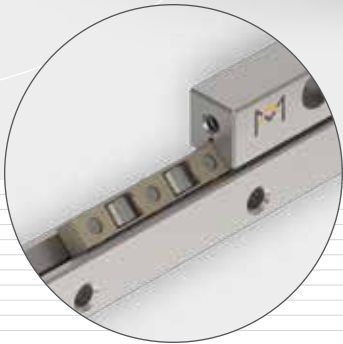
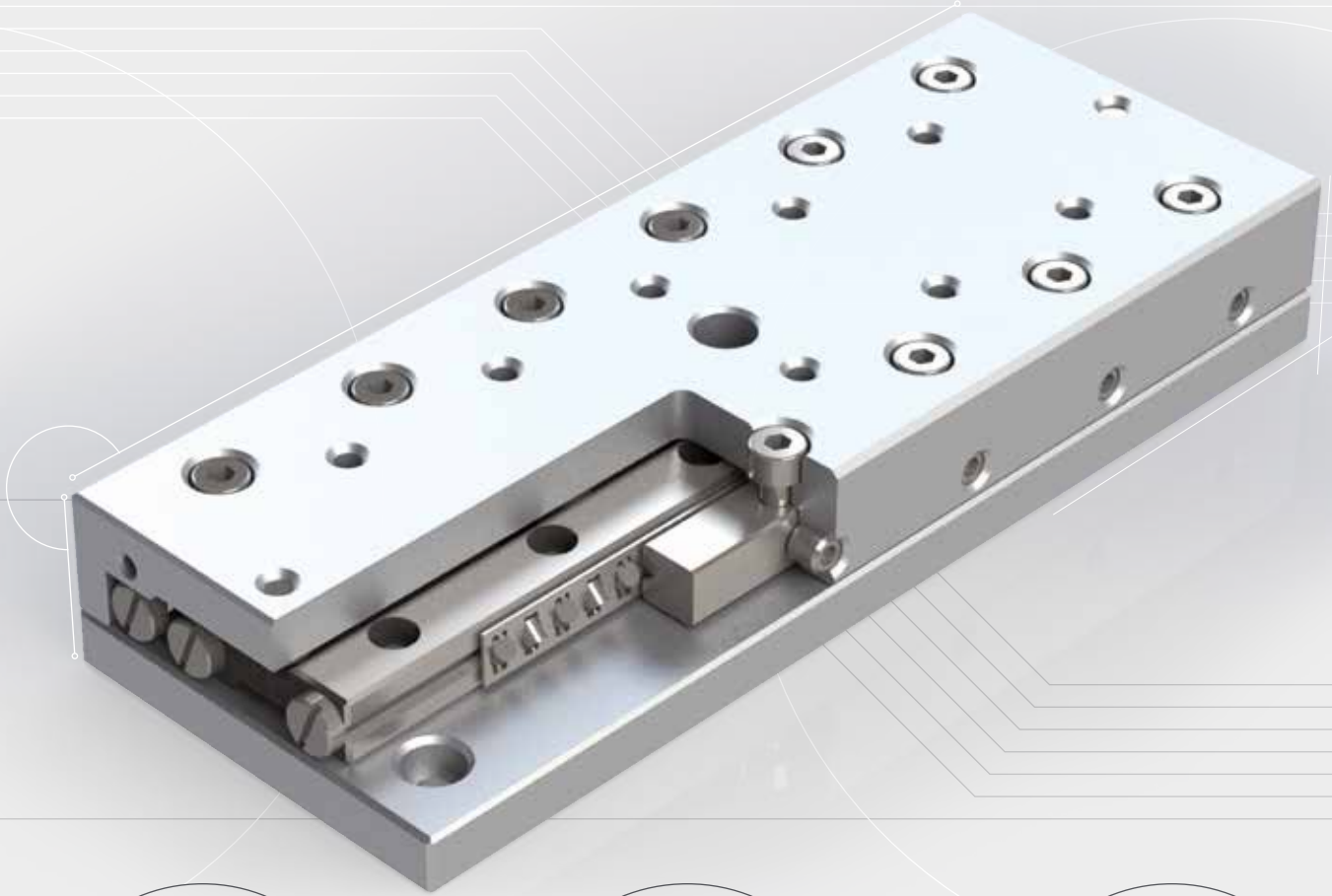


OVER
50
YEARS
of success



LINEAR BEARING SETS TYPE RNG



Company's headquarters in Dedemsvaart, Netherlands



Innovative design and manufacture of precision linear bearings, frictionless slides, positioning stages and engineered-to-spec motion systems.





INTRODUCTION

PM has engineered and manufactured innovative and top quality precision linear bearings and slides at our research and production facilities in the Netherlands since 1966. We are experts in finding solutions that meet the specific requirements of a wide variety of industry applications. A trusted partner for hundreds of industry heavyweights around the globe, our client base ranges from the semiconductor industry, medical technology and metrology sectors, to industrial automation, space and defence industries.

COMPANY

The key to the exceptional quality of PM products lies in our highly specialised manufacturing machinery and facilities. Specifically, the PM production facility is temperature controlled and built to suppress and minimise distortions caused by vibration. Our precision rails are produced with remodeled, non-standard machinery. The resulting high quality of our products makes PM an attractive supplier for various high-tech industries including semiconductor, optical and life sciences.

NEW PRODUCTS

We constantly deploy the latest technologies to create new products or functionally enhance existing products in our range. Clients typically choose to work with PM for our proven ability to meet a complex set of requirements, mostly including maximum performance of parts in the most compact of spaces. We are always working to further refine the performance of PM products, in order to ensure that we consistently meet the requirements of clients in high-tech industries. The following new PM products are the result of our relentless drive to be operating at the cutting edge of the latest technologies:

- **Linear bearing type RNG:** is a compact design with high load capacity. Available with optional Anti Cage Creep solution (ACC). Perfectly integrates robustness and compactness.
- **Micro roller slide type PMMR:** featuring crossed-rollers. Designed for best performance in micro-sized applications.
- **Flat Mounted Bearing type FMB:** is an extremely flat, low-friction and easy to install table bearing.

CUSTOMISED PARTS

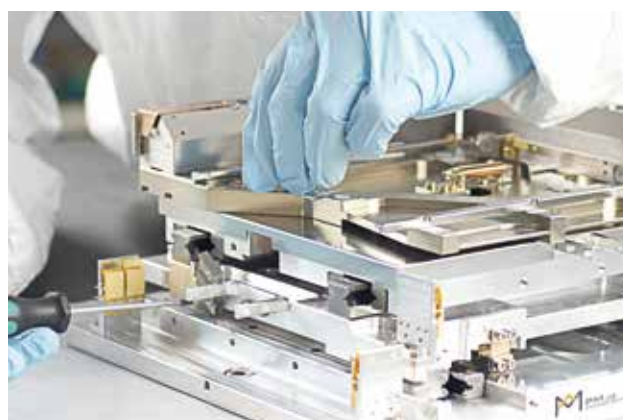
In addition to offering high-quality standardised products, we design and manufacture engineered linear bearings and positioning systems meeting our clients' application-specific requirements.

PM combines the latest knowledge from its in-house R&D department, developments in manufacturing technology

more widely as well as performance insights generated by industry deployment of precision applications.

Over the past 50 years PM has expanded its reach to serve a global client base. Our experienced, multilingual engineering and sales teams stand ready to work with you in realising your demanding projects.

Technical data in this catalogue is based on standard quality grade Q8 (no suffix). For higher quality grades please contact our product experts to discuss your requirements.



DISCLAIMER

This catalogue is the result of a full revision of its previous edition. It reflects the latest progress in linear bearings technology as well as insights gathered from industry application. Any information from previous editions that does not correspond to the data in this current edition, is therefore invalid. Due to the continuous development of our product range, we reserve the right to make modifications without prior notice.

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PRODUCT OVERVIEW

PM linear bearings are used as components in multiple industries worldwide. What really sets apart PM products is their unsurpassed quality and technical performance in terms of accuracy, their extremely low levels of friction, high rigidity and long lifetime.

Our wide range of linear bearings allows for maximum design flexibility, realising a play-free linear movement that is both cost-effective and the best fit for its application. Popular linear bearings are also available as set packages including all the essential components like cages, end pieces and attachment screws. In the following pages, this catalogue presents these standard sets, specifying options for load capacity and stroke length.

Importantly, PM customers benefit from over 50 years' experience in the field of linear bearings manufacturing. As a result of our continuous testing of innovations and new insights in engineering and manufacturing, our linear bearings are constantly being optimised further and often become an industry benchmark.

At PM we are always driven by our goal to be industry leaders in quality and performance. We possess the expertise and manufacturing capability to supply custom made linear bearings and linear slides.

So whether you choose a standard product as presented in this catalogue or a customised component that meets your specific needs, we only ever deliver top quality.

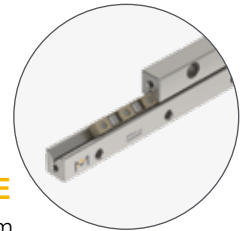
1. LINEAR BEARING TYPE RSD

- Equipped with balls or rollers
- For light up to medium load
- Available in size 1.5 - 24 mm
- Lengths from 20 - 1400 mm
- Also available as a set, see page 41



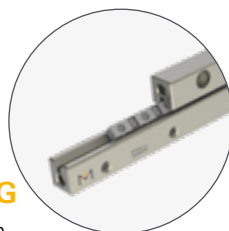
2. LINEAR BEARING TYPE RSDE

- Equipped with rollers, size 3 – 9 mm
- For precision applications
- For medium up to high loads
- Anti cage creep technology optional
- Also available as a set, see page 57



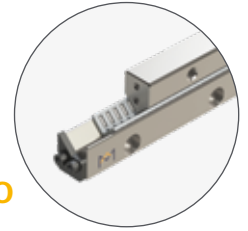
3. LINEAR BEARING TYPE RNG

- Equipped with rollers 4 and 6 mm
- Very compact design and high load ratings
- Offers reduced weight
- Anti cage creep technology optional
- Also available as a set, page 67



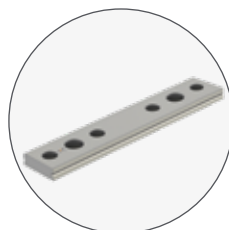
4. LINEAR BEARINGS TYPE N/O AND M/V

- Equipped with needle rollers
- Best load ratings and maximum rigidity
- Lengths from 100 - 1200 mm
- Anti cage creep technology optional



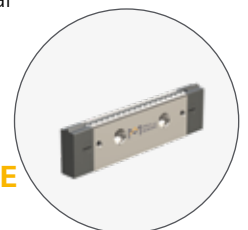
5. DOUBLE PRISM TYPE DS

- Compact design
- Can be combined with RSD linear bearings and recirculating units UK and UR
- Available in size 2 - 15 mm
- Lengths up to 1400 mm



6. RECIRCULATING UNITS TYPE UK AND UR

- For unlimited travel
- Low profile and space saving design
- Equipped with balls (UK) or rollers (UR)
- Available in size 2 - 15 mm





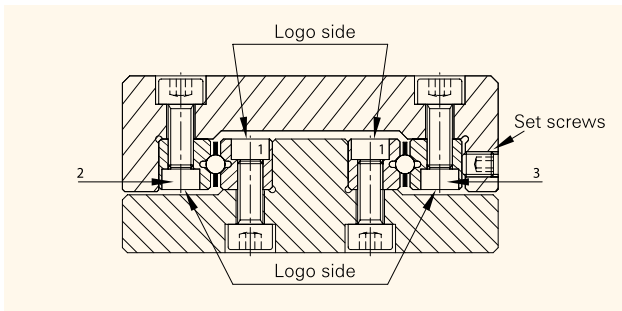
ASSEMBLY PROCEDURE

PRIOR TO ASSEMBLY

PM linear bearings are precision components; they have to be handled with meticulous care. To achieve a perfect linear bearing, it is necessary to respect the following guidelines:

- When handling the components. Damage on the rail surface will impact the running performance and operational lifetime
- Prevent contact with any foreign materials when mounting the rails
- During assembly, ensure that all linear bearing components have the same temperature
- For uniform tightening of the bolts the use of a torque screw driver is recommended. Various models are available.

ASSEMBLY LINEAR BEARINGS



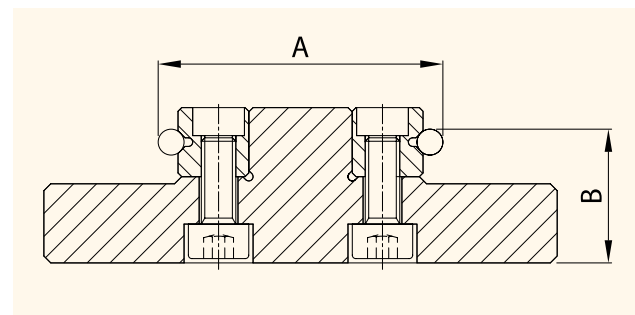
For satisfactory installation of all types of linear bearings in this catalogue, it is necessary to consider the following points:

- 1) To determine the location of fixing holes in the support structure (slide base) the holes in the rails should be taken as a reference and "copied" onto the support structure. This is highly desirable as the original pitch of individual holes may have altered during hardening by as much as 0.4 mm. To compensate this, special type GD or GDN attachment screws can be supplied. The dimensions of these screws are listed in the tables at the end of each chapter.
- 2) Carefully de-burr and clean all elements, to ensure a flat surface and a perfect fit of the rails.
- 3) Now, as a required first step, to fasten the inner rail pair (marked as 1 in figure above) the base and reference face 1 of the linear bearing rails should be lightly oiled before they are clamped against the mounting and reference shoulder. Subsequently,

they can be fastened by starting from one end and working towards the opposite end.

- 4) Parallelism of the V-groove of the rails (A and B) should be checked to ensure they don't exceed the tolerance of the linear bearings (page 14). After these steps have been followed, the slide element is ready for assembly.

Parallelism of rails V-groove: ΔA and ΔB

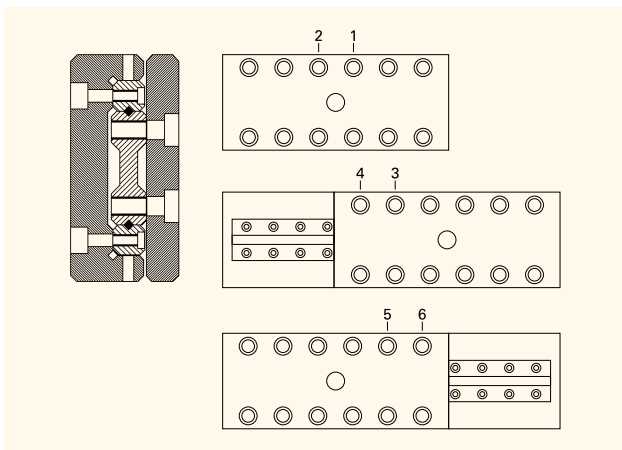


- 4.1) The fixed bearing rail (2) should be mounted as described under step 3 above, but care should be taken not to tighten the adjustable rail (marked as 3 in figure on the left side) too much, so as to leave a gap between the V-grooves for the insertion of ball cages, roller cages or needle cages.
- 5) If any end stop screws are present, remove them now.
- 6) Carefully insert the cages. When placed in their exact position, lightly secure the adjustable rail until the screws are finger-tight.
- 7) Fit the end screws or end pieces.
- 8 I) The linear bearing set is now ready to be backlash free-adjusted using the lateral preload set screws (page 19, Preload Settings). The amount of preload is given in the tables at page 23.
- 8 II) Before starting the preload procedure carefully move the slide top over its stroke length back and forth and feel that there are no irregularities.
- 9) Preload procedure: put the slide on a clean surface on its side with the lateral preload set screws up. Follow step 1, 2 and 3 for the correct preload sequence.
 - Step 1. Start in the middle position and adjust the set screws with the recommended torque value, working outwards from the middle. Notice: Only adjust the screws directly above the cage.



Step 2. Move the slide top in one direction and adjust the set screws to the recommended torque value.

Step 3. Move the slide top in opposite position and repeat the adjusting for the screws which are now above the cages.



Again move the slide top back and forth a couple of times and feel that there are no irregularities.

- 10) Secure the attachment screws on the adjusting rail.
- 11) When assembly is complete, the linear bearings must be checked for absence of play and inspected for running quality.



TABLES

RECOMMENDED PRELOAD SETTINGS

Table 1 Linear bearings type RSD with roller cages

Roller size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
1.5	3	M2.5	10	0.75
2	4	M3	15	1.50
3	5	M5	25	4.50
4	7	M5	40	11.50
6	9	M6	100	27.50
9	14	M8	100	105.50
12	18	M10	100	212.00
15	20	M12	100	370.00

Table 5 Linear bearings type N/O and M/V with needle cages

Needle size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
2	4.5	M6	50	1.05
2	4.5	M8	100	1.30
2.5	5	M8	100	2.70
2.5	5.5	M8	100	2.90
3	6	M12	100	5.70
3.5	7	M14	100	7.70

*pitch between the preload setscrews

Table 2 Linear bearings type RSD with ball cages

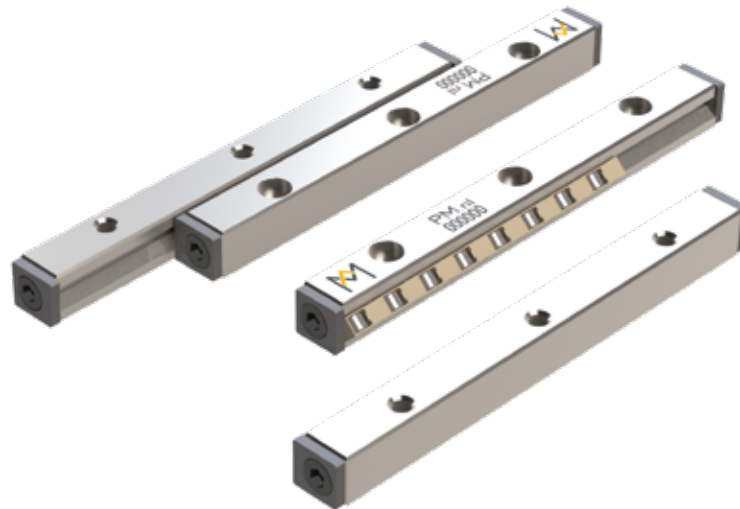
Ball size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
1.5	3	M2.5	10	0.15
2	4	M3	15	0.36
3	5	M5	25	1.05
4	7	M5	40	2.70
6	9	M6	50	4.00
9	14	M8	100	11.70
12	18	M10	100	25.00
15	20	M12	100	34.50

Table 3 Linear bearings type RSDE with roller cages

Roller size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
3	3.3	M5	25	16
4	4.4	M5	40	41
6	6.6	M6	50	86
9	On request			

Table 4 Linear bearings type RNG with roller cages

Roller size (mm)	Pitch cage (mm)	Set screw	Pitch* (mm)	Preload (Ncm)
4	4.4	M3	25	14
6	6.6	M4	25	25



LINEAR BEARINGS SET

User benefits

- Packaged as a set
- Standard stroke lengths*
- Ready for assembly, therefore cost-effective
- Cages are straightened
- Short lead times
- Global standard
- Pre selection by load capacity and travel length

*Do you require longer stroke lengths? Roller cages can easily be shortened. Cage length should be at least 70% of the rail length.

Linear bearings set type RNG

Used by industries around the world, high precision linear motion applications provide high accuracy and superior reliability with a compact design. A standard set consists of:

- 4 pcs. Rails type RNG
 - 2 pcs. Roller cages type KRE
 - 8 pcs. End pieces type GBN inserted in the rail ends
- Packed and delivered as a set.

Example: RNG-4150x22KRE

One set consists of:

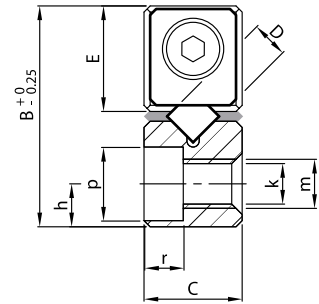
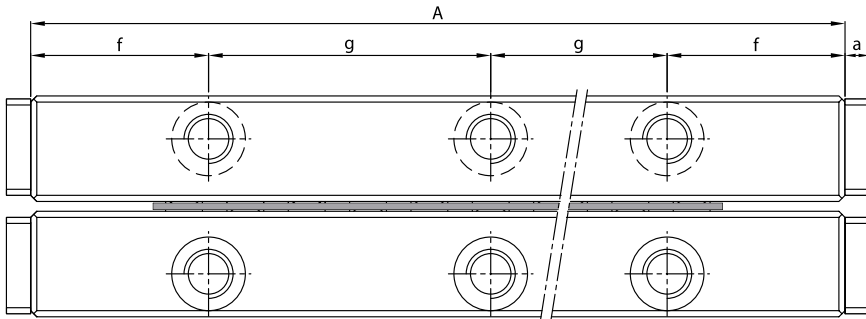
- 4 pcs. Rails type RNG-4150
- 2 pcs. Roller cages type R4x22KRE
- 8 pcs. End pieces type GBN-4

PRODUCT CODES

To specify your detailed order, please follow the product code format as set out in the table below.

Type + Size	Rail length	Quality grade (Suffix Q4, Q2)	Rail finishing	Number of rollers	Cage type (Suffix KRE, KREV...)	Stainless steel (Suffix SS)
RNG-4	150			22	KRE	

Order template (adjust as needed): Standard: 1 set RNG-4150x22KRE
 Stainless steel: 1 set RNG-4150x22KRE-SS

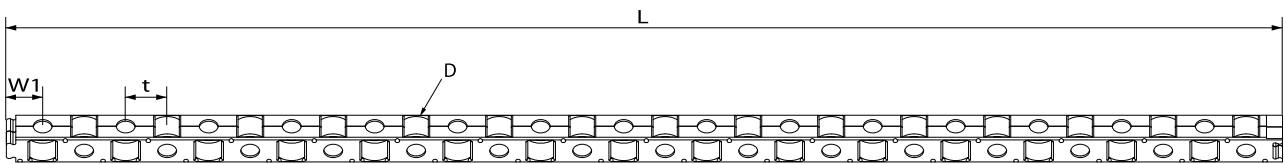
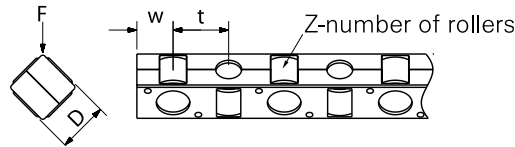


One set includes: 4 rails + 2 roller cages + 8 end pieces

RSDE kit		Main dimensions					Mounting holes					
Standard	Stainless steel	A	B	C	E	D	f	g	h	k	m	p
RNG-4050x7KRE	RNG-4050x7KRE-SS	50						1x25				
RNG-4075x11KRE	RNG-4075x11KRE-SS	75						2x25				
RNG-4100x15KRE	RNG-4100x15KRE-SS	100						3x25				
RNG-4125x19KRE	RNG-4125x19KRE-SS	125						4x25				
RNG-4150x23KRE	RNG-4150x23KRE-SS	150						5x25				
RNG-4175x27KRE	RNG-4175x27KRE-SS	175	19	9	9	4	12.5	6x25	3.5 ^{±0.2}	2.65	M3	5.5
RNG-4200x30KRE	RNG-4200x30KRE-SS	200						7x25				
RNG-4225x32KRE	RNG-4225x32KRE-SS	225						8x25				
RNG-4250x35KRE	RNG-4250x35KRE-SS	250						9x25				
RNG-6100x10KRE	RNG-6100x10KRE-SS	100						3x25				
RNG-6150x16KRE	RNG-6150x16KRE-SS	150						5x25				
RNG-6200x20KRE	RNG-6200x20KRE-SS	200						7x25				
RNG-6250x25KRE	RNG-6250x25KRE-SS	250						9x25				
RNG-6300x31KRE	RNG-6300x31KRE-SS	300						11x25				
RNG-6350x36KRE	RNG-6350x36KRE-SS	350	25	12	12	6	12.5	13x25	5 ^{±0.2}	3.3	M4	7
RNG-6400x40KRE	RNG-6400x40KRE-SS	400						15x25				

Bold = Short lead time item

Regular = Long lead time item - please ask us about prices and lead times



r	End pieces a	Weight (g)	C _{dyn} in (N)	Roller cage						Stroke	Type
				D	t	w	w1	L	Z		
2.7	4	125	5495	4	4.4	2.8	3.85	32	7	30	RNG-4050x7KRE
		205	8635					49.6	11	45	RNG-4075x11KRE
		275	11775					67.2	15	60	RNG-4100x15KRE
		345	14915					84.8	19	75	RNG-4125x19KRE
		415	18055					102.4	23	90	RNG-4150x23KRE
		485	21195					120	27	105	RNG-4175x27KRE
		555	23550					133.2	30	130	RNG-4200x30KRE
		625	25120					144.3	32	155	RNG-4225x32KRE
	695	27475	157.5	35	180	RNG-4250x35KRE					
3.2	4	460	17650	6	6.6	4.3	6.3	68	10	50	RNG-6100x10KRE
		690	28240					107.6	16	80	RNG-6150x16KRE
		920	35300					134	20	120	RNG-6200x20KRE
		1150	44125					167	25	150	RNG-6250x25KRE
		1380	54715					210.6	31	175	RNG-6300x31KRE
		1610	63540					243.6	36	210	RNG-6350x36KRE
		1840	70600					270	40	245	RNG-6400x40KRE

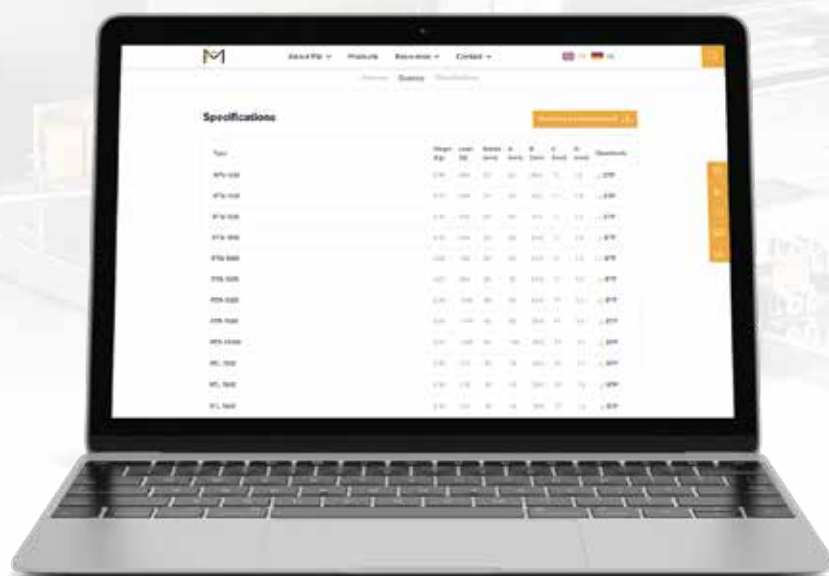
F = For load direction please refer to picture provided

Units: mm



SAVE TIME!

Direct access to the 3D CAD models of our standard products



www.PM.NL

PM RESEARCH AND PRODUCTION FACILITIES



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2020