate lubricant.

## Oil lubrication

Circulating mineral oils with EP additives to enhance resistance to aging and corrosion in compliance with CL based on DIN 51517, part 2, are especially suitable for the lubrication of satellite roller screws. Speed, ambient temperature and operating temperature are determining factors in the choice of viscosity.

The amount of oil required depends on the screw diameter, the number of supporting rollers and the amount of heat to dissipate. 1 cm<sup>3</sup>/h (for small screw diameters) to 30 cm<sup>3</sup>/h (for large screw diameters) can be used as reference values. Rollvis Engineering can support to calculate the power to be dissipated by the screw and make recommendation on the flow of oil to cool down the screw.

The shortest possible lubrication intervals (...5 minutes) are recommended for high loads and longer intervals (5 minutes to 1 hr) for low loads. Automatic lubrication is recommended for high loads and speeds.

For immersion lubrication, the oil level should be such that the bottommost roller is completely submerged in the oil. The amount of oil and the oil-change intervals depend on the loading and installation.

The viscosity of the oil should be chosen to enable an adequate film of lubricant to form on the contact surfaces.

**Figure a** shows the operating viscosity  $V_K$  to achieve for the mean speed of the satellite roller screw and screw diameter.

Viscosity  $V_K$  ensures a state of lubrication to fulfil the nominal lifespan provided the lubrication system is free of foreign bodies.

Nominal viscosity can be calculated on the basis of viscosity  $V_K$  with the viscosity-temperature diagram (diagram **V-t**, **figure b**) and the operating temperature. Nominal viscosity is the viscosity of oil at 40°C. Viscosity classes **ISO VG (DIN 51519)** are plotted in diagram **V-t**.

**Figure a** shows the nominal diameters of RV satellite roller screws. The diameters of RVR satellite roller screws are slightly different. The required operating viscosity values can be obtained by interpolation.

Intermediate values can be obtained from the steps. These must be rounded up to the nearest viscosity value.

The operating temperature must be known or estimated to calculate nominal viscosity. The operating temperature must be measured on the nut after stabilisation. A suitable oil can be found in oil suppliers' lists with the nominal viscosity at 40°C. In general, an operating temperature of 30°C\* can be taken as a basis for selecting a lubricant.

**Example:** Satellite roller screw RV 39 x 10  
Mean operating speed:  $n_m = 1400 \text{ min}^{-1}$   
Operating temperature (estimated):  $t = 25 \text{ }^\circ\text{C}$

In **figure a**, for a number of revolutions  $n_m = 1400 \text{ min}^{-1}$  and a nominal diameter of 39mm, the nominal viscosity is  $V_K = 33 \text{ mm}^2/\text{s}$ .

After the nominal viscosity has been defined, we recommend to apply a viscosity factor that can be estimated as the function of the loading conditions (**Figure a'**).

For instance if for this application the mean load is 56kN, then the ratio is about 30% which gives a factor of 3.

The corrected nominal viscosity is then 100 cst.

In diagram **V-t** (**figure b**), the 25°C temperature and 100 mm<sup>2</sup>/s viscosity lines intersect with line ISO VG 46. The oil to select must have at least this viscosity if operating temperature is stabilized at 25°C. Note that a higher viscosity would also be possible but we do not recommend to choose a lower one.

A suitable CLP (DIN 51517) or HLP (DIN 51525) oil can be selected from this class.

\* In case operating conditions are not known, Rollvis recommends using an oil with about 150 cst viscosity at 40°C.

## Grease lubrication

For satellite roller screw, grease is usually preferred as a lubricant. Grease with lithium, barium or calcium thickeners are preferred. The chosen grease must have a viscosity at least 100 to 150 cst at 40°C, grade II and with specific additives. Lubrication recommendation are different when an automatic lubrication system is used.

Lubrication intervals depend on the screw arrangement, size and operating conditions. Rollvis can provide recommendations for any type of application.

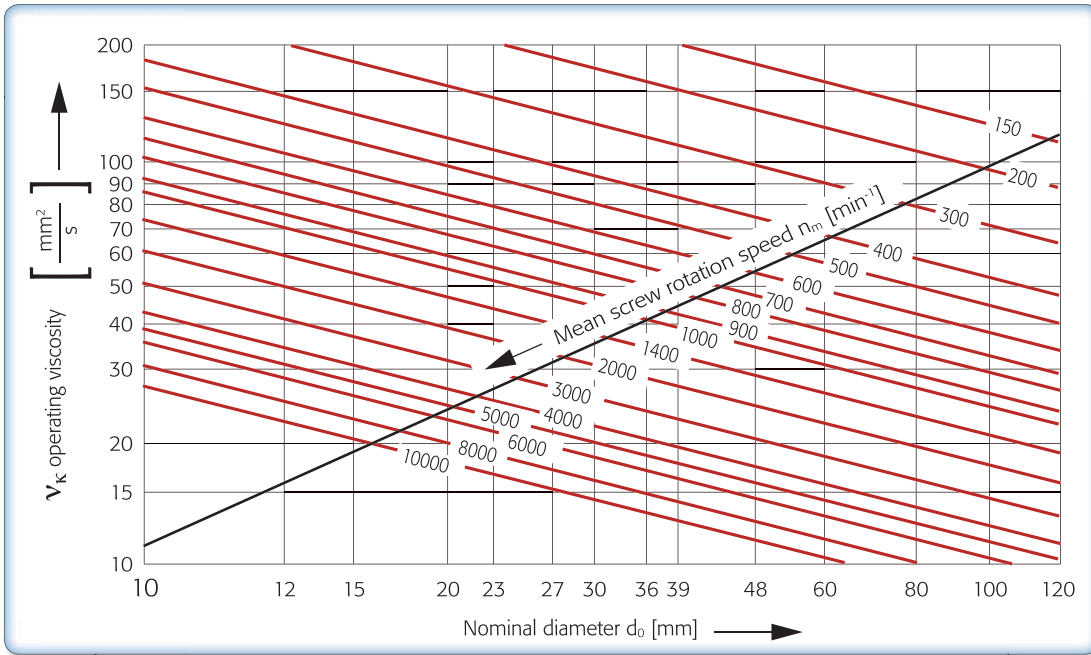


Figure a

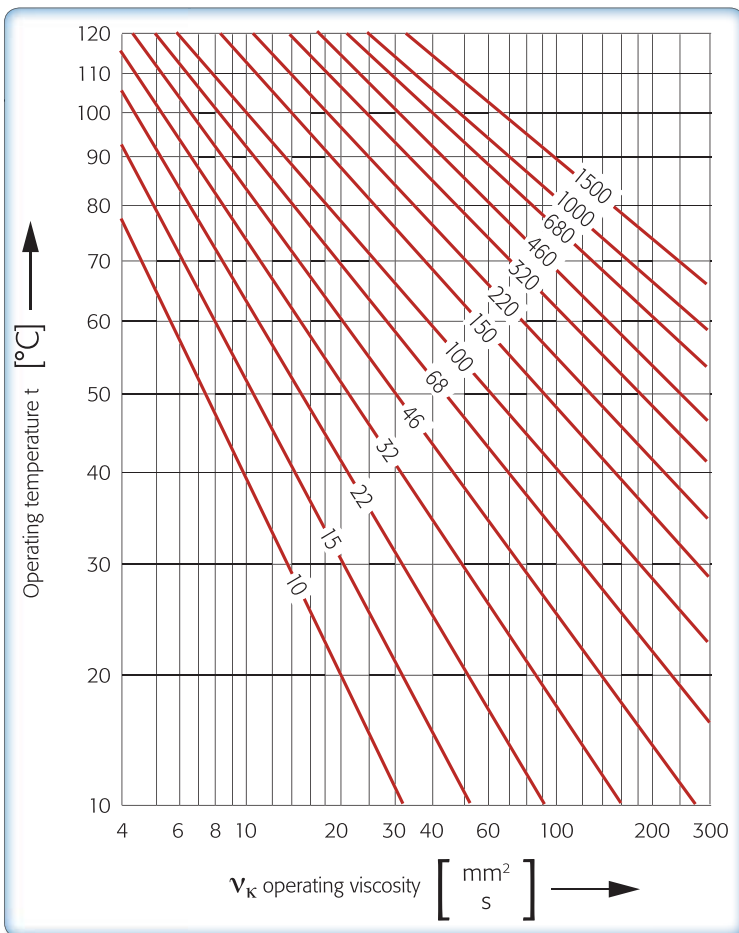


Figure b

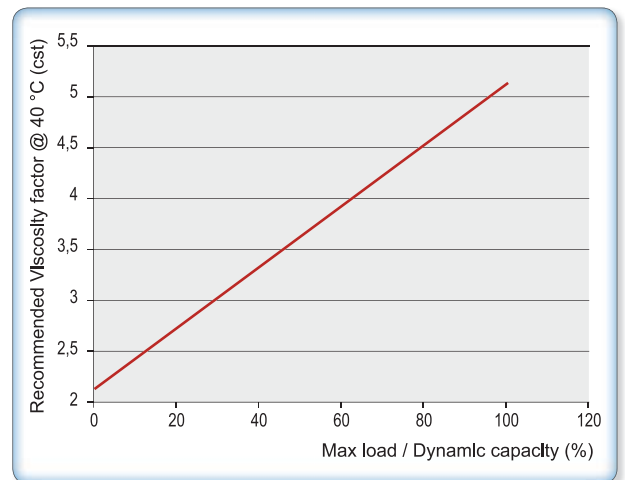


Figure a'

## Assembly

If possible, the nut should not be removed from the screw shaft. However, should this be necessary, an assembly sleeve must be used. External diameter of assembly sleeve:

External diameter of the assembly sleeve  $d_3 = d_2 + 0,05$ <sup>0</sup>  
( $d_2$  = screw core diameter)

## Screw assembly

Montage de la vis

The following points must be followed when assembling the screw:

- 1 • Align the screw and slide guideways axially parallel.
- 2 • Fix the nut in housing.
- 3 • Run the nut along the entire length of the thread and check the screw for ease of movement

## CAUTION

**RV screws always have a multiple-start thread. If the friction torque is slightly different after the nut is reassembled, the nut can be taken off again and reinstalled on the next thread start until friction torque is back to the original level !**

## Handling

Please heed strictly the following instructions to ensure optimal an operation and a long lifetime of the satellite roller screw.

Please, feel free to contact Rollvis for more **information or if you have any question.**

### Lubrication



Satellite roller screws are greased prior to shipment (unless oil lubrication is requested).

Do not remove this grease. **Only use this type of grease for relubrication.**

### Transport



Handle screws with care: do not let boxes or crates drop. Lift and handle so that the thread does not get damaged.

### Installation



Do not remove the nut from the shaft (or only with an assembly sleeve).

Carefully align satellite roller screws parallel to the guideways.

Alignment errors may generate side loads, create additional friction or noise and may damage the screw.

### Storage









Only remove satellite roller screws from their original packing just before installation.

### Bending



Design and installation must prevent radial forces or tilting moments on the nut.



	pages		
<b>RV Screws</b>	from 22 to 39		<b>RV Range</b> →
<b>HRV Screws</b>	from 40 to 45		<b>HRV Range</b> →
<b>RVI Screws</b>	from 46 to 51		<b>RVI Range</b> →
<b>RVR Screws</b>	from 52 to 57		<b>RVR Range</b> →
<b>RVD Screws</b>	from 58 to 63		<b>RVD Range</b> →
<b>Bearing units for roller screws BU</b>	from 64 to 68		<b>Bearing units BU</b> →

Preferred range



RV Range – Table of the standard available dimensions

Screw diameter (D)	Number of starts (N)	Lead (P)																		
		1	2	3	4	5	6	8	10	12	15	18	20	24	25	30	35	40	42	50
3,5	3	X	X																	
5	3	X	X	X																
7	4	X	X	X	X															
8	4	X	X	X	X															
10	4	X																		
	5		X	X	X															
12	4	X																		
	5		X	X	X	X	X													
15	5		X	X	X	X	X	X												
18	5		X	X	X	X	X	X	X											
20	5		X	X	X	X	X	X	X	X										
21	5		X	X	X	X	X	X	X	X										
23	5		X	X	X	X	X	X	X	X										
25	6			X							X									
27	5		X		X	X	X	X	X	X	X									
30	5		X		X	X	X	X	X	X	X	X								
36	6					X					X	X	X							
39	5		X		X	X	X	X	X	X	X	X	X							
44	6					X					X	X	X	X						
48	6					X	X	X	X	X	X	X	X	X						
51	5				X			X	X	X	X	X	X	X	X					
56	6					X			X	X	X	X	X	X	X					
60	6					X	X	X	X	X	X	X	X	X	X	X				X
64	5				X			X	X	X	X	X	X	X	X	X				
70	6				X			X	X	X	X	X	X	X	X	X				
75	5					X			X	X	X	X	X	X	X	X				
80	6					X			X	X	X	X	X	X	X	X				
87	5					X			X	X	X	X	X	X	X	X				
92	6					X			X	X	X	X	X	X	X	X				
100	6					X			X	X	X	X	X	X	X	X				
	5					X			X	X	X	X	X	X	X	X				
120	6					X			X	X	X	X	X	X	X	X				
	5					X			X	X	X	X	X	X	X	X				

X	N = 3
X	N = 4
X	N = 5
X	N = 6



RV 12 x 8

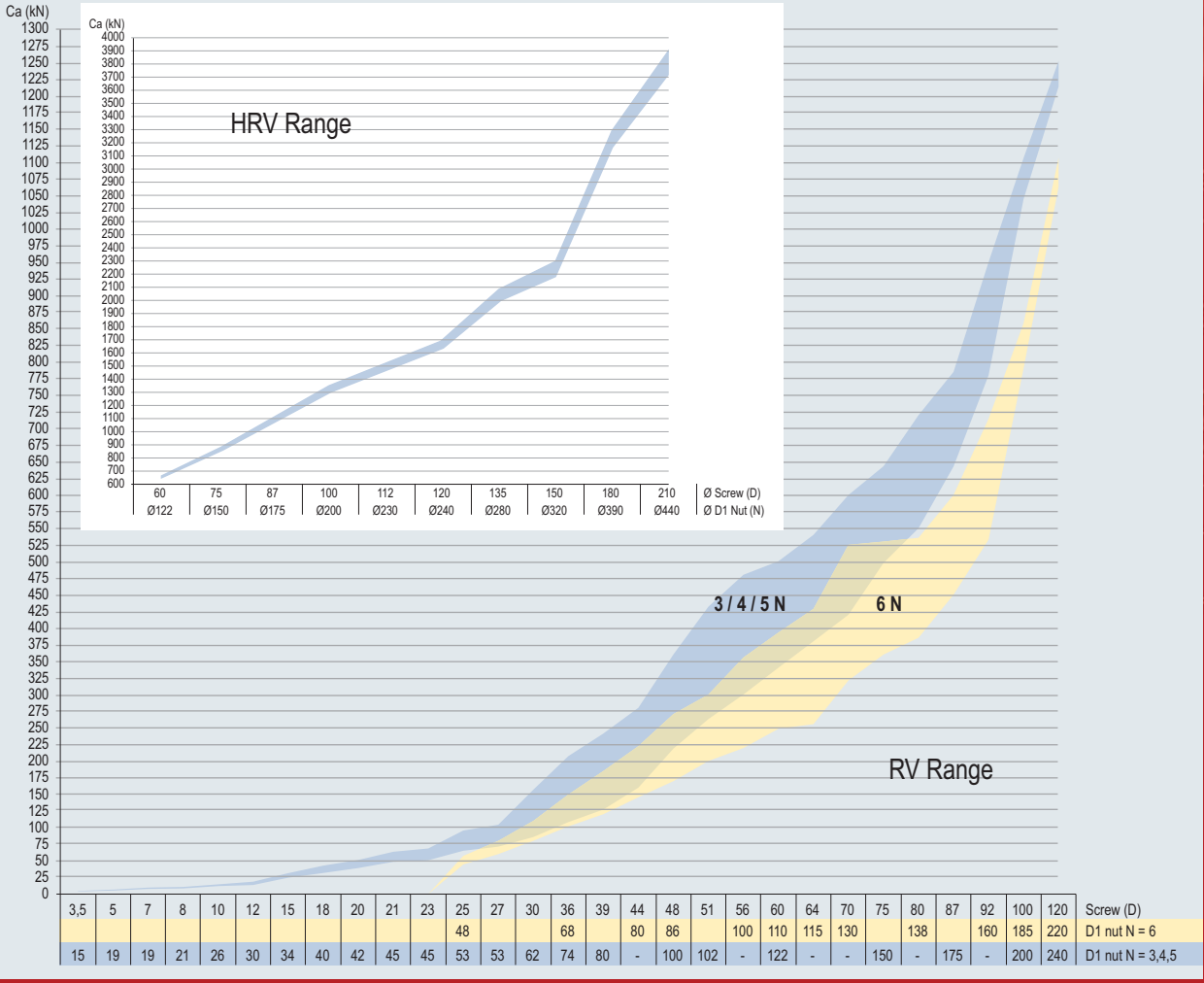


RV 30 x 30



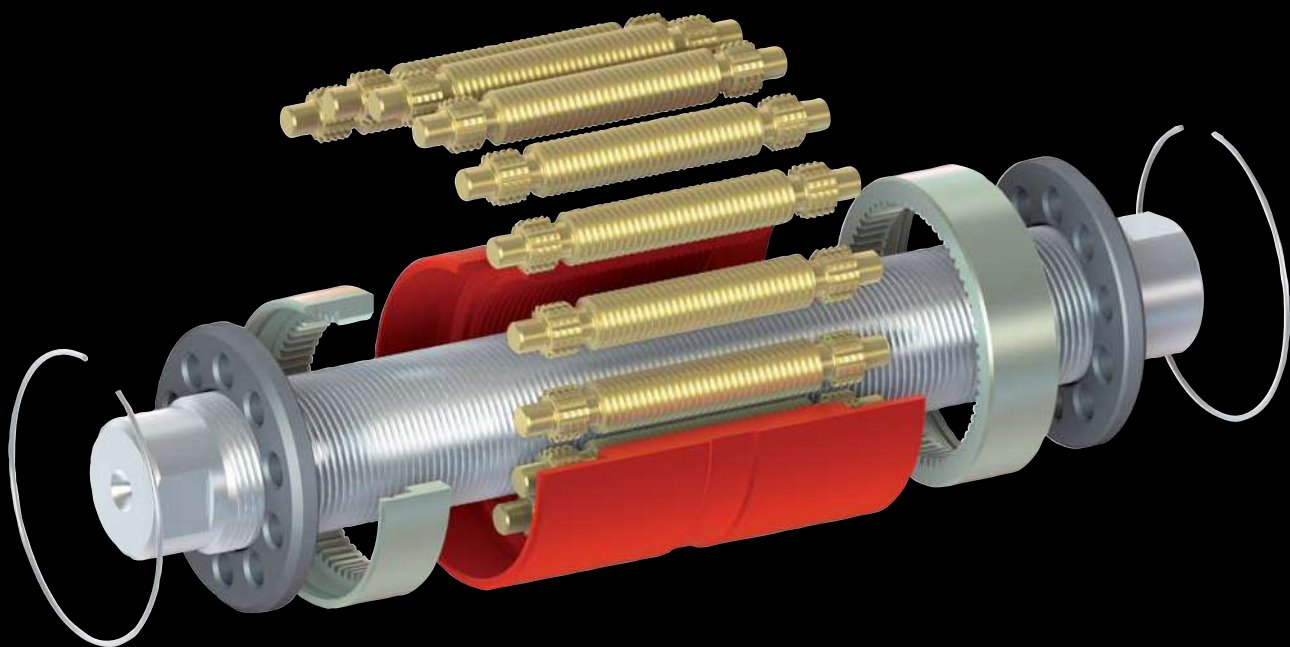
RV 39 x 10

Dynamic capacities (Ca) diagram for roller screws as a function of the standard dimensions for standard RV and HRV roller screws range



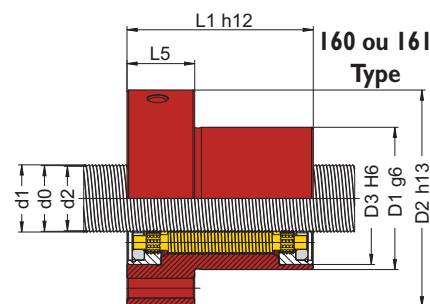
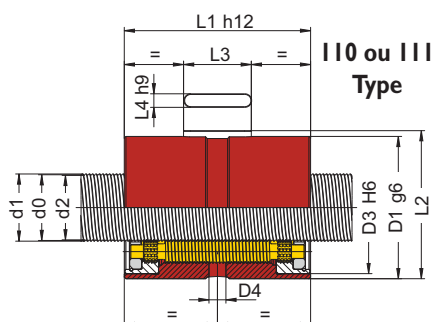


<i>Dimensions</i>	<i>pages</i>
● <b>RV 3,5 / 5 / 7 / 8 / 10 / 12 / 15</b>	24 et 25
● <b>RV 18 / 20 / 21 / 23</b>	26 et 27
● <b>RV 25 / 27 / 30</b>	28 et 29
● <b>RV 36 / 39 / 44</b>	30 et 31
● <b>RV 48 / 51 / 56</b>	32 et 33
● <b>RV 60 / 64 / 70</b>	34 et 35
● <b>RV 75 / 80 / 87 / 92</b>	36 et 37
● <b>RV 100 / 120</b>	38 et 39





# RV Range - Satellite roller screws

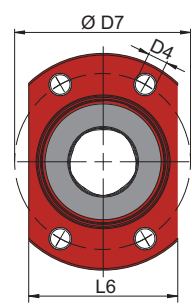
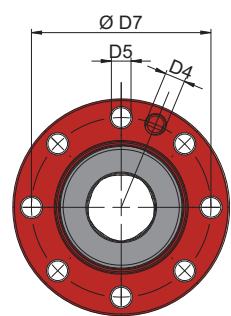
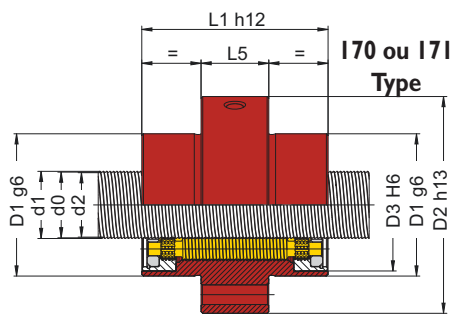
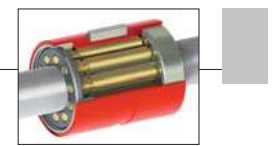


## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	3,5 x	I	3	5,20	3,9	8,4	28,6	0,01	3,9	8,4	42,9	561	0,03	2,2	4,2	18,0	561	0,03	0,89	0,87
		2		10,31	4,6	8,5	20,2	0,02	4,6	8,5	30,3	252	0,03	2,5	4,2	12,7	252	0,03	0,88	0,86
RV	5 x	I	3	4,05	5,2	11,7	33,0	0,02	5,2	11,7	49,5	679	0,04	2,9	5,9	20,8	679	0,04	0,88	0,86
		2		8,05	6,2	11,8	23,0	0,02	6,2	11,8	34,5	390	0,04	3,4	5,9	14,5	390	0,04	0,89	0,87
		3		11,98	6,7	11,9	18,8	0,02	6,7	11,9	28,2	193	0,04	3,7	6,0	11,8	193	0,04	0,86	0,83
RV	7 x	I	4	2,60	7,7	18,7	50,6	0,02	7,7	18,7	76,0	519	0,04	4,2	9,3	31,9	519	0,04	0,84	0,81
		2		5,20	8,3	16,4	32,3	0,03	8,3	16,4	48,4	377	0,04	4,6	8,2	20,3	377	0,04	0,89	0,87
		3		7,77	9,0	16,2	26,2	0,04	9,0	16,2	39,3	260	0,04	4,9	8,1	16,5	260	0,04	0,89	0,88
		4		10,31	9,7	16,6	22,9	0,05	9,7	16,6	34,3	168	0,04	5,3	8,3	14,4	168	0,04	0,88	0,86
RV	8 x	I	4	2,28	8,4	20,2	52,3	0,02	8,4	20,2	78,4	581	0,05	4,6	10,1	32,9	581	0,05	0,83	0,79
		2		4,55	10,0	20,3	36,3	0,02	10,0	20,3	54,5	453	0,05	5,5	10,2	22,9	453	0,05	0,88	0,87
		3		6,81	9,9	17,5	26,7	0,04	9,9	17,5	40,1	329	0,05	5,4	8,8	16,8	329	0,05	0,89	0,88
		4		9,04	10,7	18,0	23,4	0,05	10,7	18,0	35,1	232	0,05	5,9	9,0	14,8	232	0,05	0,88	0,87
RV	10 x	I	4	1,82	12,0	22,8	54,7	0,02	12,0	22,8	82,1	587	0,06	6,6	11,4	34,5	587	0,06	0,80	0,75
		2		3,47	13,3	24,8	46,4	0,02	13,3	24,8	69,6	475	0,06	7,3	12,4	29,2	475	0,06	0,87	0,85
		3		5,20	14,3	24,1	36,9	0,03	14,3	24,1	55,4	378	0,06	7,9	12,0	23,3	378	0,06	0,89	0,87
		4		6,91	14,6	22,6	30,4	0,04	14,6	22,6	45,6	297	0,06	8,0	11,3	19,1	297	0,06	0,89	0,88
RV	12 x	I	4	1,52	13,6	25,0	56,4	0,02	13,6	25,0	84,6	673	0,08	7,5	12,5	35,5	673	0,08	0,78	0,71
		2		3,04	14,6	26,9	47,6	0,02	14,6	26,9	71,3	578	0,08	8,0	13,4	30,0	578	0,08	0,86	0,83
		3		4,55	15,7	26,1	37,9	0,02	15,7	26,1	56,8	485	0,08	8,7	13,0	23,8	485	0,08	0,88	0,87
		4		6,06	17,2	27,2	33,3	0,03	17,2	27,2	50,0	392	0,08	9,5	13,6	21,0	392	0,08	0,89	0,88
		5		7,55	18,1	27,3	29,8	0,05	18,1	27,3	44,7	313	0,08	9,9	13,6	18,8	313	0,08	0,89	0,88
		6		9,04	18,4	26,5	26,7	0,05	18,4	26,5	40,1	246	0,08	10,1	13,2	16,8	246	0,08	0,88	0,87
		8		11,98	18,6	24,9	22,0	0,05	18,6	24,9	33,1	146	0,08	10,2	12,5	13,9	146	0,08	0,86	0,83
RV	15 x	2	5	2,43	24,6	55,4	66,7	0,02	24,6	55,4	100,1	617	0,10	13,6	27,7	42,0	617	0,10	0,84	0,80
		3		3,64	25,5	50,5	50,9	0,02	25,5	50,5	76,3	540	0,10	14,0	25,3	32,0	540	0,10	0,87	0,85
		4		4,85	26,8	49,5	43,3	0,03	26,8	49,5	64,9	466	0,10	14,8	24,7	27,3	466	0,10	0,88	0,87
		5		6,06	28,9	51,5	39,4	0,04	28,9	51,5	59,1	394	0,10	15,9	25,7	24,8	394	0,10	0,89	0,88
		6		7,26	29,9	51,0	35,8	0,05	29,9	51,0	53,7	330	0,10	16,5	25,5	22,5	330	0,10	0,89	0,88
		8		9,63	31,4	50,1	30,6	0,05	31,4	50,1	45,9	223	0,10	17,3	25,1	19,3	223	0,10	0,88	0,86

\* Axial backlash can be reduced on demand.

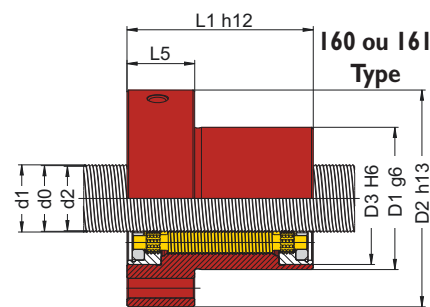
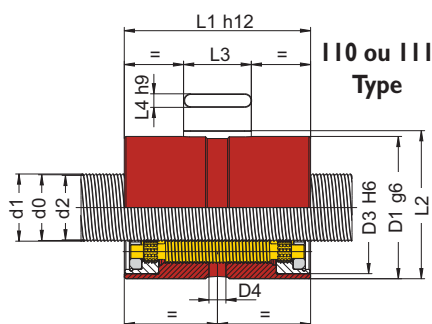
<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque



Types	SCREW				NUT														
	D x P	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	3,5 x	1	3,63	3,5	3,35	15	35	13,5	/	/	4,8	25	28	38	16	10	2	13	17
		2	3,75		3,20														
RV	5 x	1	4,63	4,5	4,35	19	39	17	3	/	4,8	29	30	40	20,3	10	3	13	21
		2	4,75		4,20														
		3	4,88		4,06														
RV	7 x	1	7,09	7	6,89	19	41	17	3	/	4,8	31	31	41	20,3	10	3	13	21
		2	7,19		6,78														
		3	7,28		6,67														
		4	7,38		6,56														
RV	8 x	1	8,09	8	7,89	21	41	19	5	M5	4,8	31	31	41	22,3	10	3	13	23
		2	8,19		7,78														
		3	8,28		7,67														
		4	8,38		7,56														
RV	10 x	1	10,09	10	9,89	26	48	24	5	M5	4,8	36	31	41	25,3	10	3	13	26
		2	10,65		10,32														
		3	10,73		10,23														
		4	10,80		10,14														
RV	12 x	1	12,09	12	11,89	30	50	28	5	M5	4,8	40	31	41	31,3	10	3	13	32
		2	12,15		11,82														
		3	12,23		11,73														
		4	12,30		11,64														
		5	12,38		11,56														
		6	12,45		11,47														
		8	12,60		11,29														
		RV	15 x		2														
3	15,23			14,73															
4	15,30			14,64															
5	15,38			14,56															
6	15,45			14,47															
8	15,60			14,29															

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

# RV Range - Satellite roller screws



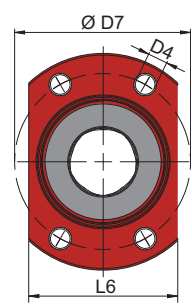
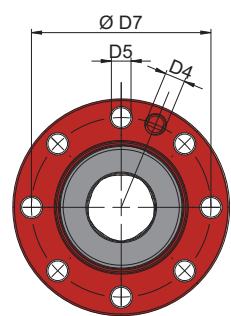
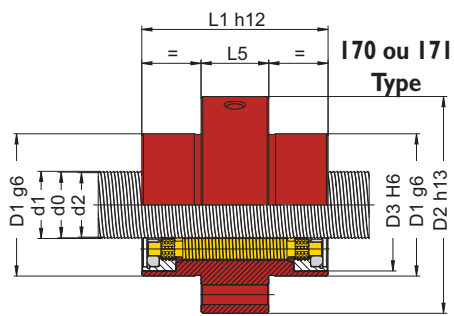
## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	18 x	5	2	2,03	31,7	75,8	76,5	0,02	31,7	75,8	114,7	803	0,15	17,5	37,9	48,2	803	0,15	0,82	0,77
			3	3,04	35,0	76,1	61,8	0,02	35,0	76,1	92,7	722	0,15	19,3	38,0	38,9	722	0,15	0,86	0,83
			4	4,05	37,5	76,3	53,2	0,02	37,5	76,3	79,8	645	0,15	20,6	38,1	33,5	645	0,15	0,88	0,86
			5	5,05	39,0	74,9	46,9	0,03	39,0	74,9	70,4	564	0,15	21,5	37,4	29,6	564	0,15	0,89	0,87
			6	6,06	38,7	69,7	40,6	0,04	38,7	69,7	61,0	490	0,15	21,3	34,9	25,6	490	0,15	0,89	0,88
			8	8,05	40,2	67,2	34,5	0,05	40,2	67,2	51,7	361	0,15	40,2	33,6	21,7	361	0,15	0,89	0,87
			10	10,03	42,7	69,1	31,2	0,05	42,7	69,1	46,8	260	0,15	23,5	34,5	19,6	260	0,15	0,88	0,86
RV	20 x	5	2	1,87	39,1	102,1	87,8	0,02	39,1	102,1	131,7	1002	0,20	21,5	51,1	55,3	1002	0,20	0,81	0,76
			3	2,80	42,7	100,6	70,1	0,02	42,7	100,6	105,1	911	0,20	23,5	50,3	44,1	911	0,20	0,85	0,82
			4	3,74	45,7	100,8	60,4	0,02	45,7	100,8	90,6	821	0,20	25,2	50,4	38,1	821	0,20	0,87	0,85
			5	4,67	48,0	100,2	53,5	0,03	48,0	100,2	80,3	733	0,20	26,4	50,1	33,7	733	0,20	0,88	0,87
			6	5,59	50,3	101,3	49,0	0,04	50,3	101,3	73,5	645	0,20	27,7	50,7	30,9	645	0,20	0,89	0,88
			8	7,44	49,3	89,3	39,2	0,05	49,3	89,3	58,8	492	0,20	27,2	44,7	24,7	492	0,20	0,89	0,88
			10	9,27	51,2	88,1	34,7	0,05	51,2	88,1	52,1	364	0,20	28,2	44,1	21,9	364	0,20	0,88	0,87
RV	21 x	5	2	1,74	48,4	106,9	89,2	0,02	48,4	106,9	133,7	1175	0,25	26,7	53,4	56,2	1175	0,25	0,80	0,74
			3	2,60	52,9	105,3	70,9	0,02	52,9	105,3	106,4	1082	0,25	29,1	52,6	44,7	1082	0,25	0,84	0,81
			4	3,47	56,7	105,5	61,3	0,02	56,7	105,5	91,9	983	0,25	31,2	52,8	38,6	983	0,25	0,87	0,85
			5	4,33	59,4	104,8	54,2	0,03	59,4	104,8	81,3	886	0,25	32,7	52,4	34,2	886	0,25	0,88	0,86
			6	5,20	62,4	106,0	49,6	0,03	62,4	106,0	74,4	791	0,25	34,4	53,0	31,2	791	0,25	0,89	0,87
			8	6,91	61,2	93,5	39,7	0,04	61,2	93,5	59,6	619	0,25	33,7	46,7	25,0	619	0,25	0,89	0,88
			10	8,62	63,5	92,2	35,1	0,05	63,5	92,2	52,7	472	0,25	35,0	46,1	22,1	472	0,25	0,89	0,87
RV	23 x	5	2	1,62	50,8	111,4	90,4	0,02	50,8	111,4	135,6	1330	0,30	28,0	55,7	57,0	1330	0,30	0,79	0,73
			3	2,43	55,5	109,7	71,8	0,02	55,5	109,7	107,7	1230	0,30	30,6	54,8	45,2	1230	0,30	0,84	0,80
			4	3,24	59,5	109,9	62,1	0,02	59,5	109,9	93,1	1130	0,30	32,8	55,0	39,1	1130	0,30	0,86	0,84
			5	4,05	62,4	109,2	54,9	0,03	62,4	109,2	82,4	1028	0,30	34,4	54,6	34,6	1028	0,30	0,88	0,86
			6	4,85	65,5	110,5	50,2	0,03	65,5	110,5	75,3	928	0,30	36,1	55,3	31,6	928	0,30	0,88	0,87
			8	6,46	68,5	107,1	42,8	0,04	68,5	107,1	64,2	741	0,30	37,7	53,6	27,0	741	0,30	0,89	0,88
			10	8,05	66,8	96,1	35,6	0,05	66,8	96,1	53,4	580	0,30	36,8	48,1	22,4	580	0,30	0,89	0,87

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque

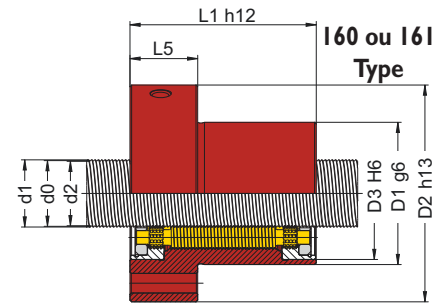
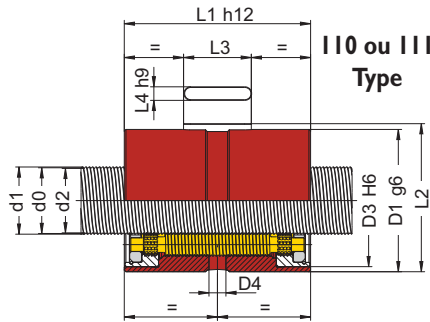




Types	D x P	SCREW			NUT														
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	18 x	2	18,15		17,82														
		3	18,23		17,73														
		4	18,30		17,64														
		5	18,38	18	17,56	40	62	35	5	M6	5,8	51	48	58	41,7	18	4	18	42
		6	18,45		17,47														
		8	18,60		17,29														
		10	18,75		17,11														
RV	20 x	2	19,65		19,32														
		3	19,73		19,23														
		4	19,80		19,14														
		5	19,88	19,5	19,06	42	64	39	5	M6	5,8	53	55	65	43,7	20	4	20	44
		6	19,95		18,97														
		8	20,10		18,79														
		10	20,25		18,61														
RV	21 x	2	21,15		20,82														
		3	21,23		20,73														
		4	21,30		20,64														
		5	21,38	21	20,56	45	67	41	5	M6	5,8	56	55	65	47	20	5	18	47
		6	21,45		20,47														
		8	21,60		20,29														
		10	21,75		20,11														
RV	23 x	2	22,65		22,32														
		3	22,73		22,23														
		4	22,80		22,14														
		5	22,88	22,5	22,06	45	68	42	5	M6	7,0	56	55	65	46,7	20	4	20	47
		6	22,95		21,97														
		8	23,10		21,79														
		10	23,25		21,61														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

# RV Range - Satellite roller screws

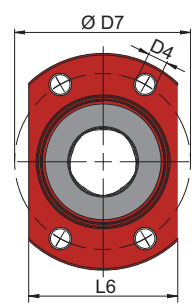
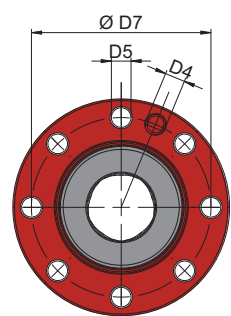
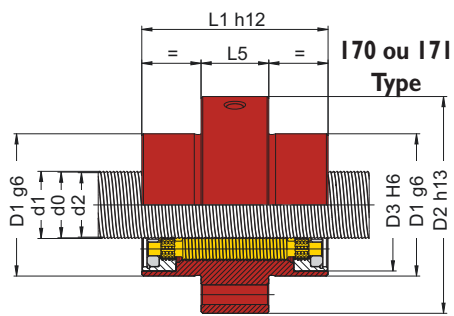
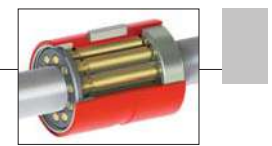


## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	25 x	3	6	2,28	44,4	89,9	76,0	0,02	44,4	89,9	114,0	1366	0,35	24,5	44,9	47,9	1366	0,35	0,83	0,79
		6		4,55	49,0	81,8	49,9	0,03	49,0	81,8	74,8	1055	0,35	27,0	40,9	31,4	1055	0,35	0,88	0,87
		12		9,04	57,4	83,1	35,3	0,05	57,4	83,1	53,0	538	0,35	31,6	41,6	22,2	538	0,35	0,88	0,87
		2	5	1,52	65,1	160,6	107,1	0,02	65,1	160,6	160,7	1465	0,35	35,9	80,3	67,5	1465	0,35	0,78	0,71
		4		3,04	77,0	161,2	74,1	0,02	77,0	161,2	111,2	1265	0,35	42,4	80,6	46,7	1265	0,35	0,86	0,83
		5		3,79	81,3	161,5	66,0	0,03	81,3	161,5	99,0	1160	0,35	44,8	80,8	41,6	1160	0,35	0,87	0,85
		6		4,55	84,2	159,6	59,6	0,03	84,2	159,6	89,4	1055	0,35	46,4	79,8	37,5	1055	0,35	0,88	0,87
		8		6,06	90,8	162,4	51,9	0,04	90,8	162,4	77,8	860	0,35	50,0	81,2	32,7	860	0,35	0,89	0,88
		10		7,55	89,6	148,1	43,6	0,05	89,6	148,1	65,4	686	0,35	49,4	74,1	27,5	686	0,35	0,89	0,88
		15		11,25	95,5	144,4	35,0	0,05	95,5	144,4	52,5	364	0,35	52,6	72,2	22,1	364	0,35	0,87	0,85
RV	27 x	2	5	1,35	71,3	175,1	110,2	0,02	71,3	175,1	165,3	1508	0,40	39,3	87,5	69,4	1508	0,40	0,76	0,68
		4		2,70	83,6	173,4	75,6	0,02	83,6	173,4	113,4	1332	0,40	46,1	86,7	47,6	1332	0,40	0,85	0,82
		5		3,37	88,3	173,7	67,5	0,03	88,3	173,7	101,2	1238	0,40	48,6	86,8	42,5	1238	0,40	0,86	0,84
		6		4,05	91,4	171,6	60,9	0,03	91,4	171,6	91,3	1143	0,40	50,4	85,8	38,3	1143	0,40	0,88	0,86
		8		5,39	98,7	174,7	52,8	0,03	98,7	174,7	79,2	960	0,40	54,4	87,3	33,3	960	0,40	0,89	0,87
		10		6,72	103,9	175,3	47,4	0,04	103,9	175,3	71,1	793	0,40	57,2	87,7	29,8	793	0,40	0,89	0,88
		15		10,03	104,2	155,4	35,7	0,05	104,2	155,4	53,5	461	0,40	57,4	77,7	22,5	461	0,40	0,88	0,86
RV	30 x	2	5	1,22	85,7	223,6	123,1	0,02	85,7	223,6	184,6	1715	0,50	47,2	111,8	77,5	1715	0,50	0,74	0,65
		4		2,43	100,8	221,6	84,0	0,02	100,8	221,6	126,1	1540	0,50	55,5	110,8	52,9	1540	0,50	0,84	0,80
		5		3,04	107,2	224,7	75,5	0,03	107,2	224,7	113,3	1446	0,50	59,0	112,3	47,6	1446	0,50	0,86	0,83
		6		3,64	111,1	222,4	68,3	0,03	111,1	222,4	102,4	1350	0,50	61,2	111,2	43,0	1350	0,50	0,87	0,85
		8		4,85	117,2	217,7	58,1	0,03	117,2	217,7	87,1	1160	0,50	64,6	108,9	36,6	1160	0,50	0,88	0,87
		10		6,06	126,3	226,5	52,9	0,04	126,3	226,5	79,3	983	0,50	69,6	113,3	33,3	983	0,50	0,89	0,88
		15		9,04	127,3	201,5	39,9	0,05	127,3	201,5	59,8	615	0,50	70,1	100,7	25,1	615	0,50	0,88	0,87
		20		11,98	156,8	229,8	35,2	0,05	156,8	229,8	52,9	363	0,50	86,4	114,9	22,2	363	0,50	0,86	0,83
		25		14,86	166,2	238,7	32,1	0,05	166,2	238,7	48,1	206	0,50	91,6	119,3	20,2	206	0,50	0,81	0,77
		30		17,66	160,7	219,4	28,0	0,05	160,7	219,4	42,0	113	0,50	88,5	109,7	17,7	113	0,50	0,74	0,64

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque

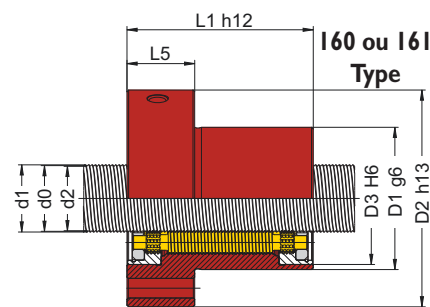
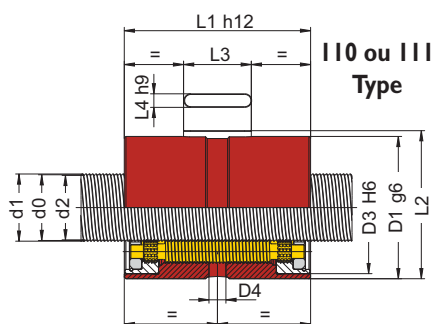


Types	D x P	SCREW			NUT																												
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]															
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6																	
RV	25 x	3	24,19		23,78	48	71	44	5	M6	7,0	59	48	58	49,7	18	4	20	50														
		6	24,38	24	23,56																												
		12	24,75		23,11																												
		2	24,15		23,82																												
		4	24,30		23,64																												
		5	24,38		23,56																												
		6	24,45	24	23,47															53	84	48	5	M6	7,0	70	64	78	55,5	25	6	20	55
		8	24,60		23,29																												
		10	24,75		23,11																												
		15	25,13		22,67																												
RV	27 x	2	27,15		26,82	53	83	50	5	M6	7,0	68	65	79	55,2	20	5	22	55														
		4	27,30		26,64																												
		5	27,38		26,56																												
		6	27,45	27	26,47																												
		8	27,60		26,29																												
		10	27,75		26,11																												
		15	28,13		25,67																												
RV	30 x	2	30,15		29,82	62	92	58	5	M6	9,0	77	71	85	64,7	20	6	27	64														
		4	30,30		29,64																												
		5	30,38		29,56																												
		6	30,45		29,47																												
		8	30,60	30	29,29																												
		10	30,75		29,11																												
		15	31,13		28,67																												
		20	31,50		28,22																												
		25	31,88		27,78																												
		30	32,25		27,33																												

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter



# RV Range - Satellite roller screws



## TECHNICAL CHARACTERISTICS

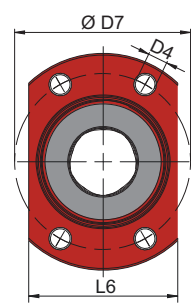
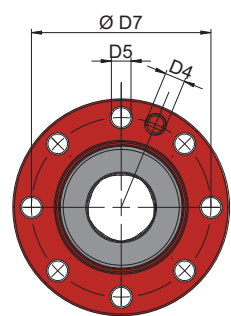
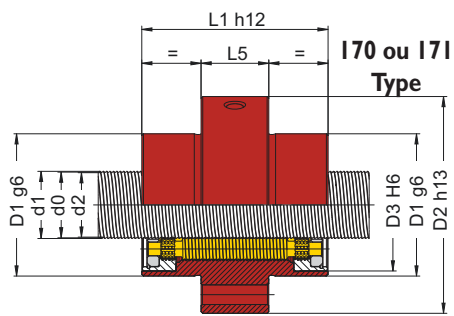
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	36 x	6	3,04	101,6	212,6	76,7	0,03	101,6	212,6	115,1	1 565	0,65	56,0	106,3	48,3	1 565	0,65	0,86	0,83	
			12	6,06	114,0	199,4	51,2	0,04	114,0	199,4	76,8	1 065	0,65	62,8	99,7	32,3	1 065	0,65	0,89	0,88
			18	9,04	119,1	187,0	40,4	0,05	119,1	187,0	60,6	666	0,65	65,6	93,5	25,5	666	0,65	0,88	0,87
			24	11,98	149,6	220,4	36,2	0,05	149,6	220,4	54,3	394	0,65	82,4	110,2	22,8	394	0,65	0,86	0,83
		5	2	1,01	108,2	296,0	138,7	0,02	108,2	296,0	208,0	1 886	0,65	59,6	148,0	87,4	1 886	0,65	0,71	0,58
			4	2,03	128,1	296,9	95,4	0,02	128,1	296,9	143,1	1 734	0,65	70,6	148,4	60,1	1 734	0,65	0,82	0,77
			5	2,53	135,2	297,4	84,5	0,03	135,2	297,4	126,7	1 651	0,65	74,5	148,7	53,2	1 651	0,65	0,84	0,81
			6	3,04	140,4	294,6	76,7	0,03	140,4	294,6	115,1	1 566	0,65	77,3	147,3	48,3	1 566	0,65	0,86	0,83
			8	4,05	149,4	292,3	65,6	0,04	149,4	292,3	98,5	1 393	0,65	82,3	146,2	41,3	1 393	0,65	0,88	0,86
			10	5,05	159,6	299,6	59,1	0,04	159,6	299,6	88,7	1 225	0,65	88,0	149,8	37,2	1 225	0,65	0,89	0,87
			15	7,55	172,3	293,8	47,7	0,05	172,3	293,8	71,6	850	0,65	94,9	146,9	30,1	850	0,65	0,89	0,88
20	10,03	207,3	322,4	40,3	0,05	207,3	322,4	60,5	562	0,65	114,2	161,2	25,4	562	0,65	0,88	0,86			
RV	39 x	5	2	0,94	127,1	368,8	152,8	0,02	127,1	368,8	229,2	2 153	0,80	70,0	184,4	96,3	2 153	0,80	0,69	0,55
			4	1,87	149,7	366,2	104,9	0,02	149,7	366,2	157,4	2 000	0,80	82,5	183,1	66,1	2 000	0,80	0,81	0,76
			5	2,34	159,4	372,0	93,2	0,03	159,4	372,0	139,8	1 912	0,80	87,8	186,0	58,7	1 912	0,80	0,83	0,80
			6	2,80	166,1	370,7	84,9	0,03	166,1	370,7	127,3	1 824	0,80	91,5	185,4	53,5	1 824	0,80	0,85	0,82
			8	3,74	174,9	361,2	72,1	0,03	174,9	361,2	108,2	1 643	0,80	96,4	180,6	45,4	1 643	0,80	0,87	0,85
			10	4,67	185,5	365,7	64,5	0,04	185,5	365,7	96,8	1 464	0,80	102,2	182,8	40,6	1 464	0,80	0,88	0,87
			15	6,98	200,8	359,4	52,1	0,04	200,8	359,4	78,1	1 055	0,80	110,6	179,7	32,8	1 055	0,80	0,89	0,88
			20	9,27	234,3	374,5	42,9	0,05	234,3	374,5	64,4	728	0,80	129,1	187,2	27,0	728	0,80	0,88	0,87
			25	11,53	241,3	367,8	38,2	0,05	241,3	367,8	57,3	487	0,80	133,0	183,9	24,0	487	0,80	0,86	0,84
RV	44 x	6	6	2,49	145,5	341,5	94,2	0,03	145,5	341,5	141,3	2 089	1,00	80,2	170,8	59,3	2 089	1,00	0,84	0,81
			12	4,96	168,8	334,6	65,0	0,03	168,8	334,6	97,5	1 560	1,00	93,0	167,3	40,9	1 560	1,00	0,89	0,87
			18	7,42	176,3	313,1	50,5	0,05	176,3	313,1	75,7	1 092	1,00	97,1	156,6	31,8	1 092	1,00	0,89	0,88
			24	9,85	222,4	368,1	45,1	0,05	222,4	368,1	67,7	730	1,00	122,5	184,0	28,4	730	1,00	0,88	0,86
			30	12,24	219,8	339,8	38,9	0,05	219,8	339,8	58,3	472	1,00	121,1	169,9	24,5	472	1,00	0,85	0,83

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque

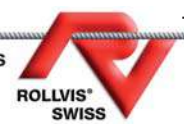




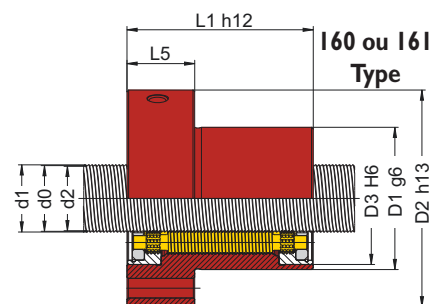
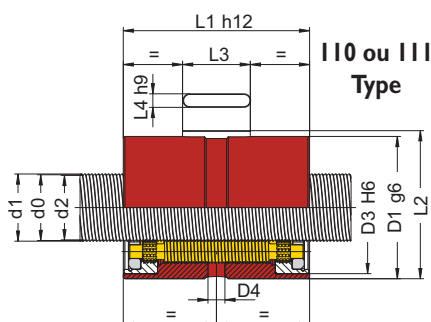


Types	D x P	SCREW			NUT														
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	36 x	6	30,38	36	35,56	68	102	62	5	M6	9,0	85	68	80	70,2	25	5	27	70
		12	30,75		35,11														
		18	31,13		34,67														
		24	31,50		34,22														
	36 x	2	36,15	36	35,82	74	110	68	5	M6	9,0	92	82	96	76,7	28	6	25	76
		4	36,30		35,64														
		5	36,38		35,56														
		6	36,45		35,47														
		8	36,60		35,29														
		10	36,75		35,11														
		15	37,13		34,67														
		20	37,50		34,22														
RV	39 x	2	39,15	39	38,82	80	116	72	5	M6	11,0	98	90	100	82,7	28	6	25	82
		4	39,30		38,64														
		5	39,38		38,56														
		6	39,45		38,47														
		8	39,6		38,29														
		10	39,75		38,11														
		15	40,13		37,67														
		20	40,50		37,22														
		25	40,88		36,78														
RV	44 x	6	44,38	44	43,56	80	118	73	5	M6	11,0	100	80	90	82,7	28	6	25	84
		12	44,75		43,11														
		18	45,13		42,67														
		24	45,50		42,22														
		30	45,88		41,78														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter



# RV Range - Satellite roller screws

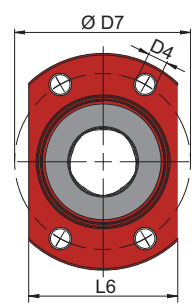
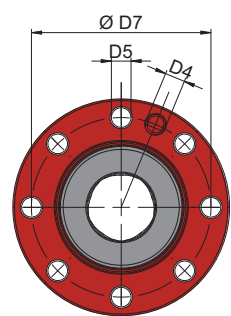
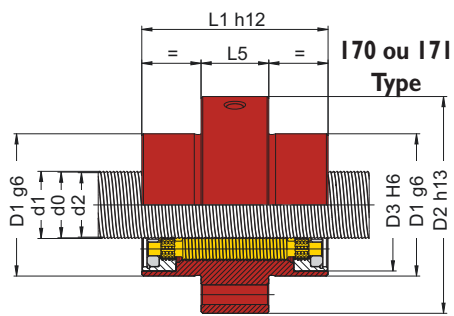
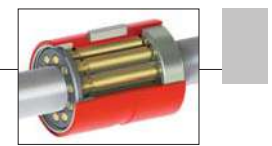


## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT			Max axial backlash *	DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]		Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	48 x	5	6	1,90	169,7	448,8	117,3	0,03	169,7	448,8	176,0	2 430	1,20	93,5	224,4	73,9	2 430	1,20	0,81	0,76
		6	2,28	178,7	454,7	107,1	0,03	178,7	454,7	160,7	2 345	1,20	98,5	227,3	67,5	2 345	1,20	0,83	0,79	
		8	3,04	189,7	448,5	91,7	0,03	189,7	448,5	137,5	2 168	1,20	104,5	224,2	57,8	2 168	1,20	0,86	0,83	
		10	3,79	198,2	442,3	81,0	0,04	198,2	442,3	121,5	1 989	1,20	109,2	221,1	51,0	1 989	1,20	0,87	0,85	
		12	4,55	211,2	457,6	74,9	0,04	211,2	457,6	112,4	1 811	1,20	116,3	228,8	47,2	1 811	1,20	0,88	0,87	
		15	5,68	220,8	453,6	66,5	0,04	220,8	453,6	99,8	1 555	1,20	121,7	226,8	41,9	1 555	1,20	0,89	0,88	
		18	6,81	217,5	417,5	57,5	0,05	217,5	417,5	86,2	1 320	1,20	119,8	208,8	36,2	1 320	1,20	0,89	0,88	
		20	7,55	221,6	415,1	54,3	0,05	221,6	415,1	81,4	1 176	1,20	122,1	207,6	34,2	1 176	1,20	0,89	0,88	
		24	9,04	270,6	478,6	50,6	0,05	270,6	478,6	76,0	923	1,20	149,1	239,3	31,9	923	1,20	0,88	0,87	
		30	11,25	340,6	605,2	43,1	0,05	340,6	605,2	64,7	625	1,20	187,6	302,6	27,2	625	1,20	0,87	0,85	
RV	51 x	5	5	1,90	218,6	556,2	111,6	0,03	218,6	556,2	167,4	2 430	1,20	120,4	278,1	70,3	2 430	1,20	0,81	0,76
		10	3,79	258,5	559,1	77,5	0,03	258,5	559,1	116,2	1 989	1,20	142,4	279,6	48,8	1 989	1,20	0,87	0,85	
		15	5,68	284,5	562,1	62,9	0,03	284,5	562,1	94,3	1 555	1,20	156,7	281,0	39,6	1 555	1,20	0,89	0,88	
		20	7,55	360,1	659,2	55,9	0,05	360,1	659,2	83,8	1 176	1,20	198,4	329,6	35,2	1 176	1,20	0,89	0,88	
		25	9,41	354,1	637,6	49,2	0,05	354,1	637,6	73,7	867	1,20	195,1	318,8	31,0	867	1,20	0,88	0,87	
RV	56 x	6	6	1,95	219,5	584,9	119,0	0,03	219,5	584,9	178,5	2 763	1,60	120,9	292,5	75,0	2 763	1,60	0,81	0,77
		12	3,90	256,1	575,9	82,2	0,03	256,1	575,9	123,4	2 243	1,60	141,1	288,0	51,8	2 243	1,60	0,87	0,86	
		18	5,84	277,9	566,9	66,2	0,04	277,9	566,9	99,4	1 737	1,60	153,1	283,5	41,7	1 737	1,60	0,89	0,88	
		24	7,77	339,4	631,2	56,7	0,05	339,4	631,2	85,1	1 300	1,60	187,0	315,6	35,7	1 300	1,60	0,89	0,88	
		30	9,68	355,7	648,1	51,4	0,05	355,7	648,1	77,1	946	1,60	195,9	324,0	32,4	946	1,60	0,88	0,86	
		36	11,56	332,0	584,9	44,7	0,05	332,0	584,9	67,0	674	1,60	182,9	292,5	28,2	674	1,60	0,86	0,84	

\* Axial backlash can be reduced on demand.

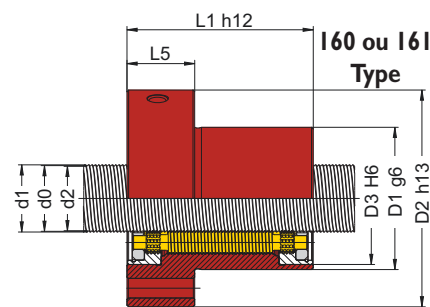
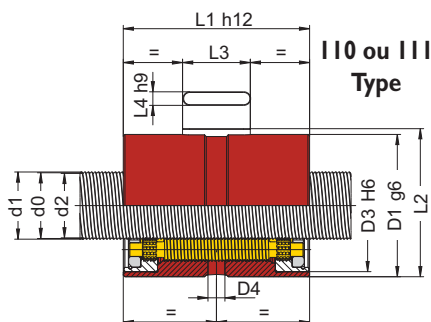
<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque



Types	D x P	SCREW			NUT														
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper [mm]	With wipers [mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	48 x	5	48,31	48	47,63	86	122	80	7	M8 x l	11,0	104	87	99	88,7	45	6	35	88
		6	48,38		47,56														
		8	48,50		47,41														
		10	48,63		47,26														
		12	48,75		47,11														
		15	48,94		46,89														
		18	49,13		46,67														
		20	49,25		46,52														
		24	49,50		46,22														
		5	48,38		47,56														
	10	48,75	47,11																
	15	49,13	46,67																
	20	49,50	46,22																
	25	49,88	45,78																
	30	50,25	45,33																
RV	51 x	5	51,38	51	50,56	102	147	94	7	M8 x l	13,5	124	125	139	105	50	8	35	104
		10	51,75		50,11														
		15	52,13		49,67														
		20	52,50		49,22														
		25	52,88		48,78														
RV	56 x	6	56,38	56	55,56	100	150	93	7	M8 x l	13,5	127	100	112	103	40	8	37	102
		12	56,75		55,11														
		18	57,13		54,67														
		24	57,50		54,22														
		30	57,88		53,78														
		36	58,25		53,33														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

# RV Range - Satellite roller screws



## TECHNICAL CHARACTERISTICS

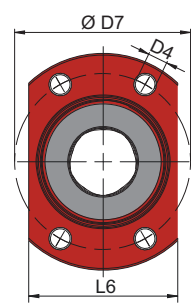
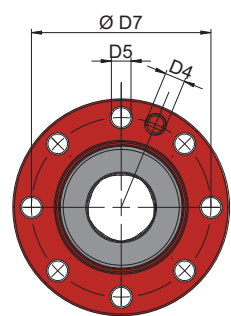
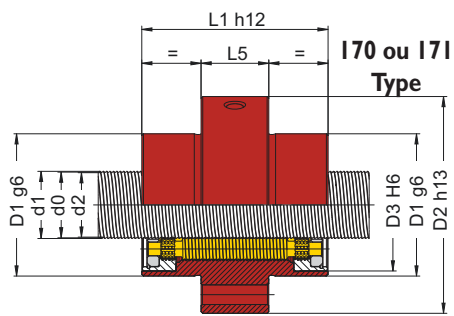
Types	D x P	N	Helix angle [°]	SINGLE NUT			Max axial backlash *	DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency		
				Ca [kN]	C0a [kN]	Fk [N/3µm]		Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]				
RV	60 x	6	1,82	248,5	689,4	128,2	0,04	248,5	689,4	192,4	2 936	1,80	136,9	344,7	80,8	2 936	1,80	0,80	0,75		
		10	3,04	277,8	678,4	97,2	0,04	277,8	678,4	145,9	2 601	1,80	153,1	339,2	61,3	2 601	1,80	0,86	0,83		
		12	3,64	290,3	679,7	88,3	0,04	290,3	679,7	132,5	2 429	1,80	159,9	339,8	55,6	2 429	1,80	0,87	0,85		
		18	5,45	315,6	669,9	71,2	0,04	315,6	669,9	106,7	1 926	1,80	173,9	335,0	44,8	1 926	1,80	0,89	0,87		
		20	6,06	327,4	684,4	68,2	0,04	327,4	684,4	102,3	1 769	1,80	180,4	342,2	43,0	1 769	1,80	0,89	0,88		
		30	9,04	393,2	747,8	54,6	0,07	393,2	747,8	81,8	1 108	1,80	216,6	373,9	34,4	1 108	1,80	0,88	0,87		
	RV	60 x	42	12,56	393,0	755,2	46,4	0,07	393,0	755,2	69,6	586	1,80	216,5	377,6	29,3	586	1,80	0,85	0,82	
			5	1,52	340,4	1 005,9	147,9	0,04	340,4	1 005,9	221,8	3 014	1,80	187,5	502,9	93,1	3 014	1,80	0,78	0,71	
			10	3,04	380,1	925,8	96,5	0,04	380,1	925,8	144,8	2 601	1,80	209,4	462,9	60,8	2 601	1,80	0,86	0,83	
			15	4,55	415,0	915,9	77,5	0,04	415,0	915,9	116,3	2 173	1,80	228,6	458,0	48,9	2 173	1,80	0,88	0,87	
			20	6,06	500,4	1 057,1	68,4	0,04	500,4	1 057,1	102,6	1 769	1,80	275,7	528,5	43,1	1 769	1,80	0,89	0,88	
			25	7,55	494,0	1 029,9	60,2	0,05	494,0	1 029,9	90,3	1 412	1,80	272,2	515,0	37,9	1 412	1,80	0,89	0,88	
	RV	64 x	30	9,04	495,5	1 034,1	55,1	0,07	495,5	1 034,1	82,6	1 108	1,80	273,0	517,1	34,7	1 108	1,80	0,88	0,87	
			35	10,52	470,0	958,1	48,4	0,07	470,0	958,1	72,5	857	1,80	258,9	479,0	30,5	857	1,80	0,87	0,85	
			6	1,71	255,5	802,2	137,3	0,04	255,5	802,2	206,0	3 089	2,00	142,7	401,1	86,5	3 089	2,00	0,79	0,74	
12			3,42	303,1	791,8	94,5	0,04	303,1	791,8	141,8	2 598	2,00	169,3	395,9	59,5	2 598	2,00	0,87	0,84		
18			5,12	332,8	781,4	76,0	0,04	332,8	781,4	114,0	2 101	2,00	185,9	390,7	47,9	2 101	2,00	0,89	0,87		
24			6,81	428,8	932,6	68,2	0,04	428,8	932,6	102,3	1 650	2,00	239,6	466,3	42,9	1 650	2,00	0,89	0,88		
RV	70 x	30	8,49	408,9	854,6	57,7	0,06	408,9	854,6	86,6	1 266	2,00	228,4	427,3	36,4	1 266	2,00	0,89	0,87		
		36	10,15	397,3	812,6	51,4	0,07	397,3	812,6	77,2	953	2,00	221,9	406,3	32,4	953	2,00	0,88	0,86		
		6	1,59	321,2	1 120,0	160,5	0,04	-	-	-	-	-	-	-	-	-	-	-	0,78	0,72	
		12	3,17	381,9	1 108,2	110,5	0,04	-	-	-	-	-	-	-	-	-	-	-	-	0,86	0,84
		18	4,75	420,4	1 096,4	89,0	0,04	-	-	-	-	-	-	-	-	-	-	-	-	0,88	0,87
		24	6,32	525,1	1 265,4	78,4	0,04	-	-	-	-	-	-	-	-	-	-	-	-	0,89	0,88
RV	70 x	30	7,88	518,6	1 230,5	68,4	0,05	-	-	-	-	-	-	-	-	-	-	-	0,89	0,88	
		36	9,43	498,8	1 149,4	60,3	0,07	-	-	-	-	-	-	-	-	-	-	-	-	0,88	0,87

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque

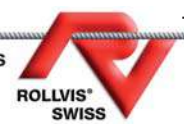




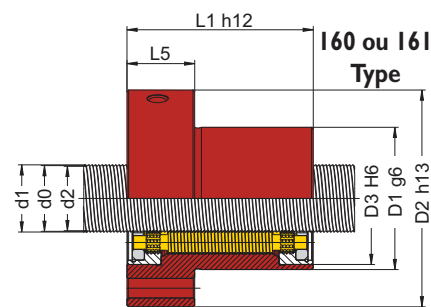
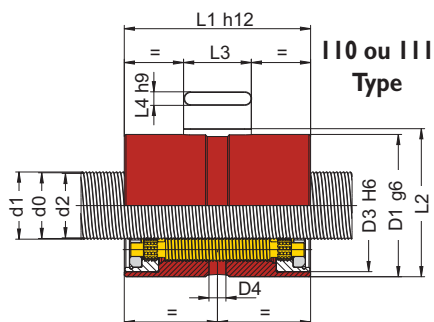


Types	D x P	SCREW			NUT														
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	60 x	6	60,38	60	59,56	110	150	100	10,5	M8 x l	13,5	130	106	124	113,2	40	8	30	112
		10	60,63		59,26														
		12	60,75		59,11														
		18	61,13		58,67														
		20	61,25		58,52														
		30	61,88		57,78														
	60 x	5	60,38	59,56	122	180	110	10,5	M8 x l	17,5	150	140	152	125,7	45	10	40	124	
		10	60,75	59,11															
		15	61,13	58,67															
		20	61,50	58,22															
		25	61,88	57,78															
		30	62,25	57,33															
		35	62,63	56,89															
		RV	64 x	6															64,38
12	64,75			63,11															
18	65,13			62,67															
24	65,50			62,22															
30	65,88			61,78															
36	66,25			61,33															
RV	70 x	6	69,38	69	68,56	130	172	115	9	M8 x l	13,5	152	140	170	133,7	50	10	45	132
		12	69,75		68,11														
		18	70,13		67,67														
		24	70,50		67,22														
		30	70,88		66,78														
		36	71,25		66,33														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter



# RV Range - Satellite roller screws

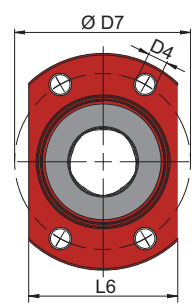
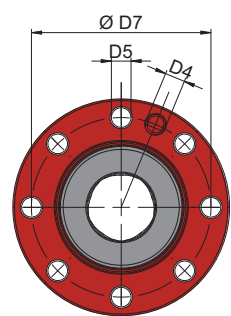
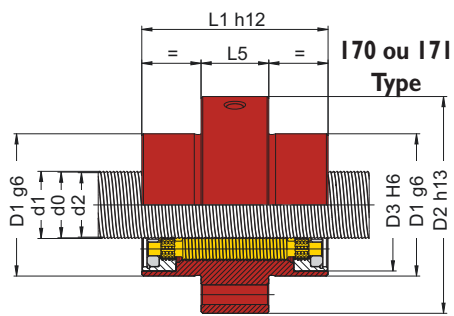


## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency		
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]				
RV	75 x	5	10	2,43	497,8	1 452,7	116,7	0,04	-	-	-	-	-	-	-	-	-	-	0,84	0,80	
				15	3,64	549,5	1 440,4	94,3	0,04	-	-	-	-	-	-	-	-	-	-	0,87	0,85
				20	4,85	639,5	1 666,1	82,7	0,04	-	-	-	-	-	-	-	-	-	-	0,88	0,87
				25	6,06	642,4	1 651,7	73,7	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,88
				30	7,26	643,2	1 637,3	66,8	0,05	-	-	-	-	-	-	-	-	-	-	0,89	0,88
RV	80 x	6	12	2,73	385,3	1 040,9	105,3	0,04	-	-	-	-	-	-	-	-	-	-	0,85	0,82	
				18	4,10	428,2	1 045,8	85,4	0,04	-	-	-	-	-	-	-	-	-	-	0,88	0,86
				24	5,45	524,6	1 225,8	75,7	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,87
				30	6,81	535,7	1 251,7	68,2	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,88
				36	8,15	508,8	1 148,6	59,0	0,06	-	-	-	-	-	-	-	-	-	-	0,89	0,87
RV	87 x	5	10	2,10	642,8	2 026,2	137,6	0,04	-	-	-	-	-	-	-	-	-	-	0,82	0,78	
				15	3,14	656,7	1 862,8	105,1	0,04	-	-	-	-	-	-	-	-	-	-	0,86	0,84
				20	4,19	768,0	2 179,5	92,5	0,04	-	-	-	-	-	-	-	-	-	-	0,88	0,86
				25	5,23	767,8	2 140,3	81,9	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,87
				30	6,26	785,1	2 191,9	75,6	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,88
RV	92 x	6	12	2,38	532,8	1 646,7	129,1	0,04	-	-	-	-	-	-	-	-	-	-	0,83	0,80	
				18	3,56	583,3	1 611,2	103,4	0,04	-	-	-	-	-	-	-	-	-	-	0,87	0,85
				24	4,75	695,3	1 886,2	91,5	0,04	-	-	-	-	-	-	-	-	-	-	0,88	0,87
				30	5,93	714,6	1 940,4	82,9	0,04	-	-	-	-	-	-	-	-	-	-	0,89	0,88
				36	7,10	709,8	1 898,9	74,8	0,05	-	-	-	-	-	-	-	-	-	-	0,89	0,88

\* Axial backlash can be reduced on demand.

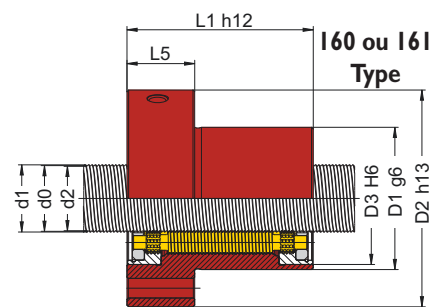
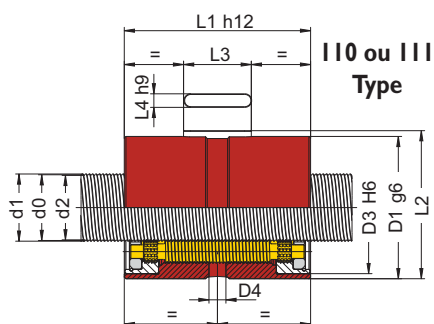
<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque



Types	SCREW				NUT													
	D x P	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6		
RV	75 x	10	75,75	74,11	150	210	140	10,5	M8 x l	17,5	180	175	191	153	63	10	45	152
		15	76,13	73,67														
		20	76,50	73,22														
		25	76,88	72,78														
		30	77,25	72,33														
RV	80 x	12	80,75	79,11	138	180	130	10,5	M8 x l	13,5	160	130	158	141,7	50	10	35	140
		18	81,13	78,67														
		24	81,50	78,22														
		30	81,88	77,78														
		36	82,25	77,33														
RV	87 x	10	87,75	86,11	175	235	162	10,5	M8 x l	17,5	200	190	215	178	63	10	45	177
		15	88,13	85,67														
		20	88,50	85,22														
		25	88,88	84,78														
		30	89,25	84,33														
RV	92 x	12	92,75	91,11	160	220	146	10,5	M8 x l	17,5	190	155	179	163	63	10	45	162
		18	93,13	90,67														
		24	93,50	90,22														
		30	93,88	89,78														
		36	94,25	89,33														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

# RV Range - Satellite roller screws



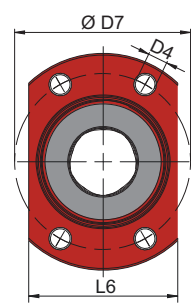
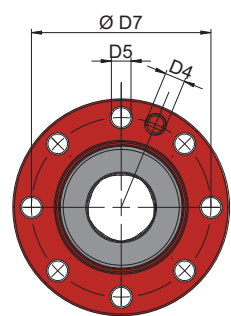
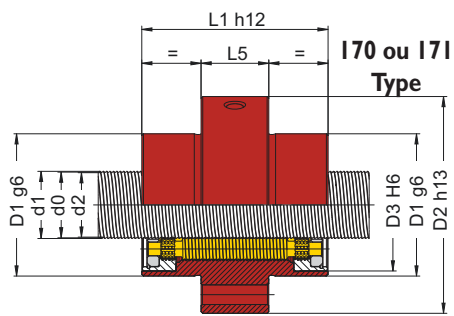
## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]			
RV	100 x	12	6	2,19	790,2	2 649,7	153,2	0,05	-	-	-	-	-	-	-	-	-	-	0,82	0,79
		18		3,28	843,7	2 603,3	123,0	0,05	-	-	-	-	-	-	-	-	-	-	0,86	0,84
		24		4,37	858,2	2 610,2	106,0	0,05	-	-	-	-	-	-	-	-	-	-	0,88	0,86
		30		5,45	857,8	2 563,9	94,0	0,05	-	-	-	-	-	-	-	-	-	-	0,89	0,87
	15	5	2,76	1 044,9	3 598,6	135,4	0,05	-	-	-	-	-	-	-	-	-	-	-	0,85	0,82
	20		3,68	1 063,3	3 605,5	116,4	0,05	-	-	-	-	-	-	-	-	-	-	-	0,87	0,85
	25		4,60	1 077,2	3 612,3	103,8	0,05	-	-	-	-	-	-	-	-	-	-	-	0,88	0,87
	30		5,51	1 088,0	3 619,1	95,0	0,05	-	-	-	-	-	-	-	-	-	-	-	0,89	0,87
	35		6,42	1 106,7	3 679,6	88,6	0,05	-	-	-	-	-	-	-	-	-	-	-	-	0,89
RV	120 x	18	6	2,73	1 063,2	3 667,3	142,3	0,05	-	-	-	-	-	-	-	-	-	-	0,85	0,82
		24		3,64	1 082,0	3 675,6	122,6	0,05	-	-	-	-	-	-	-	-	-	-	0,87	0,85
		30		4,55	1 090,3	3 652,0	108,8	0,05	-	-	-	-	-	-	-	-	-	-	0,88	0,87
		36		5,45	1 107,2	3 692,0	99,9	0,05	-	-	-	-	-	-	-	-	-	-	0,89	0,87
	15	5	2,28	1 252,5	4 634,6	151,7	0,05	-	-	-	-	-	-	-	-	-	-	-	0,83	0,79
	20		3,04	1 214,1	4 320,3	124,4	0,05	-	-	-	-	-	-	-	-	-	-	-	0,86	0,83
	25		3,79	1 214,0	4 234,2	109,5	0,05	-	-	-	-	-	-	-	-	-	-	-	0,87	0,85
	30		4,55	1 232,5	4 274,3	100,0	0,05	-	-	-	-	-	-	-	-	-	-	-	0,88	0,87
	35		5,30	1 220,6	4 157,0	91,4	0,05	-	-	-	-	-	-	-	-	-	-	-	0,89	0,87

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque





Types	D x P	SCREW			NUT														
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]	
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L2	L3	L4	L5	L6			
RV	100 x	12	100,75	100	99,11	185	260	172	10,5	M8 x l	17,5	225	200	220	188	63	10	50	187
		18	101,13		98,67														
		24	101,50		98,22														
		30	101,88		97,78														
	120 x	15	100,13	99	97,67	200	275	186	15	M8 x l	17,5	240	250	271	203	63	10	50	202
		20	100,50		97,22														
		25	100,88		96,78														
		30	101,25		96,33														
RV	120 x	18	121,13	120	118,67	220	260	200	15	M10 x l	17,5	240	230	260	223	100	10	50	222
		24	121,50		118,22														
		30	121,88		117,78														
		36	122,25		117,33														
	120 x	15	121,13	120	118,67	240	300	220	15	M10 x l	17,5	270	280	300	243	100	10	55	242
		20	121,50		118,22														
		25	121,88		117,78														
		30	122,25		117,33														
		35	122,63		116,89														

**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

HRV Range – Table of the standard available dimensions

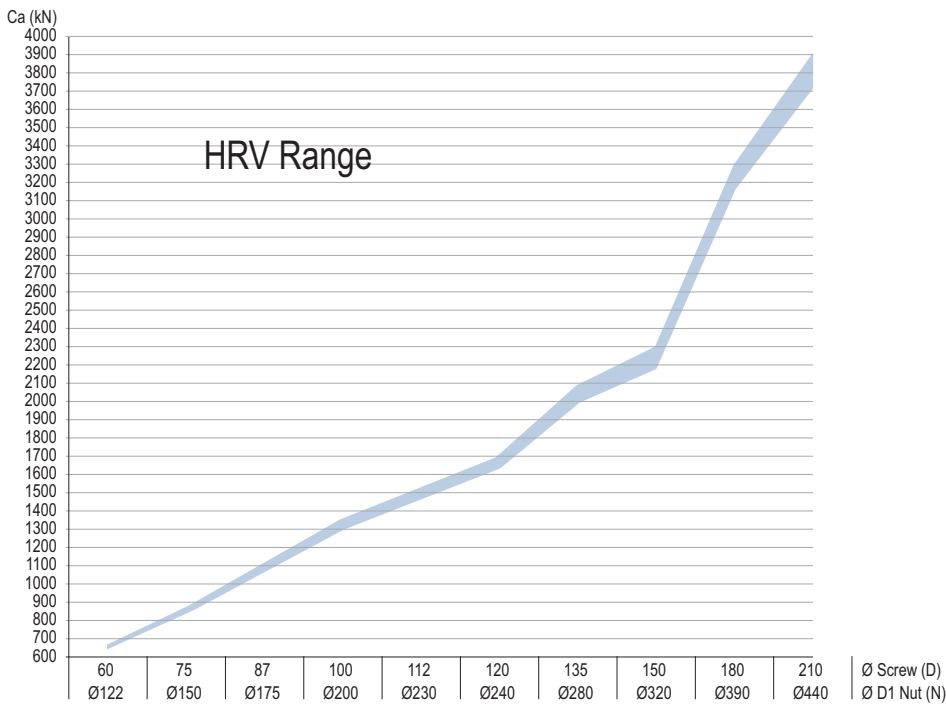
Screw diameter (D)	Number of starts (N)	Lead (P)												
		15	18	20	24	25	30	35	36	40	42	50		
60	5	X		X		X	X							
75	5	X		X		X	X							
87	5	X		X		X	X							
100	5	X		X		X	X	X						
112	5	X		X		X	X	X						
120	5	X		X		X	X	X		X				
135	5	X		X		X	X	X		X		X		
150	5	X		X		X	X	X		X		X		
180	5			X			X			X		X		
210	5						X			X		X		

HRV Range



HRV 75 x 15

Dynamic capacities (Ca) diagram for roller screws as a function of the standard dimensions for standard HRV roller screws range





### Dimensions

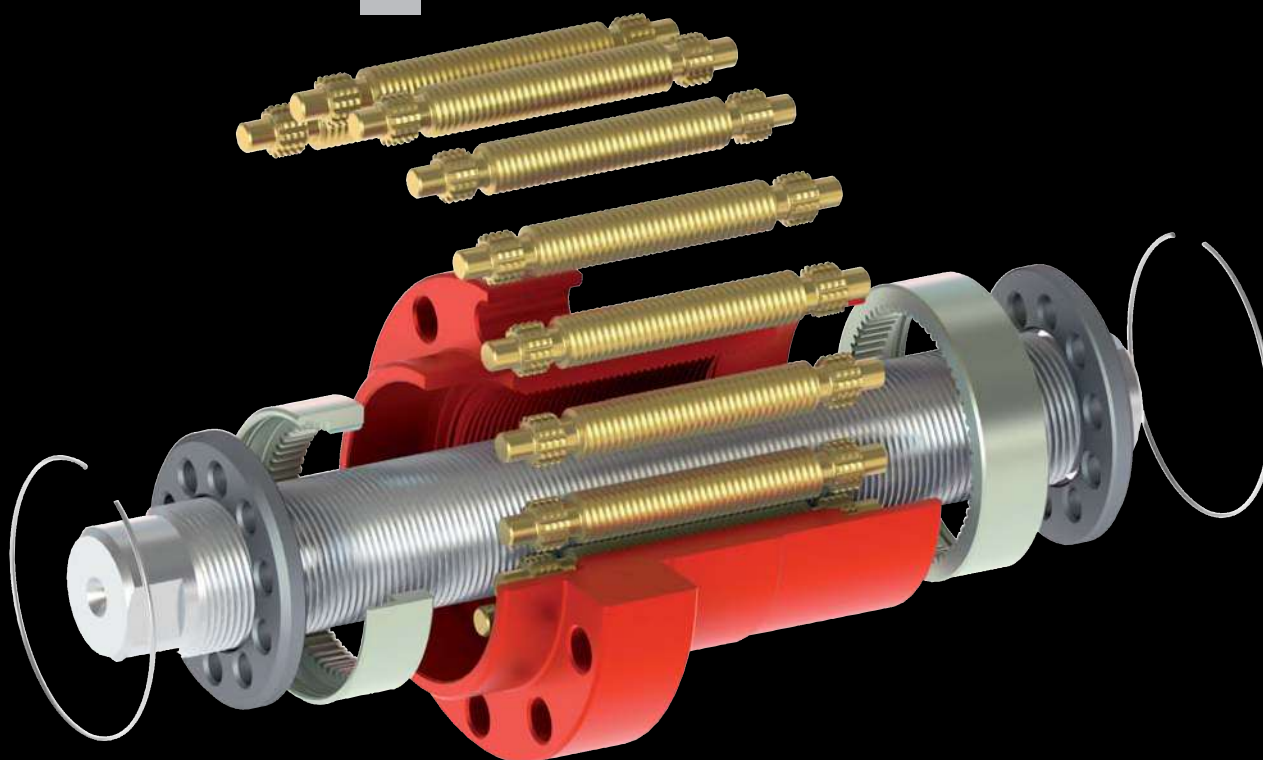
pages

● HRV 60 / 75 / 87 / 100 / 112 / 120

42 et 43

● HRV 135 / 150 / 180 / 210

44 et 45



# HRV Range - High Capacity satellite roller screws



HRV Range

## TECHNICAL CHARACTERISTICS

### SINGLE NUT

Types	D x P	N	Helix angle [°]	SINGLE NUT			Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [Nz/3µm]				
HRV	60 x	5	15	4,55	654,9	1 512,4	88,9	0,04	0,88	0,87
			20	6,06	655,8	1 498,0	76,4	0,04	0,89	0,88
			25	7,55	665,2	1 522,3	68,9	0,04	0,89	0,88
			30	9,04	650,9	1 469,2	62,0	0,04	0,88	0,87
HRV	75 x	5	15	3,64	842,5	2 449,6	108,9	0,04	0,87	0,85
			20	4,85	862,0	2 480,3	95,0	0,04	0,88	0,87
			25	6,06	866,9	2 462,0	84,4	0,04	0,89	0,88
			30	7,26	858,0	2 395,2	76,0	0,04	0,89	0,88
HRV	87 x	5	15	3,14	1 074,0	3 531,7	127,9	0,04	0,86	0,84
			20	4,19	1 087,0	3 510,3	110,2	0,04	0,88	0,86
			25	5,23	1 106,3	3 545,9	99,1	0,04	0,89	0,87
			30	6,26	1 099,7	3 467,5	89,1	0,04	0,89	0,88
HRV	100 x	5	15	2,76	1 301,0	4 708,0	145,1	0,05	0,85	0,82
			20	3,68	1 323,9	4 716,1	124,9	0,05	0,87	0,85
			25	4,60	1 329,5	4 658,9	111,2	0,05	0,88	0,87
			30	5,51	1 354,7	4 732,1	102,2	0,05	0,89	0,87
			35	6,42	1 347,3	4 642,4	93,4	0,05	0,89	0,88
HRV	112 x	5	15	2,43	1 526,9	5 937,5	162,5	0,05	0,84	0,80
			20	3,24	1 460,5	5 415,6	131,4	0,05	0,86	0,84
			25	4,05	1 480,1	5 425,0	117,3	0,05	0,88	0,86
			30	4,85	1 483,0	5 361,5	106,6	0,05	0,88	0,87
			35	5,66	1 482,6	5 298,0	98,0	0,05	0,89	0,88
HRV	120 x	5	15	2,28	1 694,4	6 949,4	174,1	0,05	0,83	0,79
			20	3,04	1 634,0	6 419,5	141,6	0,05	0,86	0,83
			25	3,79	1 656,2	6 429,5	126,3	0,05	0,87	0,85
			30	4,55	1 648,2	6 283,1	114,1	0,05	0,88	0,87
			35	5,30	1 668,7	6 332,0	106,0	0,05	0,89	0,87
			40	6,06	1 673,8	6 302,8	98,7	0,05	0,89	0,88

\* Axial backlash can be reduced on demand.

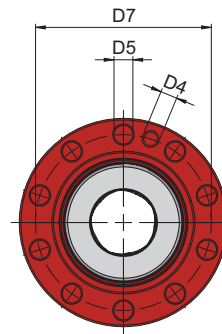
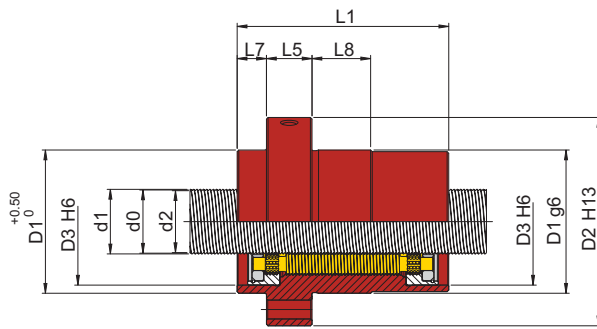
#### Terms used in tables

**P** Lead (travel per revolution)  
**D** Reference diameter

**N** Number of starts  
**Ca** Dynamic load capacity  
**C0a** Static load capacity

**F<sub>k</sub>** Rigidity factor  
**F<sub>v</sub>** Preloading force  
**M<sub>v</sub>** Preload torque





Types	D x P	SCREW			NUT									
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L5	L7	L8
HRV 60 x	15	61,13	60	58,67	122	180	110	M8 x 1	17,5	150	171	30	20	40
	20	61,50		58,22										
	25	61,88		57,78										
	30	62,25		57,33										
HRV 75 x	15	76,13	75	73,67	150	210	140	M8 x 1	17,5	180	213	35	25	40
	20	76,50		73,22										
	25	76,88		72,78										
	30	77,25		72,33										
HRV 87 x	15	88,13	87	85,67	175	235	162	M8 x 1	17,5	200	245	40	25	40
	20	88,50		85,22										
	25	88,88		84,78										
	30	89,25		84,33										
HRV 100 x	15	100,13	99	97,67	200	245	186	M8 x 1	17,5	224	280	50	25	40
	20	100,50		97,22										
	25	100,88		96,78										
	30	101,25		96,33										
	35	101,63		95,89										
HRV 112x	15	113,63	112,50	111,17	230	285	210	M10 x 1	17,5	260	300	50	30	60
	20	114,00		110,72										
	25	114,38		110,28										
	30	114,75		109,83										
	35	115,13		109,39										
HRV 120 x	15	121,13	120	118,67	240	300	220	M10 x 1	17,5	270	346	55	40	60
	20	121,50		118,22										
	25	121,88		117,78										
	30	122,25		117,33										
	35	122,63		116,89										
	40	123,00		116,44										

**Terms used in tables**

**P** Lead (travel per revolution)

**D** Reference diameter

**d1** External diameter

**d0** Nominal diameter

**d2** Thread root diameter

# HRV Range - High Capacity satellite roller screws



HRV Range

## TECHNICAL CHARACTERISTICS

Types			°	SINGLE NUT			Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	
	D x P	N		Helix angle	[kN]	[kN]				[Nz/3µm]
				Ca	C0a	Fk				
HRV	135 x	15	5	2,03	2 061,7	9 351,8	198,3	0,07	0,82	0,77
		20		2,70	2 085,6	9 267,2	170,0	0,07	0,85	0,82
		25		3,37	1 988,6	8 461,7	142,4	0,07	0,86	0,84
		30		4,05	2 030,1	8 605,9	130,8	0,07	0,88	0,86
		35		4,72	2 054,8	8 661,2	121,7	0,07	0,88	0,87
		40		5,39	2 049,7	8 539,1	112,9	0,07	0,89	0,87
		50		6,72	2 031,9	8 295,8	99,3	0,07	0,89	0,88
HRV	150 x	15	5	1,82	2 235,9	10 488,5	206,4	0,07	0,80	0,75
		20		2,43	2 284,1	10 555,5	178,8	0,07	0,84	0,80
		25		3,04	2 294,1	10 410,0	157,7	0,07	0,86	0,83
		30		3,64	2 181,9	9 506,5	135,2	0,07	0,87	0,85
		35		4,25	2 215,7	9 616,2	125,9	0,07	0,88	0,86
		40		4,85	2 218,4	9 531,5	117,3	0,07	0,88	0,87
		50		6,06	2 216,3	9 362,4	103,7	0,07	0,89	0,88
HRV	180 x	20	5	2,03	3 204,3	17 663,4	225,0	0,10	0,82	0,77
		30		3,04	3 286,4	17 695,4	182,1	0,10	0,86	0,83
		40		4,05	3 155,2	16 249,9	148,4	0,10	0,88	0,86
		50		5,05	3 195,3	16 278,8	133,0	0,10	0,89	0,87
HRV	210 x	30	5	2,60	3 893,4	22 704,7	202,0	0,10	0,84	0,81
		40		3,47	3 723,7	20 709,1	163,5	0,10	0,87	0,85
		50		4,33	3 773,0	20 743,4	146,3	0,10	0,88	0,86

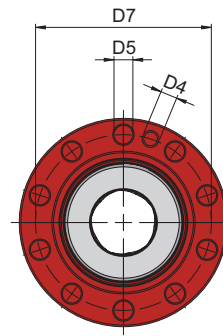
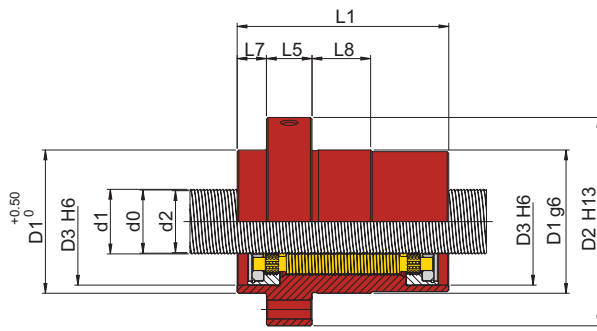
\* Axial backlash can be reduced on demand.

### Terms used in tables

**P** Lead (travel per revolution)  
**D** Reference diameter

**N** Number of starts  
**Ca** Dynamic load capacity  
**C0a** Static load capacity

**F<sub>k</sub>** Rigidity factor  
**F<sub>v</sub>** Preloading force  
**M<sub>v</sub>** Preload torque



Types	SCREW				NUT										
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
	D x P	Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	L1	L5	L7	L8	
HRV 135 x	15	136,13	135	133,67	280	345	260	M12	20,0	315	370	60	35	80	
	20	136,50		133,22											
	25	136,88		132,78											
	30	137,25		132,33											
	35	137,63		131,89											
	40	138,00		131,44											
	50	138,75		130,55											
HRV 150 x	15	151,13	150	148,67	320	385	280	M12	20,0	355	412	70	50	80	
	20	151,50		148,22											
	25	151,88		147,78											
	30	152,25		147,33											
	35	152,63		146,89											
	40	153,00		146,44											
	50	153,75		145,55											
HRV 180 x	20	181,50	180	178,22	390	470	330	M12	24,0	433	528	90	55	100	
	30	182,25		177,33											
	40	183,00		176,44											
	50	183,75		175,55											
HRV 210 x	30	212,25	210	207,33	440	530	398	M12	26,0	490	570	100	55	100	
	40	213,00		206,44											
	50	213,75		205,55											

**Terms used in tables**

**P** Lead (travel per revolution)

**D** Reference diameter

**d1** External diameter

**d0** Nominal diameter

**d2** Thread root diameter

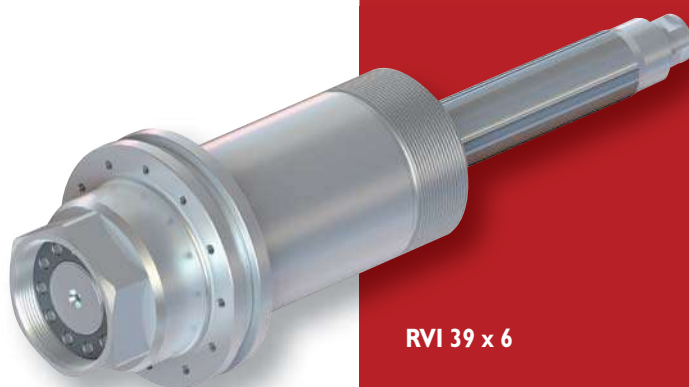
RVI Range – Table of the standard available dimensions

Screw diameter (D)	Number of starts (N)	Lead (P)															
		1	2	3	4	5	6	7	8	9	10	12	14	15	16		
10,5	3		x														
12	3	x	x														
13,5	3	x	x														
15	3	x	x	x													
18	3	x	x	x													
21	3		x	x	x												
24	3		x	x	x	x											
27	3		x	x	x	x											
28	4		x	x	x	x	x										
30	3		x	x	x	x	x										
36	4		x	x	x	x	x	x									
39	3			x	x	x	x	x	x								
44	4			x	x	x	x	x	x	x							
48	3			x	x	x	x	x	x	x	x						
51	3			x	x	x	x	x	x	x	x						
56	4				x	x	x	x	x	x	x	x					
60	4				x	x	x	x	x	x	x	x	x				
64	4				x	x	x	x	x	x	x	x	x				
70	5						x		x		x	x	x	x			
75	5						x		x		x	x	x	x			
80	4						x		x		x	x	x			x	

RVI Range



RVI 8 x 0.5

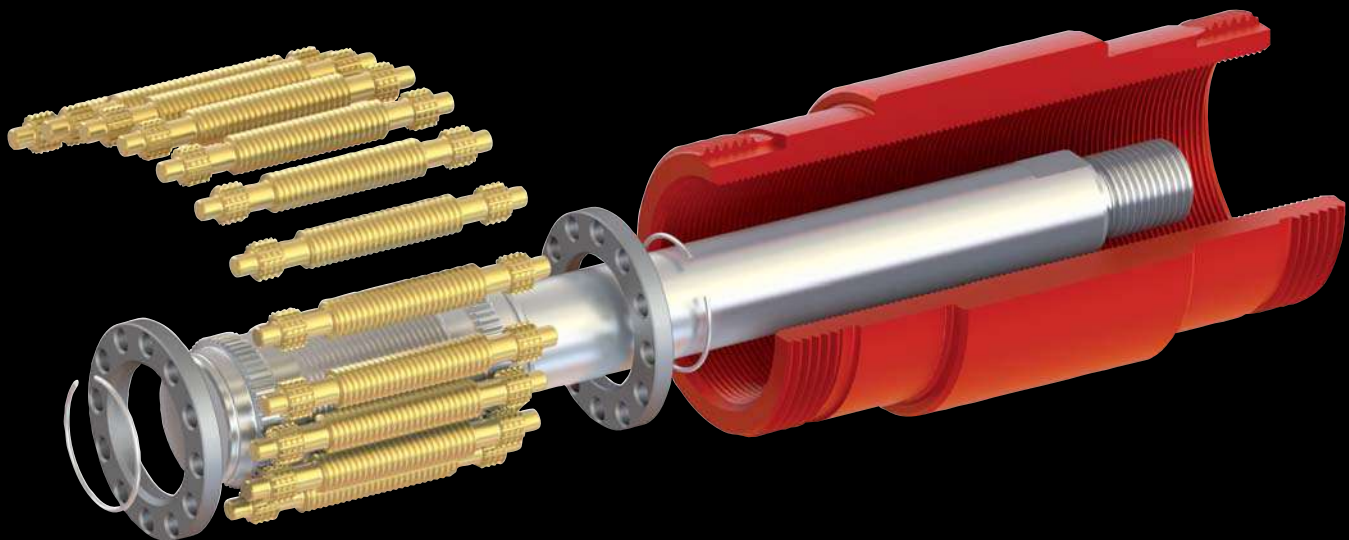


RVI 39 x 6

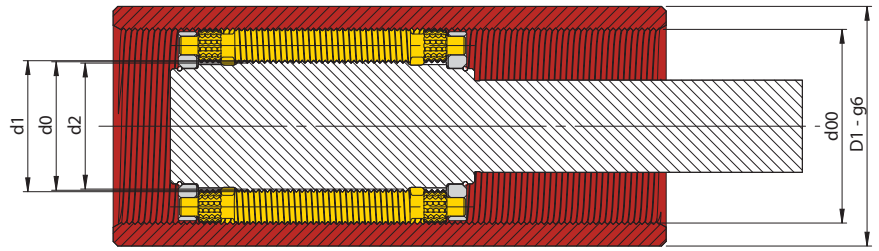
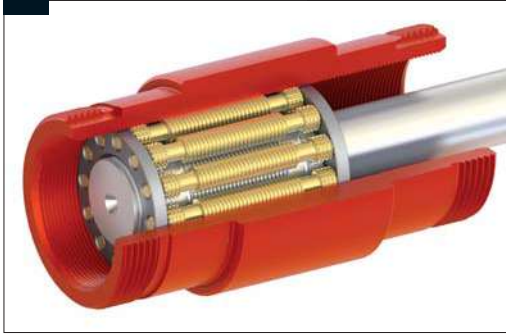




<i>Dimensions</i>	<i>pages</i>
● RVI 10,5 / 12 / 13,5 / 15 / 18 / 21 / 24 / 27 / 28	58
● RVI 30 / 36 / 39 / 44 / 48	49
● RVI 51 / 56 / 60	50
● RVI 64 / 70 / 75 / 80	51



# RVI Range - Inverted satellite roller screws



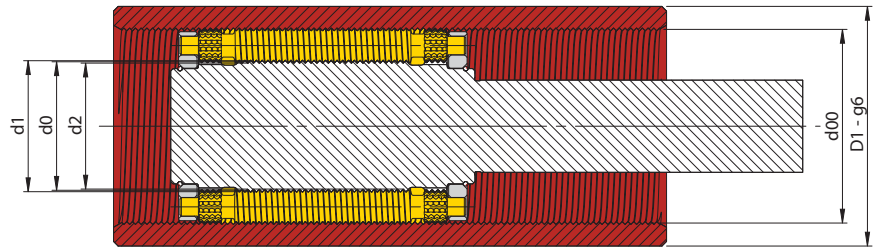
RVI Range

Types	TECHNICAL CHARACTERISTICS										SCREW			NUT	
	D x P	N	°	[kN]	[kN]	[Nz/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	[mm]	[mm]	[mm]	[mm]	[mm]	
										Helix angle	Ca	C0a	Fk	Ø d1	Ø d0
RVI	10,5 x 2,0	3	3,47	13,4	20,8	32,6	0,02	0,87	0,85	10,75	10,50	10,20	17,50	24	
RVI	12 x 2,0	3	1,52	13,9	26,8	52,1	0,02	0,78	0,71	12,13	12,00	11,85	20	26	
			3,04	16,5	27,1	36,5	0,02	0,86	0,83	12,25		11,70			
RVI	13,5 x 2,0	3	1,35	16,1	31,5	56,8	0,02	0,76	0,68	13,63	13,50	13,35	22,50	30	
			2,70	17,9	28,9	37,2	0,02	0,85	0,82	13,75		13,20			
RVI	15 x 3,0	3	1,22	23,7	56,0	74,1	0,02	0,74	0,65	15,13	15,00	14,85	25	32	
			2,43	26,0	50,2	47,9	0,02	0,84	0,80	15,25		14,70			
			3,64	29,1	51,5	39,4	0,03	0,87	0,85	15,38		14,56			
RVI	18 x 3,0	3	1,01	30,6	76,8	85,1	0,02	0,71	0,58	18,13	18,00	17,85	30	38	
			2,03	36,2	77,2	59,0	0,02	0,82	0,77	18,25		17,70			
			3,04	39,1	74,9	46,9	0,03	0,86	0,83	18,38		17,56			
RVI	21 x 4,0	3	1,74	54,5	106,0	67,5	0,02	0,80	0,74	21,25	21,00	20,70	35	45	
			2,60	59,6	104,8	54,2	0,03	0,84	0,81	21,38		20,56			
			3,47	63,3	103,7	46,5	0,03	0,87	0,85	21,50		20,41			
RVI	24 x 5,0	3	1,52	73,8	161,0	81,2	0,02	0,78	0,71	24,25	24,00	23,70	40	50	
			2,28	81,4	161,5	66,0	0,03	0,83	0,79	24,38		23,56			
			3,04	87,3	162,0	56,8	0,03	0,86	0,83	24,50		23,41			
			3,79	92,1	162,5	50,9	0,03	0,87	0,85	24,63		23,26			
RVI	27 x 5,0	3	1,35	80,1	173,1	83,1	0,02	0,76	0,68	27,25	27,00	26,70	45	55	
			2,03	88,4	173,7	67,5	0,03	0,82	0,77	27,38		26,56			
			2,70	94,8	174,3	58,0	0,03	0,85	0,82	27,50		26,41			
			3,37	100,0	174,8	51,8	0,03	0,86	0,84	27,63		26,26			
RVI	28 x 6,0	4	1,30	61,4	140,0	92,5	0,02	0,75	0,67	28,19	28,00	27,78	42	52	
			1,95	67,8	140,5	75,0	0,02	0,81	0,77	28,28		27,67			
			2,60	71,7	137,8	63,9	0,03	0,84	0,81	28,38		27,56			
			3,25	72,5	129,8	54,5	0,03	0,86	0,84	28,47		27,44			
			3,90	76,3	131,6	50,0	0,03	0,87	0,86	28,56		27,33			

\* Axial backlash can be reduced on demand.

Terms used in tables		
<b>P</b>	Lead (travel per revolution)	<b>d0</b> Nominal diameter
<b>D</b>	Reference diameter	<b>d2</b> Thread root diameter
<b>N</b>	Number of starts	<b>d00</b> Nominal diameter nut
<b>Ca</b>	Dynamic load capacity	<b>D1</b> Mini external diameter
<b>C0a</b>	Static load capacity	
<b>Fk</b>	Rigidity factor	
<b>d1</b>	External diameter	

# RVI Range - Inverted satellite roller screws



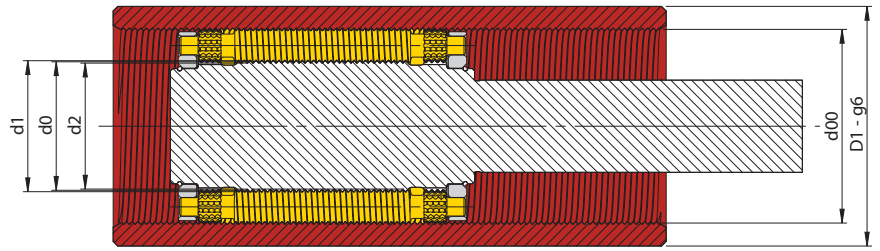
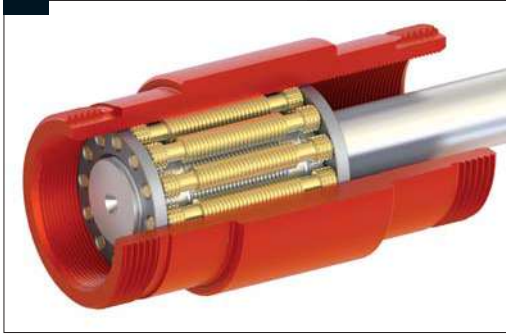
Types	TECHNICAL CHARACTERISTICS									SCREW			NUT		
	D x P	N	Helix angle [°]	Ca [kN]	C0a [kN]	Fk [Nz/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	[mm]	[mm]	[mm]	[mm]	[mm]	
										∅ d1	∅ d0	∅ d2	∅ d00	∅ DI	
RVI	30 x	2	3	1,22	97,2	224,1	93,4	0,02	0,74	0,65	30,25	30	29,70	50	60
		3		1,82	107,3	224,7	75,5	0,03	0,80	0,75	30,38		29,56		
		4		2,43	113,6	220,8	64,3	0,03	0,84	0,80	30,50		29,41		
		5		3,04	119,2	219,2	57,0	0,03	0,86	0,83	30,63		29,26		
		6		3,64	126,9	226,5	52,9	0,04	0,87	0,85	30,75		29,11		
RVI	36 x	2	4	1,01	86,9	215,4	111,7	0,02	0,71	0,58	36,19	36	35,78	54	64
		3		1,52	95,4	214,0	89,3	0,02	0,78	0,71	36,28		35,67		
		4		2,03	101,8	212,6	76,7	0,03	0,82	0,77	36,38		35,56		
		5		2,53	106,2	209,2	67,7	0,03	0,84	0,81	36,47		35,44		
		6		3,04	111,0	209,8	61,7	0,03	0,86	0,83	36,56		35,33		
		7		3,54	117,8	218,1	58,0	0,03	0,87	0,85	36,66		35,22		
RVI	39 x	3	3	1,40	159,5	372,0	93,2	0,03	0,76	0,69	39,38	39	38,56	65	75
		4		1,87	170,3	369,9	80,3	0,03	0,81	0,76	39,50		38,41		
		5		2,34	178,9	367,8	71,2	0,03	0,83	0,80	39,63		38,26		
		6		2,80	186,1	365,7	64,5	0,04	0,85	0,82	39,75		38,11		
		7		3,27	194,1	369,4	59,8	0,04	0,86	0,84	39,88		37,96		
		8		3,74	201,4	373,1	56,3	0,04	0,87	0,85	40,00		37,81		
RVI	44 x	3	4	1,24	135,1	338,4	109,3	0,02	0,74	0,65	44,28	44	43,67	66	76
		4		1,66	145,6	341,5	94,2	0,03	0,79	0,73	44,38		43,56		
		5		2,07	153,1	339,8	83,7	0,03	0,82	0,78	44,47		43,44		
		6		2,49	157,9	333,2	75,3	0,03	0,84	0,81	44,56		43,33		
		7		2,90	166,8	343,6	70,6	0,03	0,85	0,83	44,66		43,22		
		8		3,31	169,2	334,6	65,0	0,04	0,86	0,84	44,75		43,11		
		9		3,73	171,8	328,0	60,6	0,04	0,87	0,85	44,84		43,00		
RVI	48 x	3	3	1,14	218,7	556,2	111,6	0,03	0,73	0,63	48,38	48	47,56	80	90
		4		1,52	234,6	557,2	95,4	0,03	0,78	0,71	48,50		47,41		
		5		1,90	246,8	554,6	85,0	0,03	0,81	0,76	48,63		47,26		
		6		2,28	259,0	559,1	77,5	0,04	0,83	0,79	48,75		47,11		
		7		2,66	262,4	538,7	70,1	0,04	0,84	0,82	48,88		46,96		
		8		3,04	277,7	561,1	66,7	0,04	0,86	0,83	49,00		46,81		
		9		3,42	285,7	562,1	62,9	0,05	0,87	0,84	49,13		46,67		
		10		3,79	286,0	541,7	58,6	0,05	0,87	0,85	49,25		46,52		

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>Ca</b> Dynamic load capacity	<b>d0</b> Nominal diameter
<b>P</b> Lead (travel per revolution)	<b>C0a</b> Static load capacity	<b>d2</b> Thread root diameter
<b>D</b> Reference diameter	<b>Fk</b> Rigidity factor	<b>d00</b> Nominal diameter nut
<b>N</b> Number of starts	<b>d1</b> External diameter	<b>DI</b> Mini external diameter

RVI Range

# RVI Range - Inverted satellite roller screws



RVI Range

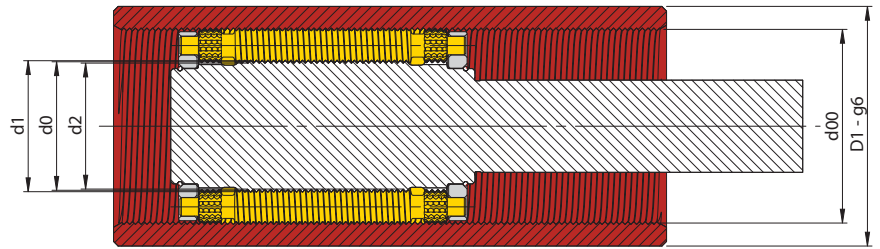
Types	TECHNICAL CHARACTERISTICS									SCREW			NUT		
	D x P	N	°	[kN]	[kN]	[Nz/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	[mm]	[mm]	[mm]	[mm]	[mm]	
										Helix angle	Ca	C0a	Fk	Ø d1	Ø d0
RVI	51 x	3	3	1,07	263,1	725,9	126,3	0,03	0,72	0,60	51,38	51	50,56	85	99
			4	1,43	279,5	715,2	106,6	0,03	0,77	0,70	51,50		50,41		
			5	1,79	298,1	727,9	96,2	0,03	0,80	0,75	51,63		50,26		
			6	2,14	308,5	717,3	86,9	0,04	0,82	0,78	51,75		50,11		
			7	2,50	320,2	718,3	80,0	0,04	0,84	0,81	51,88		49,96		
			8	2,86	326,2	703,9	74,0	0,04	0,85	0,83	52,00		49,81		
			9	3,22	340,3	720,4	70,3	0,05	0,86	0,84	52,13		49,67		
			10	3,57	346,6	713,7	66,5	0,05	0,87	0,85	52,25		49,52		
RVI	56 x	4	4	1,30	219,6	584,9	119,0	0,03	0,75	0,67	56,38	56	55,56	84	98
			5	1,63	231,9	585,8	105,9	0,03	0,79	0,73	56,47		55,44		
			6	1,95	240,8	580,4	96,0	0,03	0,81	0,77	56,56		55,33		
			7	2,28	250,8	584,4	88,8	0,03	0,83	0,79	56,66		55,22		
			8	2,60	256,5	575,9	82,2	0,04	0,84	0,81	56,75		55,11		
			9	2,93	260,4	564,4	76,6	0,04	0,85	0,83	56,84		55,00		
			10	3,25	274,4	590,0	74,1	0,04	0,86	0,84	56,94		54,89		
			12	3,90	279,0	566,9	66,2	0,05	0,87	0,86	57,13		54,67		
RVI	60 x	4	4	1,22	248,6	689,4	128,2	0,03	0,74	0,65	60,38	60	59,56	90	108
			5	1,52	259,3	676,9	112,7	0,03	0,78	0,71	60,47		59,44		
			6	1,82	272,7	684,5	103,1	0,03	0,80	0,75	60,56		59,33		
			7	2,13	281,4	678,7	94,8	0,03	0,82	0,78	60,66		59,22		
			8	2,43	290,7	679,7	88,3	0,04	0,84	0,80	60,75		59,11		
			9	2,73	298,2	677,2	83,0	0,04	0,85	0,82	60,84		59,00		
			10	3,04	306,9	681,5	78,9	0,04	0,86	0,83	60,94		58,89		
			12	3,64	316,7	669,9	71,2	0,05	0,87	0,85	61,13		58,67		

\* Axial backlash can be reduced on demand.

Terms used in tables		
<b>P</b>	Lead (travel per revolution)	<b>d0</b> Nominal diameter
<b>D</b>	Reference diameter	<b>d2</b> Thread root diameter
<b>N</b>	Number of starts	<b>d00</b> Nominal diameter nut
<b>Ca</b>	Dynamic load capacity	<b>D1</b> Mini external diameter
<b>C0a</b>	Static load capacity	
<b>Fk</b>	Rigidity factor	
<b>d1</b>	External diameter	



# RVI Range - Inverted satellite roller screws



Types				TECHNICAL CHARACTERISTICS						SCREW			NUT		
	D x P	N	Helix angle [°]	Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	ø d1 [mm]	ø d0 [mm]	ø d2 [mm]	ø d00 [mm]	ø DI [mm]	
RVI	64 x	4	4	1,14	278,7	802,2	137,3	0,03	0,73	0,63	64,38	64	63,56	96	114
		5		1,42	291,9	792,4	120,9	0,03	0,77	0,69	64,47		63,44		
		6		1,71	306,0	797,0	110,1	0,03	0,79	0,74	64,56		63,33		
		7		1,99	319,5	805,1	102,2	0,04	0,81	0,77	64,66		63,22		
		8		2,28	326,4	791,8	94,5	0,04	0,83	0,79	64,75		63,11		
		9		2,56	337,8	799,9	89,3	0,04	0,84	0,81	64,84		63,00		
		10		2,85	340,6	779,5	83,5	0,04	0,85	0,83	64,94		62,89		
RVI	70 x	6	5	1,56	260,3	722,7	123,1	0,02	0,78	0,72	70,45	70	69,47	98	120
		8		2,08	276,2	712,1	105,2	0,03	0,82	0,78	70,60		69,29		
		10		2,60	291,6	713,8	93,8	0,04	0,84	0,81	70,75		69,11		
		12		3,12	308,0	727,8	86,1	0,04	0,86	0,84	70,90		68,93		
		14		3,64	317,9	723,3	79,2	0,04	0,87	0,85	71,05		68,75		
		15		3,90	317,2	702,6	75,4	0,05	0,87	0,86	71,13		68,67		
RVI	75 x	6	5	1,46	294,7	851,9	132,4	0,03	0,77	0,70	75,45	75	74,47	105	127
		8		1,94	314,6	847,1	113,5	0,03	0,81	0,77	75,60		74,29		
		10		2,43	330,5	842,3	100,7	0,04	0,84	0,80	75,75		74,11		
		12		2,92	343,7	837,5	91,5	0,04	0,85	0,83	75,90		73,93		
		14		3,40	358,5	845,9	84,7	0,04	0,87	0,84	76,05		73,75		
		15		3,64	360,0	830,3	81,0	0,05	0,87	0,85	76,13		73,67		
RVI	80 x	6	4	1,37	387,4	1 038,4	121,9	0,03	0,76	0,68	80,56	80	79,33	120	142
		8		1,82	415,6	1 040,9	105,3	0,04	0,80	0,75	80,75		79,11		
		10		2,28	443,2	1 060,8	94,5	0,04	0,83	0,79	80,94		78,89		
		12		2,73	458,6	1 045,8	85,4	0,05	0,85	0,82	81,13		78,67		
		14		3,19	476,0	1 048,3	78,9	0,05	0,86	0,84	81,31		78,44		
		15		3,40	476,0	1 048,3	78,9	0,05	0,86	0,84	81,31		78,44		
		16		3,64	559,4	1 225,8	75,7	0,05	0,87	0,85	81,50		78,22		

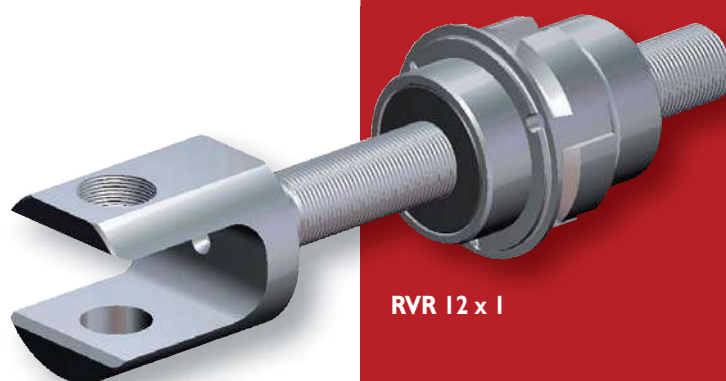
\* Axial backlash can be reduced on demand.

Terms used in tables		
<b>P</b>	Lead (travel per revolution)	
<b>D</b>	Reference diameter	
<b>N</b>	Number of starts	
<b>Ca</b>	Dynamic load capacity	<b>d0</b> Nominal diameter
<b>C0a</b>	Static load capacity	<b>d2</b> Thread root diameter
<b>Fk</b>	Rigidity factor	<b>d00</b> Nominal diameter nut
<b>d1</b>	External diameter	<b>DI</b> Mini external diameter

## RVR Range – Table of the standard available dimensions

Screw diameter (D)	Lead (P)						
	0,25	0,5	1	2	3	4	5
8	×	×	×	×			
10	×	×	×	×			
12	×	×	×	×			
16		×	×	×			
20		×	×	×			
25			×	×			
32			×	×		×	
36			×	×			
40			×	×		×	
50			×	×	×	×	
63				×	×	×	
80				×	×	×	
100					×	×	×
125							×

RVR Range





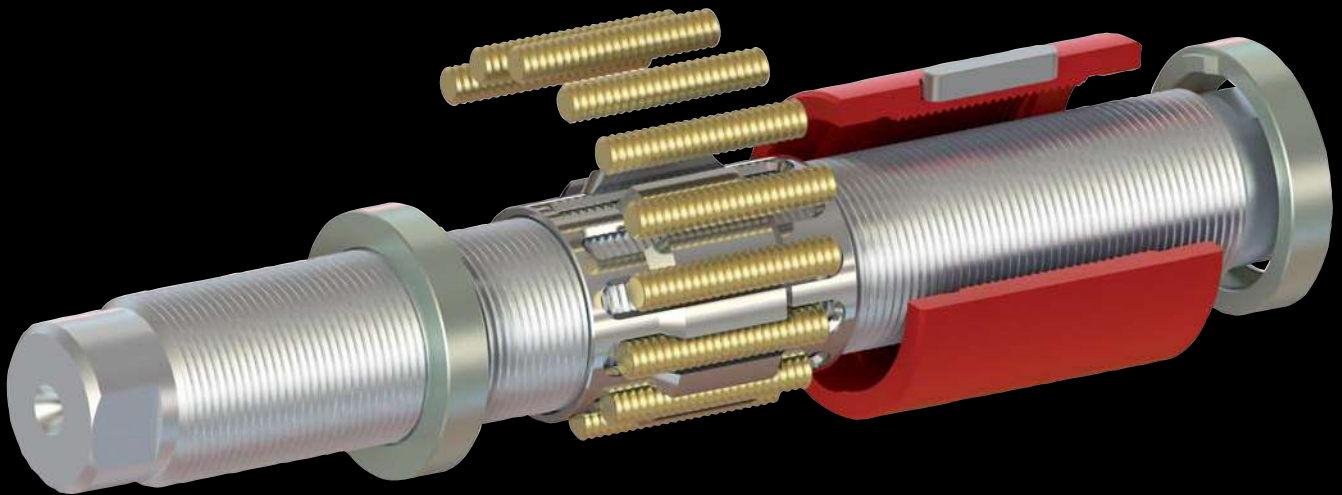
RVR 12 x 1



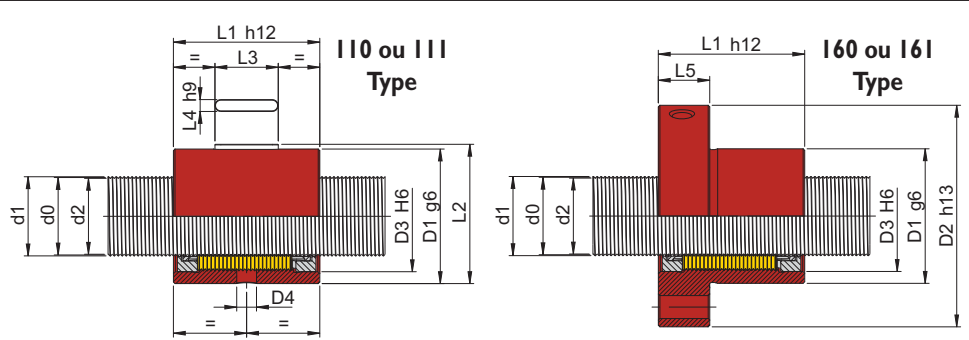
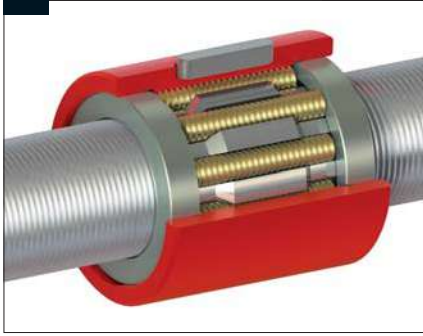
*Dimensions*

*pages*

 <b>RVR 8 / 10 / 12 / 16 / 20 / 25 / 32 / 36 / 40</b>	54 et 55
 <b>RVR 50 / 63 / 80 / 100 / 125</b>	56 et 57



# RVR Range - Satellite roller screw - mechanism with recirculating rollers



## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				SPLIT NUT					DIRECT efficiency	INDIRECT efficiency		
				Ca [kN]	C0a [kN]	Fk [N/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N/3µm]	Fv [N]	Mv [Nm]				
RVR	8 x	0,25	1	0,58	7,3	14,3	40,5	0,02	4,2	7,1	25,5	820	0,06	0,58	0,29	
		0,5		1,17	8,7	13,5	27,4	0,02	5,0	6,8	17,3	790	0,06	0,73	0,63	
		1		2,39	11,8	14,3	18,9	0,03	6,8	7,2	11,9	730	0,06	0,83	0,80	
		2	4,77	11,8	14,3	18,9	0,03	6,8	7,2	11,9	550	0,06	0,88	0,87		
RVR	10 x	0,25	1	0,46	8,8	17,7	45,9	0,02	5,0	8,9	28,9	870	0,08	0,53	0,11	
		0,5		0,93	10,4	16,8	31,0	0,02	6,0	8,4	19,6	855	0,08	0,69	0,55	
		1		1,89	14,1	17,8	21,4	0,03	8,1	8,9	13,5	810	0,08	0,81	0,76	
		2	3,78	14,1	17,8	21,4	0,03	8,1	8,9	13,5	665	0,08	0,87	0,85		
RVR	12 x	0,25	1	0,38	10,1	21,2	51,0	0,02	5,8	10,6	32,1	910	0,10	0,51	0,02	
		0,5		0,77	11,9	20,1	34,5	0,02	6,8	10,0	21,7	895	0,10	0,65	0,46	
		1		1,57	16,1	21,3	23,8	0,03	9,3	10,6	15,0	860	0,10	0,78	0,72	
		2	3,13	16,1	21,3	23,8	0,03	9,3	10,6	15,0	740	0,10	0,86	0,84		
RVR	16 x	0,5	1	0,58	14,3	26,7	40,8	0,02	8,2	13,3	25,7	1 020	0,15	0,58	0,29	
		1		1,17	19,4	28,2	28,2	0,03	11,1	14,1	17,8	990	0,15	0,73	0,63	
		2	2,33	19,4	28,2	28,2	0,03	11,1	14,1	17,8	895	0,15	0,83	0,80		
RVR	20 x	0,5	1	0,46	19,5	45,5	53,6	0,02	11,2	22,7	33,8	1 090	0,20	0,53	0,11	
		1		0,93	27,1	49,7	37,5	0,03	15,6	24,8	23,7	1 070	0,20	0,69	0,55	
		2	1,86	27,1	49,7	37,5	0,03	15,6	24,8	23,7	995	0,20	0,80	0,76		
RVR	25 x	1	1	0,74	39,7	85,2	48,3	0,03	22,8	42,6	30,4	1 295	0,30	0,64	0,44	
		2	1,48	39,7	85,2	48,3	0,03	22,8	42,6	30,4	1 228	0,30	0,77	0,70		
RVR	32 x	1	2	1	0,58	60,8	148,9	61,0	0,03	34,9	74,4	38,4	1 698	0,50	0,58	0,29
		2		1,15	60,8	148,9	61,0	0,03	34,9	74,4	38,4	1 635	0,50	0,73	0,63	
		4		2,33	73,5	144,7	42,6	0,03	42,2	72,4	26,8	1 493	0,50	0,83	0,80	
RVR	36 x	1	1	0,51	73,8	180,5	64,1	0,03	42,4	90,2	40,4	1 815	0,60	0,56	0,20	
		2		1,03	86,5	171,5	44,2	0,03	49,7	85,7	27,9	1 775	0,60	0,71	0,59	
RVR	40 x	1	2	1	0,46	79,8	206,9	69,5	0,03	45,8	103,5	43,8	1 908	0,70	0,53	0,11
		2		0,92	79,8	206,9	69,5	0,03	45,8	103,5	43,8	1 857	0,70	0,69	0,54	
		4		1,86	97,3	199,0	47,7	0,03	55,9	99,5	30,0	1 740	0,70	0,80	0,76	

\* Axial backlash can be reduced on demand.

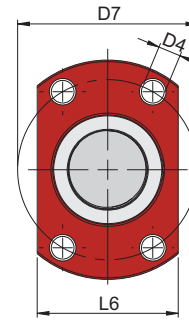
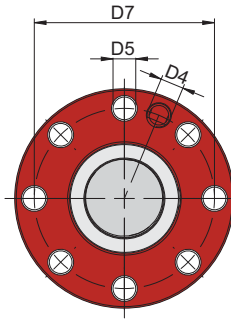
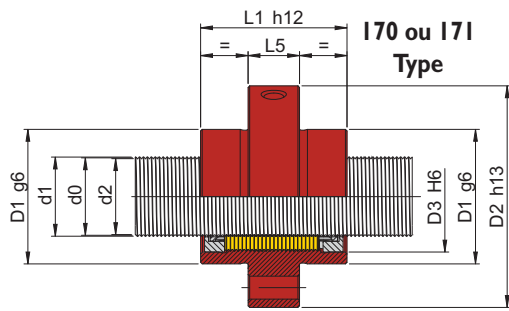
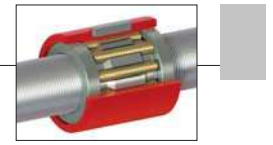
### Terms used in tables

**P** Lead (travel per revolution)  
**D** Reference diameter

**N** Number of starts  
**Ca** Dynamic load capacity  
**C0a** Static load capacity

**Fk** Rigidity factor  
**Fv** Preloading force  
**Mv** Preload torque



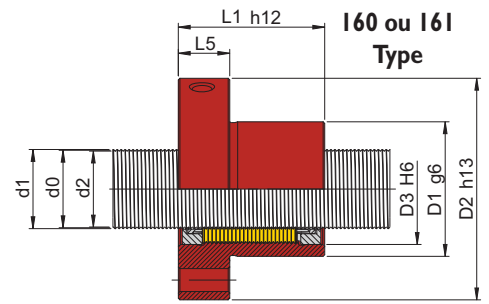
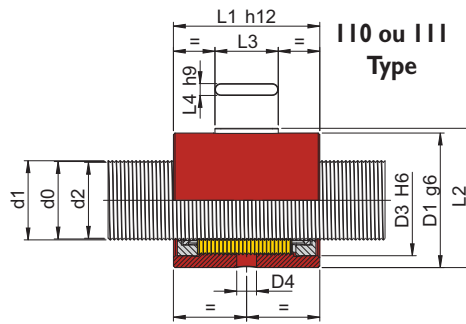
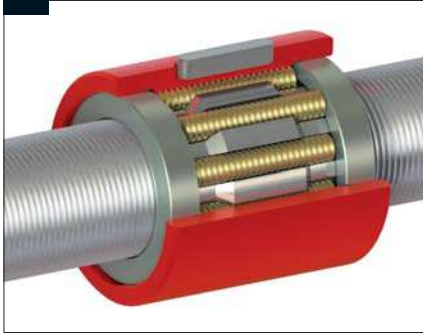


Types	D x P	SCREW			NUT													
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Without wiper	With wipers	[mm]	[mm]	[mm]	[mm]	[mm]
		∅ d1	∅ d0	∅ d2	∅ D1	∅ D2	∅ D3	D4	∅ D5	∅ D7	L1	L2	L3	L4	L5	L6		
RVR	8 x	0,25	7,91	7,80	20	43	17,0	5	M5	4,8	33	31	41	20,8	10	2	13	22
		0,5	7,82	7,60														
		1	7,63	7,19														
		2	7,63	7,19														
RVR	10 x	0,25	9,91	9,80	22	43	18,5	5	M5	4,8	33	31	41	22,8	12	2	13	24
		0,5	9,82	9,60														
		1	9,63	9,19														
		2	9,63	9,19														
RVR	12 x	0,25	11,91	11,80	24	46	20	5	M5	4,8	36	31	41	24,8	12	2	13	26
		0,5	11,82	11,60														
		1	11,63	11,19														
		2	11,63	11,19														
RVR	16 x	0,5	15,82	15,60	29	51	25	5	M6	4,8	41	31	41	30,2	12	3	13	31
		1	15,63	15,19														
		2	15,63	15,19														
RVR	20 x	0,5	19,82	19,60	34	58	28	5	M6	5,8	46	37	47	35,2	16	3	18	36
		1	19,63	19,19														
		2	19,63	19,19														
RVR	25 x	1	24,63	24,19	42	68	36	5	M6	5,8	56	44	54	43,5	20	4	18	44
		2	24,63	24,19														
RVR	32 x	1	31,63	31,19	53	83	46	5	M6	7,0	70	55	67	55,2	20	4	20	55
		2	31,63	31,19														
		4	31,26	30,38														
RVR	36 x	1	35,63	35,19	61	90	53	5	M6	9,0	75	62	75	63,7	28	6	17	63
		2	35,26	34,38														
RVR	40 x	1	39,63	39,19	70	104	58	5	M6	9,0	85	66	80	72,7	28	6	26	72
		2	39,63	39,19														
		4	39,26	38,38														

RVR Range

**Terms used in tables**      **D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter

# RVR Range - Satellite roller screw - mechanism with recirculating rollers

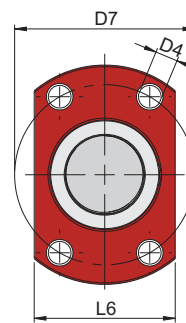
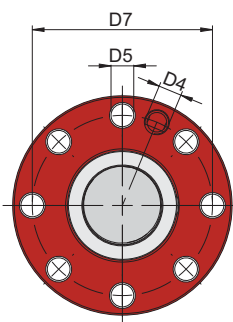
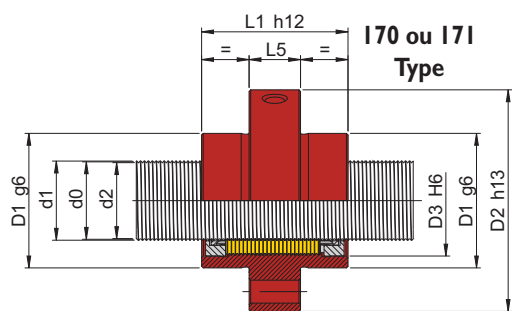


## TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [Nz/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [Nz/3µm]	Fv [N]	Mv [Nm]			
RVR	50 x	1	1	0,37	134,1	410,4	93,6	0,03	77,0	205,2	58,9	1969	0,90	0,52	0,06
		2	1	0,73	139,9	424,4	94,6	0,03	80,3	212,2	59,6	1930	0,90	0,64	0,44
		3	2	1,11	160,0	429,0	76,9	0,03	91,9	214,5	48,5	1888	0,90	0,72	0,62
		4	2	1,48	168,2	407,6	64,7	0,03	96,6	203,8	40,8	1842	0,90	0,77	0,70
RVR	63 x	2	1	0,59	219,6	563,0	73,6	0,03	126,1	281,5	46,3	2068	1,20	0,59	0,30
		3	1	0,88	241,4	534,1	58,2	0,03	138,7	267,0	36,7	2043	1,20	0,68	0,53
		4	2	1,17	219,6	563,0	73,6	0,03	126,1	281,5	46,3	1990	1,20	0,73	0,64
RVR	80 x	2	1	0,46	374,6	1393,4	115,8	0,05	215,2	696,7	73,0	/	/	0,53	0,11
		3	1	0,69	414,2	1361,1	93,4	0,05	237,9	680,5	58,8	/	/	0,63	0,40
		4	1	0,93	440,6	1326,1	80,5	0,05	253,0	663,1	50,7	/	/	0,69	0,55
RVR	100 x	3	1	0,55	512,0	1576,5	93,8	0,05	294,0	788,3	59,1	/	/	0,57	0,26
		4	1	0,74	523,3	1548,0	80,4	0,05	300,6	774,0	50,6	/	/	0,64	0,44
		5	1	0,93	527,5	1519,6	71,3	0,05	302,9	759,8	44,9	/	/	0,69	0,55
RVR	125 x	5	1	0,74	986,0	3972,5	111,5	0,05	566,3	1986,2	70,2	/	/	0,64	0,44

\* Axial backlash can be reduced on demand.

<b>Terms used in tables</b>	<b>N</b> Number of starts	<b>F<sub>k</sub></b> Rigidity factor
<b>P</b> Lead (travel per revolution)	<b>Ca</b> Dynamic load capacity	<b>F<sub>v</sub></b> Preloading force
<b>D</b> Reference diameter	<b>C0a</b> Static load capacity	<b>M<sub>v</sub></b> Preload torque



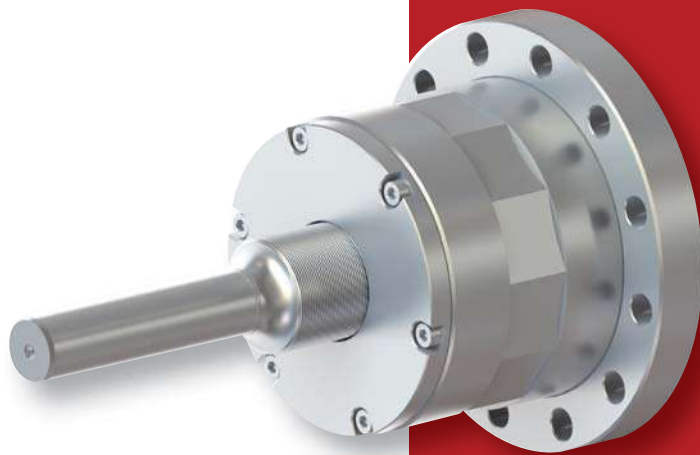
Types	D x P	SCREW			NUT														
		Ø d1	Ø d0	Ø d2	Ø D1	Ø D2	Ø D3	D4	Ø D5	Ø D7	Without wiper	With wipers	L1	L2	L3	L4	L5	L6	
RVR	50 x	1	49,63	49,19	82	124	74	8	M6	11,0	102	85	101	84,7	32	6	28	84	
		2	49,63	49,19															
		3	49,45	48,79															
		4	49,26	48,38															
RVR	63 x	2	62,26	61,38	102	148	94	8	M8 x l	13,5	127	110	124	104,7	40	6	32	104	
		3	61,89	60,57															
		4	62,26	61,38															
RVR	80 x	2	79,26	78,38	140	198	115	10	M8 x l	17,5	170	175	189	141,7	50	10	35	140	
		3	78,89	77,57															
		4	78,52	76,76															
RVR	100 x	3	98,89	97,57	174	238	146	10	M8 x l	17,5	210	180	196	173,7	56	12	40	172	
		4	98,52	96,76															
		5	98,15	95,95															
RVR	125 x	5	125	123,15	120,95	220	310	188	15	M10 x l	20,0	270	262	282	223	100	12	55	225

RVR Range

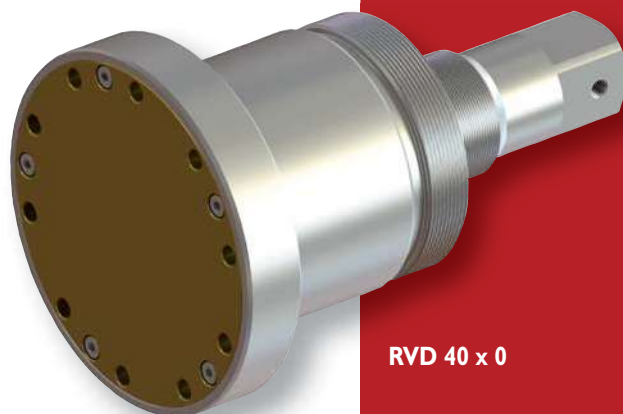
**Terms used in tables**  
**D** Reference diameter      **d0** Nominal diameter  
**P** Lead (travel per revolution)      **d1** External diameter      **d2** Thread root diameter



RVD 42 x 0.1

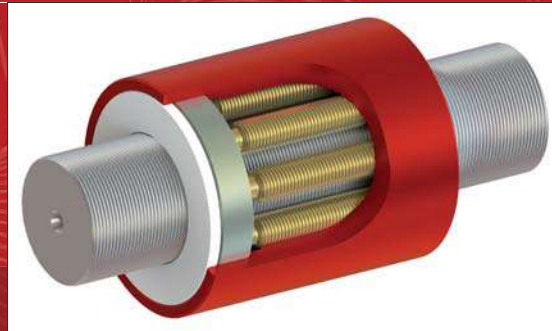


RVD 60 x 0.6

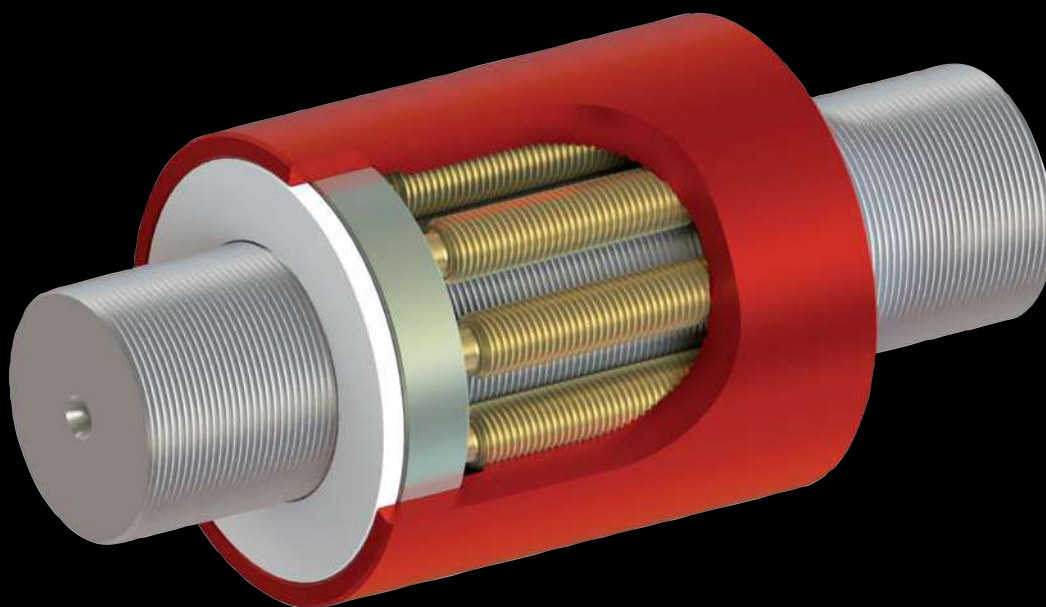


RVD 40 x 0

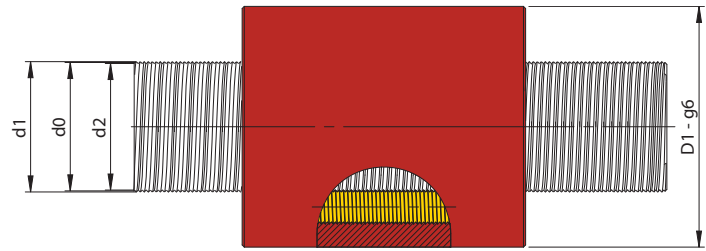
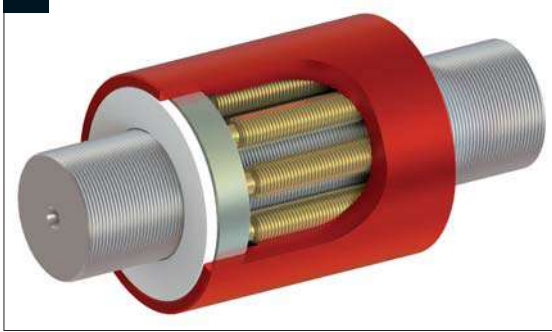




<i>Dimensions</i>	<i>pages</i>
● RVD 12 / 15 / 18	60
● RVD 21 / 24 / 27	61
● RVD 30 / 33	62
● RVD 36 / 39	63



# RVD Range - Differential roller screws



Types	TECHNICAL CHARACTERISTICS				SCREW			NUT
	D x P	SCREW			Ø d1	Ø d0	Ø d2	Ø D1
		Ca	C0a	Fk				
RVD	12 x	0,05	9,0	11,1	27,4	12	11,82	26
		0,10	14,2	22,2	43,5		11,82	
		0,15	15,6	21,9	34,9		11,73	
		0,20	16,6	21,6	29,9		11,64	
		0,25	18,0	22,6	27,3		11,56	
		0,30	13,1	15,1	23,6		11,64	
		0,35	15,2	24,4	46,4		11,82	
		0,40	12,3	17,8	37,5		11,82	
		0,45	12,6	17,7	35,2		11,80	
		0,50	15,5	19,4	27,9		11,64	
RVD	15 x	0,05	12,2	16,3	32,2	15	14,82	32
		0,10	19,4	32,6	51,1		14,82	
		0,15	21,6	32,8	41,5		14,73	
		0,20	23,2	33,0	35,7		14,64	
		0,25	24,9	33,7	32,2		14,56	
		0,30	18,3	23,1	28,2		14,64	
		0,35	20,6	35,9	54,4		14,82	
		0,40	16,7	26,1	44,0		14,82	
		0,45	17,1	25,8	41,2		14,80	
		0,50	21,7	29,7	33,3		14,64	
RVD	18 x	0,05	18,7	30,1	42,4	18	17,82	36
		0,10	29,7	60,3	67,4		17,82	
		0,15	33,0	60,5	54,4		17,73	
		0,20	35,6	60,7	46,8		17,64	
		0,25	37,8	60,9	41,7		17,56	
		0,30	28,1	42,5	36,9		17,64	
		0,35	31,6	66,3	71,8		17,82	
		0,40	25,6	48,2	58,1		17,82	
		0,45	26,3	47,8	54,1		17,80	
		0,50	33,2	54,6	43,7		17,64	

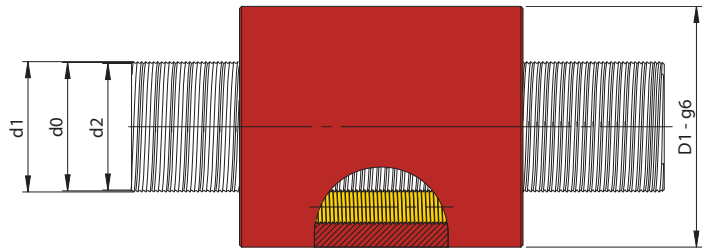
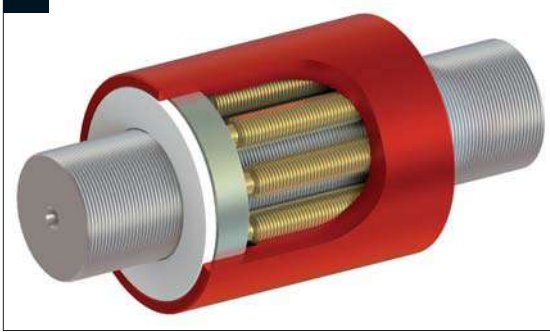
### Terms used in tables

**P** Lead (travel per revolution)  
**D** Reference diameter  
**Ca** Dynamic load capacity

**C0a** Static load capacity  
**F<sub>k</sub>** Rigidity factor  
**d1** External diameter

**d0** Nominal diameter  
**d2** Thread root diameter  
**D1** Mini external diameter

# RVD Range - Differential roller screws



Types	D x P	TECHNICAL CHARACTERISTICS			SCREW			NUT
		[kN]	[kN]	[N2/3µm]	[mm]	[mm]	[mm]	[mm]
		Ca	C0a	Fk	Ø d1	Ø d0	Ø d2	Ø DI
RVD	21 x	0,05	25,7	46,9	51,8	21,15	20,82	41
		0,10	40,8	93,7	82,2	21,15	20,82	
		0,15	45,1	93,1	65,7	21,23	20,73	
		0,20	48,4	92,5	56,5	21,30	20,64	
		0,25	52,2	95,3	50,9	21,38	20,56	
		0,30	38,2	64,8	44,6	21,30	20,64	
		0,35	43,4	103,1	87,6	21,15	20,82	
		0,40	35,1	75,0	70,9	21,15	20,82	
		0,45	36,0	74,4	66,2	21,17	20,80	
		0,50	45,1	83,3	52,7	21,30	20,64	
RVD	24 x	0,05	35,1	73,0	63,3	24,15	23,82	46
		0,10	55,7	146,0	100,5	24,15	23,82	
		0,15	61,5	144,3	80,0	24,23	23,73	
		0,20	66,9	146,6	69,5	24,30	23,64	
		0,25	70,9	146,8	61,9	24,38	23,56	
		0,30	52,8	102,6	54,8	24,30	23,64	
		0,35	59,4	160,6	107,1	24,15	23,82	
		0,40	48,0	116,8	86,6	24,15	23,82	
		0,45	49,1	115,3	80,8	24,17	23,80	
		0,50	62,4	131,9	64,8	24,30	23,64	
RVD	27 x	0,05	38,7	80,7	65,6	27,15	26,82	53
		0,10	61,5	161,4	104,1	27,15	26,82	
		0,15	68,4	161,7	83,8	27,23	26,73	
		0,20	73,8	162,0	71,9	27,30	26,64	
		0,25	78,6	163,4	64,4	27,38	26,56	
		0,30	58,2	113,4	56,7	27,30	26,64	
		0,35	65,5	177,5	110,9	27,15	26,82	
		0,40	53,0	129,1	89,7	27,15	26,82	
		0,45	54,8	129,8	84,6	27,17	26,80	
		0,50	68,8	145,8	67,0	27,30	26,64	

### Terms used in tables

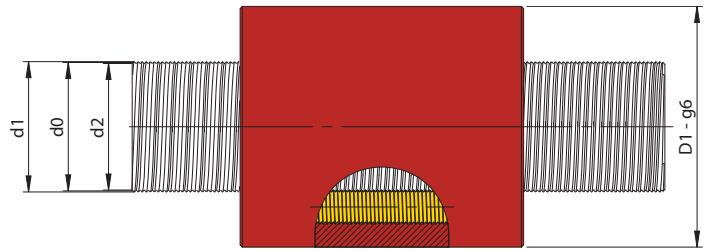
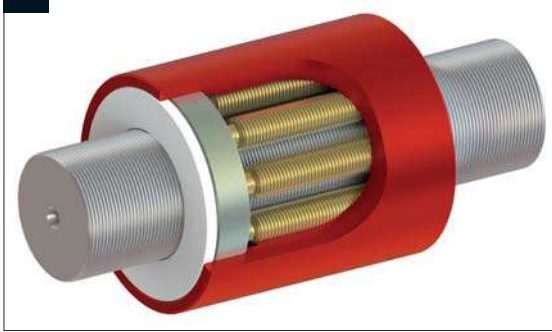
**P** Lead (travel per revolution)  
**D** Reference diameter  
**Ca** Dynamic load capacity

**C0a** Static load capacity  
**F<sub>k</sub>** Rigidity factor  
**d1** External diameter

**d0** Nominal diameter  
**d2** Thread root diameter  
**DI** Mini external diameter

RVD Range

# RVD Range - Differential roller screws



Types	TECHNICAL CHARACTERISTICS				SCREW			NUT
	D x P	SCREW			ø d1	ø d0	ø d2	ø D1
		Ca	C0a	Fk				
RVD	30 x	0,05	46,8	104,1	73,6	30,15	29,82	60
		0,10	74,3	208,2	116,8	30,15	29,82	
		0,15	82,7	208,5	94,0	30,23	29,73	
		0,20	88,5	206,4	79,8	30,30	29,64	
		0,25	94,9	210,4	71,9	30,38	29,56	
		0,30	69,8	144,5	62,9	30,30	29,64	
		0,35	79,1	229,0	124,5	30,15	29,82	
		0,40	64,0	166,5	100,7	30,15	29,82	
		0,45	66,0	166,6	94,3	30,17	29,80	
		0,50	82,5	185,7	74,4	30,30	29,64	
RVD	33 x	0,05	42,7	84,3	66,3	33,15	32,82	67
		0,10	67,8	168,6	105,2	33,15	32,82	
		0,15	75,8	170,2	84,9	33,23	32,73	
		0,20	80,7	166,8	71,7	33,30	32,64	
		0,25	86,7	171,0	64,5	33,38	32,56	
		0,30	63,6	116,8	56,5	33,30	32,64	
		0,35	72,2	185,4	112,1	33,15	32,82	
		0,40	58,4	134,9	90,7	33,15	32,82	
		0,45	60,1	134,4	84,9	33,17	32,80	
		0,50	75,2	150,1	66,8	33,30	32,64	

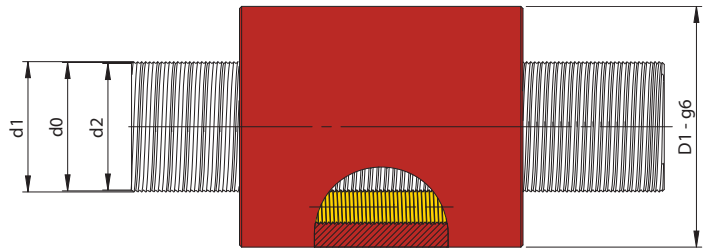
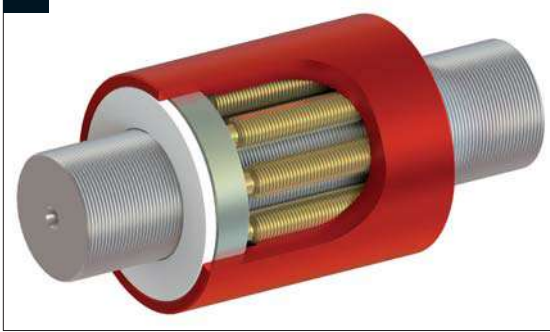
### Terms used in tables

**P** Lead (travel per revolution)  
**D** Reference diameter  
**Ca** Dynamic load capacity

**C0a** Static load capacity  
**F<sub>k</sub>** Rigidity factor  
**d1** External diameter

**d0** Nominal diameter  
**d2** Thread root diameter  
**D1** Mini external diameter

# RVD Range - Differential roller screws



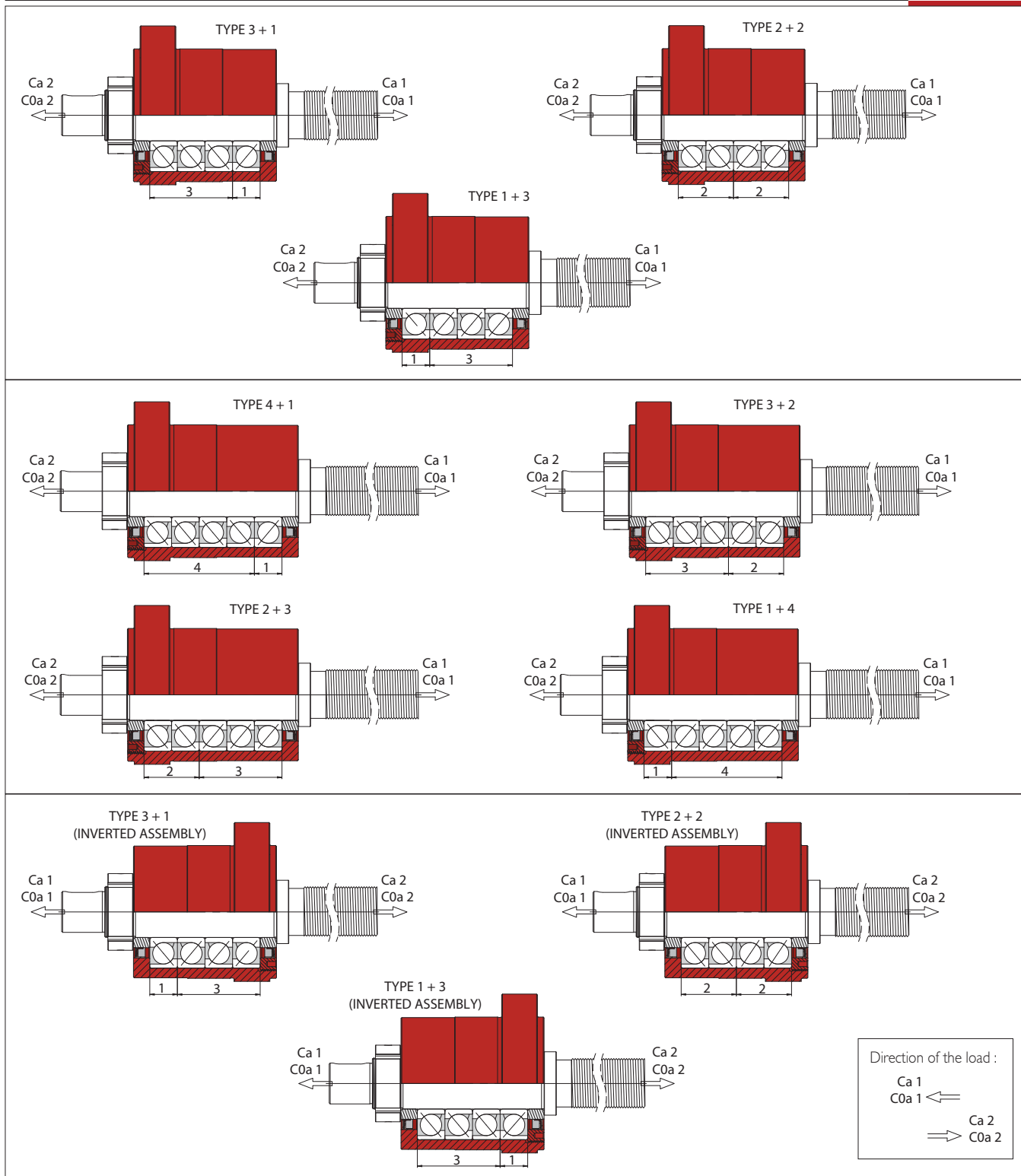
Types	TECHNICAL CHARACTERISTICS				SCREW			NUT
	D x P	[kN]	[kN]	[N2/3µm]	[mm]	[mm]	[mm]	[mm]
		Ca	C0a	Fk	Ø d1	Ø d0	Ø d2	Ø DI
RVD	36 x	0,05	45,4	88,3	67,4	36,15	35,82	74
		0,10	72,0	176,6	107,1	36,15	35,82	
		0,15	80,5	178,3	86,4	36,23	35,73	
		0,20	85,7	174,7	73,1	36,30	35,64	
		0,25	92,1	179,2	65,5	36,38	35,56	
		0,30	67,6	122,3	57,7	36,30	35,64	
		0,35	76,7	194,2	114,1	36,15	35,82	
		0,40	62,1	141,2	92,3	36,15	35,82	
		0,45	63,9	140,8	86,5	36,17	35,80	
		0,50	79,9	157,3	68,2	36,30	35,64	
RVD	39 x	0,05	67,2	164,4	89,5	39,15	38,82	82
		0,10	106,7	328,9	142,1	39,15	38,82	
		0,15	118,1	326,2	113,4	39,23	38,73	
		0,20	127,4	326,6	97,5	39,30	38,64	
		0,25	136,0	330,2	86,4	39,38	38,56	
		0,30	100,5	228,6	76,9	39,30	38,64	
		0,35	113,7	361,8	151,4	39,15	38,82	
		0,40	92,0	263,1	122,5	39,15	38,82	
		0,45	94,3	260,7	114,6	39,17	38,80	
		0,50	118,8	293,9	90,9	39,30	38,64	

RVD Range

<b>Terms used in tables</b>	<b>C0a</b> Static load capacity	<b>d0</b> Nominal diameter
<b>P</b> Lead (travel per revolution)	<b>F<sub>k</sub></b> Rigidity factor	<b>d2</b> Thread root diameter
<b>D</b> Reference diameter	<b>d1</b> External diameter	<b>DI</b> Mini external diameter
<b>Ca</b> Dynamic load capacity		



## Bearing units for satellite roller screws - Standard types of assembly available



### Nominal fatigue lifetime for axial loaded bearings:

$$L_{10} = \left( \frac{C_a}{F_m} \right)^3 \text{ revolutions} \quad \text{Respectively} \quad L_h = \frac{L_{10}}{n_m \cdot 60} \quad [h]$$

### Nominal fatigue lifetime for the bearing unit:

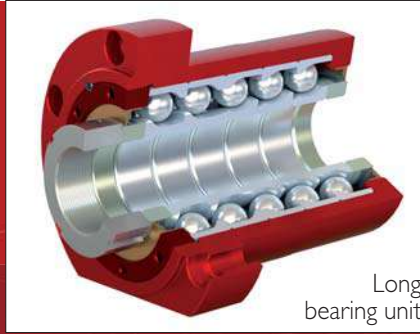
All bearing units are preloaded to ensure optimal support. When loads are applied in the two different axial directions, bearing unit lifetime calculation depends on average axial forces  $F_m$  (considering preload) and on the equivalent dynamic capacity of each set of bearings assembled in the same direction. As a result, with the two lifetime values  $L_{10(1)}$  and  $L_{10(2)}$  (revolutions), we can calculate the global bearing unit lifetime.

$$L_{10(1)} = \left( \frac{C_{a1}}{F_{ma(1)}} \right)^3 \cdot 10^6 \text{ revolutions}$$

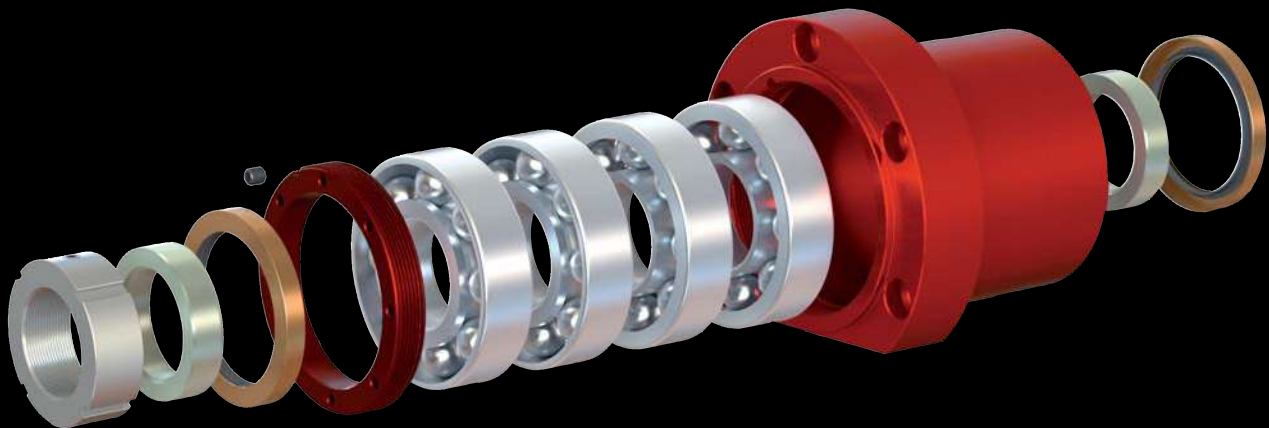
$$L_{10(2)} = \left( \frac{C_{a2}}{F_{ma(2)}} \right)^3 \cdot 10^6 \text{ revolutions}$$

$$L_{10} = \left( L_{10(1)}^{-10/9} + L_{10(2)}^{-10/9} \right)^{-9/10} \text{ revolutions}$$

# BU - Bearing units for roller screws

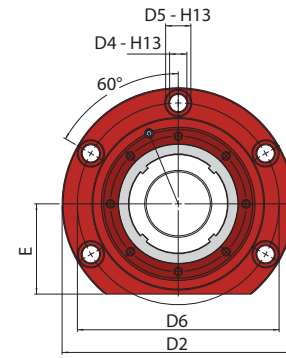
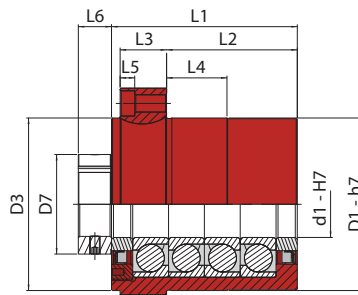


Type	pages
● BU 1 / 2 / 3 / 4 / 5 / 6 / 6L / 7 / 7L	66
● BU 8 / 8L / 9 / 9XL	67
● Shaft ends dimensions	68



Bearing units **BU**

# BU - Bearing units for roller screws

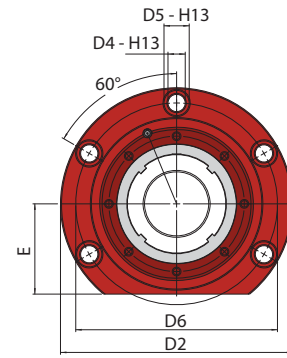
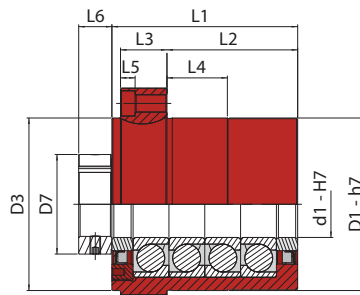


HOUSING			DIMENSIONS														EQUIVALENT AXIAL LOAD RATINGS					
Family	n°	Bearings arrangement Types	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]	[kN]	[kN]	[Nm]
			∅ d1	∅ D1	∅ D2	∅ D3	∅ D4	∅ D5	∅ D6	∅ D7	L1	L2	L3	L4	L5	L6	E	Capacities* depending on load direction				
																	Ca 1	C0a 1	Ca 2	C0a 2	Mv	
BU	1	1 + 1	12	47	76	50	6,6	11	63	22	42	25	12	12	2	8	27	13,0	13,7	13,0	13,7	15
BU	2	1 + 1	17	60	90	62	6,6	11	76	28	46	32	12	18	2	10	32	24,9	27,7	24,9	27,7	22
BU	3	1 + 3	20	60	90	58	9	14	74	38	77	60	15	30	2	20	32	24,6	30,0	53,0	90,0	27
		2 + 2																39,9	60,0	39,9	60,0	
		3 + 1																53,0	90,0	24,6	30,0	
BU	4	1 + 3	25	80	120	80	11	17	100	45	89	68	19	36	3	20	44	49,1	60,8	106,0	182,3	38
		2 + 2																79,8	121,5	79,8	121,5	
		3 + 1																106,0	182,3	49,1	60,8	
BU	5	1 + 3	35	100	142	99	13	19	120	58	110	82	25	47	5	22	54	75,4	105,8	162,8	317,3	65
		2 + 2																122,6	211,5	122,6	211,5	
		3 + 1																162,8	317,3	75,4	105,8	
BU	6	1 + 3	50	130	175	130	13	19	152	75	140	98,5	37	58,5	12	25	67	131,6	192,3	283,9	576,9	110
		2 + 2																213,8	384,6	213,8	384,6	
		3 + 1																283,9	576,9	131,6	192,3	
	6L	1 + 4									131,6	192,3	347,2	769,2								
		2 + 3									213,8	384,6	283,9	576,9								
		3 + 2									283,9	576,9	213,8	384,6								
		4 + 1									347,2	769,2	131,6	192,3								
BU	7	1 + 3	65	170	227	170	17	25	198	105	180	133,5	42	53,5	12	32	87	193,0	315,4	416,4	946,2	200
		2 + 2																313,5	630,8	313,5	630,8	
		3 + 1																416,4	946,2	193,0	315,4	
	7L	1 + 4									193,0	315,4	509,3	1 261,5								
		2 + 3									313,5	630,8	416,4	946,2								
		3 + 2									416,4	946,2	313,5	630,8								
		4 + 1									509,3	1 261,5	193,0	315,4								

\* See types of bearings arrangement and the legend, page 64

<b>Terms used in tables</b>	<b>Mv</b> Preload torque
<b>Ca</b> Dynamic load capacity	<b>d1</b> Shaft diameter (bearing unit bore)
<b>C0a</b> Static load capacity	<b>D1</b> Housing external diameter

# BU - Bearing units for roller screws



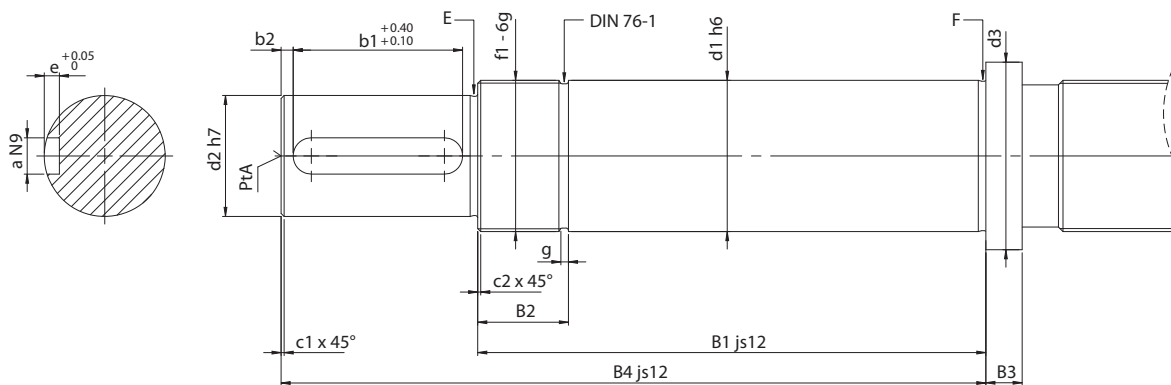
HOUSING		Bearings arrangement Types	DIMENSIONS														EQUIVALENT AXIAL LOAD RATINGS					
Family	n°		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]	[kN]	[kN]	[Nm]	
			Ø d1	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	Ø D6	Ø D7	L1	L2	L3	L4	L5	L6	E	Capacities* depending on load direction				Mv
BU	8	1 + 3	90	220	290	216	22	32	252	130	235	179	50	99	15	38	115	315,8	596,2	681,4	1 788,5	
		2 + 2																513,0	1 192,3	513,0	1 192,3	
		3 + 1																681,4	1 788,5	315,8	596,2	
	8L	1 + 4									315,8	596,2	833,4	2 384,6								
		2 + 3									513,0	1 192,3	681,4	1 788,5								
		3 + 2									681,4	1 788,5	513,0	1 192,3								
4 + 1	833,4	2 384,6	315,8	596,2																		
BU	9	1 + 3	100	250	327	243	25	38	285	140	253	195	52	115	16	38	130	375,4	757,7	810,1	2 273,1	400
		2 + 2																609,9	1 515,4	609,9	1 515,4	
		3 + 1																810,1	2 273,1	375,4	757,7	
	9XL	1 + 5									375,4	757,7	1 158,3	3 788,5								
		2 + 4									609,9	1 515,4	990,8	3 030,8								
		3 + 3									810,1	2 273,1	810,1	2 273,1								
		4 + 2									990,8	3 030,8	609,9	1 515,4								
		5 + 1									1 158,3	3 788,5	375,4	757,7								

\* See types of bearings arrangement and the legend, page 64

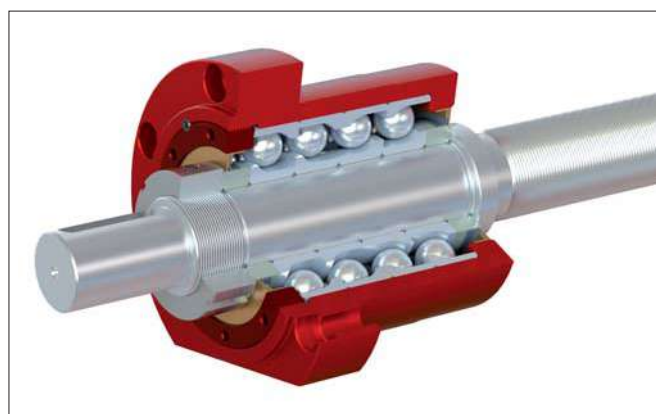
**Terms used in tables**  
**Ca** Dynamic load capacity  
**C0a** Static load capacity  
**Mv** Preload torque  
**d1** Shaft diameter (bearing unit bore)  
**D1** Housing external diameter

Bearing units BU

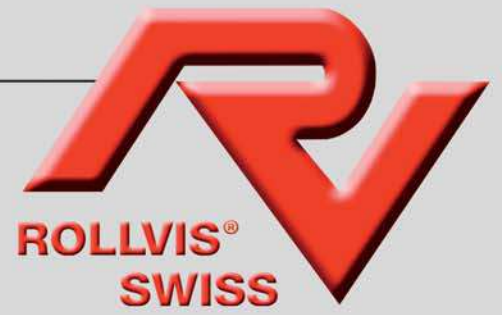
## End shafts dimensions



HOUSING		END SHAFTS DIMENSIONS																	
Family	n°	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
		∅ d1	∅ d2	∅ d3	B1	B2	B3	B4	∅ f1	c1	c2	g	E	F	b1	b2	a	e	Pta
BU	1	12	10	17	51	10	5	71	M12 x 1	0,5	0,7	1,5	0,4 x 0,2	0,4 x 0,3	16	1,5	3	1,8	1,6 - 3,35
BU	2	17	15	23	66	21	5	96	M17 x 1	0,5	0,7	1,5	0,6 x 0,2	0,6 x 0,2	25	2	5	3	2 - 4,25
BU	3	20	17	27	98	22	7	138	M20 x 1	0,5	0,7	1,5	0,6 x 0,2	0,6 x 0,2	32	3	5	3	2 - 4,25
BU	4	25	20	34	111	24	7	156	M25 x 1,5	0,5	1	2,5	0,6 x 0,2	0,6 x 0,2	40	2,5	6	3,5	2,5 - 5,3
BU	5	35	30	45	134	26	10	189	M35 x 1,5	1	1	2,5	0,6 x 0,2	0,6 x 0,2	45	2,5	8	4	3,15 - 6,7
BU	6	50	40	62	168	30	12	233	M50 x 1,5	1	1	2,5	0,8 x 0,3	0,8 x 0,3	56	4	12	5	3,15 - 6,7
	6L				195			260											
BU	7	65	60	78	215	37	18	315	M65 x 2	1	1,5	4	1 x 0,4	1,6 x 0,3	90	3	18	7	4 - 8,5
	7L			248	348														
BU	8	90	85	108	275	43	25	395	M90 x 2	1	1,5	4	1,6 x 0,3	1,6 x 0,3	100	8	25	9	6,3 - 13,2
	8L			318	438														
BU	9	100	95	120	293	43	25	433	M100 x 2	1	1,5	4	1,6 x 0,3	1,6 x 0,3	125	7	25	9	6,3 - 13,2
	9XL			387	527														







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**ISO 9001 : 2015**

**EN 9100 : 2016**

*Certification*





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# Application data list for roller screws

## Operation conditions :

### Number of screws supporting the lead :

Max static load :

Max. dynamic load :

Typical load chart (function of the stroke, forward and reverse stroke) :



### Maximal linear speed of the application :

Stroke :

length of screw :

Main load :  Compression

Tension

Rotation :  Nut

Screw shaft

Positioning of the screw :  Vertical

Horizontal

Specific limitations :  Vibration :

Shocks :

Expected lifetime Nb of cycles :

Total time required - years-month :

Environnement : Humidity / Fluid / Dust :

Temperature range :

Geometric limitations : Nut/Shaft max diameter/Length :

Interfaces :

Motor torque :

Lubrication requirement :

## Preload - Backlash - Accuracy - Stiffness :

Lead accuracy :  G5 (23\_m/300mm)  G3 (12\_m/300mm)  G1 (6\_m/300mm)

Manufacturing tolerances (ISO 3408-3) :  Classe 5

Classe 3

Classe 1

Axial backlash :  Standard

Without backlash

Preloading/Stiffness

Nut :  Flange

Cylindrical

Double

Specific design

## Mounting conditions of the roller screw

Fixed - Free :  XX ———

Fixde - Supported :  XX ———X

Fixed - Fixed :  XX ———XX

Supported - Supported :  X ———X

Notes / Remarks / Sketch :

# Conversion tables

## LENGTH

mm	m	inches	feet
<b>1</b>	0,001	0,0394	0,0033
1000	<b>1</b>	39,37	3,28
25,4	0,0254	<b>1</b>	0,083
304,8	0,305	12	<b>1</b>

## SURFACE

m <sup>2</sup>	cm <sup>2</sup>	mm <sup>2</sup>	sq.in	sq.ft
<b>1</b>	10000	1000000	1550	10,76
0,0001	<b>1</b>	100	0,155	0,0011
0,000001	0,01	<b>1</b>	0,00155	1,076E-05
0,0006	6,45	645,2	<b>1</b>	0,0069
0,0929	929,03	92903	144	<b>1</b>

## VOLUME

m <sup>3</sup>	dm <sup>3</sup> (liter)	cm <sup>3</sup>	mm <sup>3</sup>	in <sup>3</sup>	ft <sup>3</sup>	gallons (US)	fl oz
<b>1</b>	1000	1000000	1000000000	61 023,74	35,31	264,17	33813,7
0,001	<b>1</b>	1000	1000000	61,02	0,035	0,264	33,81
0,000001	0,001	<b>1</b>	1000	0,06	3,53-05	0,0003	0,034
0,000000001	0,000001	0,001	<b>1</b>	6,1-05	3,53-08	2,64-07	3,38-05
1,64-05	0,0164	16,387	16 387	<b>1</b>	0,0006	0,0043	0,5541
0,0283	28,3	28 316	28 316 846,59	1 728	<b>1</b>	7,48	957,49
0,003785	3,785	3 785	3 785 441,28	231,001	0,13	<b>1</b>	127,99
2,96	0,0296	29,57	29 573,8	1,8	0,001	0,0078	<b>1</b>

## LOAD

N	kN	Tonf	kgf	Lbf
<b>1</b>	0,001	0,0001	0,102	0,225
1000	<b>1</b>	0,102	101,97	224,8
9806,7	9,8067	<b>1</b>	1000	2 204,6
9,81	0,0098	0,001	<b>1</b>	2,205
4,45	0,0044	0,0005	0,45	<b>1</b>

## TORQUE

Nm	Ncm	Nmm	daN.m	daN.cm	kgf.cm	in.lbf	ft.lbf
<b>1</b>	100	1000	0,1	10	10,197	8,85	0,7376
0,01	<b>1</b>	10	0,001	0,1	0,102	0,0885	0,0074
0,001	0,1	<b>1</b>	0,0001	0,01	0,0102	0,0089	0,0007
10	1000	10000	<b>1</b>	100	101,9716	88,5	7,3756
0,1	10	100	0,01	<b>1</b>	10,197	0,885	0,0738
0,098	9,807	98,07	0,0098	0,98	<b>1</b>	0,868	0,0723
0,113	11,29	112,985	0,0113	1,129	1,152	<b>1</b>	0,0833
1,3558	135,58	1 355,8	0,1356	13,56	13,83	12	<b>1</b>

## STIFFNESS

N/mm	N/μm	lbf/in x 1E6
<b>1</b>	1000	5,71
0,001	<b>1</b>	0,0057
0,1751	175,13	<b>1</b>

## LINEAR SPEED

m/s	mm/s	m/min	km/h	in/s	in/min	ft/s	ft/min	mph
<b>1</b>	1000	60	3,6	39,37	2 362,2	3,28	196,85	2,237
0,001	<b>1</b>	0,06	0,0036	0,039	2,36	0,0033	0,197	0,0022
0,016	16,66	<b>1</b>	0,06	0,66	39,37	0,0547	3,28	0,0373
0,2778	277,77	16,66	<b>1</b>	10,936	656,168	0,91	54,68	0,62
0,0254	25,4	1,52	0,09	<b>1</b>	60	0,08	5	0,0568
0,0004	0,42	0,025	0,0015	0,0167	<b>1</b>	0,0014	0,083	0,0009
0,305	304,8	18,23	1,097	12	720	<b>1</b>	60	0,68
0,00508	5,08	0,305	0,018	0,2	12	0,0167	<b>1</b>	0,011
0,447	447,04	26,82	1,6	17,6	1 055,997	1,466	87,99	<b>1</b>