



YOSO
LINEAR MOTION

PLANETARY ROLLER SCREW

About Us

Jingpeng Machinery Equipment (Shanghai) Co., Ltd. was established in 2015. Its main products include ball screws, linear guides, cross guides, precision ball screws/splines, single-axis actuators, medium and large bearings, racks, couplings, support units, servo motors and drivers, etc. In cooperation with the German YOSO company, Jingpeng has independent import and export rights. Jingpeng has completed trademark registration and continues to promote its use. Now YOSO is one of the world's well-known brands. The company's products are sold all over the world and exported to the United States, Spain, Turkey, Italy, Austria, Brazil and other countries. Jingpeng Machinery learns German production technology, combines European and Japanese design concepts, and has specially established an independent R&D center, introducing advanced manufacturing equipment and high-precision testing equipment at home and abroad, and has completed an annual output value of 1.5 million sets of screw guides.

The product application areas are as follows: Automation industry Robotics industry Semiconductor industry Industrial machinery Medical equipment Green energy industry Machine tools Automatic storage system products have outstanding performance in various industrial fields. Jingpeng Machinery integrates global resources, continues to innovate, and works tirelessly for the better welfare of mankind and a better working environment. In the field of transmission components, Jingpeng Machinery has become the best partner with high-quality professional manufacturing and solutions, and provides technical support and industry analysis to meet customer needs. At the same time, we have a solid business team to ensure the stability of the foreign trade sales system and strong market development capabilities, so that our products can be exported to all parts of the world at the fastest speed. Jingpeng Machinery is a global professional manufacturer of transmission control products and system technology products.

Content

General Concepts

Planetary roller screws compared to ball screws.....	P.01
Advantages of the planetary roller screws.....	P.01
Examples of applications	P.01
Types of roller screws	P.02
Identification system	P.04
Accuracy - Efficiency.....	P.05
Geometry	P.06
Preloading	P.07
Preloading examples	P.08
Mean speed and axial load.....	P.09
Nominal lifespan	P.10
Rigidity	P.11
Rotation speed	P.12
Driving torque.....	P.13
Calculation example.....	P.15
Lubrication.....	P.17
Handling advice.....	P.19

Planetary Roller Screw Series

Screw YRV series	P.20
Screw YHRV series	P.37
Screw YRVI series	P.42
Screw YRVR series.....	P.47
Screw YRVD series	P.52
Bearing units BU	P.57

■ Planetary roller screws compared to ball screws

Planetary roller screws mainly differentiate from ball screws because the load transfer elements are threaded rollers instead of balls. The main advantage of planetary 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

Planetary roller screws can rotate much faster and support much greater acceleration.

YRV Planetary roller screws are designed so that the rollers are not recirculating. This means the mechanism can reach 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.

The lead of roller screws (axial travel per turn) can be very small. It is typically limited to 1mm for small diameters of YRV 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. YRVR recirculating screws are single or double starts which give a pitch equal or at least half the lead. YRVD 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 design iterations with minor changes of the envelope 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 for ball screws 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 planetary roller screw greater rigidity and shock tolerance than a ball screw.

■ Advantages of the planetary roller screws

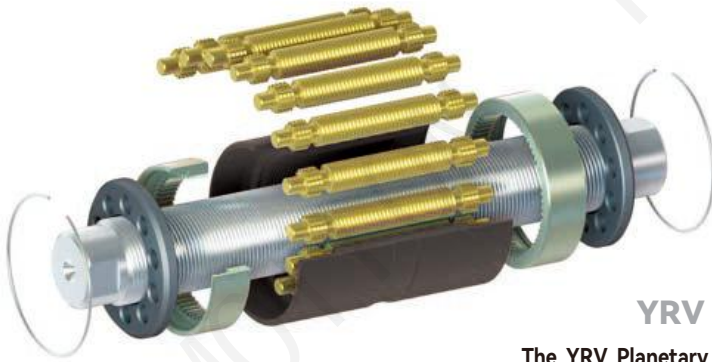
- High axial load capacity
- Long lifespan
- High efficiency
- No backlash
- Extremely high rigidity
- Accuracy down to 6 µm/300 mm
- High rotation speed (YRV types)
- Small leads (from 0.25 mm) with large diameters (YRVR types)
- Thin leads (to 0.02 mm) with medium diameters (YRVD types)
- High acceleration and deceleration
- High reliability
- Easy customization
- Available in standard or Stainless materials

■ Examples of applications

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

- Machine tools
- Measuring machines
- Bending machines
- Robotics
- Aeronautics (aircrafts, helicopters, drones)
- Space (rockets, satellites, launchers, spacecrafts)
- Defence (tanks, guns, missiles, etc.)
- Oil industry
- Nuclear industry
- Medical
- Chemical industry
- Optical
- Telescopes
- Printing
- Laser machines
- Injection moulding machines
- Car industry
- Semicon
- Presses

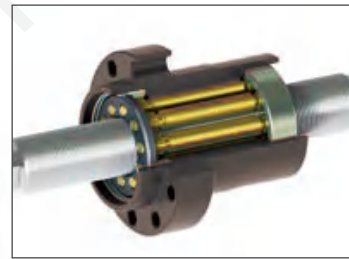
■ Types of roller screws



YRV screws

The **YRV Planetary 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.



YHRV screws

The **YHRV roller screw** is a variant of the planetary roller screw YRV designed for very high loads applications or when extended life is required. This design is based on specific optimization of the YRV design, with even more contacts in the assembly and a new thread profile.

Nuts are then longer than in the standard YRV version. YHRV 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.



YRVR screws

The **YRVR 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 speed

■ Types of roller screws



YRVI screws

The YRVI Inverted roller screw is based on the same principle as the YRV 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.



YRVD screws

The YRVD 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 down to 0.05 mm or even 0.02 mm. Available strokes are relatively smaller for this type of roller screw.

YRVD screw requires very specific tools and very high manufacturing accuracy to ensure an extreme high quality standard.

■ Identification system

Example → YRV 2 1 0 / 30.5. R 3. 350/230 - 6YY---

Design YRV = Planetary rollers screws
 YHRV = High capacity roller screws
 YRVR = Recirculating roller screws
 YRVI = Inverted roller screws
 YRVD = 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 wiper
 1 = With wipers (possibility to order only one wiper)

Screw diameter d_0 In mm

Nominal lead P In 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 μ m/300 mm
 G3 = 12 μ m/300 mm
 G5 = 23 μ m/300 mm

Total screw shaft length / threaded length - in mm

This model number is defined by YOSO

* refer to page 4 and ISO 3408-3 for thread accuracy details.

Accuracy

Planetary roller screws are divided into tolerance classes as defined in ISO 3408-3. The determining factor is the lead error V_{300p} corresponding to a thread length of 300 mm.

The table opposite shows the tolerance classes:

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

Planetary 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 planetary roller screw by the following formula:

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

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

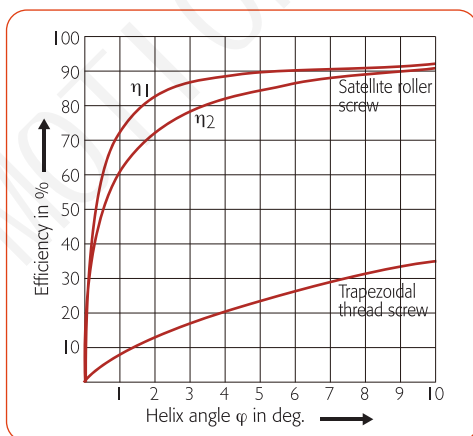
Lead is checked by a CMM measuring machine.

L_u		Ep 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 η_1 corresponds to the efficiency of the mechanism when the rotation is converted into a translation motion.
- Indirect efficiency η_2 corresponds to the efficiency of the mechanism when a translation motion is converted into a rotation.



← YOSO planetary roller screws achieve high rates of mechanical efficiency. The figure shows efficiency rates η_1 and η_2 as a function of the helix angle. The efficiency of a trapezoidal thread screw (sliding screws) is shown for comparison.

■ Geometry

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



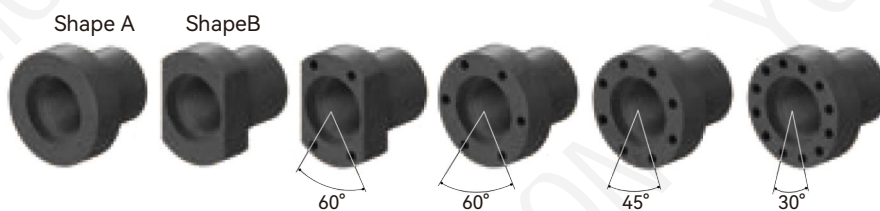
SPLIT NUTS:

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

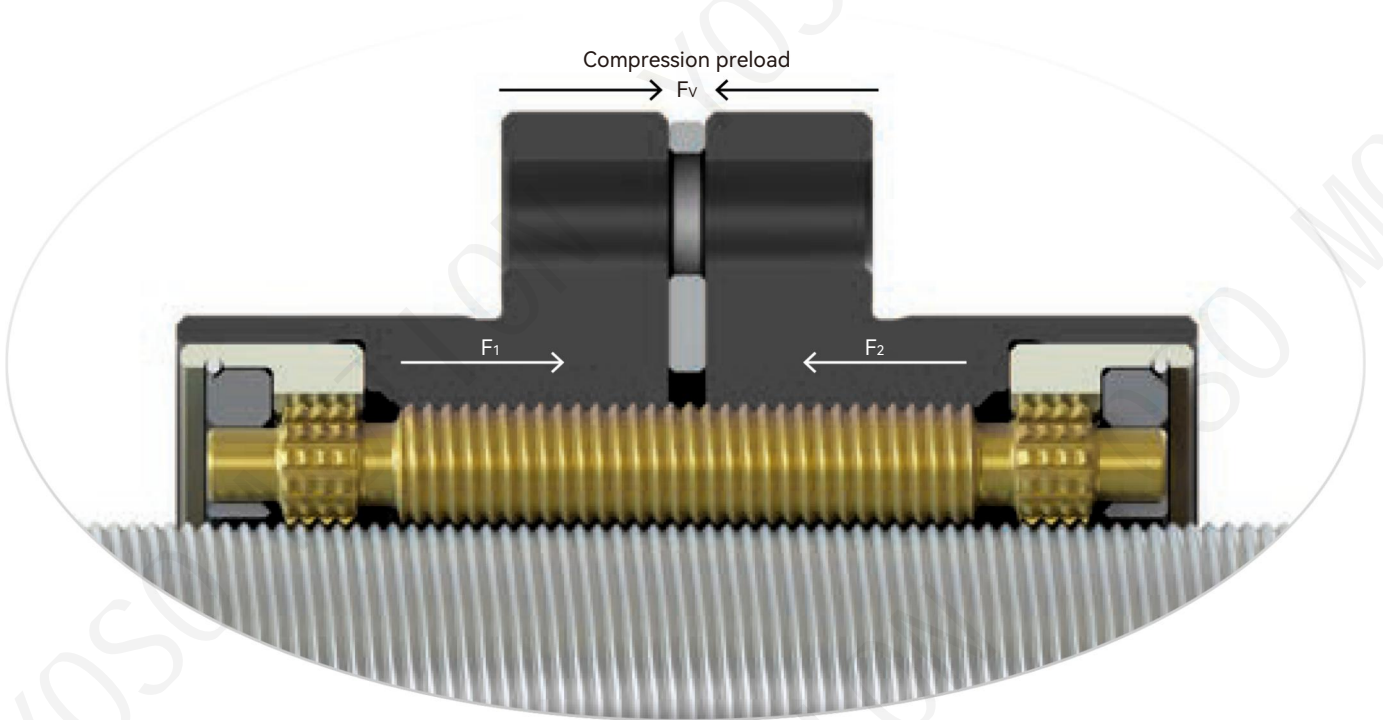


FLANGE SHAPES

Examples of typical flange shapes

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

■ Preloading



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 ($F_1...F_n$). This may yield to new individual loads ($F_{1v}...F_{nv}$).

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

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

If a planetary 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 .

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

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

- $F_1...F_n$ [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

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:

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

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

Relieved half of nut:

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

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

■ Preloading examples

- Preloading with rigid spacer (thickness calibrated by YOSO)



Flange nut
Extension preload



Cylindrical nut
Compression preload



Central flange nut
Compression preload

- Preloading with elastic washers



Flange nut



Cylindrical nut

Elastic preload makes calibration easier, 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).

- 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).

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

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

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



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

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

- n_m [min⁻¹] : mean speed
- $n_1 \dots n_n$ [min⁻¹] : 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 planetary 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:

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

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_a 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)

L_{hn} [h] : modified lifespan (hours)

L_{10} [revolutions] : nominal lifespan (revolutions)

L_h [h] : nominal lifespan (hours)

L_{hN} [h] : lifetime in actual hours

f_r [-] : reliability factor

C_a [N] : dynamic load capacity

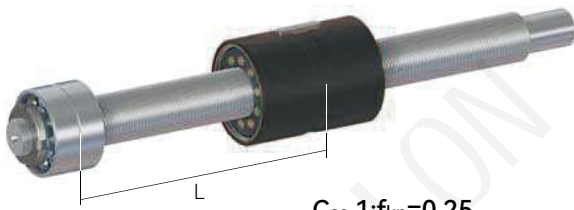
F_m [N] : mean load (single nut with backlash)

F_{ma} [N] : mean load (preloaded nut)

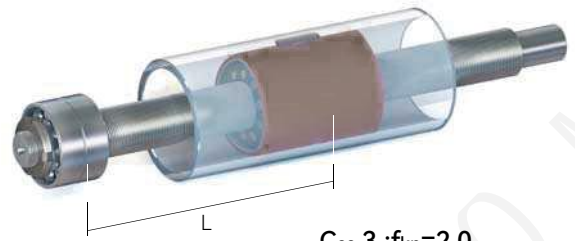
n_m [min⁻¹] : mean speed

f_N [-] : utilisation factor

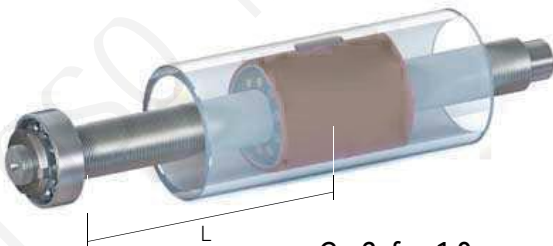
■ Rigidity



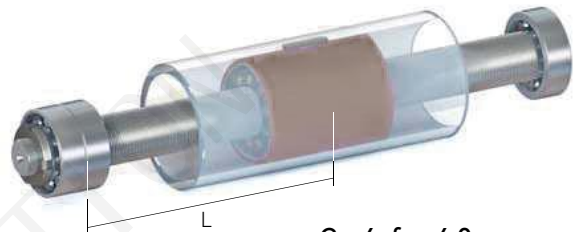
Cas 1: $f_{kn}=0.25$



Cas 3: $f_{kn}=2.0$



Cas 2: $f_{kn}=1.0$



Cas 4: $f_{kn}=4.0$

• Planetary roller screw rigidity

The overall rigidity C_{ges} of a planetary 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.

• Screw rigidity C_s

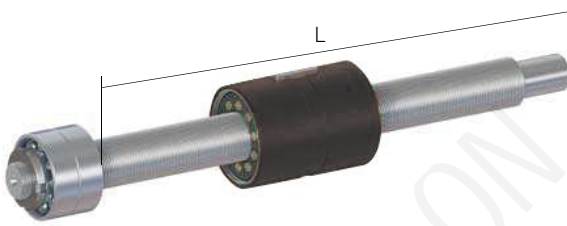
Screw rigidity C_s can be calculated with the following simplified formula:

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

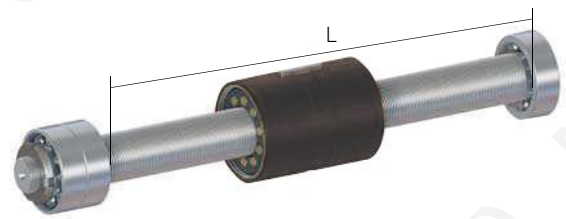
F_v	[N] : preloading force
F_n	[N] : axial load
C_{me}	[N/ μm] : nut rigidity
C_s	[N/ μm] : screw rigidity
f_s	[N ^{2/3} / μm] : rigidity factor

f_m	[-] : correction factor
L	[mm] : free screw length
d_0	[mm] : nominal diameter of screw
F_{knzul}	[N] : permissible buckling force
f_{kn}	[-] : correction factor for bearing type

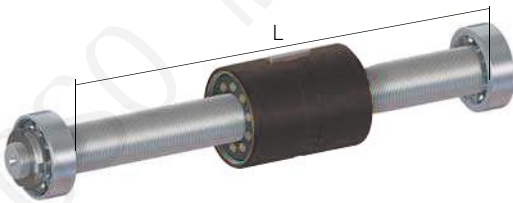
■ Rotation speed



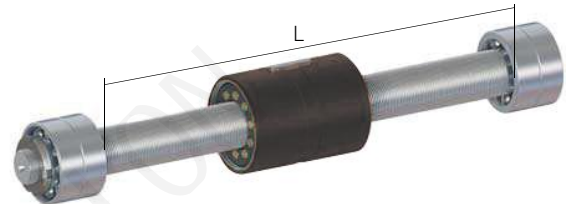
Case 1: $f_{kr}=0.4$



Case 3: $f_{kr}=1.77$



Case 2: $f_{kr}=1.13$



Case 4: $f_{kr}=2.57$

• Permissible rotation speed and axial load

Planetary 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 corresponds 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.

YRV : $d_0 \cdot n \leq 160'000$
 YRVR : $d_0 \cdot n \leq 32'000$
 YRVI : $d_0 \cdot n \leq 160'000$
 YRVD : $d_0 \cdot n \leq 100'000$

• 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 planetary roller screw nuts provide no guidance and the bearings at the screw end are considered rigid in the radial direction.

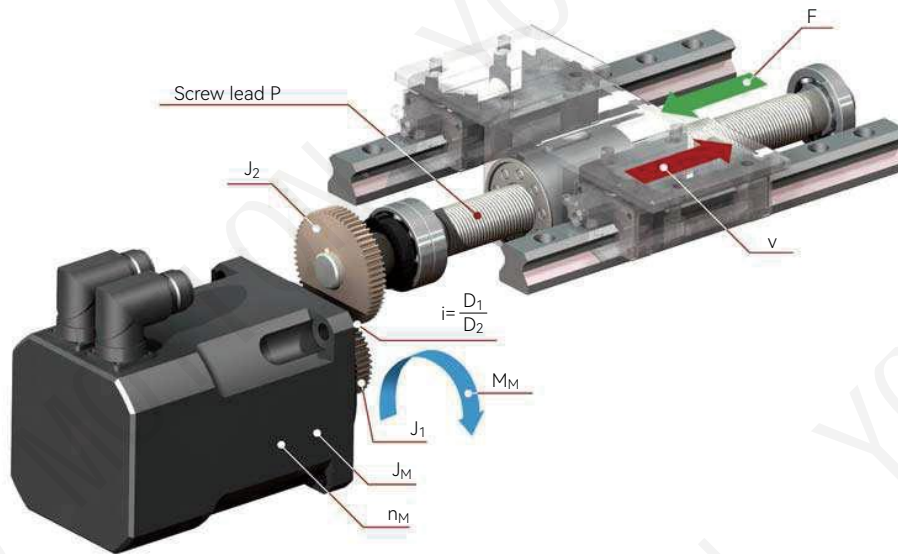
$$n_{kr} = 108 \cdot 10^6 \cdot d_0 \cdot \frac{1}{L^2} \quad [\text{min}^{-1}]$$

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	$[\text{min}^{-1}]$: rotation speed	d_0	$[\text{mm}]$: nominal diameter of screw
n_{kr}	$[\text{min}^{-1}]$: critical rotation speed	f_{kr}	$[-]$: correction factor for bearing type
n_{krzul}	$[\text{min}^{-1}]$: permissible critical rotation speed	0.8	$[-]$: safety factor
L	$[\text{mm}]$: free screw length		

■ Driving torque



• 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 sideway 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	F_v	[N] : preloading force
d_0	[mm] : nominal diameter of the screw	F_a	[N] : acceleration force
d_b	[mm] : diameter of the bore of the screw shaft	M_v	[Nm] : load-free torque
d_2	[mm] : root diameter of screw	M_{L1}	[Nm] : « ascent » load torque at constant speed
P	[mm] : screw lead	M_{L2}	[Nm] : « descent » load torque at constant speed
L	[mm] : length of planetary roller screw	M_M	[Nm] : motor driving torque
m_T	[kg] : mass to move	M_{La}	[Nm] : load torque on acceleration
D_1	[mm] : diameter of driving wheel	M_B	[Nm] : acceleration torque
D_2	[mm] : diameter of driven wheel	M_{Ma}	[Nm] : motor driving torque on acceleration
i	[-] : reduction ratio	M_R	[Nm] : frictional torque of screw bearings
F	[N] : feed force		

• **Motor driving torque M_{Ma} with acceleration**

The rotary moment of inertia of screw JR can be approximated with the formulae below.

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 ²]
Screw moment of inertia (rotation)	$J_R = 7.66 \cdot L \cdot (d_0^4 - d_B^4) \cdot 10^{-13}$	[kgm ²] (for steel)
Sum of reduced moments of inertia	$J = J_M + J_1 + i^2 (J_R + J_T + J_2)$	[kgm ²]
Motor speed	$n_M = \frac{v \cdot 6 \cdot 10^4}{P \cdot i}$	[Min ⁻¹]
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 ⁻¹]
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 ²] : moment of inertia of motor	v	[m/s] : speed rate
J_R	[kgm ²] : rotary moment of inertia of screw	n_M	[min ⁻¹] : rotation speed of motor
J_T	[kgm ²] : moment of inertia of screw (translation)	η	[-] : mechanical efficiency of gearing
J	[kgm ²] : moment of inertia	η_1	[-] : mechanical efficiency of planetary roller screw for « ascent » $\eta_1 = 0,71 \dots 0,89$
J_1	[kgm ²] : moment of inertia of driving wheel	η_2	[-] : mechanical efficiency of planetary roller screw for « descent » $\eta_2 = 0,61 \dots 0,85$
J_2	[kgm ²] : moment of inertia of driven wheel	c	[-] : coefficient of friction referred to preloading $c = 0,1 \dots 0,5$
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		

■ Calculation example

• Planetary roller screws YRV 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^{-1}]	Axial load F_n [N]
1	Peak load	$q_1 = 5$	$n_1 = 15$	$F_1 = 8300$
2	Roughing feed	$q_2 = 40$	$n_2 = 110$	$F_2 = 4500$
3	Finishing feed	$q_3 = 50$	$n_3 = 70$	$F_3 = 4200$
4	Rapid	$q_4 = 5$	$n_4 = 1700$	$F_4 = 1150$

• 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.

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

• Load on nut half 1

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

$$F_{1v} = F_1 \quad \text{et ainsi} \quad \begin{matrix} F_{1v} = 8300 \text{ N} \\ F_{2v} = 4500 \text{ N} \\ F_{3v} = 4200 \text{ N} \end{matrix}$$

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 :

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

• Equivalent Mean load

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

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

• Lifespan

Dynamic load capacity of a nut $C_a = 23\,400$ N

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

$$\text{Half nut 2} \quad L_{10(1)} = \left(\frac{23400}{1789} \right)^3 \cdot 10^6 = 296 \cdot 10^6 \text{ revolutions}$$

- Total lifespan**

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

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

$$L_{10} = 270 \cdot 10^6 \text{ revolutions}$$

$$L_{hN} = \frac{270 \cdot 10^6}{165 \cdot 0,6 \cdot 60} = 45\,450 \text{ h}$$

- Planetary roller screw rigidity**

Free length between fixed bearing and nut $L = 1000 \text{ mm}$
Nominal diameter of screw $d_0 = 20 \text{ mm}$

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

- 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: $P_{Mmax} = \frac{(1.05 + 0.5 + 0.2) \cdot 1700}{9.55} = 312 \text{ W}$

■ Lubrication

Lubricants used for planetary roller screws are generally close to the ones used for gears and bearings. Oil or grease can both be used, depending on the application conditions and how maintenance is managed. Without specific request from customer, YOSO use its standard grease.

As a function of customer's application, we are able to define and offer the most appropriate lubricant.

• Total lifespan

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 planetary 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. 1cm³/h (for small screw diameters) to 30cm³/h (for large screw diameters) can be used as reference values. YOSO 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 ν_k to achieve for the mean speed of the planetary roller screw and screw diameter.

Viscosity ν_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 ν_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 YRV planetary roller screws. The diameters of YRVR planetary 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: Planetary roller screw YRV 39 x 10
Mean operating speed: $n_m = 1400 \text{ min}^{-1}$
Operating temperature (estimated): $t = 25^\circ\text{C}$

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

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 mm²/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, YOSO recommends using an oil with about 150 cst viscosity at 40°C.

• Grease lubrication

For planetary 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. YOSO can provide recommendations for any type of application.

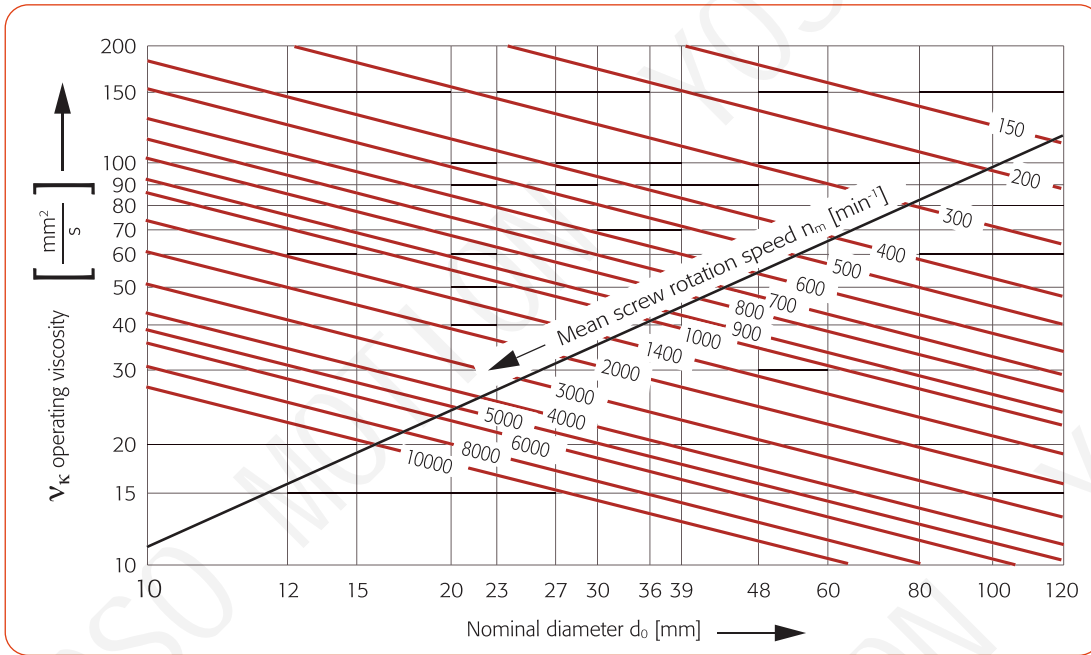


Figure a

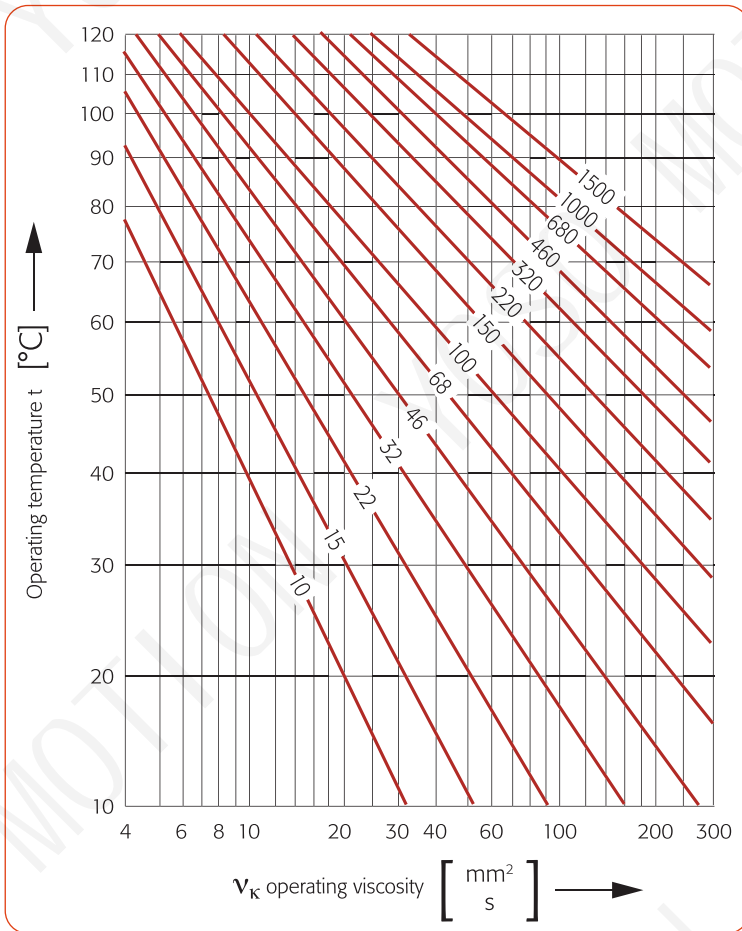


Figure b

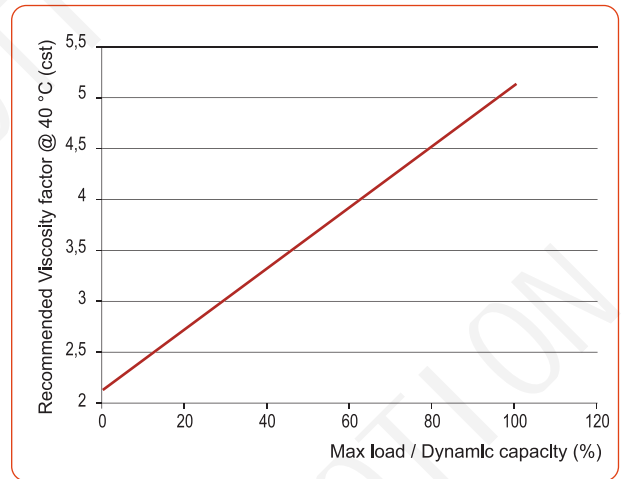


Figure a'

■ Handling advice

• 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:

$$\text{External diameter of the assembly sleeve } d_3 = d_2 - 0.05$$

(d_2 = screw core diameter)

• Screw assembly

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

YRV 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 an optimal operation and a long lifetime of the planetary roller screw.

Lubrication



Planetary roller screws are greased prior to shipment (unless oil lubrication is requested). Do not remove this grease. **Only use this type of grease for lubrication.**

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 planetary roller screws parallel to the guideways. Alignment errors may generate side loads, create additional friction or noise and may damage the screw.

Storage



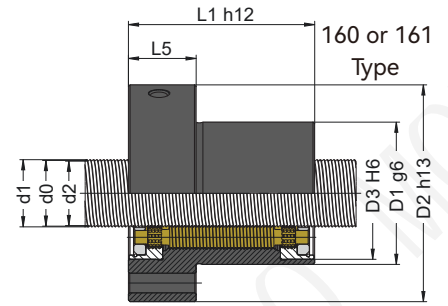
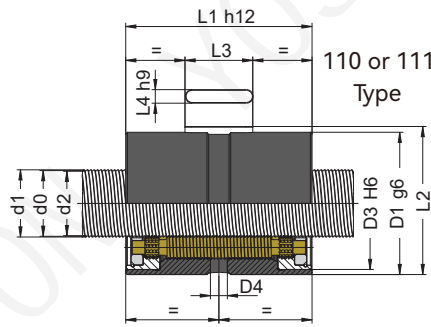
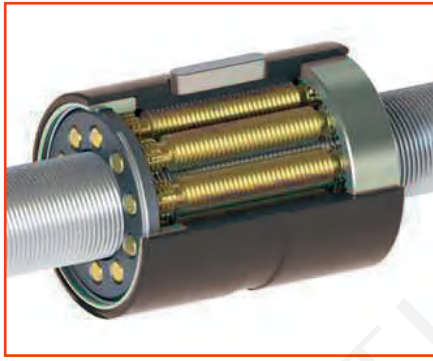
Only remove planetary roller screws from their original packaging just before installation.

Bending



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

YRV Series - Planetary roller screws

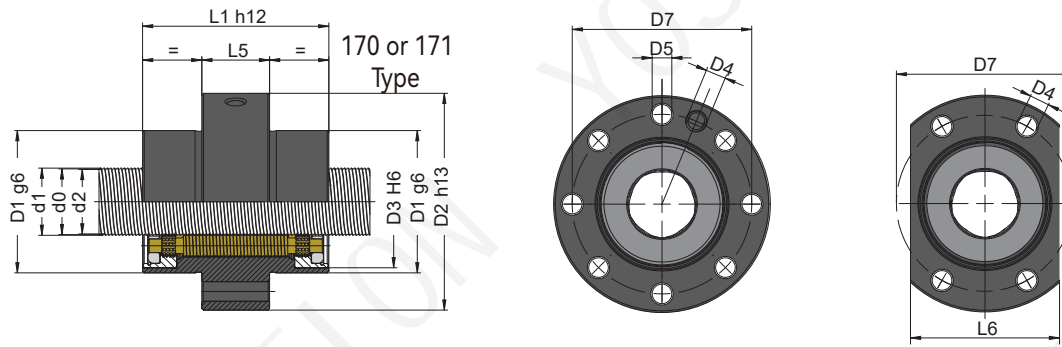


TECHNICAL CHARACTERISTICS																				
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]			
YRV	3,5 x	1	3	5.20	3.9	8.4	28.6	0.01	0.01	3.9	8.4	42.9	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	0.02	4.6	8.5	30.3	0.03	2.5	4.2	12.7	252	0.03	0.88	0.86
YRV	5 x	1	3	4.05	5.2	11.7	33.0	0.02	0.02	5.2	11.7	49.5	0.04	2.9	5.9	20.8	679	0.04	0.88	0.86
		2		8.05	6.2	11.8	23.3	0.02	0.02	6.2	11.8	34.5	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	0.02	6.7	11.9	28.2	0.04	3.7	6.0	11.8	193	0.04	0.86	0.83
YRV	7 x	1	4	2.60	7.7	18.7	50.6	0.02	0.02	7.7	18.7	76.0	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	0.03	8.3	16.4	48.4	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	0.04	9.0	16.2	39.3	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	0.05	9.7	16.6	34.3	0.04	5.3	8.3	14.4	168	0.04	0.88	0.86
YRV	8 x	1	4	2.28	8.4	20.2	52.3	0.02	0.02	8.4	20.2	78.4	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	0.02	10.0	20.3	54.5	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	0.04	9.9	17.5	40.1	0.05	5.4	8.8	16.8	329	0.05	0.89	0.88
		4		9.04	10.7	18	23.4	0.05	0.05	10.7	18	35.1	0.05	5.9	9.0	14.8	232	0.05	0.88	0.87
YRV	10 x	1	5	1.82	12.0	22.8	54.7	0.02	0.02	12.0	22.8	82.1	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	0.02	13.3	24.8	69.6	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	0.03	14.3	24.1	55.4	0.06	7.9	12.0	23.3	378	0.06	0.89	0.87
		4		6.91	15.6	25.1	32.6	0.04	0.04	15.6	25.1	48.9	0.06	8.6	12.5	20.5	297	0.06	0.89	0.88
YRV	12 x	1	5	1.52	13.6	25.0	56.4	0.02	0.02	13.6	25.0	84.6	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	0.02	14.6	26.9	71.3	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	0.02	15.7	26.1	56.8	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	0.03	17.2	27.2	50.0	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	0.05	18.1	27.3	44.7	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	0.05	18.4	26.5	40.1	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	0.05	18.6	24.9	33.1	0.08	10.2	12.5	13.9	146	0.08	0.86	0.83
YRV	15 x	2	5	2.43	24.6	55.4	66.7	0.02	0.02	24.6	55.4	100.1	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	0.02	25.5	50.5	76.3	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	0.03	26.8	49.5	64.9	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	0.04	28.9	51.5	59.1	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	0.05	29.9	51.0	53.7	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	0.05	31.4	50.1	45.9	0.10	17.3	25.1	19.3	223	0.10	0.88	0.86

* Axial backlash can be reduced on demand.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

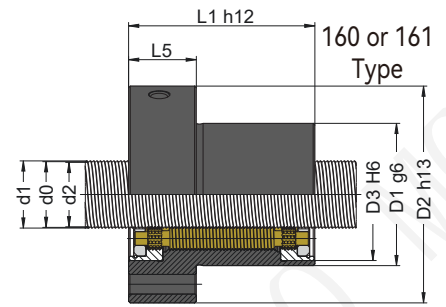
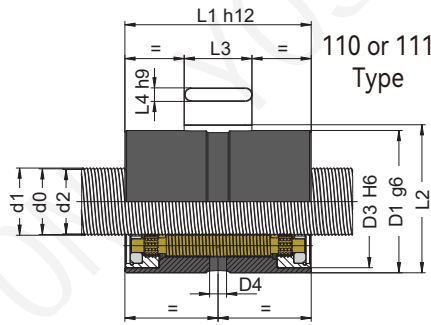
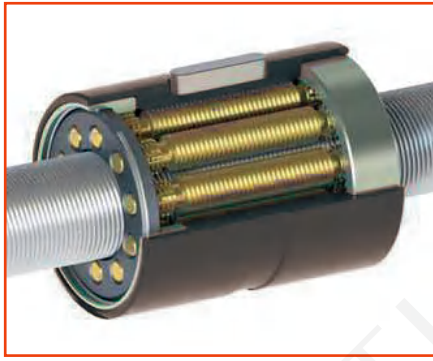
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT															
		[mm]	[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				
YRV	3,5 x	1	3.61	3.5	3.34	15	35	13.5	/	/	4.8	25	28	38	16	10	2	13	17	
		2	3.70		3.16															
YRV	5 x	1	4.61	4.5	4.34	19	39	17	3	/	4.8	29	30	40	20.3	10	3	13	21	
		2	4.71		4.17															
		3	4.78		3.97															
YRV	7 x	1	7.09	7	6.88	19	41	17	3	/	4.8	31	31	41	20.3	10	3	13	21	
		2	7.16		6.76															
		3	7.23		6.62															
		4	7.28		6.47															
YRV	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	8.17		7.76															
		3	8.23		7.63															
		4	8.29		7.48															
YRV	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	10.64		10.31															
		3	10.69	10.5	10.21	24	46	22	5	M5	4.8	36	31	41	25.3	10	3	13	26	
		4	10.75		10.10															
YRV	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	12.14		11.81															
		3	12.20	12	11.71	26	46	23	5	M5	4.8	36	31	41	27.3	10	3	13	28	
		4	12.25		11.60															
		5	12.30		11.49															
		6	12.35		11.38															
		7	12.38		11.22															
		8	12.42		11.12															
YRV	15 x	2	15.14	15	14.82	34	56	30	5	M6	5.8	45	40	50	35.7	14	4	18	36	
		3	15.20		14.72															
		4	15.26		14.61															
		5	15.32		14.51															
		6	15.37		14.39															
		7	15.42		14.28															
		8	15.45		14.16															

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

YRV Series - Planetary roller screws

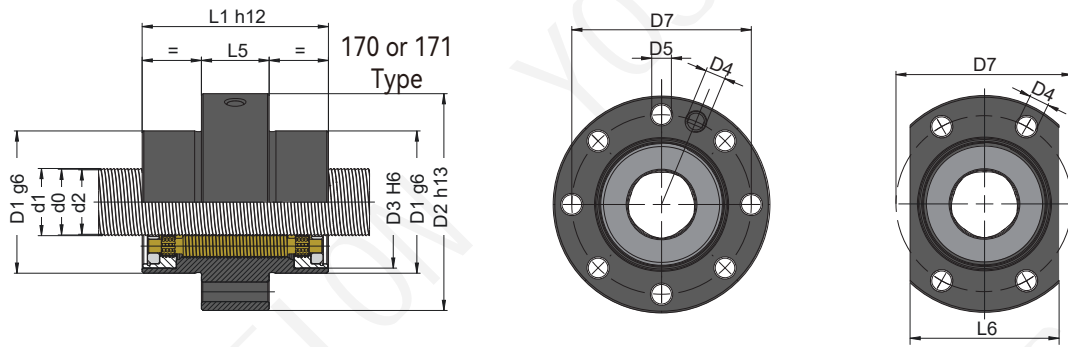


TECHNICAL CHARACTERISTICS																				
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca	C0a	Fk	Max axial backlash *	Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv			
YRV	18 x	2	5	2.03	31.7	75.8	76.5	0.02	31.7	75.8	114.7	803	0.15	17.5	37.9	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	36.6	68.1	44.0	0.03	36.6	68.1	66.0	564	0.15	20.1	34.0	27.7	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	22.1	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		
YRV	20 x	2	5	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	47.2	92.1	46.0	0.04	47.2	92.1	69.0	645	0.20	26.0	46.0	29.0	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		
YRV	21 x	2	5	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		
YRV	23 x	2	5	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	64.3	97.4	40.2	0.04	64.3	97.4	60.2	741	0.30	35.4	48.7	25.3	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.

Terms used in tables	N	Number of starts	F _k	Rigidity factor	
P	Lead (travel per revolution)	Ca	Dynamic load capacity	F _v	Preloading force
D	Reference diameter	C0a	Static load capacity	M _v	Preload torque

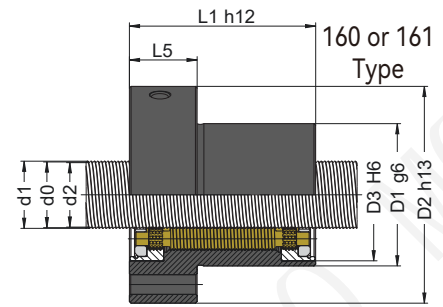
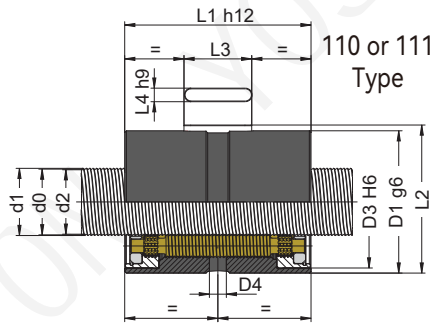
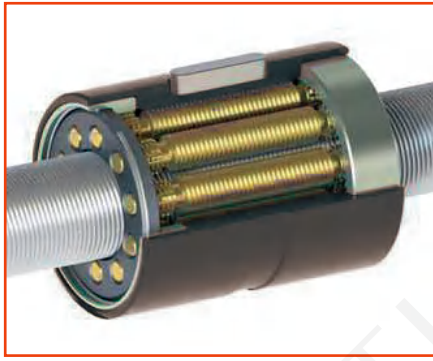
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT														
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	Without wiper [mm] L1	With wipers [mm] L2	[mm] L3	[mm] L4	[mm] L5	[mm] L6			
YRV	18 x	2	18.14	18	17.82	40	62	35	5	M6	5.8	51	48	58	41.7	18	4	18	42
		3	18.21		17.72														
		4	18.27		17.62														
		5	18.33		17.52														
		6	18.38		17.41														
		8	18.48		17.18														
		10	18.56		16.94														
YRV	20 x	2	19.64	19.5	19.32	42	64	39	5	M6	5.8	53	55	65	43.7	20	4	20	44
		3	19.71		19.22														
		4	19.77		19.12														
		5	19.83		19.02														
		6	19.88		18.91														
		8	19.99		18.69														
		10	20.07		18.45														
YRV	21 x	2	21.14	21	20.82	45	67	41	5	M6	5.8	56	55	65	47	20	5	18	47
		3	21.21		20.72														
		4	21.27		20.62														
		5	21.33		20.52														
		6	21.39		20.42														
		8	21.49		20.20														
		10	21.59		19.97														
YRV	23 x	2	22.64	22.5	22.32	45	68	42	5	M6	7.0	56	55	65	46.7	20	4	20	47
		3	22.71		22.22														
		4	22.77		22.12														
		5	22.83		22.02														
		6	22.89		21.92														
		8	23.00		21.70														
		10	23.10		21.48														

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

YRV Series - Planetary roller screws

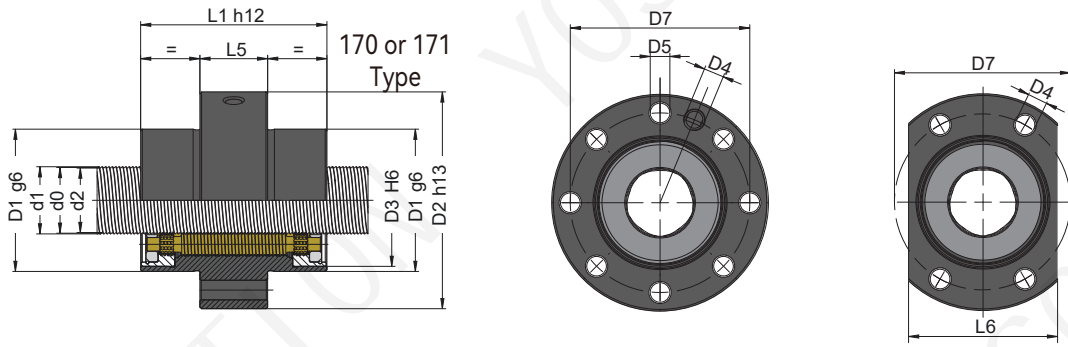


TECHNICAL CHARACTERISTICS																				
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]			
YRV	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
		5	2	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			
YRV	27 x	2	5	1.35	71.9	177.5	110.9	0.02	71.9	177.5	166.4	1508	0.40	39.6	88.8	69.9	1508	0.40	0.76	0.68
		4		2.70	85.1	178.2	76.6	0.02	85.1	178.2	114.9	1332	0.40	46.9	89.1	48.3	1332	0.40	0.85	0.82
		5		3.37	90.2	179.7	68.6	0.03	90.2	179.7	102.9	1238	0.40	49.7	89.9	43.2	1238	0.40	0.86	0.84
		6		4.05	93.8	178.9	62.1	0.03	93.8	178.9	93.1	1143	0.40	51.7	89.4	39.1	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
YRV	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	149.8	197.4	26.1	0.05	149.8	197.4	39.2	113	0.50	82.5	98.7	16.5	113	0.50	0.74	0.64			

* Axial backlash can be reduced on demand.

Terms used in tables	N	Number of starts	F _k	Rigidity factor	
P	Lead (travel per revolution)	Ca	Dynamic load capacity	F _v	Preloading force
D	Reference diameter	C0a	Static load capacity	M _v	Preload torque

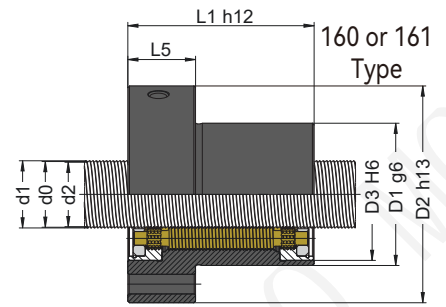
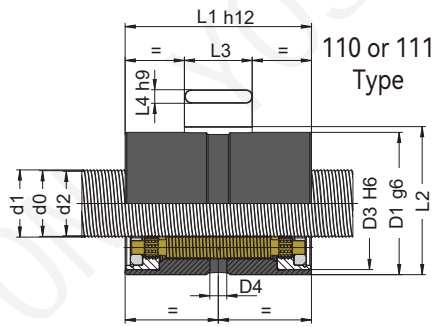
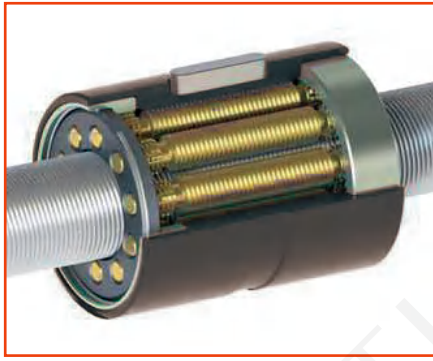
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT																												
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	Without wiper [mm] L1	With wipers [mm] L2	[mm] L3	[mm] L4	[mm] L5	[mm] L6																	
YRV 25 x	3	24.17	24	23.77	48	71	44	5	M6	7.0	59	48	58	49.7	18	4	20	50															
	6	24.33		23.52																													
	12	24.57		22.95																													
	2	24.14	24	23.82	53	84	48	5	M6	7.0	700	64	78	55.5	25	6	20	55															
	4	24.27		23.63																													
	5	24.34		23.53																													
	6	24.40		23.42																													
	8	24.51		23.21																													
	10	24.61		22.99																													
15	24.81	22.38																															
YRV 27 x	2	27.14		27															26.82	53	83	50	5	M6	7.0	68	65	79	55.2	20	5	22	55
	4	27.28																	26.63														
	5	27.34	26.53																														
	6	27.40	26.43																														
	8	27.52	26.22																														
	10	27.62	26.00																														
	15	27.84	25.41																														
YRV 30 x	2	30.14	30	29.82	62	92	58	5	M6	9.0	77	71	85	64.7	20	6	27	64															
	4	30.28		29.63																													
	5	30.34		29.53																													
	6	30.41		29.43																													
	8	30.52		29.23																													
	10	30.63		29.01																													
	15	30.87		28.44																													
	20	31.05		27.81																													
	25	31.19		27.14																													
	30	31.27		26.41																													

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

YRV Series - Planetary roller screws



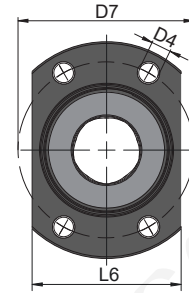
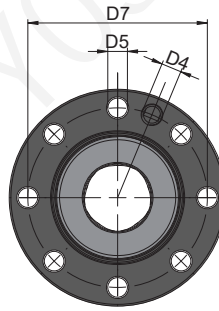
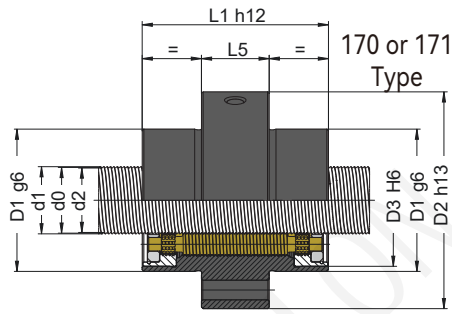
TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency
				Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [N]	Mv [Nm]		
YRV	36 x	6	3.04	101.6	212.6	76.7	0.03	101.6	212.6	115.1	1565	0.65	56.0	106.3	48.3	1565	0.65	0.86	0.83
		12	6.06	114.0	199.4	51.2	0.04	114.0	199.4	76.8	1065	0.65	62.8	99.7	32.3	1065	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	141.9	203.5	34.3	0.05	141.9	203.5	51.5	394	0.65	78.2	101.7	21.6	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	1886	0.65	59.6	148.0	87.4	1886	0.65	0.71	0.58
		4	2.03	128.1	296.9	95.4	0.02	128.1	296.9	143.1	1734	0.65	70.6	148.4	60.1	1734	0.65	0.82	0.77
		5	2.53	135.2	297.4	84.5	0.03	135.2	297.4	126.7	1651	0.65	74.5	148.7	53.2	1651	0.65	0.84	0.81
		6	3.04	140.4	294.6	76.7	0.03	140.4	294.6	115.1	1566	0.65	77.3	147.3	48.3	1566	0.65	0.86	0.83
		8	4.05	149.4	292.3	65.6	0.04	149.4	292.3	98.5	1393	0.65	82.3	146.2	41.3	1393	0.65	0.88	0.86
		10	5.05	159.6	299.6	59.1	0.04	159.6	299.6	88.7	1225	0.65	88.0	149.8	37.2	1225	0.65	0.89	0.87
YRV	39 x	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
		2	0.94	127.1	368.8	152.8	0.02	127.1	368.8	229.2	2153	0.80	70.0	184.4	96.3	2153	0.80	0.69	0.55
		4	1.87	149.7	366.2	104.9	0.02	149.7	366.2	157.4	2000	0.80	82.5	183.1	66.1	2000	0.80	0.81	0.76
		5	2.34	159.4	372.0	93.2	0.03	159.4	372.0	139.8	1912	0.80	87.8	186.0	58.7	1912	0.80	0.83	0.80
		6	2.80	166.1	370.7	84.9	0.03	166.1	370.7	127.3	1824	0.80	91.5	185.4	53.5	1824	0.80	0.85	0.82
		8	3.74	174.9	361.2	72.1	0.03	174.9	361.2	108.2	1643	0.80	96.4	180.6	45.4	1643	0.80	0.87	0.85
		10	4.67	185.5	365.7	64.5	0.04	185.5	365.7	96.8	1464	0.80	102.2	182.8	40.6	1464	0.80	0.88	0.87
		15	6.98	200.8	359.4	52.1	0.04	200.8	359.4	78.1	1055	0.80	110.6	179.7	32.8	1055	0.80	0.89	0.88
YRV	44 x	6	2.49	145.5	341.5	94.2	0.03	145.5	341.5	141.3	2089	1.00	80.2	170.8	59.3	2089	1.00	0.84	0.81
		12	4.96	168.8	334.6	65.0	0.03	168.8	334.6	97.5	1560	1.00	93.0	167.3	40.9	1560	1.00	0.89	0.87
		18	7.42	176.3	313.1	50.5	0.05	176.3	313.1	75.7	1092	1.00	97.1	156.6	31.8	1092	1.00	0.89	0.88
YRV	44 x	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.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

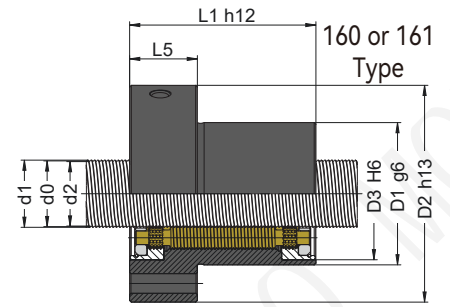
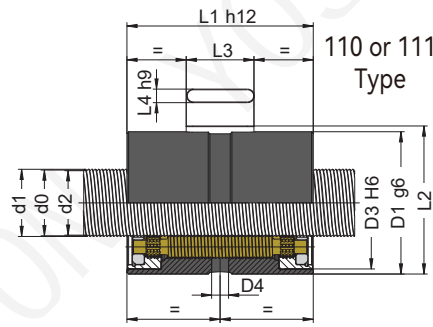
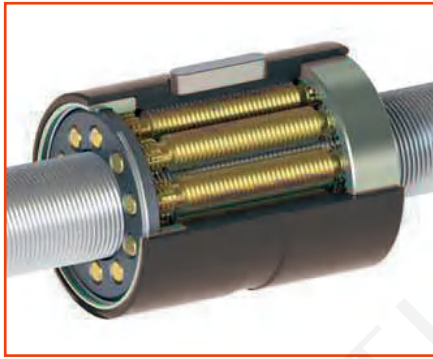
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT														
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	Without wiper [mm] L1	With wipers [mm] L2	[mm] L3	[mm] L4	[mm] L5	[mm] L6			
YRV	36 x	6	36.34	36	35.53	68	102	62	5	M6	9.0	85	68	80	70.2	25	5	27	70
		12	36.63		35.01														
		18	36.86		34.43														
	36 x	24	37.04	33.80	74	110	68	5	M6	9.0	92	82	96	76.7	28	6	25	76	
		2	36.14	35.82															
		4	36.28	35.63															
		5	36.35	35.54															
		6	36.41	35.44															
		8	36.53	35.24															
		10	36.65	35.03															
		15	36.91	34.48															
20	37.12	33.88																	
YRV	39 x	2	39.14	39	38.82	80	116	72	5	M6	11.0	98	90	100	82.7	28	6	25	82
		4	39.28		38.63														
		5	39.35		38.54														
		6	39.41		38.44														
		8	39.54		38.24														
		10	39.66		38.04														
		15	39.92		37.49														
		20	40.15		36.91														
25	40.34	36.29																	
YRV	44 x	6	44.35	44	43.54	80	118	73	5	M6	11.0	100	80	90	82.7	28	6	25	84
		12	44.65		43.03														
		18	44.90		42.47														
		24	45.11		41.87														
		30	45.28		41.23														

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

YRV Series - Planetary roller screws



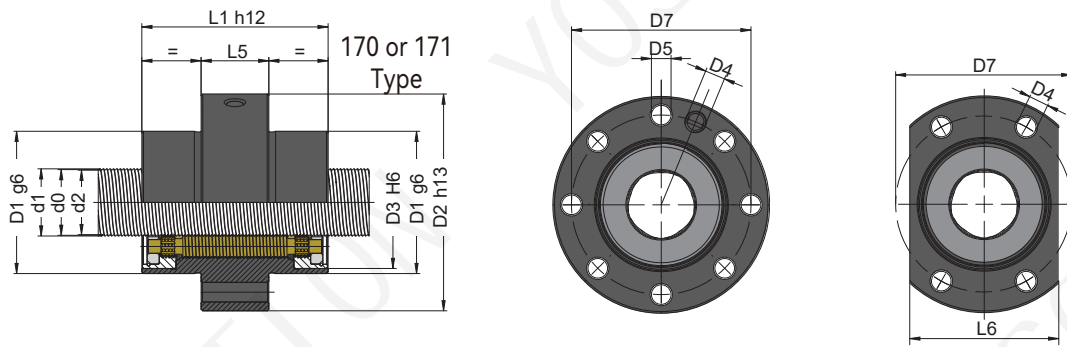
TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency
				Ca	C0a	Fk	Max axial backlash *	Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv		
YRV	48 x	5	1.90	169.7	448.8	117.3	0.03	169.7	448.8	176.0	2430	1.20	93.5	224.4	73.9	2430	1.20	0.81	0.76
		6	2.28	178.7	454.7	107.1	0.03	178.7	454.7	160.7	2345	1.20	98.5	227.3	67.5	2345	1.20	0.83	0.79
		8	3.04	189.7	448.5	91.7	0.03	189.7	448.5	137.5	2168	1.20	104.5	224.2	57.8	2168	1.20	0.86	0.83
		10	3.79	198.2	442.3	81.0	0.04	198.2	442.3	121.5	1989	1.20	109.2	221.1	51.0	1989	1.20	0.87	0.85
		12	4.55	211.2	457.6	74.9	0.04	211.2	457.6	112.4	1811	1.20	116.3	228.8	47.2	1811	1.20	0.88	0.87
		15	5.68	220.8	453.6	66.5	0.04	220.8	453.6	99.8	1555	1.20	121.7	226.8	41.9	1555	1.20	0.89	0.88
		18	6.81	217.5	417.5	57.5	0.05	217.5	417.5	86.2	1320	1.20	119.8	208.8	36.2	1320	1.20	0.89	0.88
		20	7.55	221.6	415.1	54.3	0.05	221.6	415.1	81.4	1176	1.20	122.1	207.6	34.2	1176	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	
	5	1.90	218.6	556.2	111.6	0.03	218.6	556.2	167.4	2430	1.20	120.4	278.1	70.3	2430	1.20	0.81	0.76	
	10	3.79	258.5	559.1	77.5	0.03	258.5	559.1	116.2	1989	1.20	142.4	279.6	48.8	1989	1.20	0.87	0.85	
	15	5.68	284.5	562.1	62.9	0.03	284.5	562.1	94.3	1555	1.20	156.7	281.0	39.6	1555	1.20	0.89	0.88	
	20	7.55	360.1	659.2	55.9	0.05	360.1	659.2	83.8	1176	1.20	198.4	329.6	35.2	1176	1.20	0.89	0.88	
	25	9.41	332.3	579.6	46.1	0.05	332.3	579.6	69.2	867	1.20	183.1	289.8	29.1	867	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		
YRV	51 x	5	1.79	263.0	725.9	126.3	0.03	263.0	725.9	189.4	2695	1.40	144.9	362.9	79.6	2695	1.40	0.80	0.75
		10	3.57	308.0	717.3	86.9	0.03	308.0	717.3	130.3	2241	1.40	169.7	358.7	54.7	2241	1.40	0.87	0.85
		15	5.35	339.0	720.4	70.3	0.04	339.0	720.4	105.5	1788	1.40	186.8	360.2	44.3	1788	1.40	0.89	0.87
		20	7.12	425.8	844.0	62.6	0.05	425.8	844.0	93.9	1383	1.40	234.6	422.0	39.4	1383	1.40	0.89	0.88
		25	8.87	432.0	861.1	56.5	0.05	432.0	861.1	84.8	1044	1.40	238.0	430.5	35.6	1044	1.40	0.89	0.87
YRV	56 x	6	1.95	219.5	584.9	119.0	0.03	219.5	584.9	178.5	2763	1.60	120.9	292.5	75.0	2763	1.60	0.81	0.77
		12	3.90	256.1	575.9	82.2	0.03	256.1	575.9	123.4	2243	1.60	141.1	288.0	51.8	2243	1.60	0.87	0.86
		18	5.84	277.9	566.9	66.2	0.04	277.9	566.9	99.4	1737	1.60	153.1	283.5	41.7	1737	1.60	0.89	0.88
		24	7.77	339.4	631.2	56.7	0.05	339.4	631.2	85.1	1300	1.60	187.0	315.6	35.7	1300	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.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

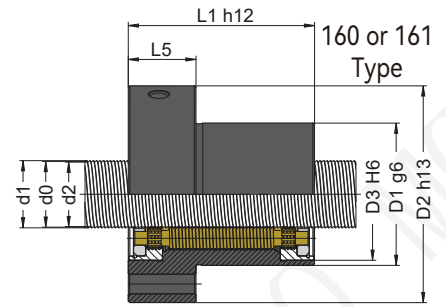
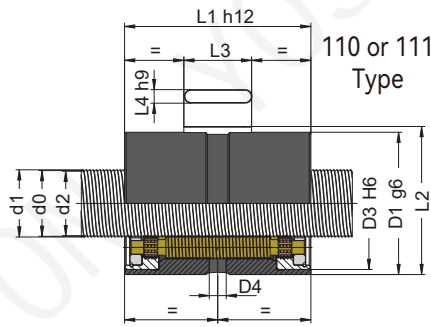
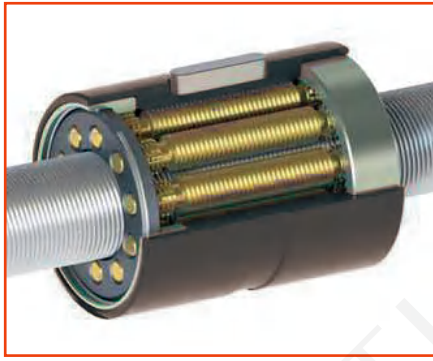
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT														
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	Without wiper [mm] L1	With wipers [mm] L2	[mm] L3	[mm] L4	[mm] L5	[mm] L6			
YRV	48 x	5	48.29	48	47.62	86	122	80	7	M8×1	11.0	104	87	99	88.7	45	6	35	88
		6	48.35		47.54														
		8	48.46		47.38														
		10	48.56		47.21														
		12	48.66		47.04														
		15	48.79		46.77														
		18	48.92		46.49														
	20	49.00	46.30	100	150	94	7	M8×1	13.5	127	115	127	103	45	8	37	102		
	24	49.14	45.90																
	5	48.35	47.54																
	10	48.67	47.05																
	15	48.96	46.53																
	20	49.21	45.97																
	25	49.43	45.38																
30	49.62	44.76																	
YRV	51 x	5	51.35	51	50.54	102	147	94	7	M8×1	13.5	124	125	139	105	50	8	35	104
		10	51.68		50.06														
		15	51.97		49.54														
		20	52.23		48.99														
		25	52.45		48.40														
YRV	56 x	6	56.35	56	55.54	100	150	93	7	M8×1	13.5	127	100	112	103	40	8	37	102
		12	56.67		55.05														
		18	56.95		54.52														
		24	57.19		53.95														
		30	57.40		53.35														
		36	57.58		52.72														

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

YRV Series - Planetary roller screws



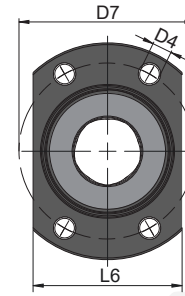
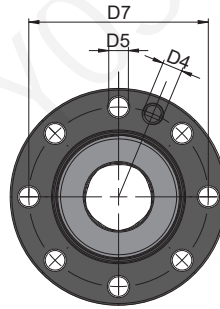
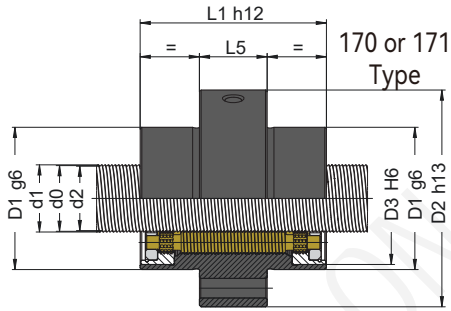
TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca	C0a	Fk	Max axial backlash *	Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv			
YRV	60 x	6	1.82	248.5	689.4	128.2	0.04	248.5	689.4	192.4	2936	1.80	136.9	344.7	80.8	2936	1.80	0.80	0.75	
		10	3.04	277.8	678.4	97.2	0.04	277.8	678.4	145.9	2601	1.80	153.1	339.2	61.3	2601	1.80	0.86	0.83	
		12	3.64	290.3	679.7	88.3	0.04	290.3	679.7	132.5	2429	1.80	159.9	339.8	55.6	2429	1.80	0.87	0.85	
		18	5.45	315.6	669.9	71.2	0.04	315.6	669.9	106.7	1926	1.80	173.9	335.0	44.8	1926	1.80	0.89	0.87	
		20	6.06	327.4	684.4	68.2	0.04	327.4	684.4	102.3	1769	1.80	180.4	342.2	43.0	1769	1.80	0.89	0.88	
		30	9.04	393.2	747.8	54.6	0.07	393.2	747.8	81.8	1108	1.80	216.6	373.9	34.4	1108	1.80	0.88	0.87	
	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	321.2	922.0	139.5	0.04	321.2	922.0	209.3	3014	1.80	177.0	461.0	87.9	3014	1.80	0.78	0.71		
	10	3.04	380.1	925.8	96.5	0.04	380.1	925.8	144.8	2601	1.80	209.4	462.9	60.8	2601	1.80	0.86	0.83		
	15	4.55	415.0	915.9	77.5	0.04	415.0	915.9	116.3	2173	1.80	228.6	458.0	48.9	2173	1.80	0.88	0.87		
	20	6.06	500.4	1057.1	68.4	0.04	500.4	1057.1	102.6	1769	1.80	275.7	528.5	43.1	1769	1.80	0.89	0.88		
	25	7.55	494.0	1029.9	60.2	0.05	494.0	1029.9	90.3	1412	1.80	272.2	515.0	37.9	1412	1.80	0.89	0.88		
	30	9.04	495.5	1034.1	55.1	0.07	495.5	1034.1	82.6	1108	1.80	273.0	517.1	34.7	1108	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		
YRV	64 x	6	1.71	255.5	802.2	137.3	0.04	255.5	802.2	206.0	3089	2.00	142.7	401.1	86.5	3089	2.00	0.79	0.74	
		12	3.42	303.1	791.8	94.5	0.04	303.1	791.8	141.8	2598	2.00	169.3	395.9	59.5	2598	2.00	0.87	0.84	
		18	5.12	332.8	781.4	76.0	0.04	332.8	781.4	114.0	2101	2.00	185.9	390.7	47.9	2101	2.00	0.89	0.87	
		24	6.81	428.8	932.6	68.2	0.04	428.8	932.6	102.3	1650	2.00	239.6	466.3	42.9	1650	2.00	0.89	0.88	
		30	8.49	408.9	854.6	57.7	0.06	408.9	854.6	86.6	1266	2.00	228.4	427.3	36.4	1266	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	
YRV	70 x	6	1.59	321.2	1120.0	160.5	0.04	-	-	-	-	-	-	-	-	-	-	0.78	0.72	
		12	3.17	381.9	1108.2	110.5	0.04	-	-	-	-	-	-	-	-	-	-	-	0.86	0.84
		18	4.75	420.4	1096.4	89.0	0.04	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		24	6.32	525.1	265.4	78.4	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.88
		30	7.88	518.6	1230.5	68.4	0.05	-	-	-	-	-	-	-	-	-	-	-	0.89	0.88
		36	9.43	498.8	1149.4	60.3	0.07	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87

* Axial backlash can be reduced on demand.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

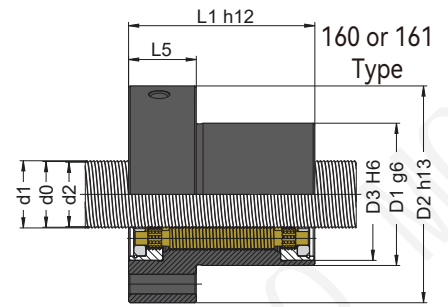
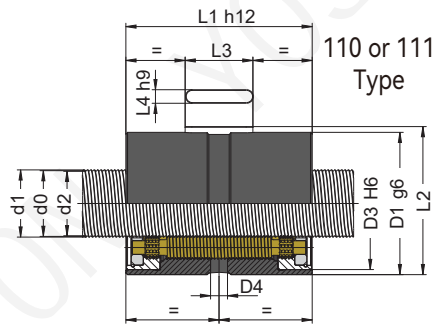
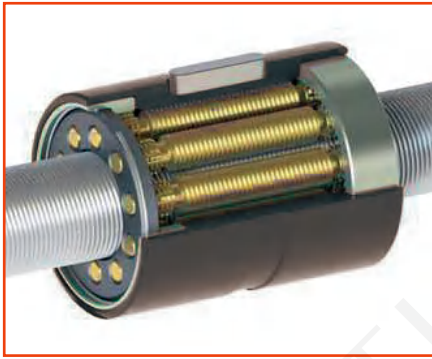
■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT																
		[mm]	[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				
YRV	60 x	6	60.35		59.54																
		10	60.57		59.22																
		12	60.67		59.05																
		18	60.96	60	58.53	110	150	100	10.5	M8×1	13.5	130	106	124	113.2	40	8	30	112		
		20	61.05		58.35																
		30	61.43		57.38																
	60 x	42	61.77		56.10																
		5	60.36		59.55																
		10	60.69		59.07																
		15	60.99		58.56																
		20	61.26	60	58.02	122	180	110	10.5	M8×1	17.5	150	140	152	125.7	45	10	40	124		
		25	61.51		57.46																
		30	61.74		56.88																
		35	61.93		56.26																
YRV	64 x	6	64.35		63.54																
		12	64.68		63.06																
		18	64.97		62.54																
		24	65.23	64	61.99	115	180	106	7	M8×1	17.5	150	118	129	118	45	8	40	117		
		30	65.46		61.41																
		36	65.66		60.80																
YRV	70 x	6	69.36		68.55																
		12	69.68		68.06																
		18	69.98		67.55																
		24	70.25	69	67.01	130	172	115	9	M8×1	13.5	152	140	170	133.7	50	10	45	132		
		30	70.48		66.43																
		36	70.70		65.84																

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

■ YRV Series - Planetary roller screws

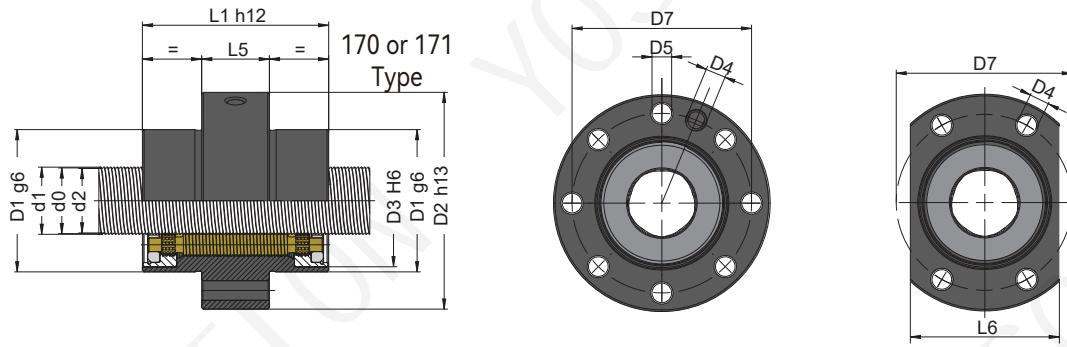


TECHNICAL CHARACTERISTICS																					
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency		
				Ca	C0a	Fk	Max axial backlash *	Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv				
YRV	75 x	10	5	2.43	497.8	1452.7	116.7	0.04	-	-	-	-	-	-	-	-	-	-	-	0.84	0.80
		15		3.64	549.5	1440.4	94.3	0.04	-	-	-	-	-	-	-	-	-	-	-	0.87	0.85
		20		4.85	639.5	1666.1	82.7	0.04	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		25		6.06	642.4	1651.7	73.7	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.88
		30		7.26	643.2	1637.3	66.8	0.05	-	-	-	-	-	-	-	-	-	-	-	-	0.89
YRV	80 x	12	6	2.73	385.3	1040.9	105.3	0.04	-	-	-	-	-	-	-	-	-	-	-	0.85	0.82
		18		4.10	428.2	1045.8	85.4	0.04	-	-	-	-	-	-	-	-	-	-	-	0.88	0.86
		24		5.45	524.6	1225.8	75.7	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.87
		30		6.81	535.7	1251.7	68.2	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.88
		36		8.15	508.8	1148.6	59.0	0.06	-	-	-	-	-	-	-	-	-	-	-	-	0.89
YRV	87 x	10	5	2.10	606.6	1857.3	129.8	0.04	-	-	-	-	-	-	-	-	-	-	-	0.82	0.78
		15		3.14	656.7	1862.8	105.1	0.04	-	-	-	-	-	-	-	-	-	-	-	0.86	0.84
		20		4.19	768.0	2179.5	92.5	0.04	-	-	-	-	-	-	-	-	-	-	-	0.88	0.86
		25		5.23	767.8	2140.3	81.9	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.87
		30		6.26	785.1	2191.9	75.6	0.04	-	-	-	-	-	-	-	-	-	-	-	-	0.89
YRV	92 x	12	6	2.38	532.8	1646.7	129.1	0.04	-	-	-	-	-	-	-	-	-	-	-	0.83	0.80
		18		3.56	583.3	1611.2	103.4	0.04	-	-	-	-	-	-	-	-	-	-	-	0.87	0.85
		24		4.75	695.3	1886.2	91.5	0.04	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		30		5.93	714.6	1940.4	82.9	0.04	-	-	-	-	-	-	-	-	-	-	-	0.89	0.88
		36		7.10	709.8	1898.9	74.8	0.05	-	-	-	-	-	-	-	-	-	-	-	-	0.89

* Axial backlash can be reduced on demand.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

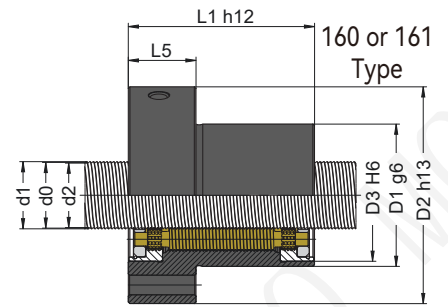
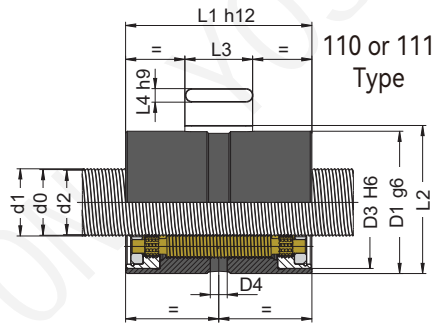
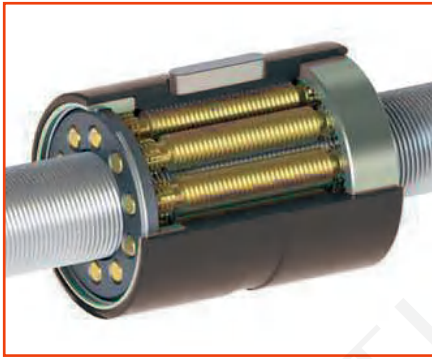
■ YRV Series - Planetary roller screws



		SCREW			NUT														
Types	D x P	[mm]	[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			
YRV	75 x	10	75.70	75	74.08	150	210	140	10.5	M8×1	17.5	180	175	191	153	63	10	45	152
		15	76.01		73.58														
		20	76.31		73.07														
		25	76.58		72.53														
		30	76.83		71.97														
YRV	80 x	12	80.69	80	79.07	138	180	130	10.5	M8×1	13.5	160	130	158	141.7	50	10	35	140
		18	81.00		78.57														
		24	81.28		78.04														
		30	81.53		77.48														
		36	81.77		76.91														
YRV	87 x	10	87.70	87	86.08	175	235	162	10.5	M8×1	17.5	200	190	215	178	63	10	45	177
		15	88.03		85.60														
		20	88.33		85.09														
		25	88.62		84.57														
		30	88.89		84.03														
YRV	92 x	12	92.70	92	91.08	160	220	146	10.5	M8×1	17.5	190	155	179	163	63	10	45	162
		18	93.01		90.58														
		24	93.30		90.06														
		30	93.58		89.53														
		36	93.83		88.97														

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

■ YRV Series - Planetary roller screws

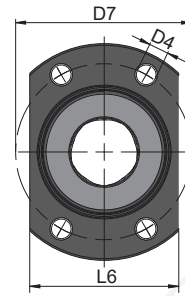
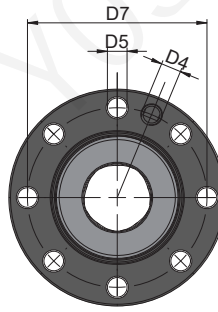
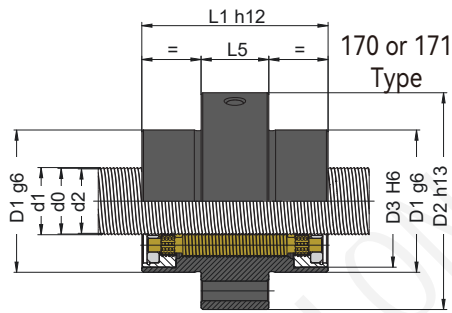


TECHNICAL CHARACTERISTICS																					
Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency		
				Ca	C0a	Fk	Max axial backlash *	Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv				
YRV	100 x	12	6	2.19	790.2	2649.7	153.2	0.05	-	-	-	-	-	-	-	-	-	-	-	0.82	0.79
		18	6	3.28	843.7	2603.3	123.0	0.05	-	-	-	-	-	-	-	-	-	-	-	0.86	0.84
		24	6	4.37	858.2	2610.2	106.0	0.05	-	-	-	-	-	-	-	-	-	-	-	0.88	0.86
		30	6	5.45	857.8	2563.9	94.0	0.05	-	-	-	-	-	-	-	-	-	-	-	0.89	0.87
		15	5	2.76	1044.9	3598.6	135.4	0.05	-	-	-	-	-	-	-	-	-	-	-	0.85	0.82
		20	5	3.68	1063.3	3605.5	116.4	0.05	-	-	-	-	-	-	-	-	-	-	-	0.87	0.85
		25	5	4.60	1077.2	3612.3	103.8	0.05	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		30	5	5.51	1088.0	3619.1	95.0	0.05	-	-	-	-	-	-	-	-	-	-	-	0.89	0.87
		35	5	6.42	1106.7	3679.6	88.6	0.05	-	-	-	-	-	-	-	-	-	-	0.89	0.88	
YRV	120 x	18	6	2.73	1063.2	3667.3	142.3	0.05	-	-	-	-	-	-	-	-	-	-	-	0.85	0.82
		24	6	3.64	1082.0	3675.6	122.6	0.05	-	-	-	-	-	-	-	-	-	-	-	0.87	0.85
		30	6	4.55	1090.3	3652.0	108.8	0.05	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		36	6	5.45	1107.2	3692.0	99.9	0.05	-	-	-	-	-	-	-	-	-	-	-	0.89	0.87
		15	5	2.28	1181.9	4248.4	143.1	0.05	-	-	-	-	-	-	-	-	-	-	-	0.83	0.79
		20	5	3.04	1214.1	4320.3	124.4	0.05	-	-	-	-	-	-	-	-	-	-	-	0.86	0.83
		25	5	3.79	1214.0	4234.2	109.5	0.05	-	-	-	-	-	-	-	-	-	-	-	0.87	0.85
		30	5	4.55	1232.5	4274.3	100.0	0.05	-	-	-	-	-	-	-	-	-	-	-	0.88	0.87
		35	5	5.30	1220.6	4157.0	91.4	0.05	-	-	-	-	-	-	-	-	-	-	0.89	0.87	

* Axial backlash can be reduced on demand.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

■ YRV Series - Planetary roller screws



Types	D x P	SCREW			NUT														
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	Without wiper [mm] L1	With wipers [mm] L2	[mm] L3	[mm] L4	[mm] L5	[mm] L6			
YRV	100 x	12	100.70	100	99.08	185	260	172	10.5	M8×1	17.5	225	200	220	188	63	10	50	187
		18	101.02		98.59														
		24	101.32		98.08														
		30	101.60	97.55															
	120 x	15	101.04	99	97.61	200	275	186	15	M8×1	17.5	240	250	271	203	63	10	50	202
		20	101.35		97.11														
		25	101.65		96.60														
		30	101.93		96.07														
YRV	120 x	18	121.03	120	118.60	220	260	200	15	M10×1	17.5	240	230	260	223	100	10	50	222
		24	121.35		118.11														
		30	121.64		117.59														
		36	121.92		117.06														
	120 x	15	121.05	120	118.62	240	300	220	15	M10×1	17.5	270	280	300	243	100	10	55	242
		20	121.37		118.13														
		25	121.68		117.63														
		30	121.98		117.12														
		35	122.26		116.59														

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

YHRV Series

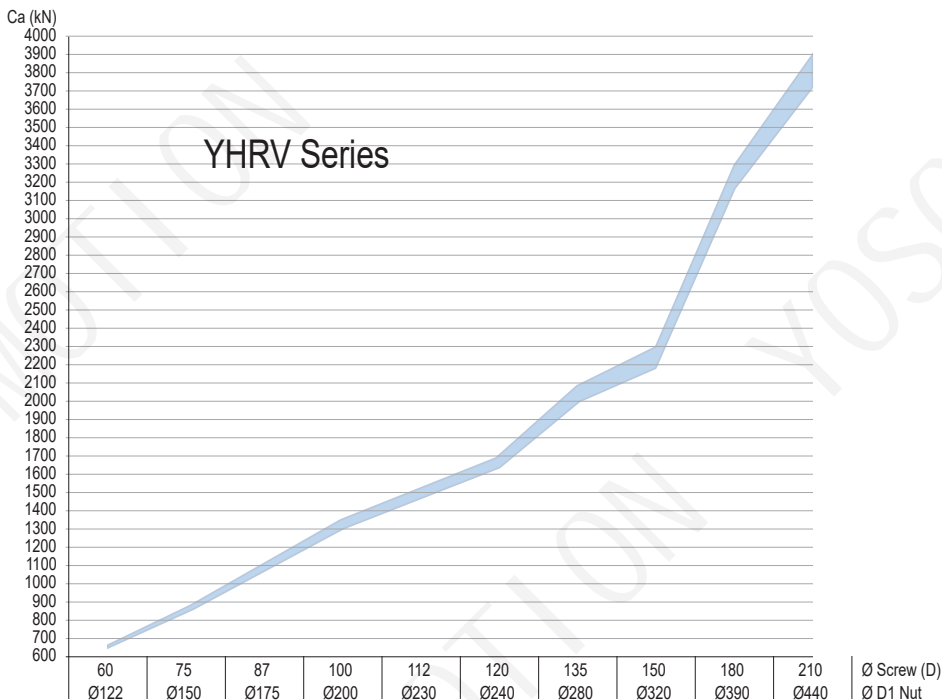
YHRV Series – Table of the standard available dimensions

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	

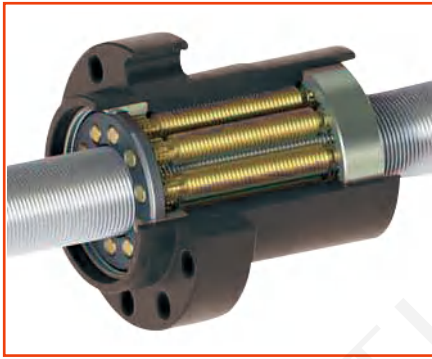


YHRV 75×15

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



■ YHRV Series - Planetary roller screws



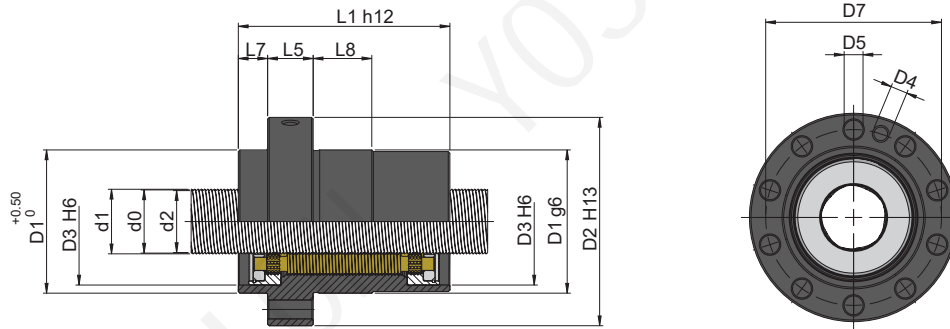
TECHNICAL CHARACTERISTICS										
Types	D x P	N	[°] Helix angle	SINGLE NUT				DIRECT efficiency	INDIRECT efficiency	
				[kN] Ca	[kN] C0a	[N2/3μm] Fk	Max axial backlash *			
YHRV	60 x	5	15	4.55	654.9	1512.4	88.9	0.04	0.88	0.87
			20	6.06	655.8	1498.0	76.4	0.04	0.89	0.88
			25	7.55	665.2	1522.3	68.9	0.04	0.89	0.88
			30	9.04	650.9	1469.2	62.0	0.04	0.88	0.87
YHRV	75 x	5	15	3.64	842.5	2449.6	108.9	0.04	0.87	0.85
			20	4.85	862.0	2480.3	95.0	0.04	0.88	0.87
			25	6.06	866.9	2462.0	84.4	0.04	0.89	0.88
			30	7.26	858.0	2395.2	76.0	0.04	0.89	0.88
YHRV	87 x	5	15	3.14	1074.0	3531.7	127.9	0.04	0.86	0.84
			20	4.19	1087.0	3510.3	110.2	0.04	0.88	0.86
			25	5.23	1106.3	3545.9	99.1	0.04	0.89	0.87
			30	6.26	1099.7	3467.5	89.1	0.04	0.89	0.88
YHRV	100 x	5	15	2.76	1301.0	4708.0	145.1	0.05	0.85	0.82
			20	3.68	1323.9	4716.1	124.9	0.05	0.87	0.85
			25	4.60	1329.5	4658.9	111.2	0.05	0.88	0.87
			30	5.51	1354.7	4732.1	102.2	0.05	0.89	0.87
			35	6.42	1347.3	4642.4	93.4	0.05	0.89	0.88
YHRV	112 x	5	15	2.43	1440.8	5442.7	153.3	0.05	0.84	0.80
			20	3.24	1460.5	5415.6	131.4	0.05	0.86	0.84
			25	4.05	1480.1	5425.0	117.3	0.05	0.88	0.86
			30	4.85	1483.0	5361.5	106.6	0.05	0.88	0.87
			35	5.66	1482.6	5298.0	98.0	0.05	0.89	0.88
YHRV	120 x	5	15	2.28	1598.9	6370.3	164.3	0.05	0.83	0.79
			20	3.04	1634.0	6419.5	141.6	0.05	0.86	0.83
			25	3.79	1656.2	6429.5	126.3	0.05	0.87	0.85
			30	4.55	1648.2	6283.1	114.1	0.05	0.88	0.87
			35	5.30	1668.7	6332.0	106.0	0.05	0.89	0.87
			40	6.06	1673.8	6302.8	98.7	0.05	0.89	0.88

* Axial backlash can be reduced on demand.

Terms used in tables

P	Lead (travel per revolution)	N	Number of starts	C0a	Static load capacity
D	Reference diameter	Ca	Dynamic load capacity	Fk	Rigidity factor

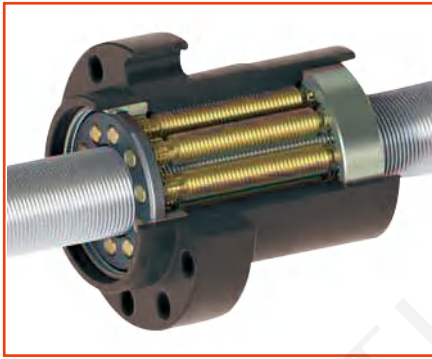
■ YHRV Series - Planetary roller screws



Types	D x P	SCREW			NUT										
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	D4	[mm] Ø D5	[mm] Ø D7	[mm] L1	[mm] L5	[mm] L7	[mm] L8	
YHRV	60 x	15	60.99	60	58.56	122	180	110	M8×1	17.5	150	171	30	20	40
		20	61.26		58.02										
		25	61.51		57.46										
		30	61.74		56.88										
YHRV	75 x	15	76.01	75	73.58	150	210	140	M8×1	17.5	180	213	35	25	40
		20	76.31		73.07										
		25	76.58		72.53										
		30	76.83		71.97										
YHRV	87 x	15	88.03	87	85.60	175	235	162	M8×1	17.5	200	245	40	25	40
		20	88.33		85.09										
		25	88.62		84.57										
		30	88.89		84.03										
YHRV	100 x	15	100.04	99	97.61	200	245	186	M8×1	17.5	224	280	50	25	40
		20	100.35		97.11										
		25	100.65		96.60										
		30	100.93		96.07										
		35	101.19		95.52										
YHRV	112 x	15	113.55	112.50	111.12	230	285	210	M10×1	17.5	260	300	50	30	60
		20	113.86		110.62										
		25	114.17		110.12										
		30	114.46		109.60										
		35	114.74		109.07										
YHRV	120 x	15	121.05	120	118.62	240	300	220	M10×1	17.5	270	346	55	40	60
		20	121.37		118.13										
		25	121.68		117.63										
		30	121.98		117.12										
		35	122.26		116.59										
		40	122.53		116.05										

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

■ YHRV Series - Planetary roller screws



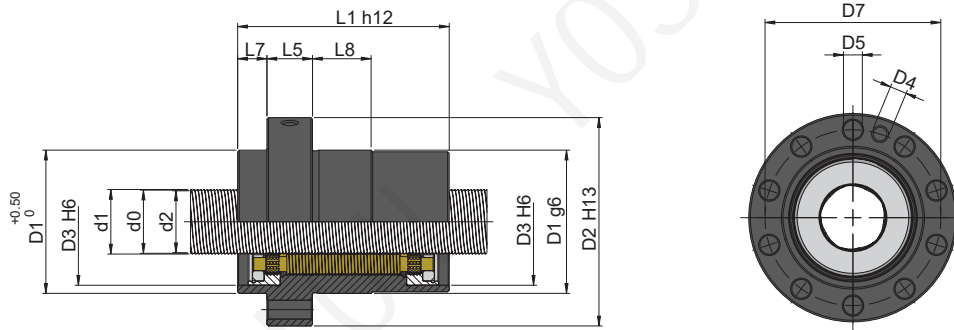
TECHNICAL CHARACTERISTICS										
Types	D x P	N	[°] Helix angle	SINGLE NUT				DIRECT efficiency	INDIRECT efficiency	
				[kN] Ca	[kN] C0a	[N2/3μm] Fk	Max axial backlash *			
YHRV	135 x	5	15	2.03	2061.7	9351.8	198.3	0.07	0.82	0.77
			20	2.70	1968.1	8494.9	160.4	0.07	0.85	0.82
			25	3.37	1988.6	8461.7	142.4	0.07	0.86	0.84
			30	4.05	2030.1	8605.9	130.8	0.07	0.88	0.86
			35	4.72	2054.8	8661.2	121.7	0.07	0.88	0.87
			40	5.39	2049.7	8539.1	112.9	0.07	0.89	0.87
			50	6.72	2031.9	8295.8	99.3	0.07	0.89	0.88
YHRV	150 x	5	15	1.82	2235.9	10488.5	206.4	0.07	0.80	0.75
			20	2.43	2155.4	9675.9	168.8	0.07	0.84	0.80
			25	3.04	2164.8	9542.5	148.8	0.07	0.86	0.83
			30	3.64	2181.9	9506.5	135.2	0.07	0.87	0.85
			35	4.25	2215.7	9616.2	125.9	0.07	0.88	0.86
			40	4.85	2218.4	9531.5	117.3	0.07	0.88	0.87
			50	6.06	2216.3	93624	103.7	0.07	0.89	0.88
YHRV	180x	5	20	2.03	3204.3	17663.4	225.0	0.10	0.82	0.77
			30	3.04	3101.2	16220.8	171.8	0.10	0.86	0.83
			40	4.05	3155.2	16249.9	148.4	0.10	0.88	0.86
			50	5.05	3195.3	16278.8	133.0	0.10	0.89	0.87
YHRV	210x	5	30	2.60	3893.4	22704.7	202.0	0.10	0.84	0.81
			40	3.47	3723.7	20709.1	163.5	0.10	0.87	0.85
			50	4.33	3773.0	20743.4	146.3	0.10	0.88	0.86

* Axial backlash can be reduced on demand.

Terms used in tables

P	Lead (travel per revolution)	N	Number of starts	C0a	Static load capacity
D	Reference diameter	Ca	Dynamic load capacity	Fk	Rigidity factor

■ YHRV Series - Planetary roller screws



Types	D x P	SCREW			NUT										
		[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	[mm] Ø D2	[mm] Ø D3	[mm] D4	[mm] Ø D5	[mm] Ø D7	[mm] L1	[mm] L5	[mm] L7	[mm] L8	
YHRV	135 x	15	136.06	135	133.63	280	345	260	M12	20.0	315	370	60	35	80
		20	136.38		133.14										
		25	136.70		132.65										
		30	137.00		132.14										
		35	137.30		131.63										
		40	137.58		131.10										
		50	138.10		130.00										
YHRV	150 x	15	151.06	150	148.63	320	385	280	M12	20.0	355	412	70	50	80
		20	151.39		148.15										
		25	151.71		147.66										
		30	152.03		147.17										
		35	152.33		146.66										
		40	152.61		146.13										
		50	153.16		145.06										
YHRV	180x	20	181.41	180	178.17	390	470	330	M12	24.0	433	528	90	55	100
		30	182.06		177.20										
		40	182.67		176.19										
		50	183.25		175.15										
YHRV	210x	30	212.08	210	207.22	440	530	398	M12	26.0	490	570	100	55	100
		40	212.71		206.23										
		50	213.31		205.21										

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

■ YRVI Series

YRVI Series – 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					
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	

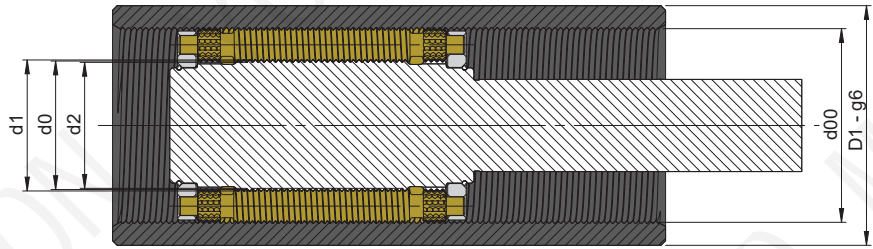


YRVI 8×0.5



YRVI 39×6

■ YRVI Series - Inverted planetary roller screws

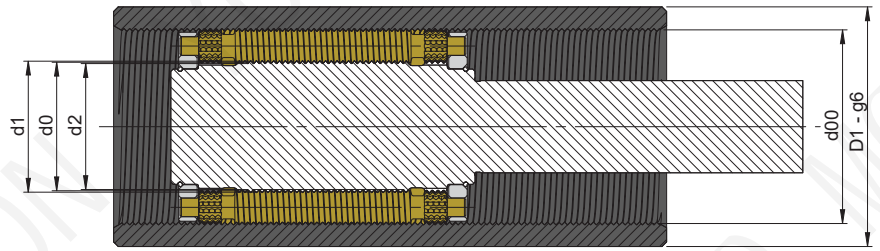
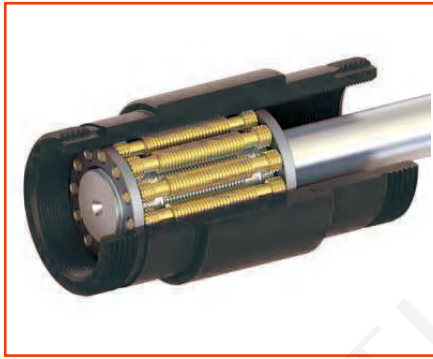


TECHNICAL CHARACTERISTICS															
Types	D x P	N	Helix angle [°]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	SCREW			NUT		
										∅ d1 [mm]	∅ d0 [mm]	∅ d2 [mm]	∅ d00 [mm]	∅ D1 [mm]	
YRVI	10.5 x	2.0	3	3.47	13.4	20.8	32.6	0.02	0.87	0.85	10.70	10.50	10.16	17.50	24
YRVI	12 x	1.0	3	1.52	13.9	26.8	52.1	0.02	0.78	0.71	12.11	12.00	11.84	20	26
		2.0		3.04	16.5	27.1	36.5	0.02	0.86	0.83	12.20		11.66		
YRVI	13.5x	1.0	3	1.35	16.1	31.5	56.8	0.02	0.76	0.68	13.61	13.50	13.34	22.50	30
		2.0		2.70	17.9	28.9	37.2	0.02	0.85	0.82	13.71		13.17		
YRVI	15x	1.0	3	1.22	23.7	56.0	74.1	0.02	0.74	0.65	15.11	15.00	14.84	25	32
		2.0		2.43	27.7	55.2	51.0	0.02	0.84	0.80	15.21		14.67		
		3.0		3.64	29.1	51.5	39.4	0.03	0.87	0.85	152.9		14.48		
YRVI	18x	1.0	3	1.01	30.6	76.8	85.1	0.02	0.71	0.58	18.12	18.00	17.85	30	38
		2.0		2.03	36.2	77.2	59.0	0.02	0.82	0.77	18.22		17.68		
		3.0		3.04	39.1	74.9	46.9	0.03	0.86	0.83	18.30		17.49		
YRVI	21x	2.0	3	1.74	54.5	106.0	67.5	0.02	0.80	0.74	21.22	21.00	20.68	35	45
		3.0		2.60	59.6	104.8	54.2	0.03	0.84	0.81	21.31		20.50		
		4.0		3.47	63.3	103.7	46.5	0.03	0.87	0.85	21.39		20.31		
YRVI	24x	2.0	3	1.52	73.8	161.0	81.2	0.02	0.78	0.71	24.22	24.00	23.68	40	50
		3.0		2.28	81.4	161.5	66.0	0.03	0.83	0.79	24.32		23.51		
		4.0		3.04	87.3	162.0	56.8	0.03	0.86	0.83	24.40		23.32		
		5.0		3.79	92.1	162.5	50.9	0.03	0.87	0.85	24.48		23.13		
YRVI	27x	2.0	3	1.35	81.2	177.2	84.0	0.02	0.76	0.68	27.23	27.00	26.69	45	55
		3.0		2.03	90.3	179.7	68.6	0.03	0.82	0.77	27.33		26.52		
		4.0		2.70	94.8	174.3	58.0	0.03	0.85	0.82	27.41		26.33		
		5.0		3.37	100.0	174.8	51.8	0.03	0.86	0.84	27.49		26.14		
YRVI	28x	2.0	3	1.30	61.4	140.0	92.5	0.02	0.75	0.67	28.17	28.00	27.77	42	52
		3.0		1.95	67.8	140.5	75.0	0.02	0.81	0.77	28.25		27.65		
		4.0		2.60	71.7	137.8	63.9	0.03	0.84	0.81	28.33		27.52		
		5.0		3.25	72.5	129.8	54.5	0.03	0.86	0.84	28.39		27.38		
		6.0		3.90	76.3	131.6	50.0	0.03	0.87	0.86	28.46		27.24		

* Axial backlash can be reduced on demand.

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

■ YRVI Series - Inverted planetary roller screws

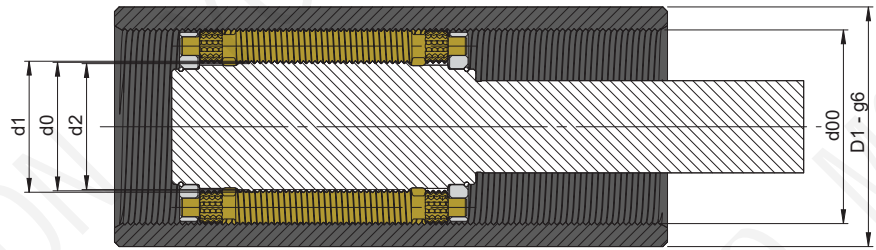
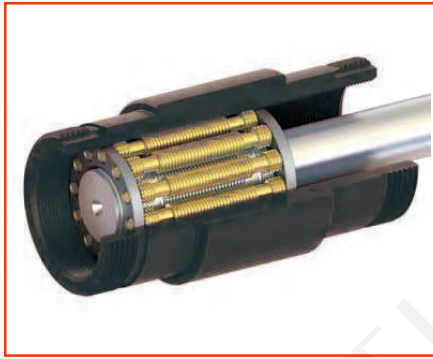


TECHNICAL CHARACTERISTICS															
Types	D x P	N	Helix angle [°]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	SCREW			NUT		
										[mm]	[mm]	[mm]	[mm]	[mm]	
										∅ d1	∅ d0	∅ d2	∅ d00	∅ D1	
YRVI	30x	2	1.22	97.2	224.1	93.4	0.02	0.74	0.65	30.23	30	29.69	50	60	
		3	1.82	107.3	224.7	75.5	0.03	0.80	0.75	30.33		29.52			
		4	2.43	113.6	220.8	64.3	0.03	0.84	0.80	30.42		29.34			
		5	3.04	119.2	219.2	57.0	0.03	0.86	0.83	30.50		29.15			
		6	3.64	126.9	226.5	52.9	0.04	0.87	0.85	30.58		28.96			
YRVI	36x	2	1.01	86.9	215.4	111.7	0.02	0.71	0.58	36.18	36	35.77	54	64	
		3	1.52	95.4	214.0	89.3	0.02	0.78	0.71	36.26		35.65			
		4	2.03	101.8	212.6	76.7	0.03	0.82	0.77	36.34		35.53			
		5	2.53	106.2	209.2	67.7	0.03	0.84	0.81	36.41		35.40			
		6	3.04	111.0	209.8	61.7	0.03	0.86	0.83	36.48		35.26			
		7	3.54	117.8	218.1	58.0	0.03	0.87	0.85	36.54		35.13			
YRVI	39x	3	1.40	159.5	372.0	93.2	0.03	0.76	0.69	39.34	39	38.53	65	75	
		4	1.87	170.3	369.9	80.3	0.03	0.81	0.76	39.44		38.36			
		5	2.34	178.9	367.8	71.2	0.03	0.83	0.80	39.53		38.18			
		6	2.80	186.1	365.7	64.5	0.04	0.85	0.82	39.62		38.00			
		7	3.27	194.1	369.4	59.8	0.04	0.86	0.84	39.69		37.80			
		8	3.74	201.4	373.1	56.3	0.04	0.87	0.85	39.77		37.61			
YRVI	44x	3	1.24	135.1	338.4	109.3	0.02	0.74	0.65	44.26	44	43.65	66	76	
		4	1.66	145.6	341.5	94.2	0.03	0.79	0.73	44.34		43.53			
		5	2.07	153.1	339.8	83.7	0.03	0.82	0.78	44.42		43.41			
		6	2.49	157.9	333.2	75.3	0.03	0.84	0.81	44.49		43.28			
		7	2.90	166.8	343.6	70.6	0.03	0.85	0.83	44.56		43.15			
		8	3.31	169.2	334.6	65.0	0.04	0.86	0.84	44.63		43.01			
		9	3.73	171.8	328.0	60.6	0.04	0.87	0.85	44.69		42.87			
YRVI	48x	3	1.14	218.7	556.2	111.6	0.03	0.73	0.63	48.34	48	47.53	80	90	
		4	1.52	234.6	557.2	95.4	0.03	0.78	0.71	48.45		47.37			
		5	1.90	246.8	554.6	85.0	0.03	0.81	0.76	48.55		47.20			
		6	2.28	259.0	559.1	77.5	0.04	0.83	0.79	48.64		47.02			
		7	2.66	262.4	538.7	70.1	0.04	0.84	0.82	48.73		46.84			
		8	3.04	277.7	561.1	66.7	0.04	0.86	0.83	48.81		46.65			
		9	3.42	285.7	562.1	62.9	0.05	0.87	0.84	48.88		46.45			
		10	3.79	286.0	541.7	58.6	0.05	0.87	0.85	48.95		46.25			

* Axial backlash can be reduced on demand.

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

■ YRVI Series - Inverted planetary roller screws

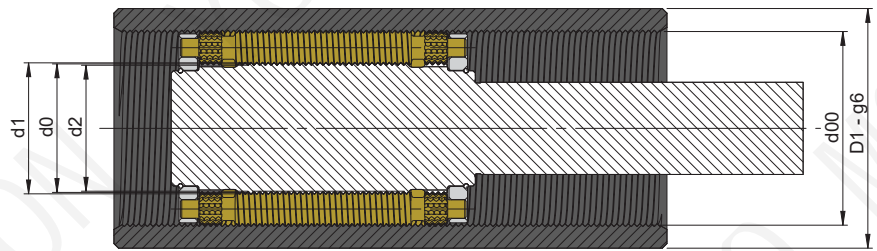


TECHNICAL CHARACTERISTICS															
Types	D x P	N	Helix angle [°]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	SCREW			NUT		
										[mm]	[mm]	[mm]	[mm]	[mm]	
										∅ d1	∅ d0	∅ d2	∅ d00	∅ D1	
YRVI	51 x	3	1.07	263.1	725.9	126.3	0.03	0.72	0.60	51.35	51	50.54	85	99	
			1.43	279.5	715.2	106.6	0.03	0.77	0.70	51.45		50.37			
			1.79	298.1	727.9	96.2	0.03	0.80	0.75	51.55		50.20			
			2.14	308.5	717.3	86.9	0.04	0.82	0.78	51.64		50.02			
			2.50	320.2	718.3	80.0	0.04	0.84	0.81	51.73		49.84			
			2.86	326.2	703.9	74.0	0.04	0.85	0.83	51.82		49.66			
			3.22	340.3	720.4	70.3	0.05	0.86	0.84	51.90		49.47			
			3.57	346.6	713.7	66.5	0.05	0.87	0.85	51.97		49.27			
YRVI	56 x	4	1.30	219.6	584.9	119.0	0.03	0.75	0.67	56.35	56	55.54	84	98	
			1.63	231.9	585.8	105.9	0.03	0.79	0.73	56.43		55.42			
			1.95	240.8	580.4	96.0	0.03	0.81	0.77	56.51		55.29			
			2.28	250.8	584.4	88.8	0.03	0.83	0.79	56.58		55.16			
			2.60	256.5	575.9	82.2	0.04	0.84	0.81	56.65		55.03			
			2.93	260.4	564.4	76.6	0.04	0.85	0.83	56.72		54.90			
			3.25	274.4	590.0	74.1	0.04	0.86	0.84	56.79		54.76			
			3.90	279.0	566.9	66.2	0.05	0.87	0.86	56.92		54.49			
YRVI	60 x	4	1.22	248.6	689.4	128.2	0.03	0.74	0.65	60.35	60	59.54	90	108	
			1.52	259.3	676.9	112.7	0.03	0.78	0.71	60.43		59.42			
			1.82	272.7	684.5	103.1	0.03	0.80	0.75	60.51		59.29			
			2.13	281.4	678.7	94.8	0.03	0.82	0.78	60.59		59.17			
			2.43	290.7	679.7	88.3	0.04	0.84	0.80	60.66		59.04			
			2.73	298.2	677.2	83.0	0.04	0.85	0.82	60.73		58.91			
			3.04	306.9	681.5	78.9	0.04	0.86	0.83	60.80		58.77			
			3.64	316.7	669.9	71.2	0.05	0.87	0.85	60.93		58.50			

* Axial backlash can be reduced on demand.

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

■ YRVI Series - Inverted planetary roller screws



TECHNICAL CHARACTERISTICS															
Types	D x P	N	[°] Helix angle	[kN] Ca	[kN] C0a	[N2/3μm] Fk	Max axial backlash *	DIRECT efficiency	INDIRECT efficiency	SCREW			NUT		
										[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø d00	[mm] Ø D1	
YRVI	64 x	4	4	1.14	278.7	802.2	137.3	0.03	0.73	0.63	64.35	64	63.54	96	114
			5	1.42	291.9	792.4	120.9	0.03	0.77	0.69	64.43		63.42		
			6	1.71	306.0	797.0	110.1	0.03	0.79	0.74	64.51		63.30		
			7	1.99	319.5	805.1	102.2	0.04	0.81	0.77	64.59		63.17		
			8	2.28	326.4	791.8	94.5	0.04	0.83	0.79	64.66		63.04		
			9	2.56	337.8	799.9	89.3	0.04	0.84	0.81	64.74		62.91		
			10	2.85	340.6	779.5	83.5	0.04	0.85	0.83	64.81		62.78		
			12	3.42	355.9	781.4	76.0	0.05	0.87	0.84	64.94		62.51		
			14	3.98	377.8	811.8	71.7	0.05	0.88	0.86	65.06		62.23		
YRVI	70 x	5	6	1.56	260.3	722.7	123.1	0.02	0.78	0.72	70.42	70	69.44	98	120
			8	2.08	276.2	712.1	105.2	0.03	0.82	0.78	70.54		69.25		
			10	2.60	291.6	713.8	93.8	0.04	0.84	0.81	70.66		69.04		
			12	3.12	308.0	727.8	86.1	0.04	0.86	0.84	70.78		68.83		
			14	3.64	317.9	723.3	79.2	0.04	0.87	0.85	70.89		68.62		
			15	3.90	317.2	702.6	75.4	0.05	0.87	0.86	70.94		68.51		
YRVI	75 x	5	6	1.46	294.7	851.9	132.4	0.03	0.77	0.70	75.42	75	74.45	105	127
			8	1.94	314.6	847.1	113.5	0.03	0.81	0.77	75.55		74.25		
			10	2.43	330.5	842.3	100.7	0.04	0.84	0.80	75.67		74.05		
			12	2.92	343.7	837.5	91.5	0.04	0.85	0.83	75.78		73.84		
			14	3.40	358.5	845.9	84.7	0.04	0.87	0.84	75.90		73.63		
			15	3.64	360.0	830.3	81.0	0.05	0.87	0.85	75.95		73.52		
YRVI	80 x	4	6	1.37	387.4	1038.4	121.9	0.03	0.76	0.68	80.52	80	79.31	120	142
			8	1.82	415.6	1040.9	105.3	0.04	0.80	0.75	80.68		79.06		
			10	2.28	443.2	1060.8	94.5	0.04	0.83	0.79	80.83		78.81		
			12	2.73	458.6	1045.8	85.4	0.05	0.85	0.82	80.97		78.54		
			14	3.19	476.0	10483	78.9	0.05	0.86	0.84	81.11		78.27		
			16	3.64	559.4	1225.8	75.7	0.05	0.87	0.85	81.24		78.00		

* Axial backlash can be reduced on demand.

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

■ YRVR Series - Inverted planetary roller screws

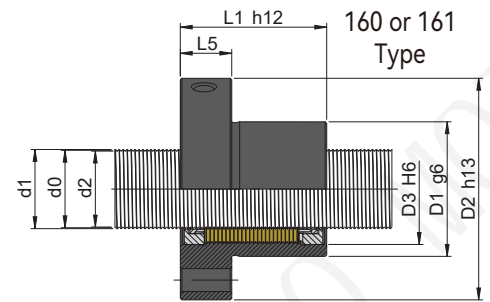
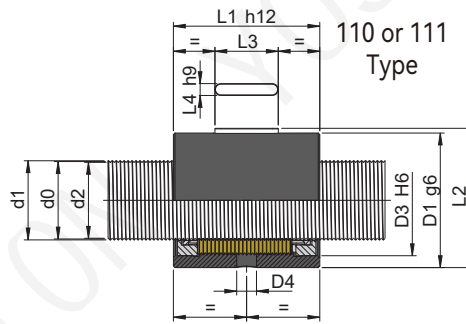
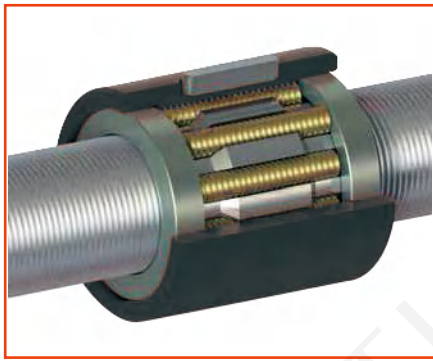
YRVR Series – Table of the standard available dimensions

Screw diameter (D)	Lead (P)						
	0.25	0.5	1	2	3	4	5
8	X	X	X	X			
10	X	X	X	X			
12	X	X	X	X			
16		X	X	X			
20		X	X	X			
25			X	X			
32			X	X		X	
36			X	X			
40			X	X		X	
50			X	X	X	X	
63				X	X	X	
80				X	X	X	
100					X	X	X
125							X



YRVR 12×1

■ YRVR Series - Planetary roller screw - mechanism with recirculating rollers



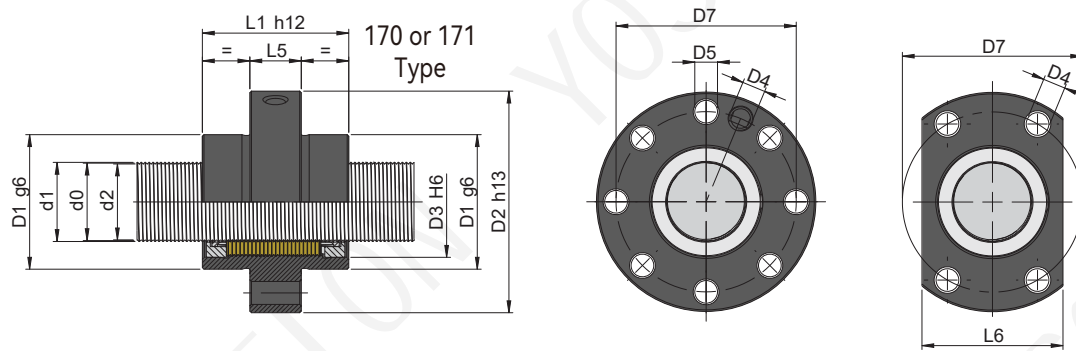
TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				Ca [kN]	C0a [kN]	Fk [N2/3µm]	Max axial backlash *	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [kN]	Mv [Nm]	Ca [kN]	C0a [kN]	Fk [N2/3µm]	Fv [kN]	Mv [Nm]			
YRVR	8x	0.25	1	0.58	7.3	14.3	40.5	0.02	7.3	14.3	60.8	820	0.06	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	8.7	13.5	41.1	790	0.06	5.0	6.8	17.3	790	0.06	0.73	0.63
		1		2.39	11.8	14.3	18.9	0.03	11.8	14.3	28.3	730	0.06	6.8	7.2	11.9	730	0.06	0.83	0.80
		2		4.77	11.8	14.3	18.9	0.03	11.8	14.3	28.3	550	0.06	6.8	7.2	11.9	550	0.06	0.88	0.87
YRVR	10x	0.25	1	0.46	8.8	17.7	45.9	0.02	8.8	17.7	68.9	870	0.08	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	10.4	16.8	46.6	855	0.08	6.0	8.4	19.6	855	0.08	0.69	0.55
		1		1.89	14.1	17.8	21.4	0.03	14.1	17.8	32.1	810	0.08	8.1	8.9	13.5	810	0.08	0.81	0.76
		2		3.78	14.1	17.8	21.4	0.03	14.1	17.8	32.1	665	0.08	8.1	8.9	13.5	665	0.08	0.87	0.85
YRVR	12x	0.25	1	0.38	10.1	21.2	51.0	0.02	10.1	21.2	76.5	910	0.10	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	11.9	20.1	51.7	895	0.10	6.8	10.0	21.7	895	0.10	0.65	0.46
		1		1.57	16.1	21.3	23.8	0.03	16.1	21.3	35.6	860	0.10	9.3	10.6	15.0	860	0.10	0.78	0.72
		2		3.13	16.1	21.3	23.8	0.03	16.1	21.3	35.6	740	0.10	9.3	10.6	15.0	740	0.10	0.86	0.84
YRVR	16x	0.5	1	0.58	14.3	26.7	40.8	0.02	14.3	26.7	61.2	1020	0.15	8.2	13.3	25.7	1020	0.15	0.58	0.29
		1		1.17	19.4	28.2	28.2	0.03	19.4	28.2	42.3	990	0.15	11.1	14.1	17.8	990	0.15	0.73	0.63
		2		2.33	19.4	28.2	28.2	0.03	19.4	28.2	42.3	895	0.15	11.1	14.1	17.8	895	0.15	0.83	0.80
YRVR	20x	0.5	1	0.46	19.5	45.5	53.6	0.02	19.5	45.5	80.5	1090	0.20	11.2	22.7	33.8	1090	0.20	0.53	0.11
		1		0.93	27.1	49.7	37.5	0.03	27.1	49.7	56.3	1070	0.20	15.6	24.8	23.7	1070	0.20	0.69	0.55
		2		1.86	27.1	49.7	37.5	0.03	27.1	49.7	56.3	995	0.20	15.6	24.8	23.7	995	0.20	0.80	0.76
YRVR	25x	1	1	0.74	39.7	85.2	48.3	0.03	39.7	85.2	72.5	1295	0.30	22.8	42.6	30.4	1295	0.30	0.64	0.44
		2		1.48	39.7	85.2	48.3	0.03	39.7	85.2	72.5	1228	0.30	22.8	42.6	30.4	1228	0.30	0.77	0.70
YRVR	32x	1	2	0.58	60.8	148.9	61.0	0.03	60.8	148.9	91.6	1698	0.50	34.9	74.4	38.4	1698	0.50	0.58	0.29
		2		1.15	60.8	148.9	61.0	0.03	60.8	148.9	91.6	1635	0.50	34.9	74.4	38.4	1635	0.50	0.73	0.63
		4		2.33	73.5	144.7	42.6	0.03	73.5	144.7	63.9	1493	0.50	42.2	72.4	26.8	1493	0.50	0.83	0.80
YRVR	36x	1	1	0.51	73.8	180.5	64.1	0.03	73.8	180.5	96.2	1815	0.60	42.4	90.2	40.4	1815	0.60	0.56	0.20
		2		1.03	86.5	171.5	44.2	0.03	86.5	171.5	66.3	1775	0.60	49.7	85.7	27.9	1775	0.60	0.71	0.59
YRVR	40x	1	2	0.46	79.8	206.9	69.5	0.03	79.8	206.9	104.3	1908	0.70	45.8	103.5	43.8	1908	0.70	0.53	0.11
		2		0.92	79.8	206.9	69.5	0.03	79.8	206.9	104.3	1857	0.70	45.8	103.5	43.8	1857	0.70	0.69	0.54
		4		1.86	97.3	199.0	47.7	0.03	97.3	199.0	71.5	1740	0.70	55.9	99.5	30.0	1740	0.70	0.80	0.76

* Axial backlash can be reduced on demand.

Terms used in tables	N	Number of starts	F _k	Rigidity factor	
P	Lead (travel per revolution)	Ca	Dynamic load capacity	F _v	Preloading force
D	Reference diameter	C0a	Static load capacity	M _v	Preload torque

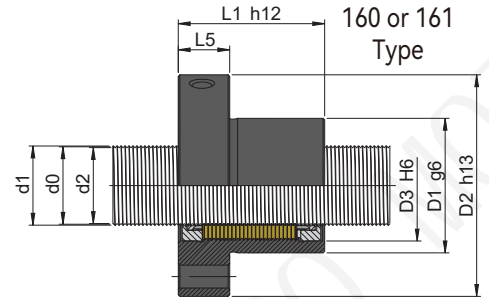
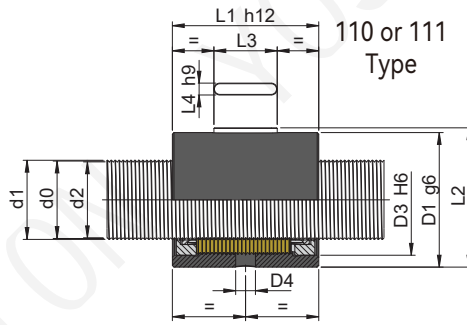
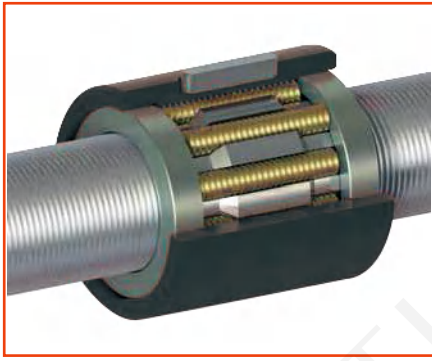
■ YRVR Series - Planetary roller screw - mechanism with recirculating rollers



Types	D x P		SCREW			NUT														
			[mm]	[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			
YRVR	8x	0.25	8	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															
YRVR	10x	0.25	10	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															
YRVR	12x	0.25	12	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															
YRVR	16x	0.5	16	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															
YRVR	20x	0.5	20	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															
YRVR	25x	1	25	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															
YRVR	32x	1	32	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															
YRVR	36x	1	36	35.63	35.19	61	90	53	5	M6	7.0	75	62	75	63.7	28	6	17	63	
		2		35.26	34.38															
YRVR	40x	1	40	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															

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

■ YRVR Series - Planetary roller screw - mechanism with recirculating rollers



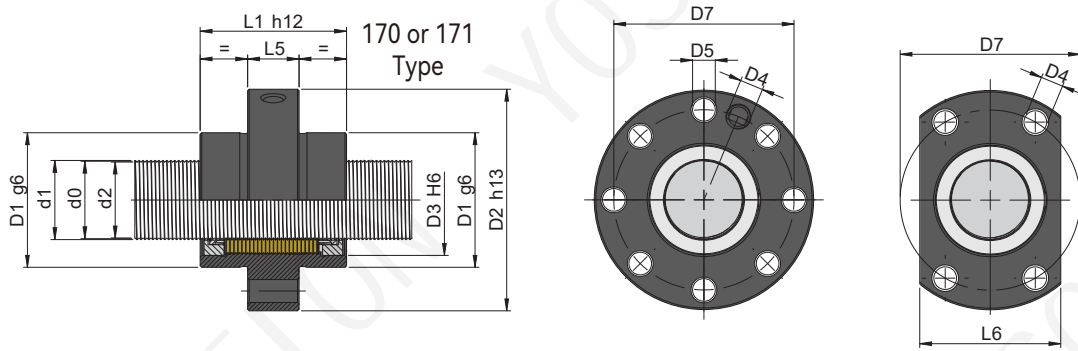
TECHNICAL CHARACTERISTICS

Types	D x P	N	Helix angle [°]	SINGLE NUT				DOUBLE NUT					SPLIT NUT					DIRECT efficiency	INDIRECT efficiency	
				[kN]	[kN]	[N2/3µm]	Max axial backlash *	[kN]	[kN]	[N2/3µm]	[kN]	[Nm]	[kN]	[kN]	[N2/3µm]	[kN]	[Nm]			
				Ca	C0a	Fk		Ca	C0a	Fk	Fv	Mv	Ca	C0a	Fk	Fv	Mv			
YRVR	50x	1	1	0.37	134.1	410.4	93.6	0.03	134.1	410.4	140.3	1969	0.90	77.0	205.2	58.9	1969	0.90	0.52	0.06
		2		0.73	139.9	424.4	94.6	0.03	134.1	410.4	140.3	1930	0.90	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	160.0	429.0	115.4	1888	0.90	91.9	214.5	48.5	1888	0.90	0.72	0.62
		4		1.48	168.2	407.6	64.7	0.03	168.2	407.6	97.1	1842	0.90	96.6	203.8	40.8	1842	0.90	0.77	0.70
YRVR	63x	2	1	0.59	219.6	563.0	73.6	0.03	219.6	563.0	110.4	2068	1.20	126.1	281.5	46.3	2068	1.20	0.59	0.30
		3		0.88	241.4	534.1	58.2	0.03	241.4	534.1	87.3	2043	1.20	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	219.6	563.0	110.4	1990	1.20	126.1	281.5	46.3	1990	1.20	0.73	0.64
YRVR	80x	2	1	0.46	374.6	1393.4	115.8	0.05	374.6	1393.4	173.7	/	/	215.2	696.7	73.0	/	/	0.53	0.11
		3		0.69	414.2	1361.1	93.4	0.05	414.2	1361.1	140.0	/	/	237.9	680.5	58.8	/	/	0.63	0.40
		4		0.93	440.6	1326.1	80.5	0.05	440.6	1326.1	120.7	/	/	253.0	663.1	50.7	/	/	0.69	0.55
YRVR	100x	3	1	0.55	512.0	1576.5	93.8	0.05	512.0	1576.5	140.7	/	/	294.0	788.3	59.1	/	/	0.57	0.26
		4		0.74	523.3	1548.0	80.4	0.05	523.3	1548.0	120.5	/	/	300.6	774.0	50.6	/	/	0.64	0.44
		5		0.93	527.5	1519.6	71.3	0.05	527.5	1519.6	106.9	/	/	302.9	759.8	44.9	/	/	0.69	0.55
YRVR	125x	5	1	0.74	986.0	3972.5	111.5	0.05	986.0	3972.5	167.2	/	/	566.3	1986.2	70.2	/	/	0.64	0.44

* Axial backlash can be reduced on demand.

Terms used in tables	N Number of starts	F_k Rigidity factor
P Lead (travel per revolution)	Ca Dynamic load capacity	F_v Preloading force
D Reference diameter	C0a Static load capacity	M_v Preload torque

■ YRVR Series - Planetary roller screw - mechanism with recirculating rollers



Types	D x P	SCREW			NUT																		
		[mm]	[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							
YRVR	50x	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																			
YRVR	63x	2	62.26	61.38	102	148	94	8	M8×1	13.5	127	110	124	104.7	40	6	32	104					
		3	61.89	60.57																			
		4	62.26	61.38																			
YRVR	80x	2	79.26	78.38	140	198	115	10	M8×1	17.5	170	175	189	141.7	50	10	35	140					
		3	78.89	77.57																			
		4	78.52	76.76																			
YRVR	100x	3	98.89	97.57	174	238	146	10	M8×1	17.5	210	180	196	173.7	56	12	40	172					
		4	98.52	96.76																			
		5	98.15	95.95																			
YRVR	125x	5	125	123.15	12.95	220	310	188	15	M10×1	20.0	270	262	282	223	100	12	55	225				

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

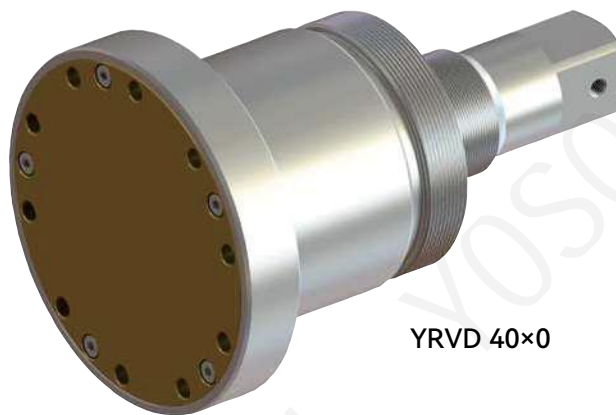
■ **YRVD Series - Differential roller screws**



YRVD 42×0.1

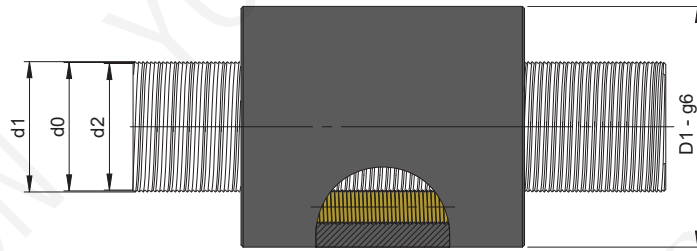


YRVD 60×0.6



YRVD 40×0

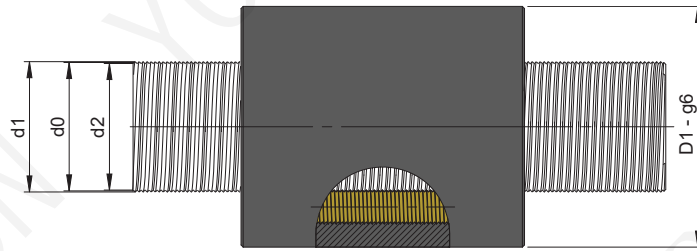
■ YRVD Series - Differential roller screws



TECHNICAL CHARACTERISTICS									
Types	D x P	SCREW			SCREW			NUT	
		[kN] Ca	[kN] C0a	[N2/3µm] Fk	[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	
YRVD	12x	0.05	9.0	11.1	27.4	12	12.14	11.82	26
		0.10	14.2	22.2	43.5		12.14	11.82	
		0.15	15.6	21.9	34.9		12.20	11.72	
		0.20	16.6	21.6	29.9		12.26	11.62	
		0.25	18.0	22.6	27.3		12.32	11.51	
		0.30	13.1	15.1	23.6		12.26	11.62	
		0.35	15.2	24.4	46.4		12.14	11.82	
		0.40	12.3	17.8	37.5		12.14	11.82	
		0.45	12.6	17.7	35.2		12.16	11.79	
		0.50	15.5	19.4	27.9		12.26	11.62	
YRVD	15x	0.05	12.2	16.3	32.2	15	15.14	14.82	32
		0.10	19.4	32.6	51.1		15.14	14.82	
		0.15	21.6	32.8	41.5		15.21	14.72	
		0.20	23.2	33.0	35.7		15.27	14.62	
		0.25	24.9	33.7	32.2		15.33	14.52	
		0.30	18.3	23.1	28.2		15.27	14.62	
		0.35	20.6	35.9	54.4		15.14	14.82	
		0.40	16.7	26.1	44.0		15.14	14.82	
		0.45	17.1	25.8	41.2		15.16	14.79	
		0.50	21.7	29.7	33.3		15.27	14.62	
YRVD	18x	0.05	18.7	30.1	42.4	18	18.14	17.82	36
		0.10	29.7	60.3	67.4		18.14	17.82	
		0.15	33.0	60.5	54.4		18.21	17.72	
		0.20	35.6	60.7	46.8		18.27	17.63	
		0.25	37.8	60.9	41.7		18.34	17.53	
		0.30	28.1	42.5	36.9		18.27	17.63	
		0.35	31.6	66.3	71.8		18.14	17.82	
		0.40	25.6	48.2	58.1		18.14	17.82	
		0.45	26.3	47.8	54.1		18.16	17.80	
		0.50	33.2	54.6	43.7		18.27	17.63	

Terms used in tables
P Lead (travel per revolution)
D Reference diameter
Ca Dynamic load capacity
C0a Static load capacity
F_k Rigidity factor
d1 External diameter
d0 Nominal diameter
d2 Thread root diameter
D1 Mini external diameter

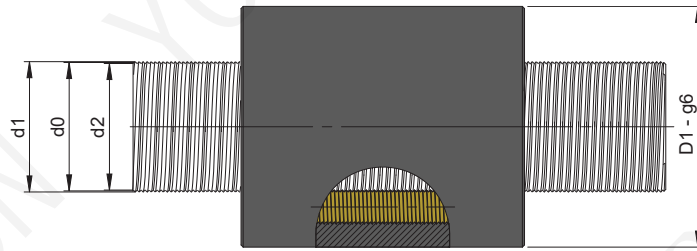
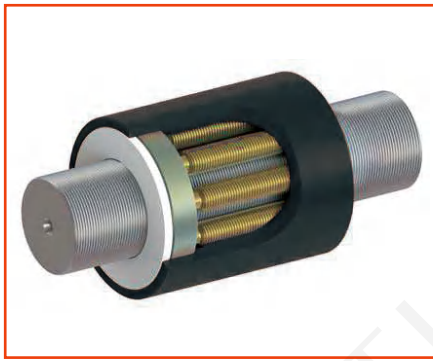
■ YRVD Series - Differential roller screws



TECHNICAL CHARACTERISTICS									
Types	D x P	SCREW			SCREW			NUT	
		[kN] Ca	[kN] C0a	[N2/3µm] Fk	[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	
YRVD	21x	0.05	25.7	46.9	51.8	21	20.82	41	
		0.10	40.8	93.7	82.2		20.82		
		0.15	45.1	93.1	65.7		20.73		
		0.20	48.4	92.5	56.5		20.63		
		0.25	52.2	95.3	50.9		20.53		
		0.30	38.2	64.8	44.6		20.63		
		0.35	43.4	103.1	87.6		20.82		
		0.40	35.1	75.0	70.9		20.82		
		0.45	36.0	74.4	66.2		20.80		
		0.50	45.1	83.3	52.7		20.63		
YRVD	24x	0.05	35.1	73.0	63.3	24	23.82	46	
		0.10	55.7	146.0	100.5		23.82		
		0.15	61.5	144.3	80.0		23.73		
		0.20	66.9	146.6	69.5		23.63		
		0.25	70.9	146.8	61.9		23.53		
		0.30	52.8	102.6	54.8		23.63		
		0.35	59.4	160.6	107.1		23.82		
		0.40	48.0	116.8	86.6		23.82		
		0.45	49.1	115.3	80.8		23.80		
		0.50	62.4	131.9	64.8		23.63		
YRVD	27x	0.05	38.7	80.7	65.6	27	26.82	53	
		0.10	61.5	161.4	104.1		26.82		
		0.15	68.4	161.7	83.8		26.73		
		0.20	73.8	162.0	71.9		26.63		
		0.25	78.6	163.4	64.4		26.54		
		0.30	58.2	113.4	56.7		26.63		
		0.35	65.5	177.5	110.9		26.82		
		0.40	53.0	129.1	89.7		26.82		
		0.45	54.8	129.8	84.6		26.80		
		0.50	68.8	145.8	67.0		26.63		

Terms used in tables
P Lead (travel per revolution)
D Reference diameter
Ca Dynamic load capacity
C0a Static load capacity
F_k Rigidity factor
d1 External diameter
d0 Nominal diameter
d2 Thread root diameter
D1 Mini external diameter

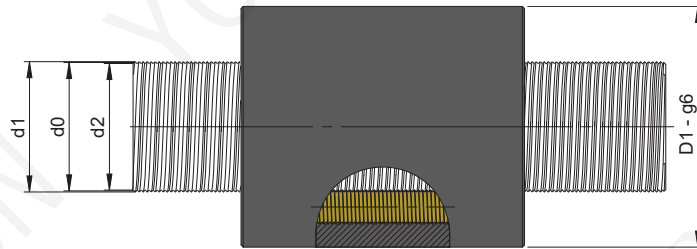
■ YRVD Series - Differential roller screws



TECHNICAL CHARACTERISTICS									
Types	D x P	SCREW			SCREW			NUT	
		[kN] Ca	[kN] C0a	[N2/3µm] Fk	[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	
YRVD	30x	0.05	46.8	104.1	73.6	30.14	30	29.82	60
		0.10	74.3	208.2	116.8	30.14		29.82	
		0.15	82.7	208.5	94.0	30.21		29.73	
		0.20	88.5	206.4	79.8	30.28		29.64	
		0.25	94.9	210.4	71.9	30.35		29.54	
		0.30	69.8	144.5	62.9	30.28		29.64	
		0.35	79.1	229.0	124.5	30.14		29.82	
		0.40	64.0	166.5	100.7	30.14		29.82	
		0.45	66.0	166.6	94.3	30.16		29.80	
		0.50	82.5	185.7	74.4	30.28		29.64	
YRVD	33x	0.05	42.7	84.3	66.3	33.15	33	32.82	67
		0.10	67.8	168.6	105.2	33.15		32.82	
		0.15	75.8	170.2	84.9	33.22		32.73	
		0.20	80.7	166.8	71.7	33.28		32.64	
		0.25	86.7	171.0	64.5	33.35		32.54	
		0.30	63.6	116.8	56.5	33.28		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	33.16		32.80	
		0.50	75.2	150.1	66.8	33.28		32.64	

Terms used in tables	C0a Static load capacity	d0 Nominal diameter
P Lead (travel per revolution)	F_k Rigidity factor	d2 Thread root diameter
D Reference diameter	d1 External diameter	D1 Mini external diameter
Ca Dynamic load capacity		

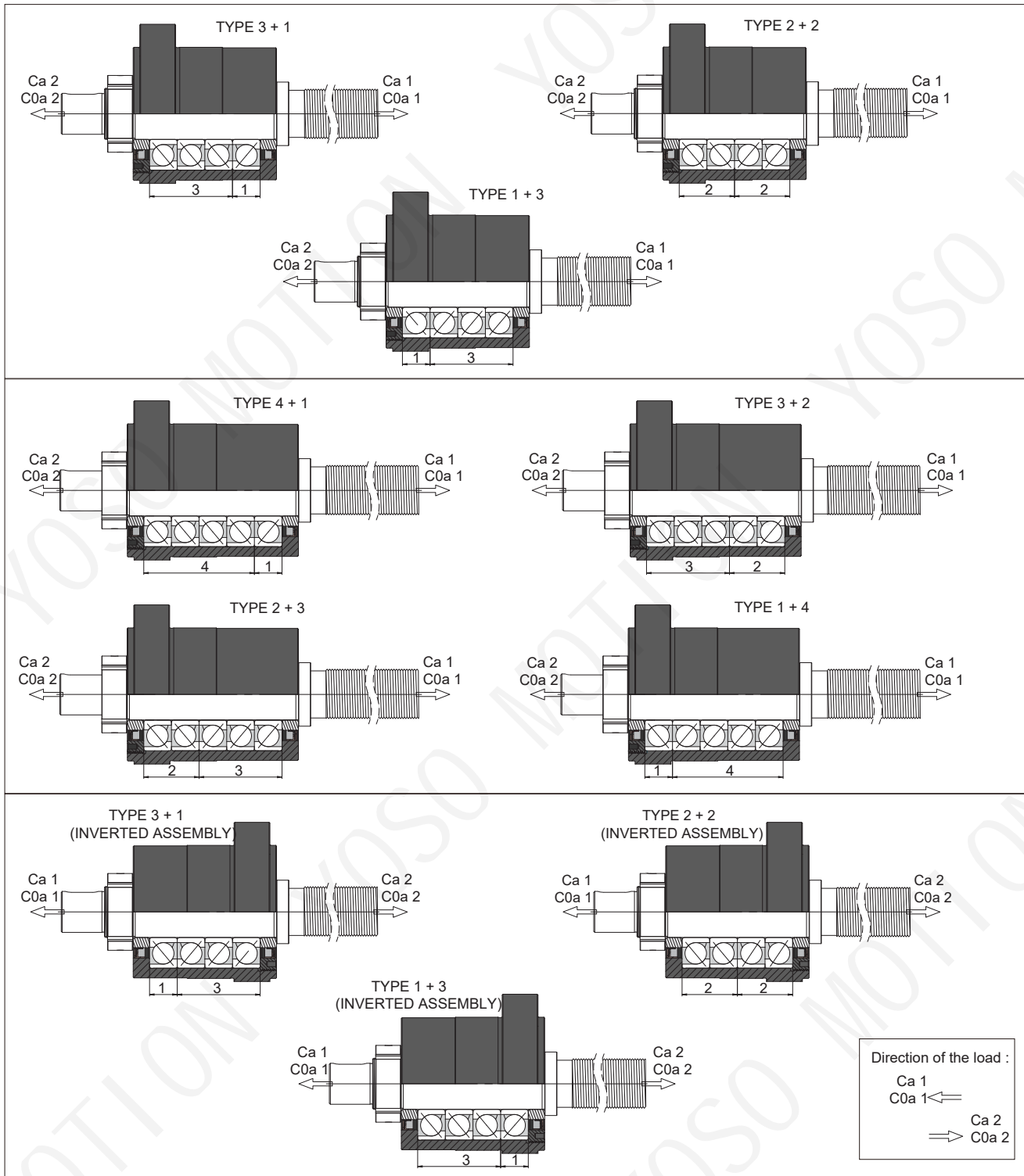
■ YRVD Series - Differential roller screws



TECHNICAL CHARACTERISTICS									
Types	D x P	SCREW			SCREW			NUT	
		[kN] Ca	[kN] C0a	[N2/3µm] Fk	[mm] Ø d1	[mm] Ø d0	[mm] Ø d2	[mm] Ø D1	
YRVD	36x	0.05	45.4	88.3	67.4	36	35.82	74	
		0.10	72.0	176.6	107.1		35.82		
		0.15	80.5	178.3	86.4		35.73		
		0.20	85.7	174.7	73.1		35.64		
		0.25	92.1	179.2	65.5		35.54		
		0.30	67.6	122.3	57.7		35.64		
		0.35	76.7	194.2	114.1		35.82		
		0.40	62.1	141.2	92.3		35.82		
		0.45	63.9	140.8	86.5		35.80		
		0.50	79.9	157.3	68.2		35.64		
YRVD	39x	0.05	67.2	164.4	89.5	39	38.82	82	
		0.10	106.7	328.9	142.1		388.2		
		0.15	118.1	326.2	113.4		38.73		
		0.20	127.4	326.6	97.5		38.64		
		0.25	136.0	330.2	86.4		38.54		
		0.30	100.5	228.6	76.9		38.64		
		0.35	113.7	361.8	151.4		38.82		
		0.40	92.0	263.1	122.5		38.82		
		0.45	94.3	260.7	114.6		38.80		
		0.50	118.8	293.9	90.9		38.64		

Terms used in tables	C0a Static load capacity	d0 Nominal diameter
P Lead (travel per revolution)	F_k Rigidity factor	d2 Thread root diameter
D Reference diameter	d1 External diameter	D1 Mini external diameter
Ca Dynamic load capacity		

■ **Bearing units for planetary roller screws - Standard types of assembly available**



● **Nominal fatigue lifetime for axial load bearings:**

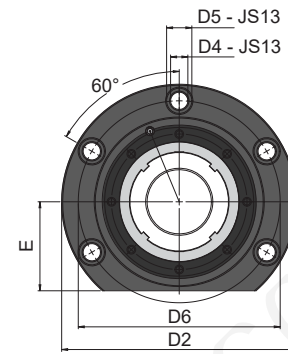
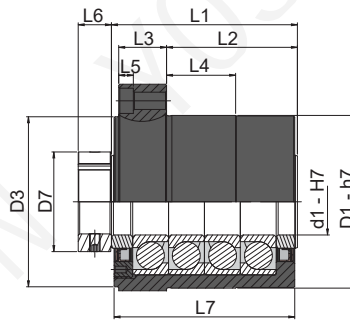
$$L_{10} = \left(\frac{C_a}{F_m} \right)^3 \text{ revolutions} \quad \text{Respectively} \quad L_h = \frac{L_{10}}{n_m \cdot 60} \text{ [h]}$$

● **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 equivalent mean axial load 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.

$$L_{10(1)} = \left(\frac{C_{a1}}{F_{ma(1)}} \right)^3 \cdot 10^6 \text{ revolutions} \quad L_{10(2)} = \left(\frac{C_{a2}}{F_{ma(2)}} \right)^3 \cdot 10^6 \text{ revolutions} \quad L_{10} = \left(L_{10(1)}^{-10/9} + L_{10(2)}^{-10/9} \right)^{-9/10} \text{ revolutions}$$

■ BU - Bearing units for roller screws

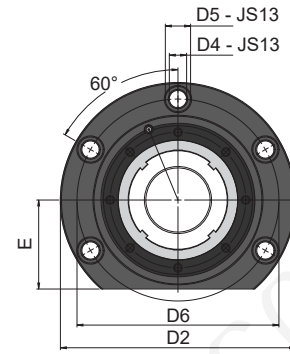
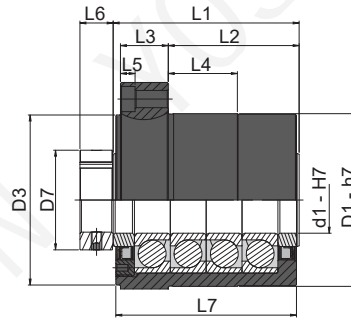


HOUSING			DIMENSIONS															EQUIVALENT AXIAL LOAD RATINGS					
Family	n°	Bearings arrangement Types	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]	[kN]	[kN]	[kN]	[Nm]
			∅ d1	∅ D1	∅ D2	∅ D3	∅ D4	∅ D5	∅ D6	∅ D7	L1	L2	L3	L4	L5	L6	L7	E	Ca 1	C0a 1	Ca 2	C0a 2	Mv
BU	1	1+1	12	47	77	47	6.6	11	63	22	42	25	12	10	2	8	40	27	13.0	13.7	13.0	13.7	15
BU	2	1+1	17	60	92	57	6.6	11	76	28	46	32	12	15	2	10	44	32	24.9	27.7	24.9	27.7	22
BU	3	1+3	20	60	92	58	9	14	74	38	77	60	15	27	2	20	74	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+31	25	80	122	74	11	17	100	45	89	68	19	33	3	20	86	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	144	94	13	19	120	58	110	82	25	42	5	22	106	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	177	128	13	19	152	75	140	98.5	36	52	11	25	136	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									213.8	384.6	283.9	576.9	163	163	131.6	192.3	347.2	769.2			
		2+3									283.9	576.9	213.8	384.6									
		3+2									347.2	769.2	131.6	192.3									
BU	7	1+3	65	170	230	164	17	25	198	105	180	133.5	41	50	11	32	175	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	1261.5	208	208	193.0	315.4	509.3	1261.5			
		2+3									313.5	630.8	416.4	946.2									
		3+2									416.4	946.2	313.5	630.8									
		4+1	509.3	1261.5	193.0	315.4																	

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

Terms used in tables
Ca Dynamic load capacity **Mv** Tightening torque for precision nut
C0a Static load capacity

■ BU - Bearing units for roller screws

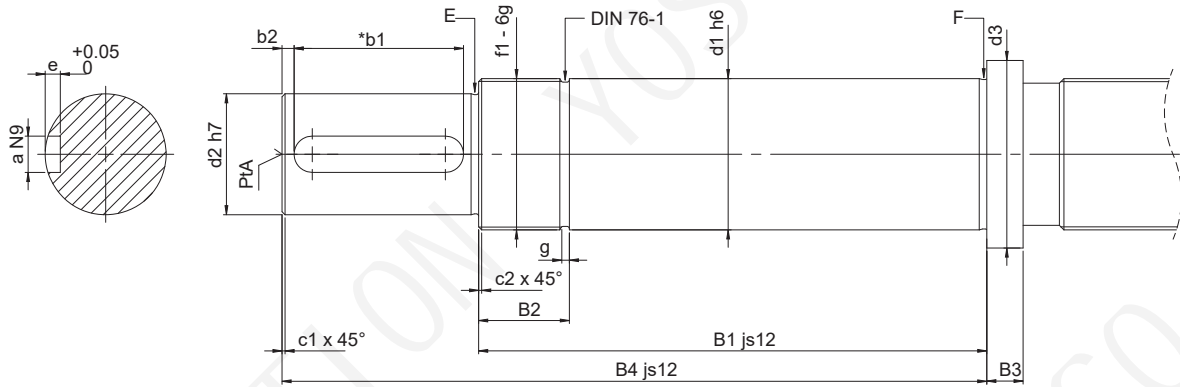


HOUSING		Bearings arrangement	DIMENSIONS														EQUIVALENT AXIAL LOAD RATINGS						
Family	n°		Types	∅ d1	∅ D1	∅ D2	∅ D3	∅ D4	∅ D5	∅ D6	∅ D7	L1	L2	L3	L4	L5	L6	L7	E	Ca 1	C0a 1	Ca 2	C0a 2
BU	8	1+3																	315.8	596.2	681.4	1788.5	300
		2+2									235	179						229	513.0	1192.3	513.0	1192.3	
		3+1																	681.4	1788.5	315.8	596.2	
	8L	1+4	90	220	292	215	22	32	252	130			48	94	13	38		115	315.8	596.2	833.4	2384.6	
		2+3									278	222						272	513.0	1192.3	681.4	1788.5	
		3+2																	681.4	1788.5	513.0	1192.3	
	4+1																	833.4	2384.6	315.8	596.2		
BU	9	1+3																	375.4	757.7	810.1	2273.1	400
		2+2									253	195						245	609.9	1515.4	609.9	1515.4	
		3+1																	810.1	2273.1	375.4	757.7	
	9XL	1+5	100	250	330	240	25	38	285	140			50	109	14	38		130	375.4	757.7	1158.3	3788.5	
		2+4																	609.9	1515.4	990.8	3030.8	
		3+3									347	289						339	810.1	2273.1	810.1	2273.1	
		4+2																	990.8	3030.8	609.9	1515.4	
		5+1																	1158.3	3788.5	375.4	757.7	

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

Terms used in tables
Ca Dynamic load capacity **Mv** Tightening torque for precision nut
C0a Static load capacity

End shafts dimensions



HOUSING		END SHAFTS DIMENSIONS																		
Family	n°	∅ d1 [mm]	∅ d1 [mm]	∅ d3 [mm]	B1 [mm]	B2 [mm]	B3 [mm]	B4 [mm]	∅ f1 [mm]	c1 [mm]	c2 [mm]	g [mm]	E [mm]	F [mm]	b1 [mm]	b2 [mm]	a [mm]	e [mm]	Pta [mm]	
BU	1	12	10	17	51	10	5	71	M12×1	0.5	0.7	1.5	0.4×0.2	0.4×0.3	16	1.5	3	1.8	1.6-3.35	
BU	2	17	15	23	66	21	5	96	M17×1	0.5	0.7	1.5	0.6×0.2	0.6×0.2	25	2	5	3	2-4.25	
BU	3	20	17	27	98	22	7	138	M20×1	0.5	0.7	1.5	0.6×0.2	0.6×0.2	32	3	5	3	2-4.25	
BU	4	25	20	34	111	24	7	156	M25×1.5	0.5	1	2.5	0.6×0.2	0.6×0.2	40	2.5	6	3.5	2.5-5.3	
BU	5	35	30	45	134	26	10	189	M35×1.5	1	1	2.5	0.6×0.2	0.6×0.2	45	2.5	8	4	3.15-6.7	
BU	6	50	40	62	168	30	12	233	M50×1.5	1	1	2.5	0.8×0.3	0.8×0.3	56	4	12	5	3.15-6.7	
	195				260															
BU	7	65	60	78	215	37	18	315	M65×2	1	1.5	4	1×0.4	1.6×0.3	90	3	18	7	4-8.5	
	248				348															
BU	8	90	85	108	275	43	25	395	M90×2	1	1.5	4	1.6×0.3	1.6×0.3	100	8	25	9	6.3-13.2	
	318				438															
BU	9	100	95	120	293	43	25	433	M100×2	1	1.5	4	1.6×0.3	1.6×0.3	125	7	25	9	6.3-13.2	
	387				527															



* Tolerances in accordance with standard DIN 6885-1



YOSO German quality, Industrie 4.0 best platform



Long life



High load



High efficiency

YOSO is committed to the R&D and manufacturing of high-performance planetary roller screws.

Jingpeng Machinery Equipment (Shanghai) Co., Ltd.

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