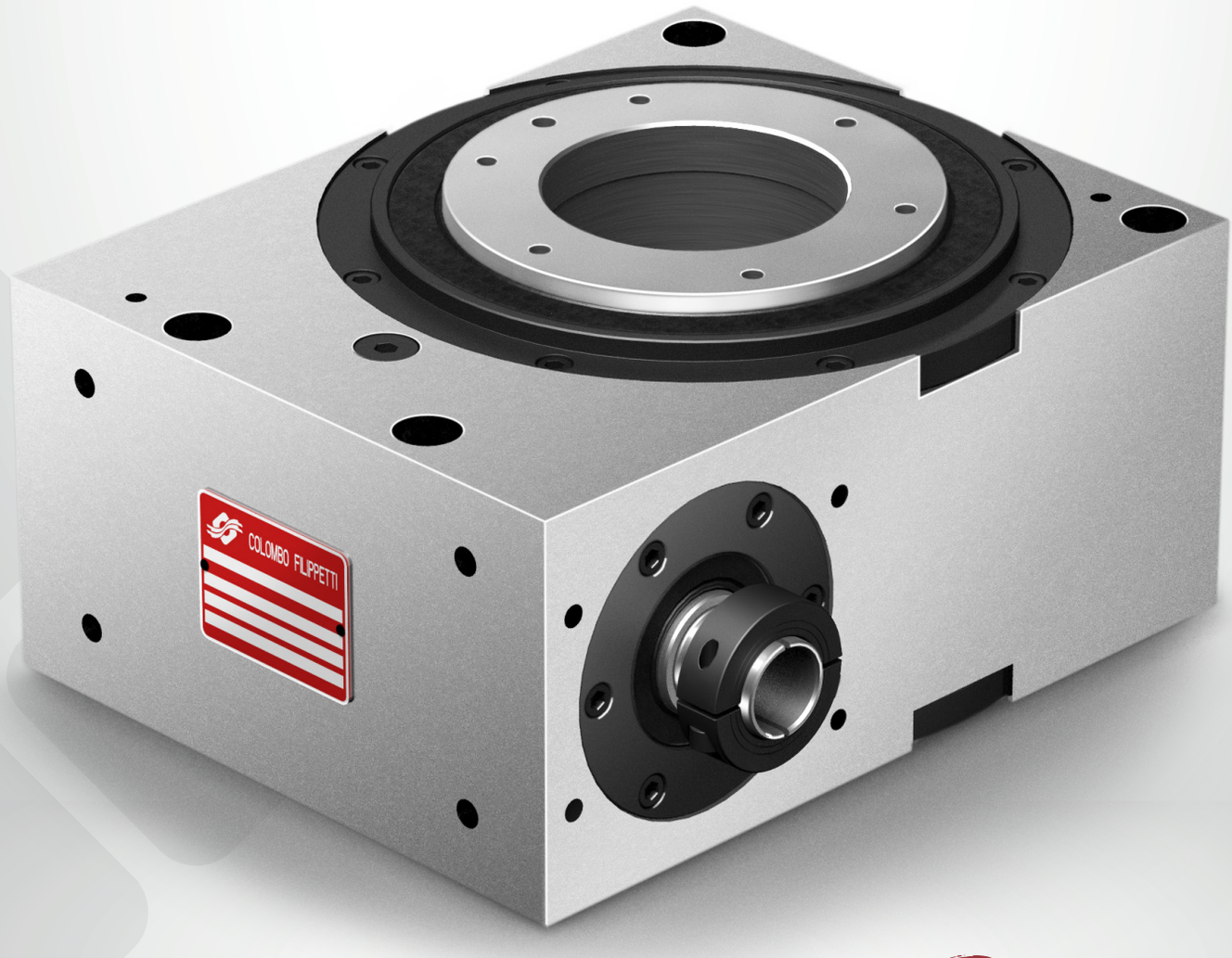
CoFIL GO

Smart Automation

SRP
Servo Roller Positioner

TECHNICAL CATALOGUE



Empowering your Servo

CoFIL
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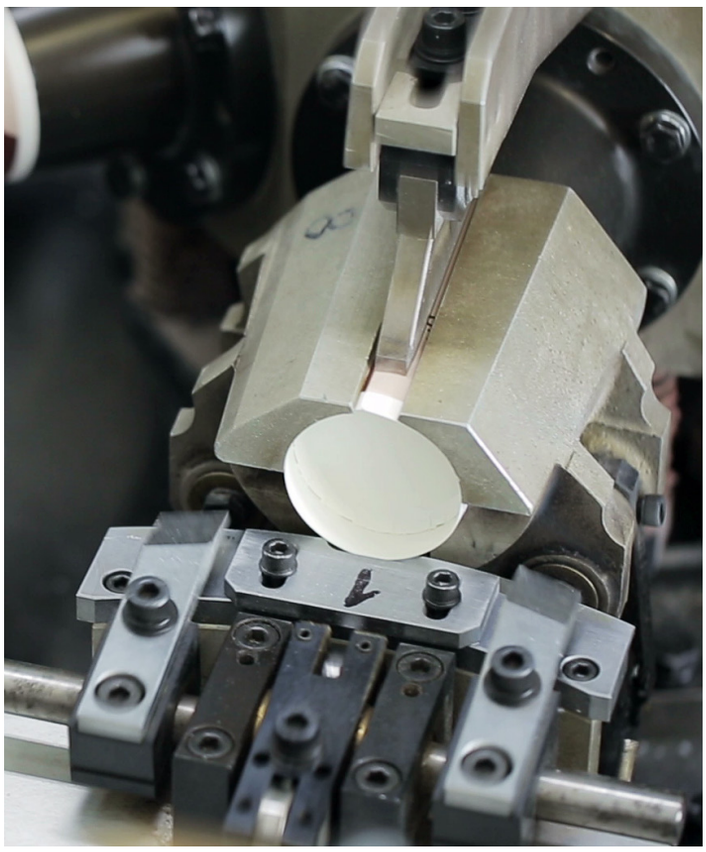
Why?



The world of servo-driven tables is the connection between electronic and mechanical disciplines. The SRP table allows the machine designer to manage the know-how of the system and maintain full control over it. At the same time, it allows full flexibility of use, thus allowing the Electronic Operator to perfect the tuning of the machine and enhance its combination of mechanical and electronic features. The high versatility and flexibility of this table helps the increasingly pressing market demands for the reduction of development times and time-to-market.

The SRP field of use crosses all industries: from automotive to medical and from packaging to filling. The SRP table can work in a wide range of conditions, involving extremely low speeds as well as high speeds with medium-high loads. The optimized cam profile allows a fluid and precise movement and the large central through-hole on the output disc allows a comfortable passage for the interlocks and supplies required for the system operation.

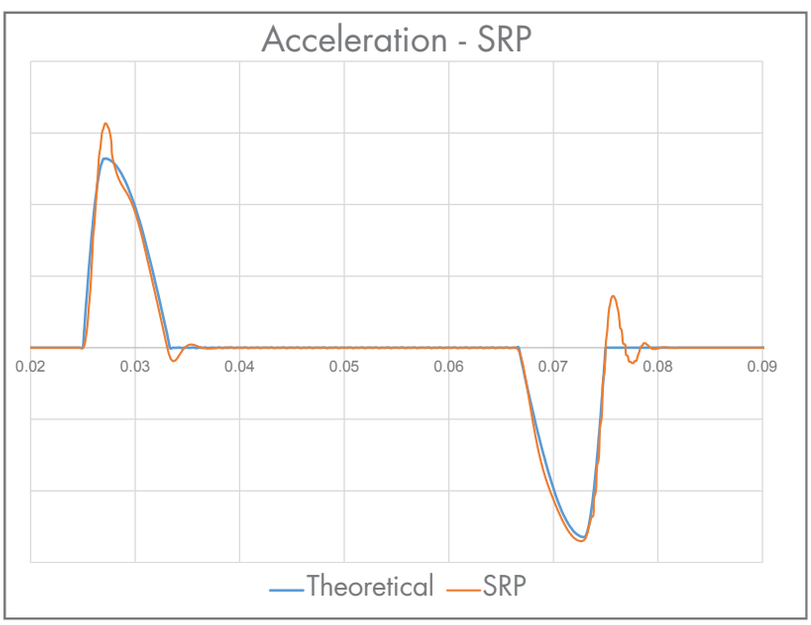
The value of displacement accuracy

Generally, the good operation of a mechanical system is a function of controlling key factors such as backlash and elasticity of the system, whilst respecting the assigned movement.
The SRP rotary table, with orthogonal axes, was designed and manufactured to allow achieving these goals. The SRP is a constant velocity rotary table, with no backlash and with high mechanical rigidity.
These features can easily be appreciated in terms of system controllability and positioning accuracy, as shown in the charts.

Mechatronics application with SRP

Advantages:

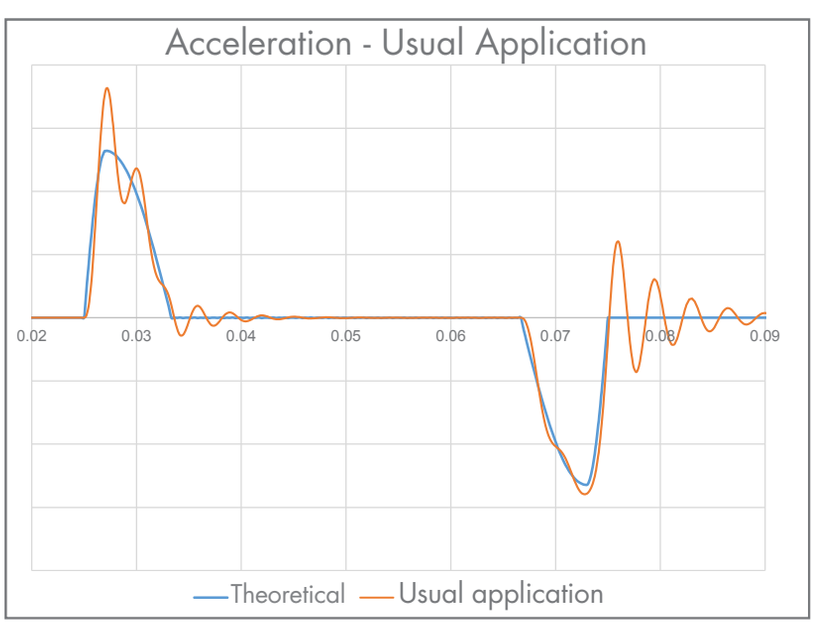
- High positioning accuracy
- Better controllability of the motor
- Minimization of vibration and overshooting effects



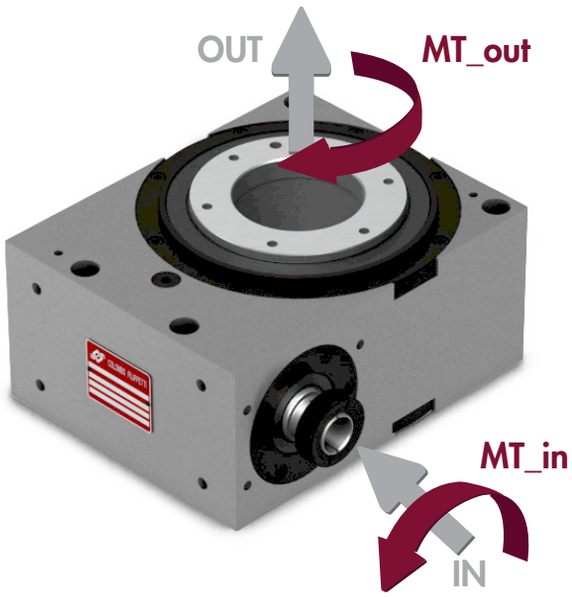
Traditional mechanical application

Limits:

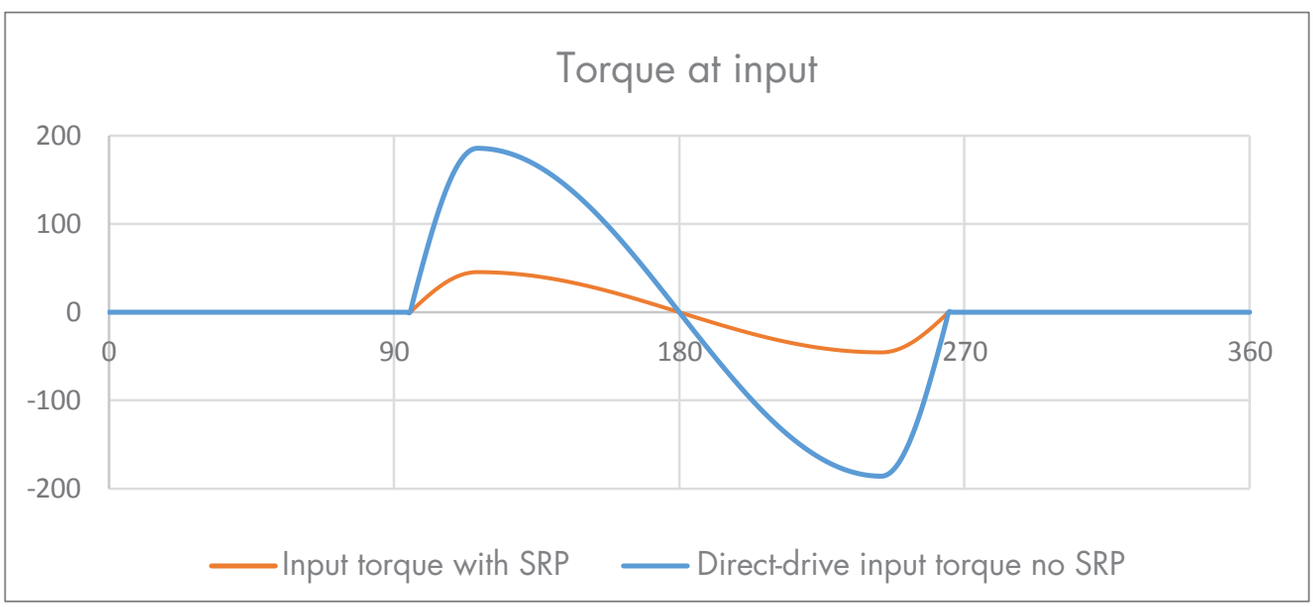
- Excessive deviation of the actual trajectory with respect to the expected theoretical one
- Reduced positioning accuracy
- Introduction of unwanted vibrations into the system

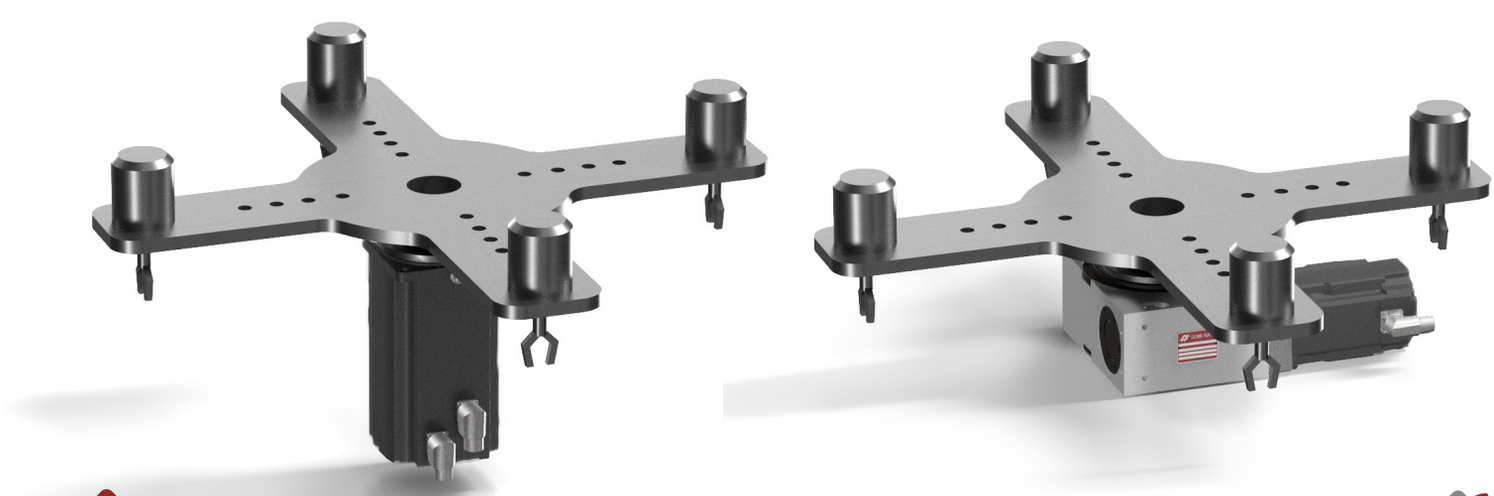


Enhancement of motor performance



One of the tasks for a machine designer is to create an energy efficient and effective system using the resources available, thus minimizing the average power demand of the system. This operation, for example, involves the homogenization of the electricity demand for the control of the motor and, therefore, of the application. Considering this, the SRP effectively reduces the inertia of the application with the square of its internal ratio, thus allowing the motor to enhance its mechanical features and control the system more efficiently.

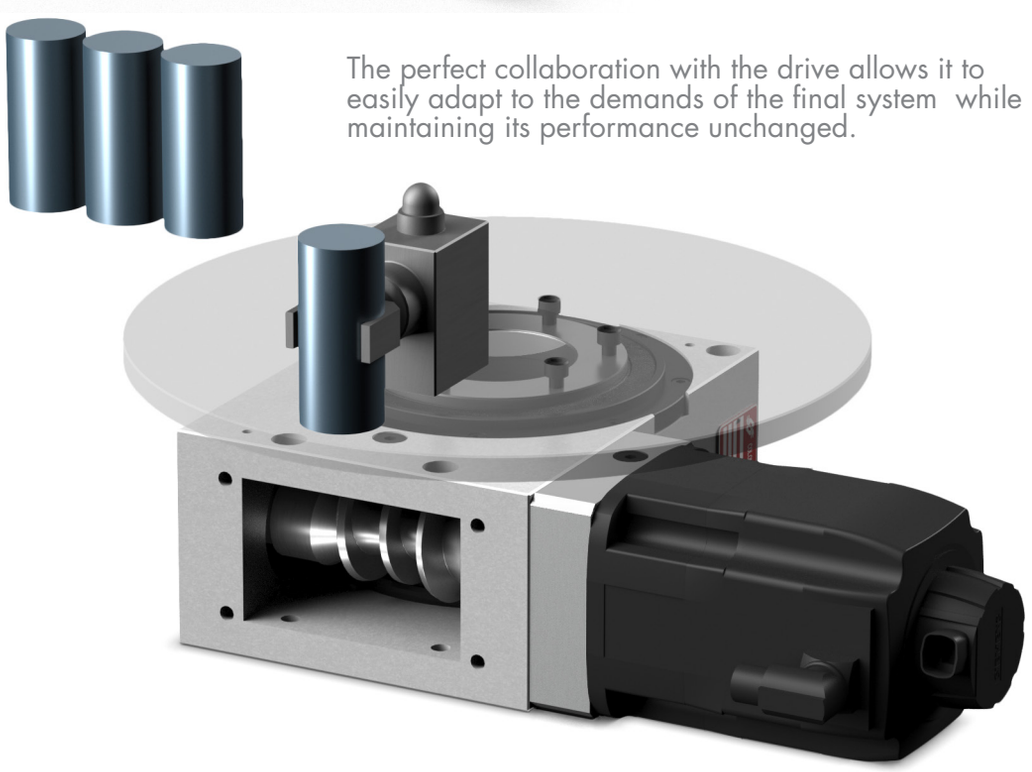




Versatility of application

The compact and symmetrical design, the possibility to vary at will the law of motion and the large central through-hole make this table suitable for any situation and field of application.
This flexibility allows the configuration of a unique machine, permitting any subsequent project change or variation required by the end-user.

The high accuracy, the absence of backlash throughout the movement and the high rigidity allow it to work in applications requiring very close tolerances and high production rates.

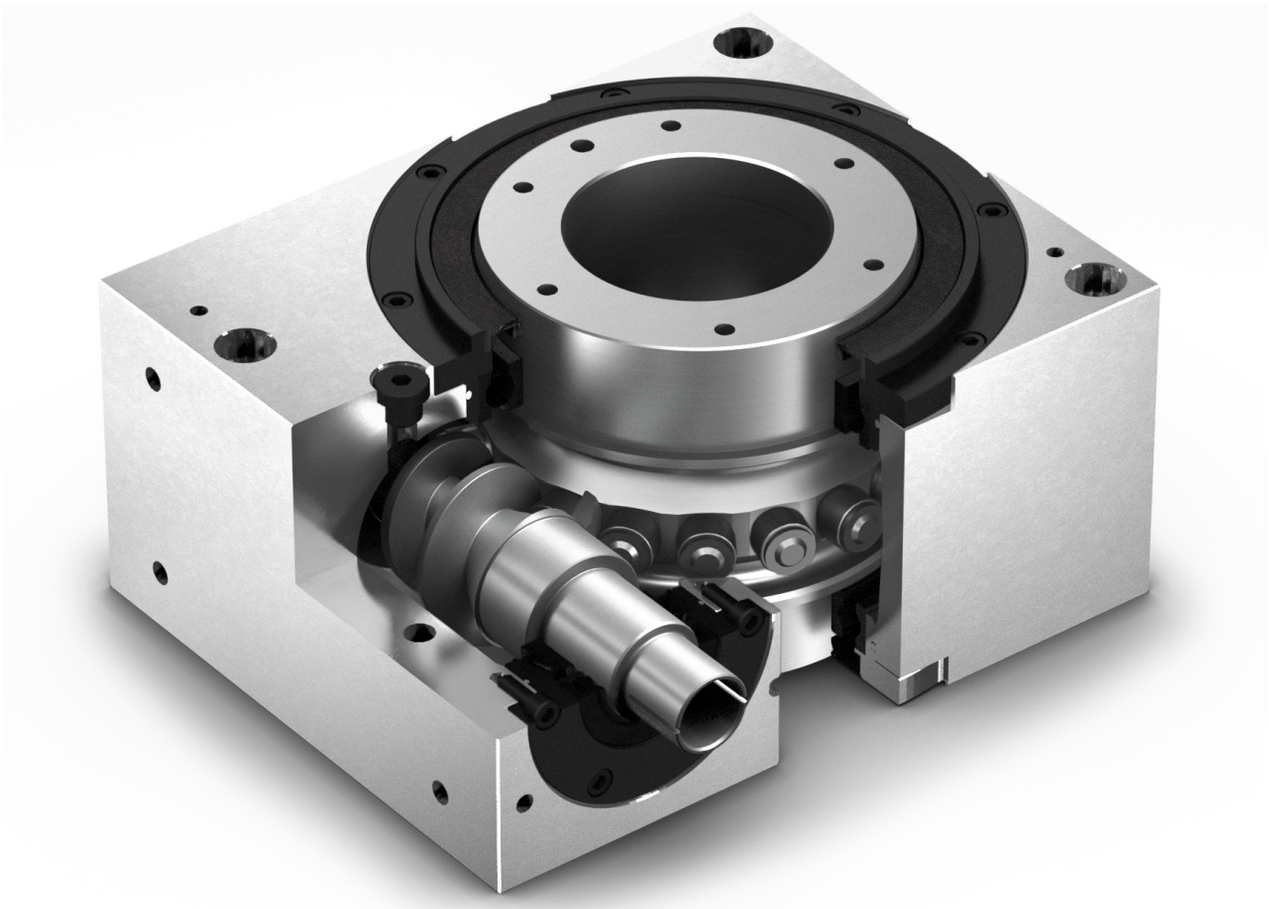


The perfect collaboration with the drive allows it to easily adapt to the demands of the final system while maintaining its performance unchanged.

Benefits of use - example

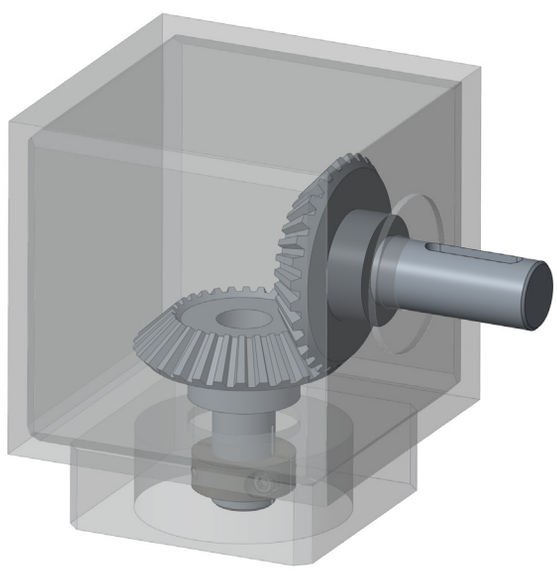
SRP

- Operation with no backlash
- Minimization of the mechanism noise
- Very high operating accuracy
- Low volume for the same load, minimal design impact when building into the machine



Gearbox

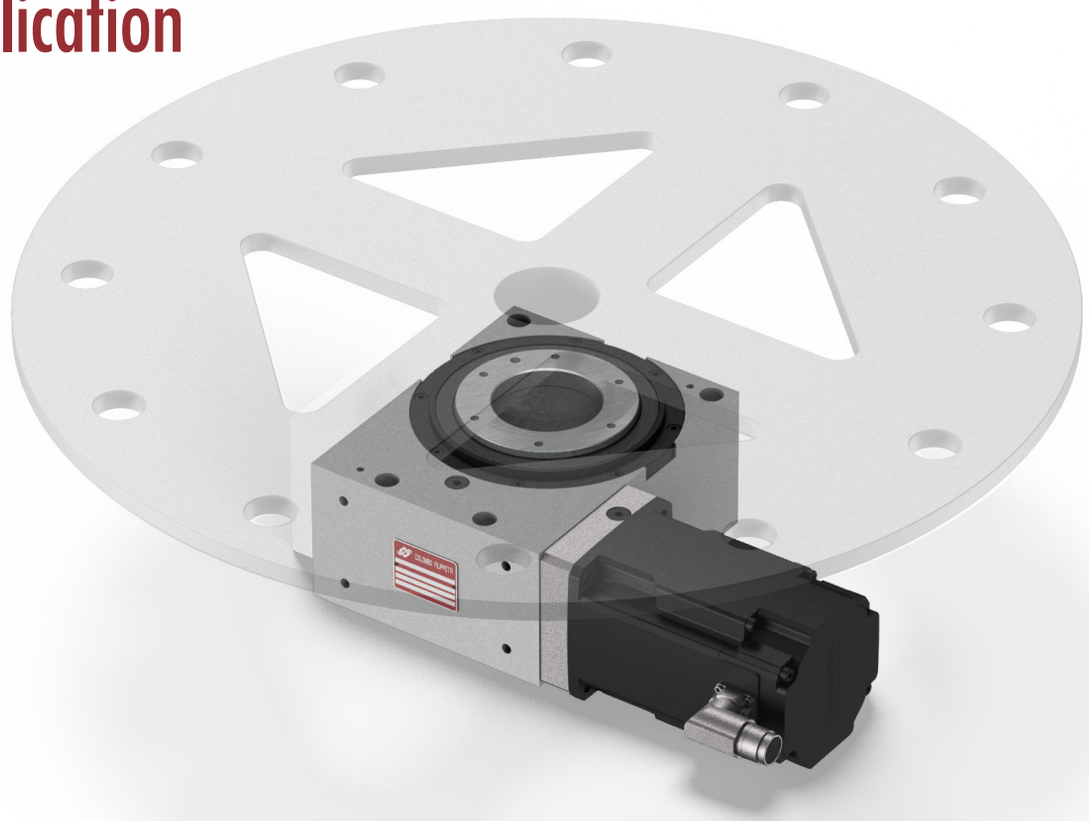
- Operation with backlash or with reduced backlas
- Low positioning accuracy
- Noise generated by reducing the backlash in high dynamic solutions



Benefits of use - example

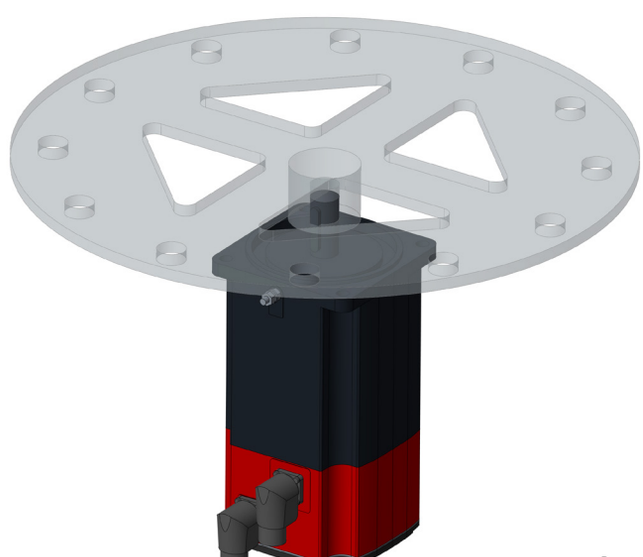
SRP Interposed between the motor and the application

- Lower motor torque required
- Reduced error referred from the motor (1/20)
- Reduced application inertia, greater system controllability
- Significant reduction of the overshooting effects



Direct motor

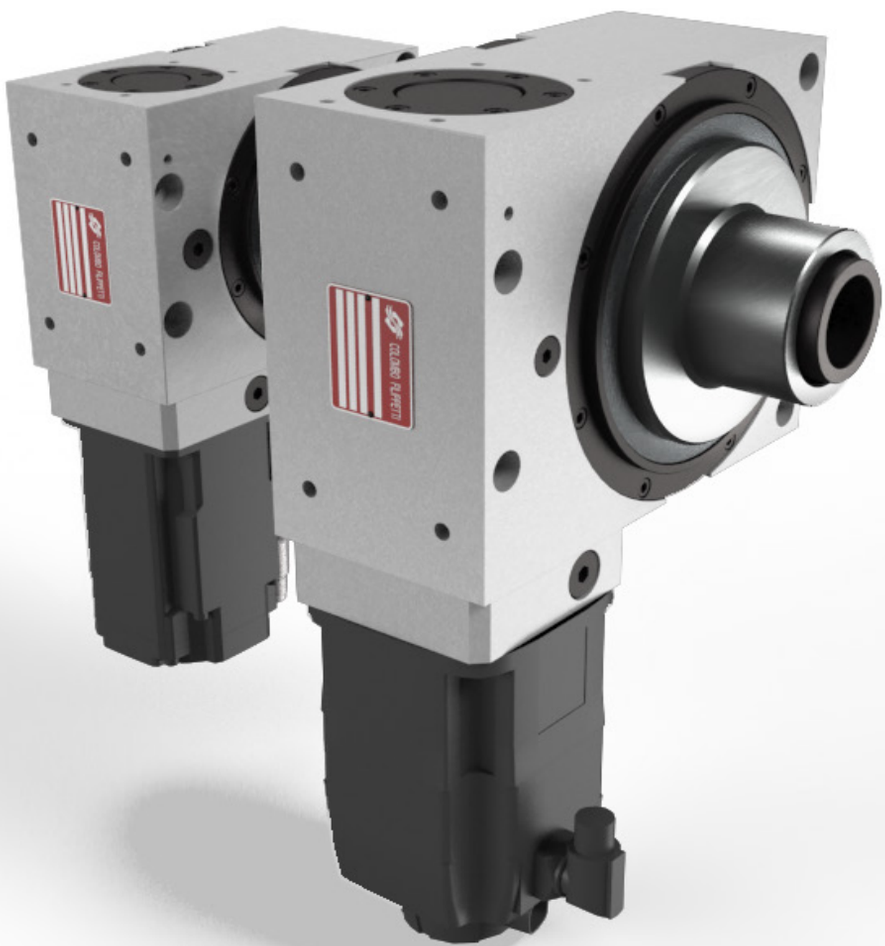
- Use of a motor with high torque and power
- Use of a drive controller capable of managing the demand for high torque and power
- Possible overshooting in conditions of high dynamics
- High thermal energy losses



Benefits of use - example

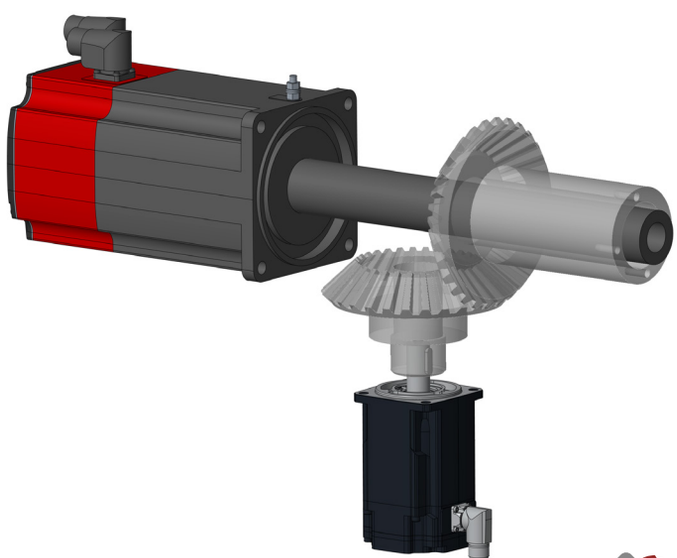
SRP coaxial outlet

- Possibility of axially linking two or more independent motions
- Through hole to allow for shafts or accessory cables
- High positioning accuracy for each output axis



Coaxial outputs

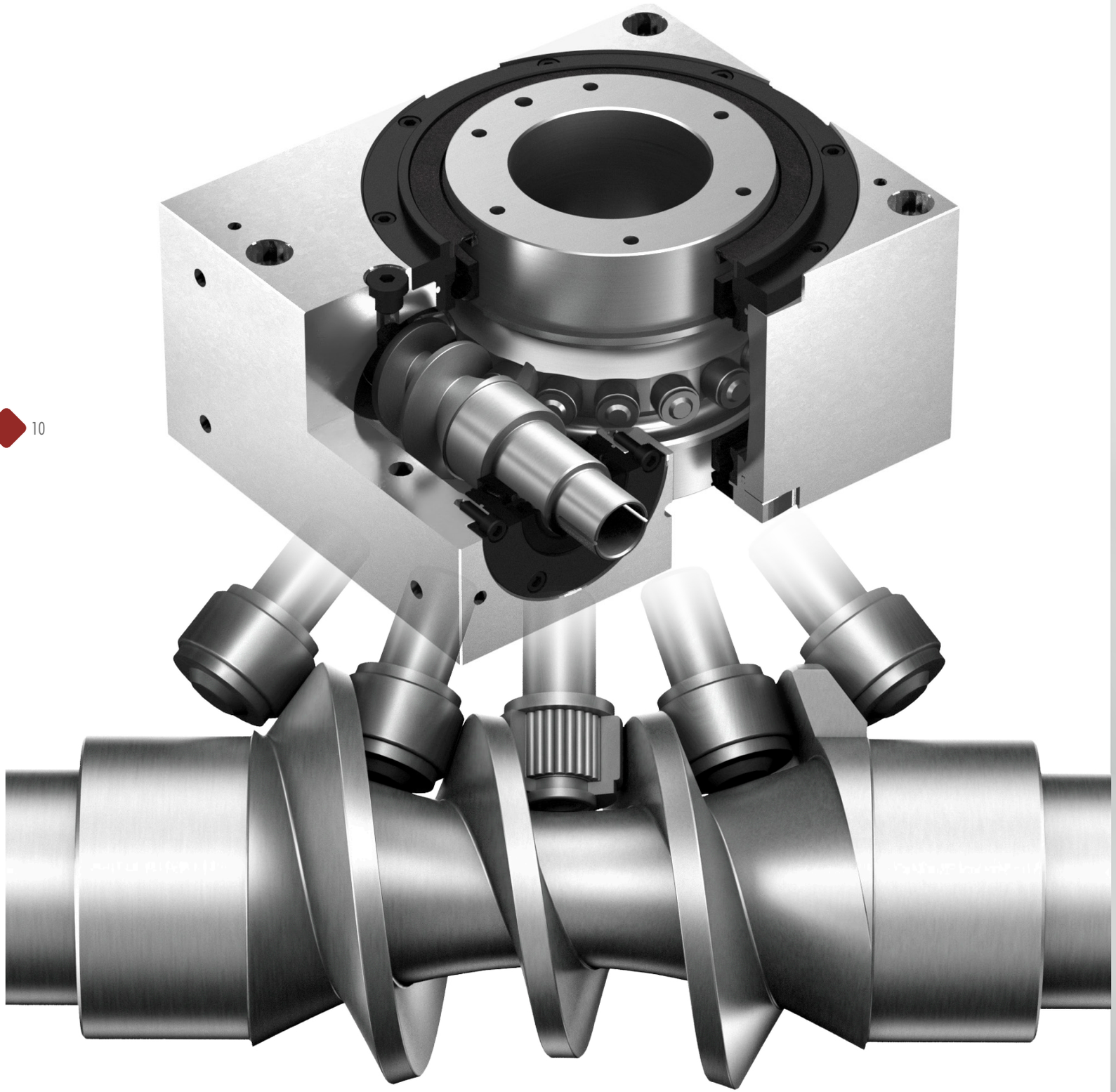
- Use of angular transmissions
- Introduction of backlash makes it unsuitable for axis tracking operations
- Impossible to specify a through-hole coaxial with the output axis



General Information

SRP63 - SRP100 - SRP150

SERVO-ROLLER POSITIONERS are rotating roller positioners with a constant-velocity globoidal cam and no backlash.
The globoidal cam moves in output disc on which the needle rollers are installed and are preloaded together in order to guarantee the total absence of backlash in any position of the cam.
The tables are available in 3 sizes: SRP63, SRP100 and SRP150.



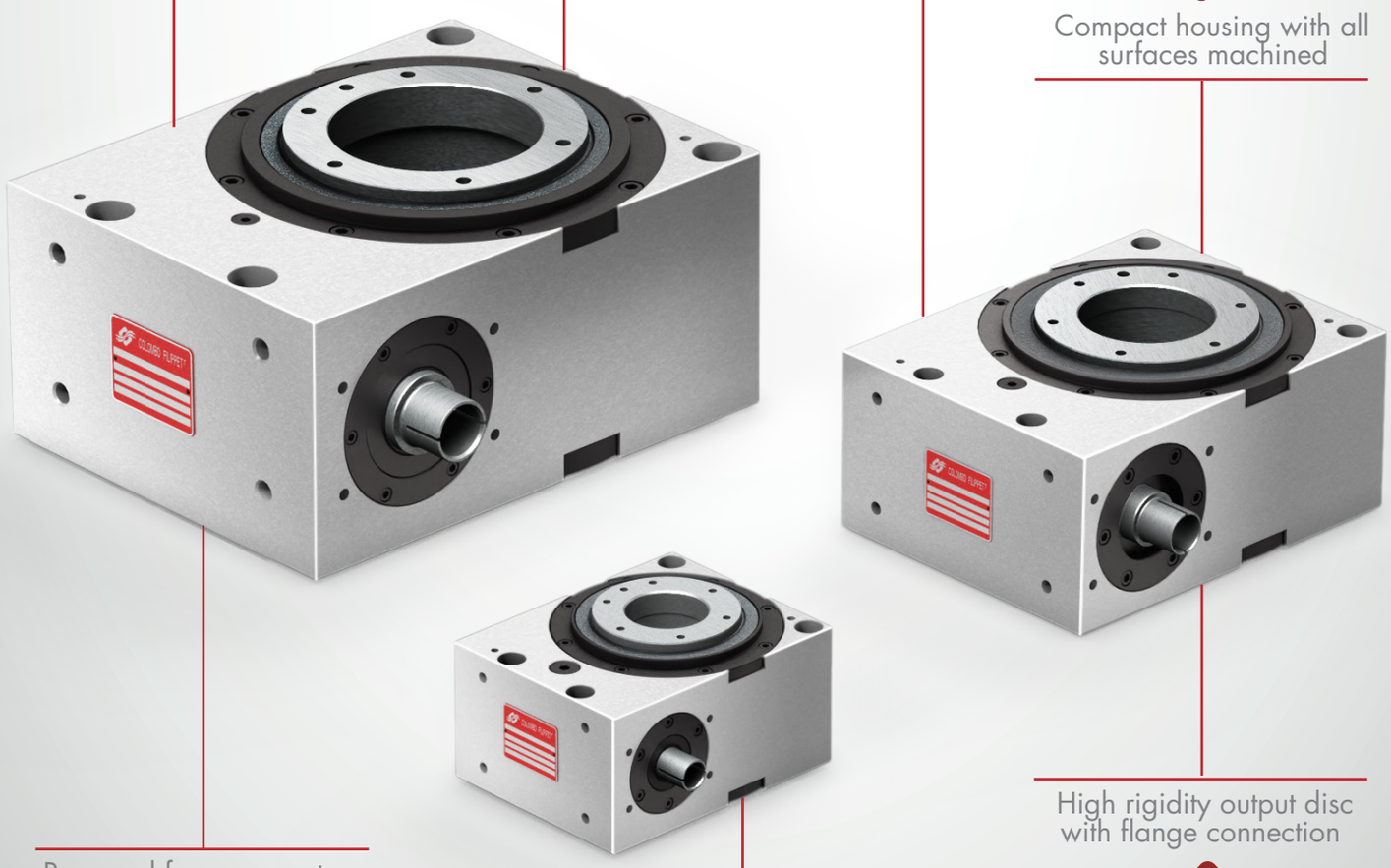
SRP63 - SRP100 - SRP150

Maximum flexibility of the output motion

High accuracy

Installation in any position

Compact housing with all surfaces machined



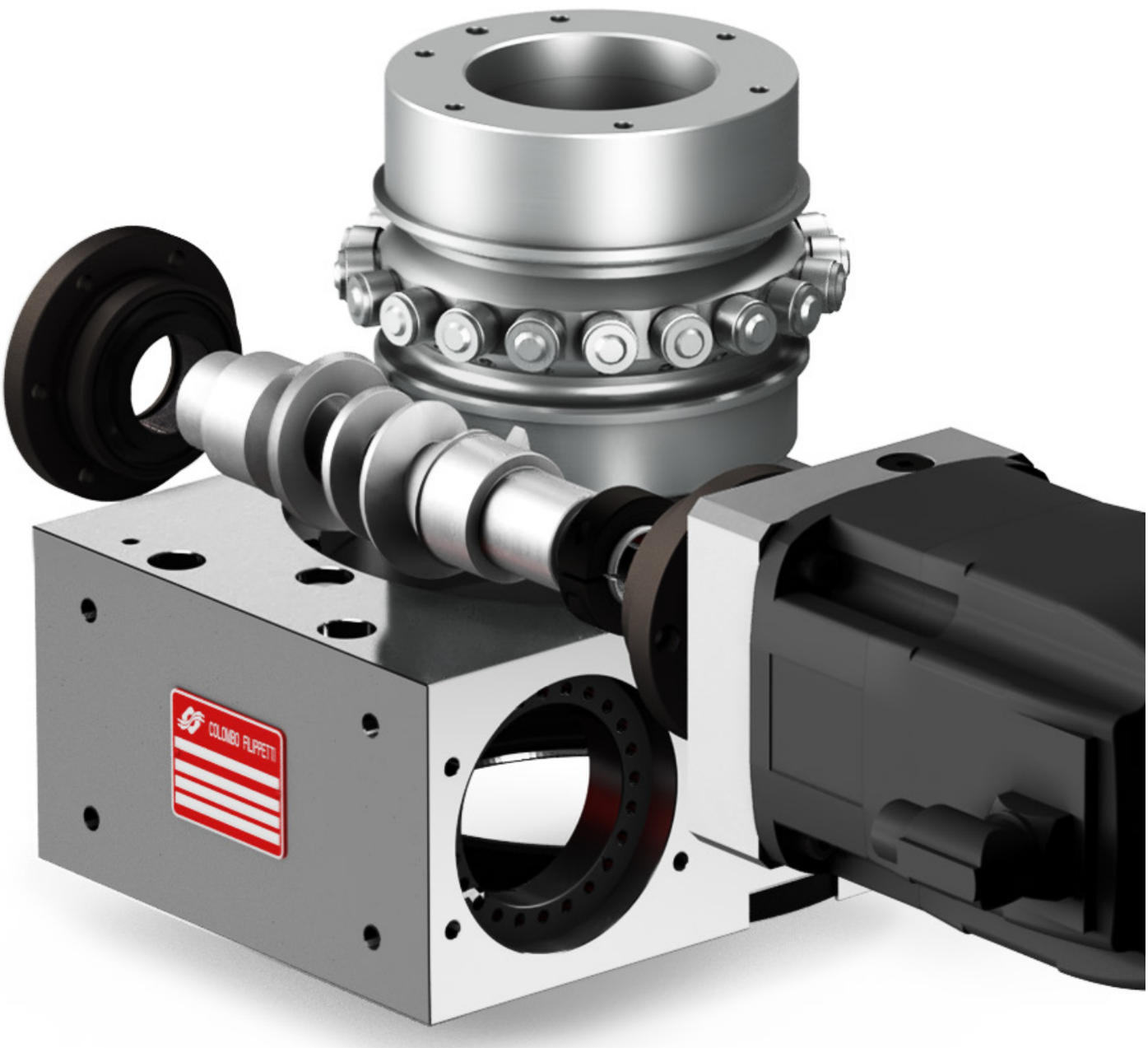
Prepared for servo-motors with user programmable movement

Large central through-hole

High rigidity output disc with flange connection

Servo-roller Positioner

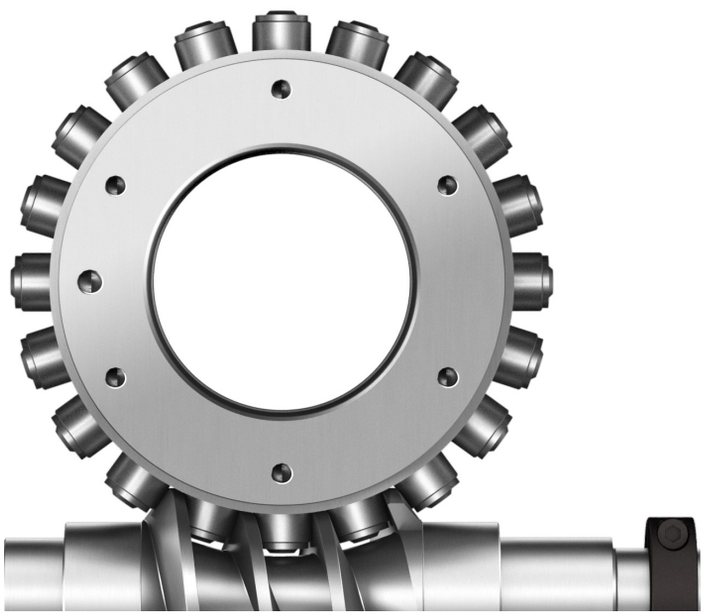
The preloading system, the absence of backlash and the needle rollers guarantee a regular movement along the entire operating cycle, a high rigidity and repeatability of positioning, high yields accompanied by a long life and very low maintenance. The servo-motor fitted on the cam input shaft and secured directly on the side of the box allows free programming of the table, with total control of its movement and speed and the acceleration of the output disc, as well as all the dynamic and kinematic parameters enabled by the drive selected.



Servo-roller Positioner

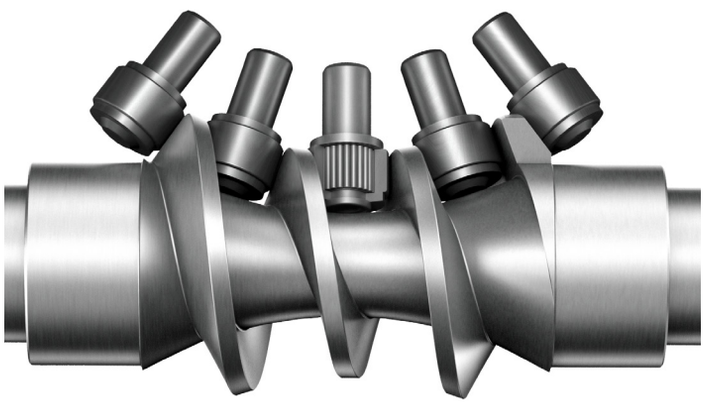
Setting

Mechanism with orthogonal axes preloaded with no backlash. The cam profile has been optimised to ensure uniform and constant contact of the wheels in any position of the cam



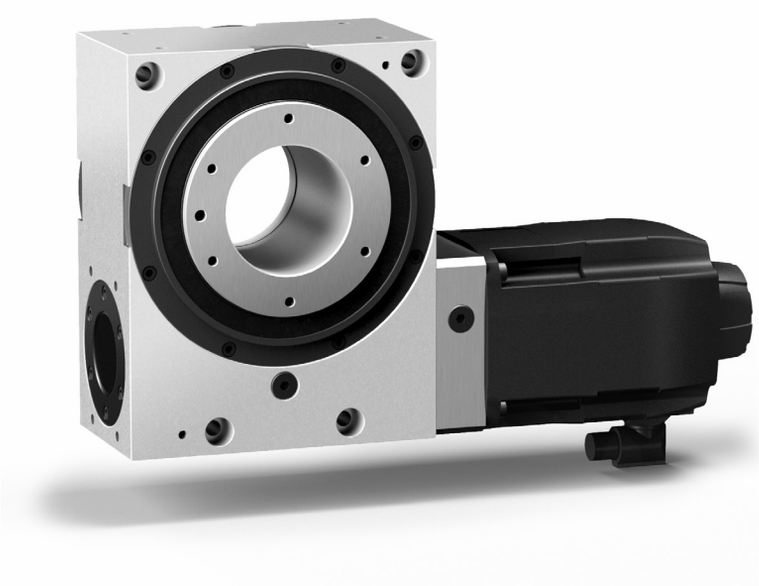
Needle rollers

The use of needle rollers combined with an optimized profile section cam allows low moving friction torques and reduced first detachment torques.



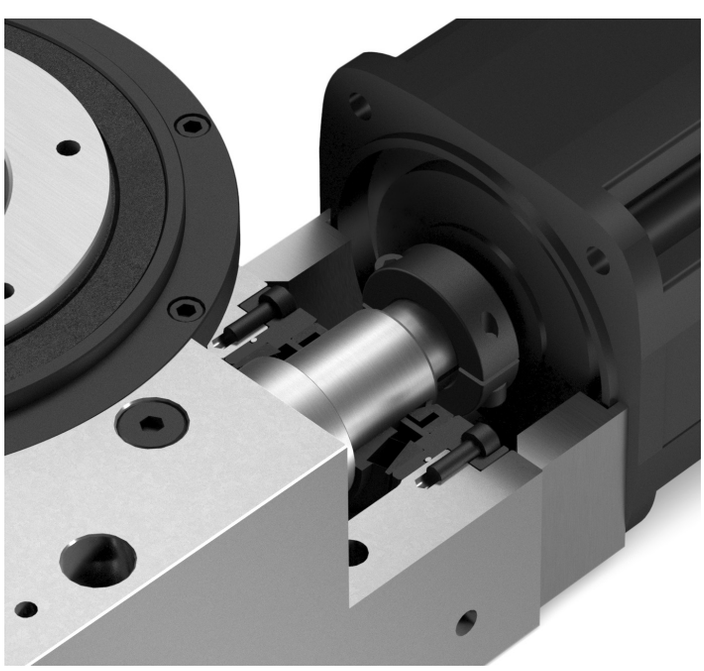
Through-hole

The large through-hole in the output disc allows easy passage of control and power systems, as well as shafts and other equipment, providing maximum design freedom.



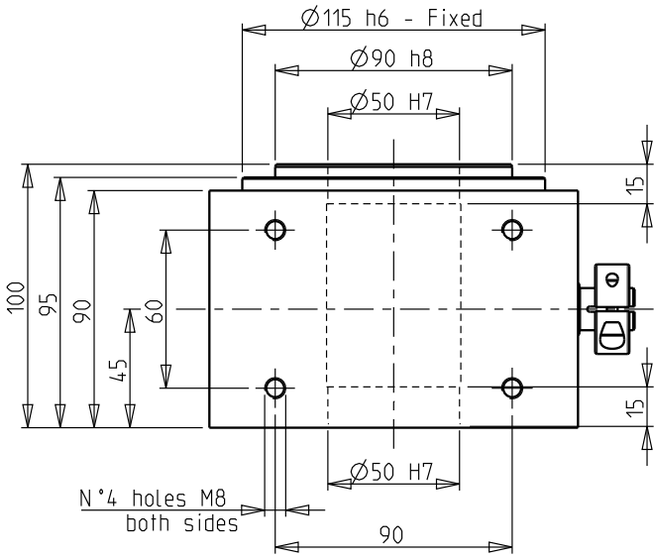
Direct connection to the motor

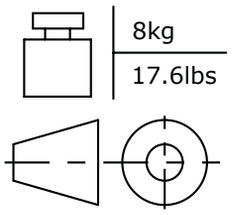
The motor can be easily connected to the table by means of a clamp. This solution minimizes the inertia on the motion axis, thus favouring its control and the complete absence of any backlash.

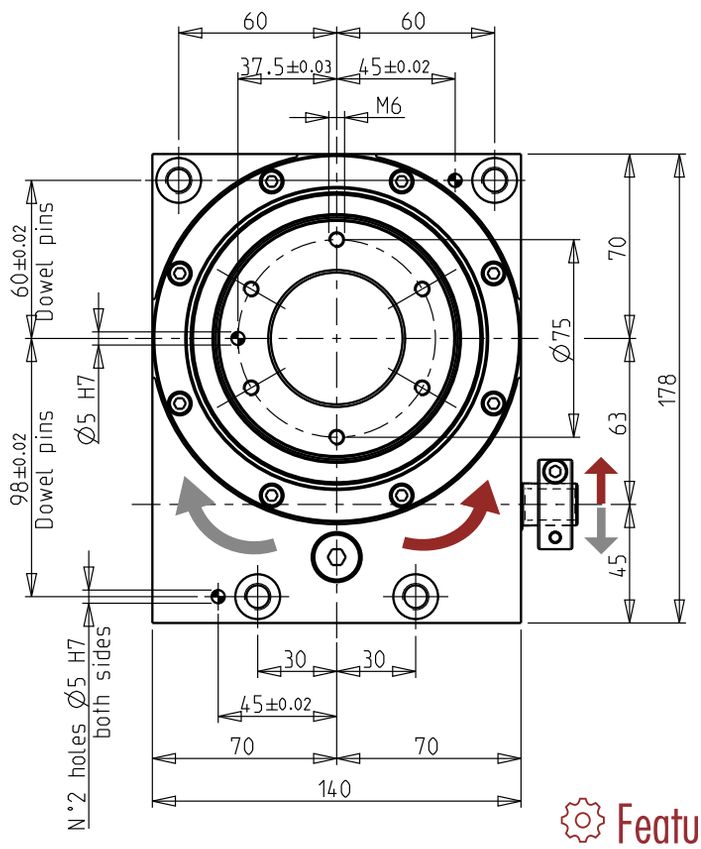


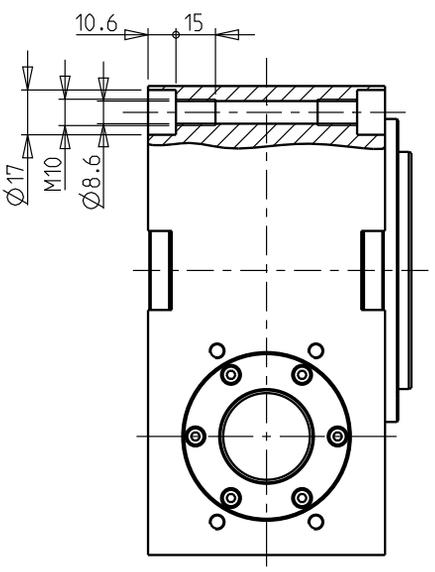
SRP63

Overall dimensions









Notes

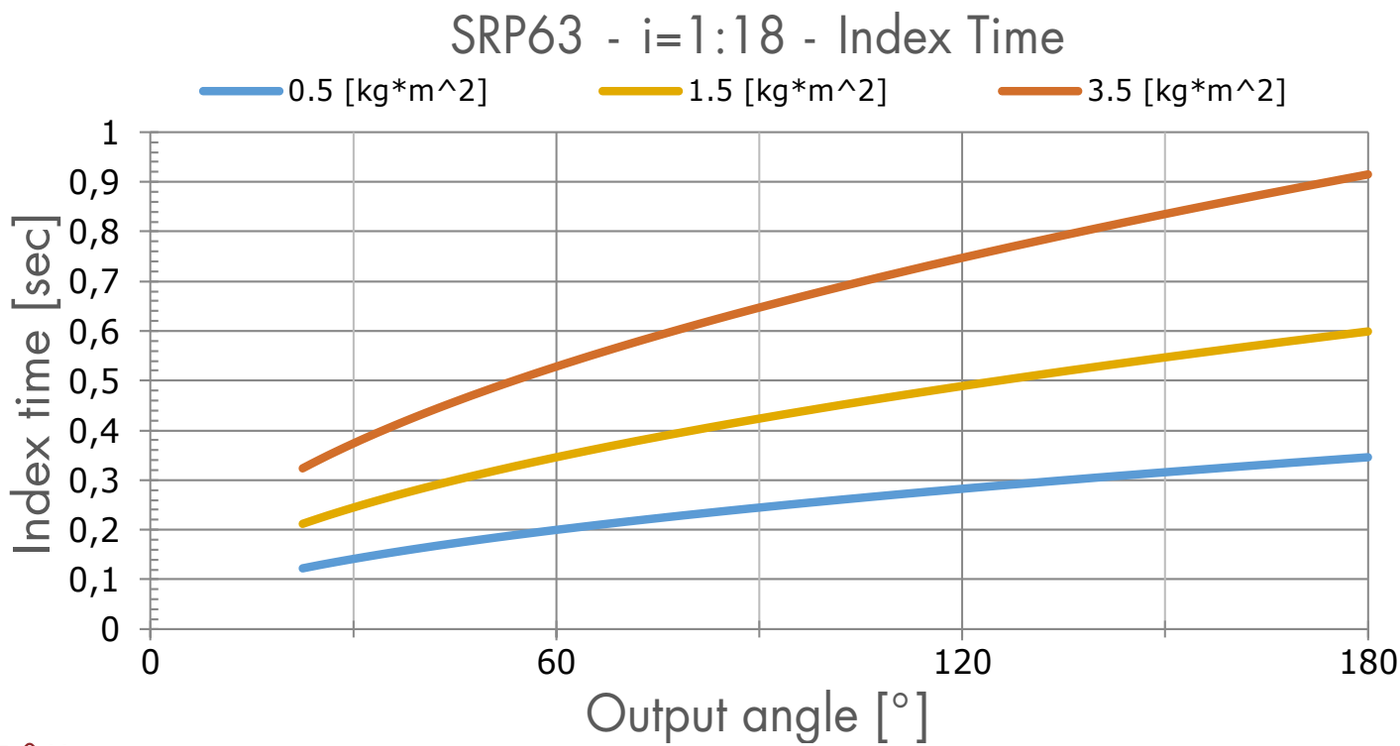
- By reversing the rotation direction of the input shaft the rotation direction of the output disc is reversed.
- Direction of rotation as indicated by the arrows in the drawing.
- The two H7 dowel pin holes in the top and bottom housing surfaces are referenced to the through-hole of the output disc.
- Motor shaft without feather key.

Features

Reduction ratio	1:18
Maximum output torque	105 Nm
Maximum input speed	3000 rev/min
Maximum input torque	5.8 Nm
Inertia at the input shaft	6.46*10^-5 kgm^2
Concentricity of the output disc	0.02 mm
Flatness of the output disc	0.01 mm

SRP63

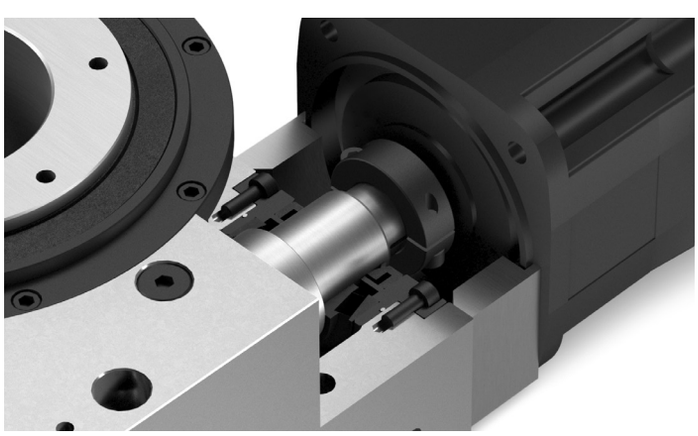
Selection



Note

The curves shown in the selection chart refer to theoretical working conditions. For an appropriate selection and use of the mechanism, it is required to take into account the dynamics of the system and the installed motor.
The curves above are calculated based on a trapezoidal motion law with 33% of constant velocity.

Motorization interface



Note

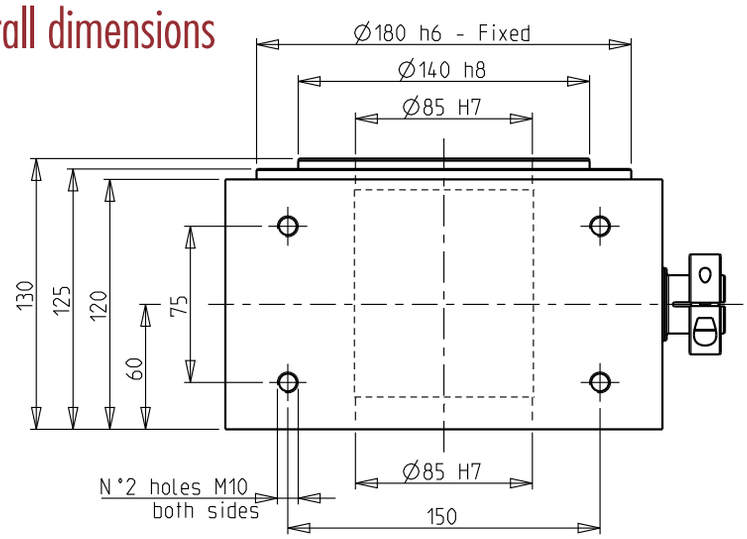
The interface flange and the clamping device are supplied with the mechanism for an easy and quick installation of the motorization on the table.
(The motor is not supplied)

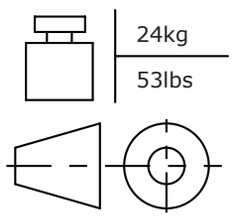
Optional motor shaft dimensions

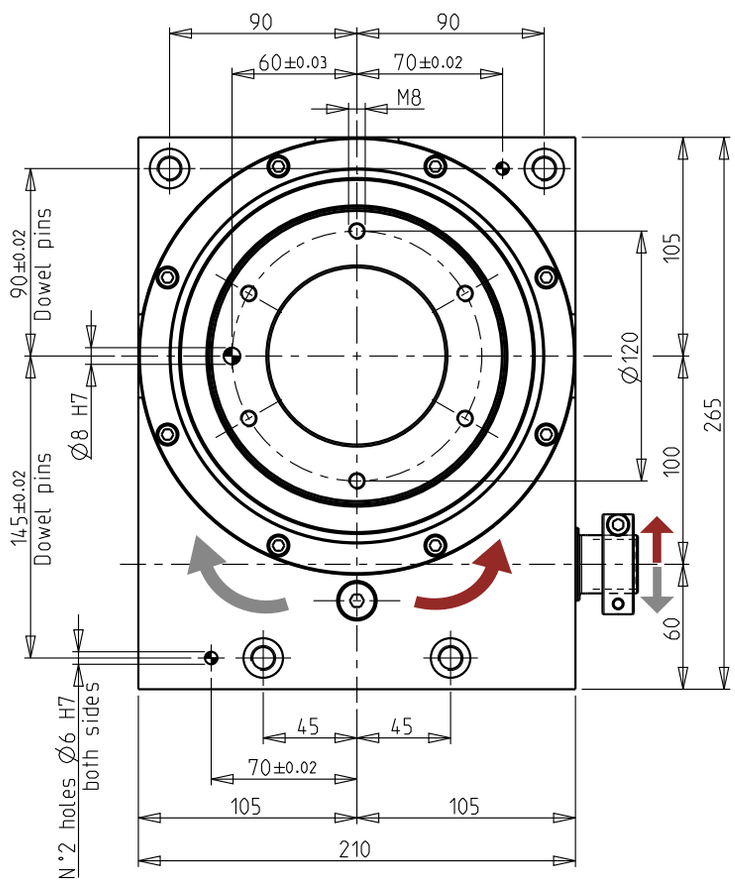
A type	B type
Hollow shaft diameters: 12 - 13 - 14 - 16mm	Hollow shaft diameters: 8 - 9 - 11mm

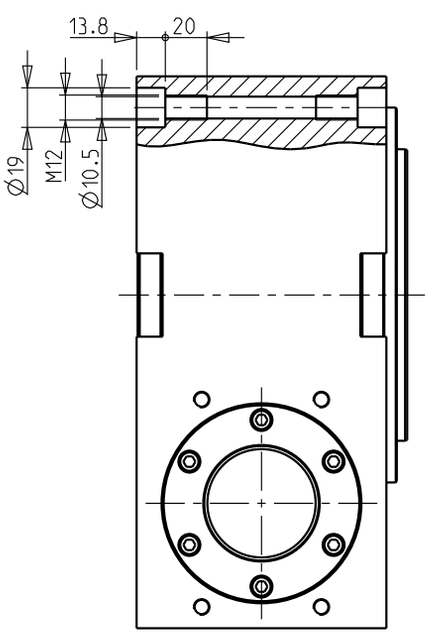
SRP100

Overall dimensions









Notes

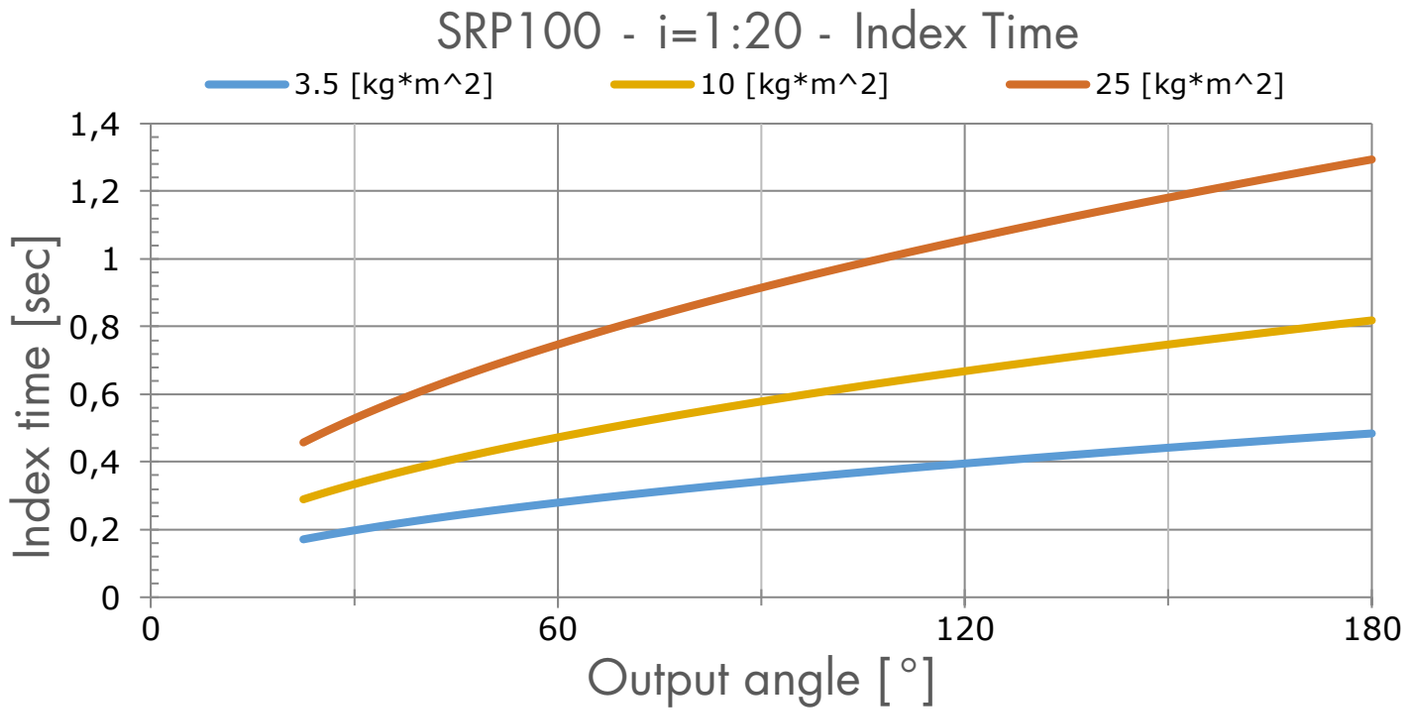
- By reversing the rotation direction of the input shaft the rotation direction of the output disc is reversed.
- Direction of rotation as indicated by the arrows in the drawing.
- The two H7 dowel pin holes in the top and bottom housing surfaces are referenced to the through-hole of the output disc.
- Motor shaft without feather key.

Features

Reduction ratio	1:20
Maximum output torque	400 Nm
Maximum input speed	3000 rev/min
Maximum input torque	20 Nm
Inertia at the input shaft	4.68*10^-4 kgm^2
Concentricity of the output disc	0.03 mm
Flatness of the output disc	0.01 mm

SRP100

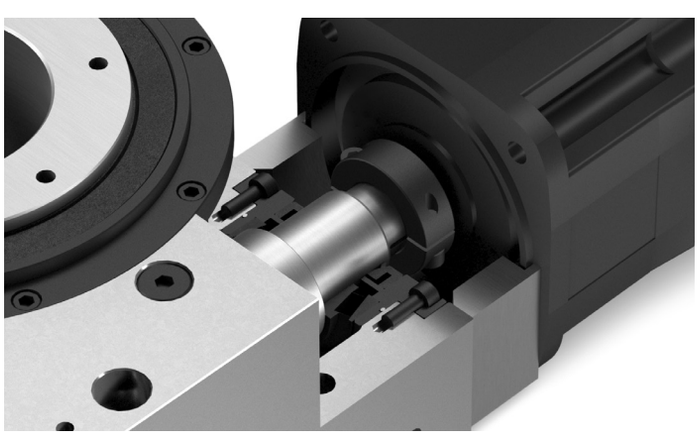
Selection



Note

The curves shown in the selection chart refer to theoretical working conditions. For an appropriate selection and use of the mechanism, it is required to take into account the dynamics of the system and the installed motor. The curves above are calculated based on a trapezoidal motion law with 33% of constant velocity.

Motorization interface



Note

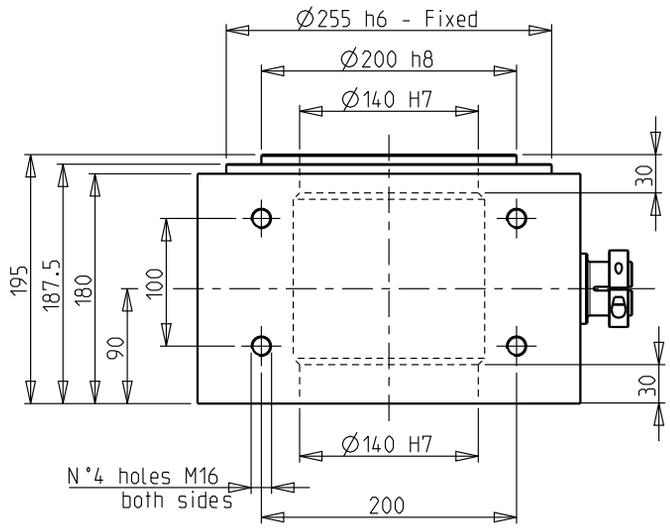
The interface flange and the clamping device are supplied with the mechanism for an easy and quick installation of the motorization on the table.
(The motor is not supplied)

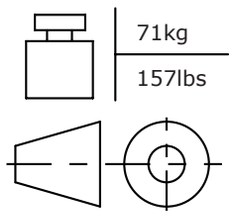
Optional motor shaft dimensions

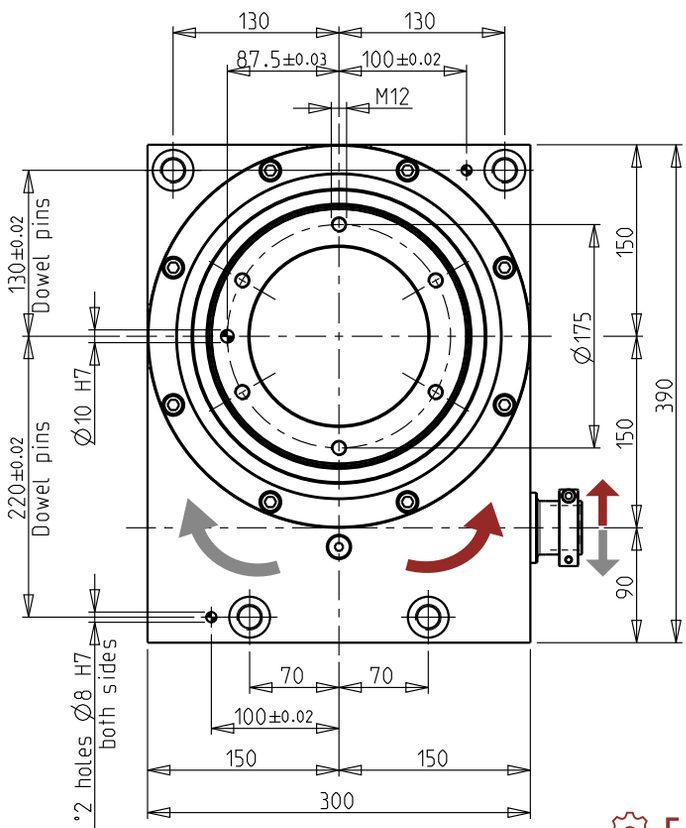
A type	B type
Hollow shaft diameters: 20 - 22 - 24mm	Hollow shaft diameters: 14 - 16 - 19mm

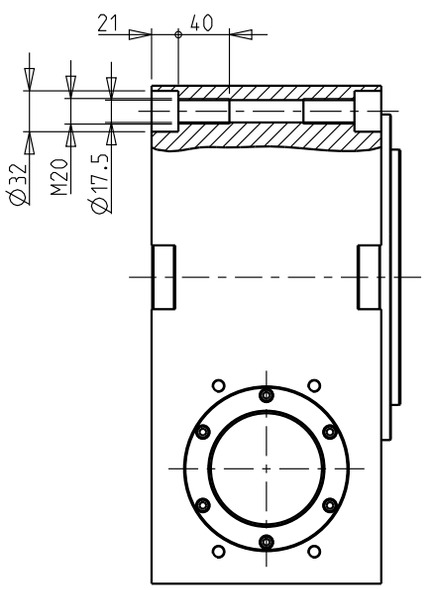
SRP150

Overall dimensions









Notes

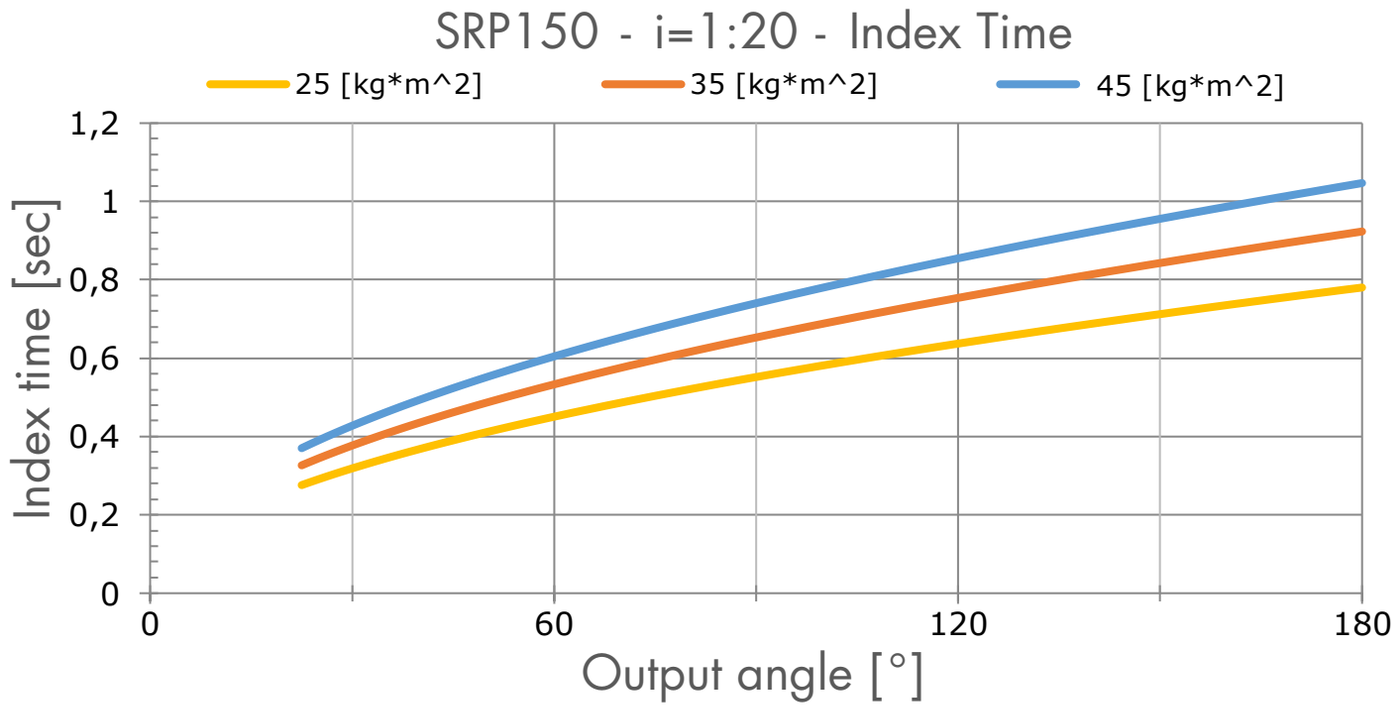
- By reversing the rotation direction of the input shaft the rotation direction of the output disc is reversed.
- Direction of rotation as indicated by the arrows in the drawing.
- The two H7 dowel pin holes in the top and bottom housing surfaces are referenced to the through-hole of the output disc.
- Motor shaft without feather key.

Features

Reduction ratio	1:20
Maximum output torque	1280 Nm
Maximum input speed	3000 rev/min
Maximum input torque	64 Nm
Inertia at the input shaft	3.97*10^-3 kgm^2
Concentricity of the output disc	0.03 mm
Flatness of the output disc	0.02 mm

SRP150

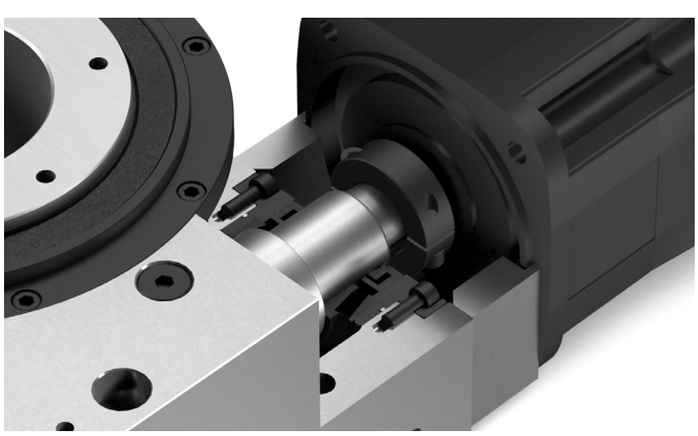
Selection



Note

The curves shown in the selection chart refer to theoretical working conditions. For an appropriate selection and use of the mechanism, it is required to take into account the dynamics of the system and the installed motor. The curves above are calculated based on a trapezoidal motion law with 33% of constant velocity.

Motorization interface



Note

The interface flange and the clamping device are supplied with the mechanism for an easy and quick installation of the motorization on the table.
(The motor is not supplied)

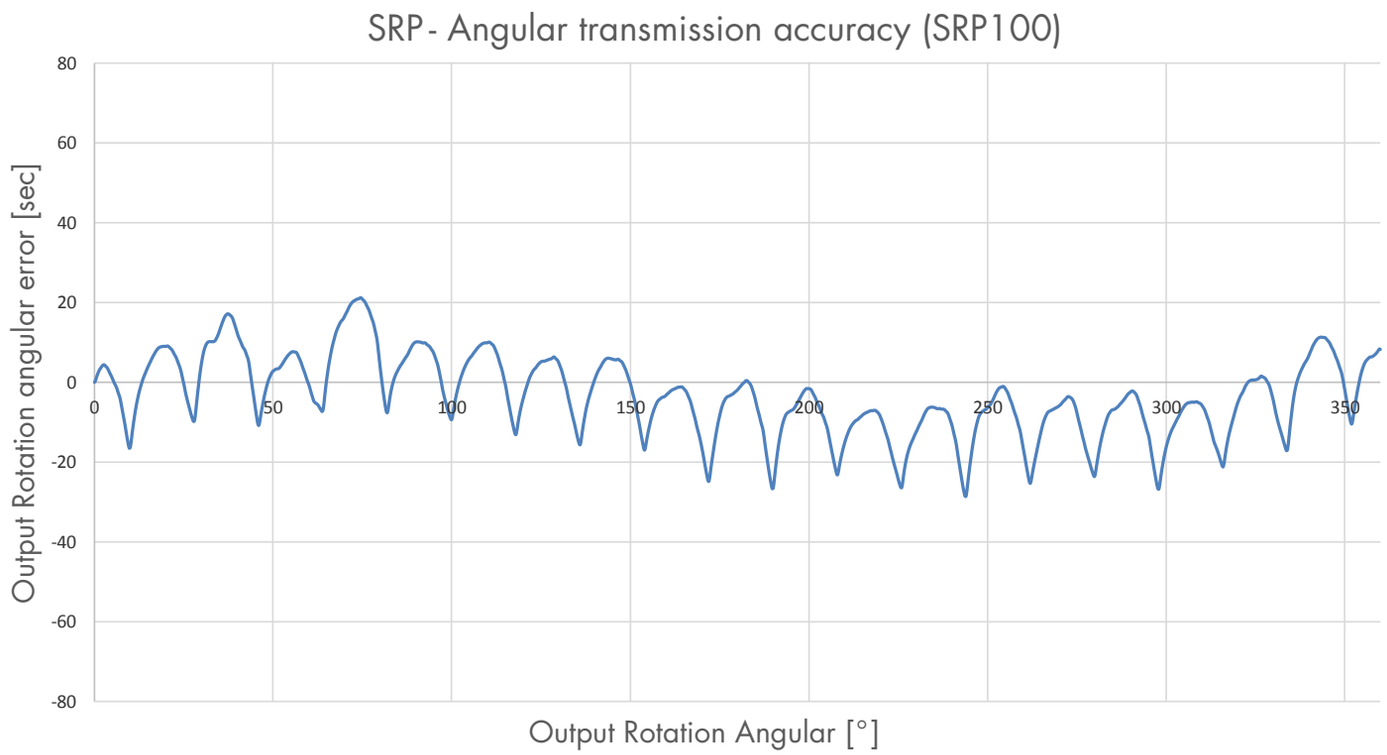
Optional motor shaft dimensions

A type	B type
Hollow shaft diameters: 29 - 32 - 35mm	Hollow shaft diameters: 24 - 28mm

SRP63 - SRP100 - SRP150

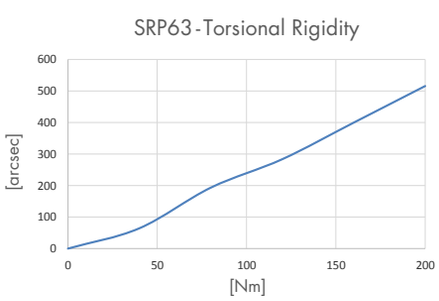
Angular accuracy

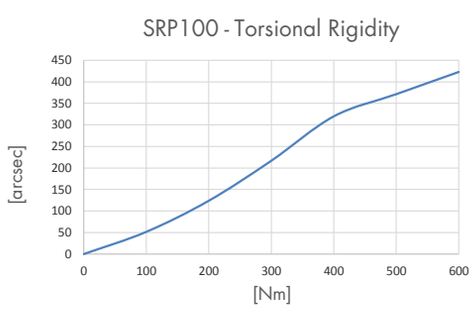
The angular accuracy, defined as the maximum deviation between the expected rotation value of the ouput disc and the value actually obtained, is less than ± 30 arcsec. This deviation is constant over time and does not depend on the dynamics of the system.

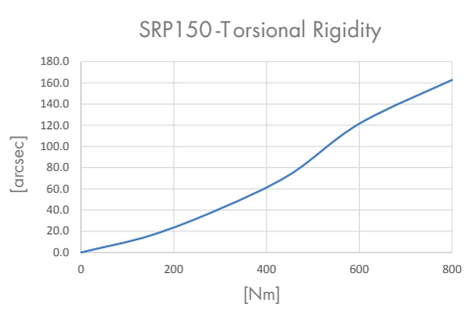


Torsional rigidity

The torsional rigidity expresses the elastic behaviour of the mechanism subject to a torque on the output axis while keeping the inlet axis rigidly constrained. This value can be used for any analyses wherein you want to study the dynamic behaviour of the application.

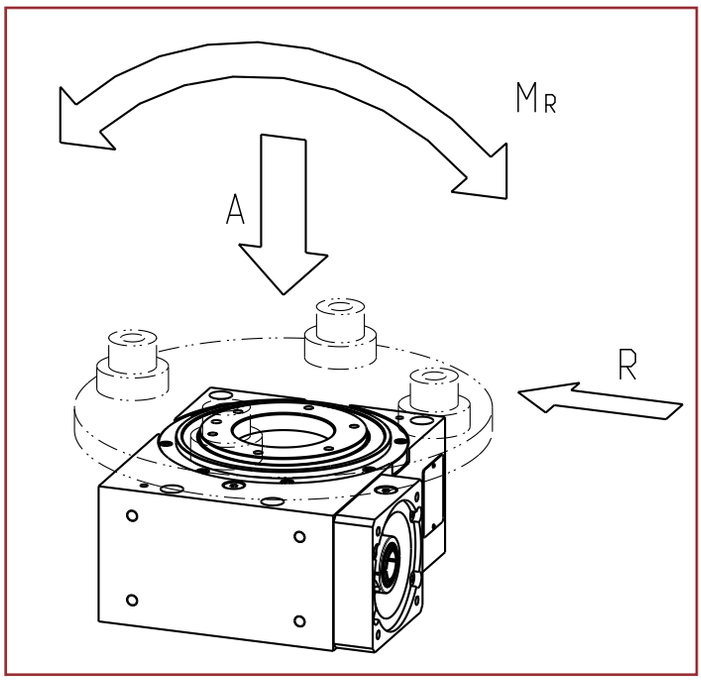






SRP63 - SRP100 - SRP150

Load capacity of the output disc



The load capacities shown in the table and drafted in the charts below refer to the assembly of the table in V5 position and show the maximum values by each type of load applied individually.

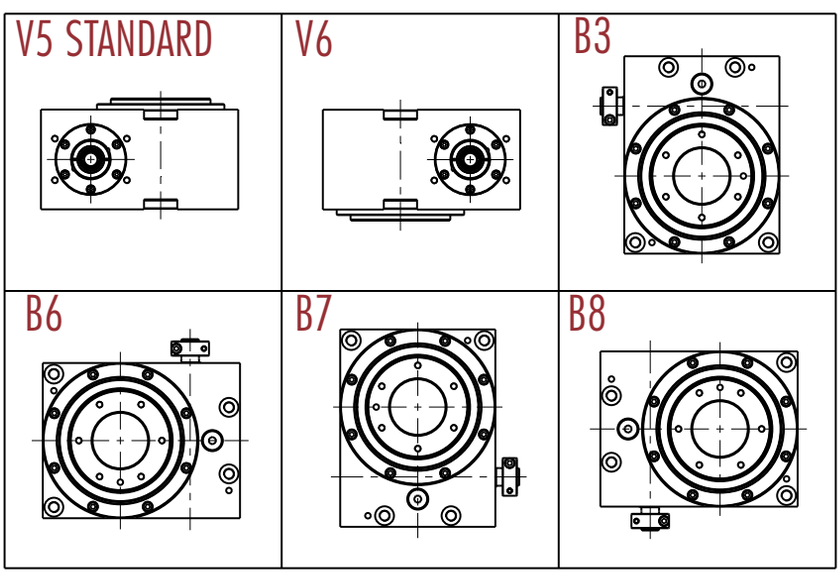
SERIES	Static load capacities		
	AXIAL A [N]	RADIAL R [N]	TILTING Mr [Nm]
SRP63	1950	2100	122
SRP100	3900	4545	359
SRP150	7610	8483	1001

Lubrication

The lubrication of the tables is foreseen for a long long-life with ISO VG150 mineral oil. SERVO-ROLLER POSITIONERS are supplied complete with the appropriate quantity of lubricant.
The lubrication of the gear units, gearmotors, speed converters, etc. ... is independent and the indications of the manufacturers of the individual products apply.

Mounting orientation of the Servo-roller Positioner

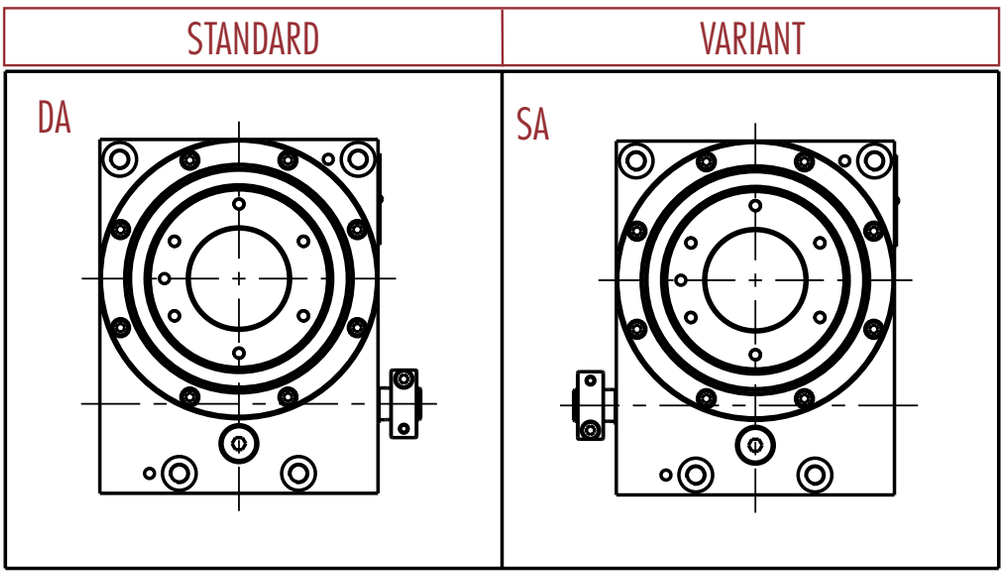
The SERVO-ROLLER POSITIONER can be installed in all orientations as it is long-life lubricated and supplied with the correct quantity of oil.



Unless otherwise specified, the SERVO-ROLLER POSITIONERS are supplied for the standard V5 installation position.

SRP63 - SRP100 - SRP150

Inlet shaft projection



PO description

The SERVO-ROLLER POSITIONER description code is manufactured following an alphanumeric classification and is made up according to the following diagram. When ordering, to avoid errors and misunderstandings, please refer to it.

SRP □ □ □ □ □

- Size (SRP63 - SRP100 - SRP150)
- Reduction ratio (Pag. 14 - 16 -18)
- Installation place (Pag 21)
- Inlet shaft projection (Pag 22)
- Motor arrangement (brand, model, size...):

Describe any further desired features

Coding example:

SRP100 table, transmission ratio 1:20, installed in V5 position, input hollow shaft on the right side and arranged to house the motor to be specified.

SRP100 - 16 - V5 - DA - "arranged to house the motor..."

COLOMBO FILIPPETTI

COLLABORATIVE ENGINEERING

CoFil

A COLOMBO FILIPPETTI COMPANY

ideas of automation

Colombo Filippetti has been present in the Industrial Automation market for seventy years as a supplier of cam systems for every handling requirement, guaranteeing extreme precision in very high-performance contexts.

The attention to every detail in the construction of customer relationships - context sharing, dedicated planning, mechanisms construction with focus on high quality, after sales service and assistance - constitutes an important and essential value of Colombo Filippetti's philosophy. This value finds application in every aspect of our daily action as an element of sharing and as expression of our professionalism.

Our positioning in the market gives us a role of international leadership and places us in the prestigious group of global players we constantly measure ourselves with. It is a great challenge that constantly stimulates our renewal and continuous innovation.

In order to be able to respond adequately to the requirements coming from the industrial automation mechanisms market - a global universe in impetuous transformation - the orientation of our activities changed. Therefore, the CoFil brand took shape: even with its own stylistic features, it stems from the long tradition of excellence, proper of Colombo Filippetti. CoFil aims to look to the future in a new and ambitious perspective - in line with the increasingly dynamic and accelerated evolution of the industrial automation industry. A new brand whose roots go back to a long history of values and skills, guaranteeing continuity in the future of what is most precious to us: our customers trust.

CoFIL

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Consulting and project engineering

Development of new projects in collaboration with the customers, attention, listening and knowledge of the markets. Our careful and continuous consultancy and ability to meet the new demands of an increasingly high-performance automation with the most remarkable technological profile. These are the distinctive traits of a business unit completely oriented towards the evolution needs of automation considering increasingly ambitious leadership goals that our customers continually arise. A team of engineers and designers always at your disposal to meet the most interesting challenges through ongoing dialogue aimed at the design and implementation of very high-performance customized mechanisms with specific and dedicated solutions. Welcome to the world of tailor-made collaboration, where technique reaches its peak of excellence.

Smart Automation

Welcome to our business unit dedicated to speed in meeting the extremely varied automation needs of the most demanding customers. Solutions that are always ready and available, based on the wide availability of a range of standardized mechanisms in the catalogue, which combine the high quality of Colombo Filippetti products with the flexibility in mounting options together with extremely fast supply times. Indexers, oscillators, rotary tables, manipulators and tool changers in the configurations that best meet current needs for precise, reliable and long-lasting handling. The increasing demand for mechanisms that can make automation solutions reach top performance in the widest array of industrial automation. This is the meeting point between our superior production capacity and the most suitable solution provided to the customer.

www.cofil.it

Cofil in the world

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