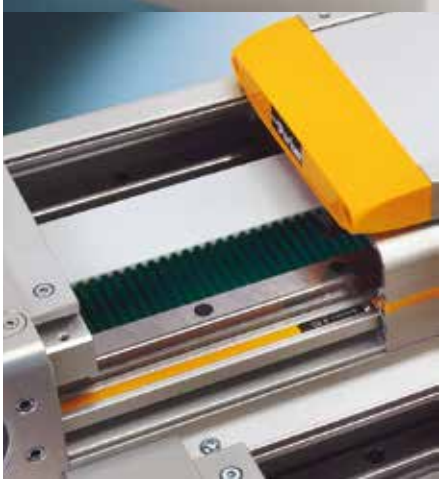


ORIGA HMR

High Moment Rodless Electric Linear Actuators - Two Drive Technologies: Screw & Toothed Belt

Driving the future

The HMR linear drive system can be equipped with a “basic” or “reinforced” profile as standard. The “basic” profile is suitable for fitting directly to a machine base that has a corresponding support surface. The “reinforced” profile, on the other hand, is the preferred choice for self-supporting systems or for use in conjunction with a base surface offering limited support.

- Two alternative drive technologies in one profile
- Unique flexibility and reliability
- High speed and precision
- Two profile versions
- Optional IP54 snap-in covers

ORIGA HMR Electromechanical Linear Actuators

We drive the future - with screw, toothed belt.

Profile designs

- Basic profile for assembling directly to the machine base
- Reinforced profile for self-supporting assembly

Mounting systems

- Integrated T-slots for attaching from below and from the side

Protection classes

- Without cover: IP20
- With cover: IP54

Guide systems

- Plain bearing guide
- Recirculating ball bearing guide

Lubrication

- Central lubrication via externally accessible lubricating nippels

Position sensing

- Integrated, adjustable position switch for end positions and homing

Impact protection

- Integrated shock absorbers for both end positions

Distance measurement

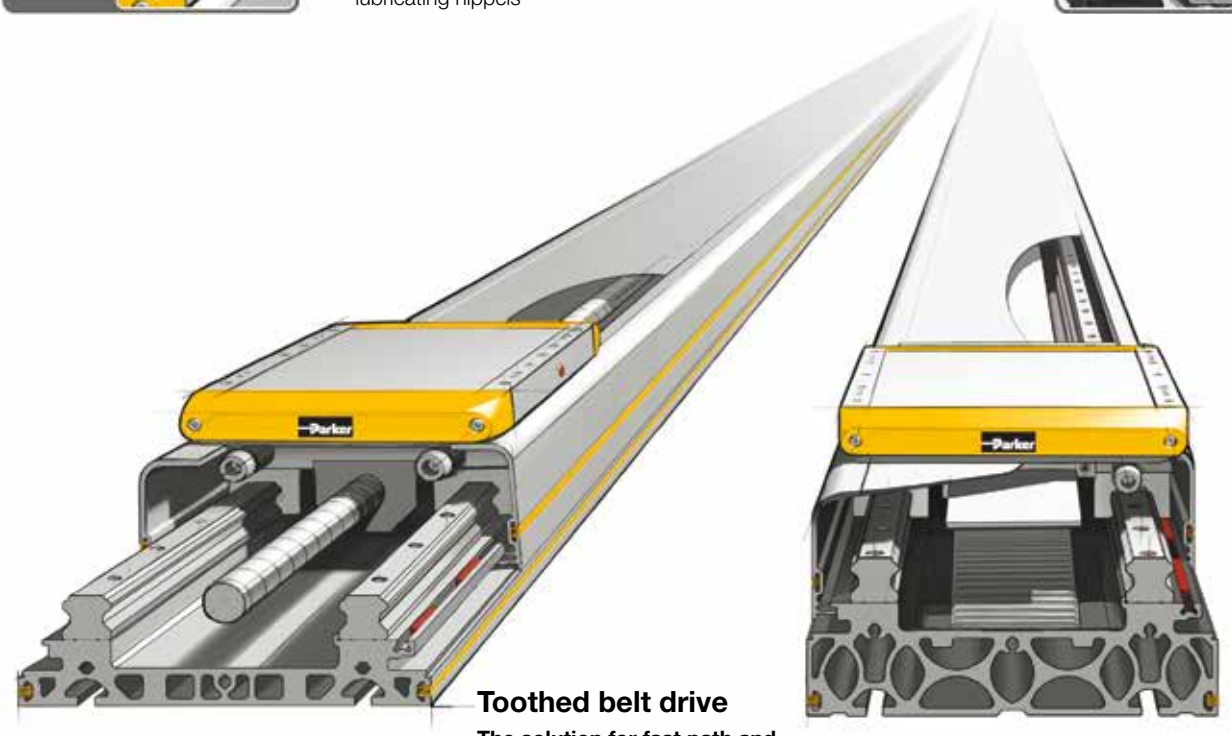
- Contact-free, incremental displacement measuring system

Brake system

- Holding brake can be implemented for horizontal and vertical movements

Cable drag chains

- Directly attachable drag chains for various cabling

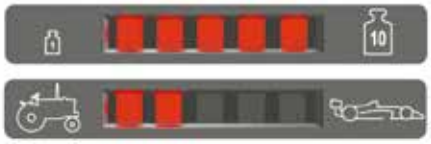


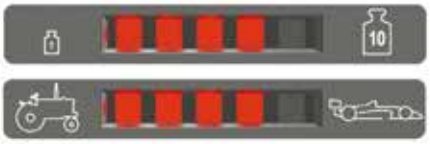
Toothed belt drive

The solution for fast path and position control for medium loads

Screw drive

The solution for precise path and position control for heavy loads





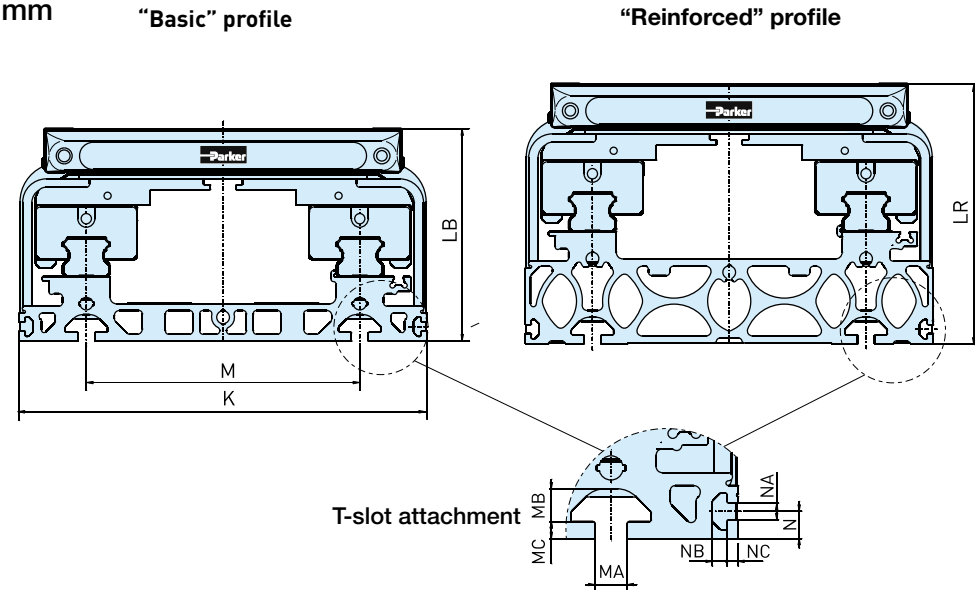
Origa Linear Drives

Sizes 85, 110,150, 180, 240 mm

HMR Series

Profile designs

- Basic
- Reinforced



The HMR linear drive system can be equipped with a "basic" or "reinforced" profile as standard. The "basic" profile is suitable for fitting directly to a machine base that has a corresponding support surface. The "reinforced" profile, on the other hand, is the preferred choice for self-supporting systems or for use in conjunction with a base surface offering limited support.

Dimensions (mm) - Profil design HMR

Size	K	LB	LR	M	MA	MB	MC	N	NA	NB	NC
HMRx085	85.0	60.0	71.0	50.0	5.2	4.5	1.5	4.5	3.4	3.0	2.5
HMRx110	110.0	69.5	89.5	70.0	5.2	4.5	1.8	4.5	3.4	3.0	2.5
HMRx150	150.0	90.0	114.0	96.0	6.2	6.8	3.0	6.5	5.2	4.6	3.5
HMRx180	180.0	111.5	134.5	116.0	8.0	7.8	4.5	8.5	5.2	4.5	3.5
HMRx240	240.0	125.0	153.0	161.0	10.0	10.2	5.3	8.5	5.2	4.5	3.5

Origa Linear Drives

Sizes 85, 110,150, 180, 240 mm

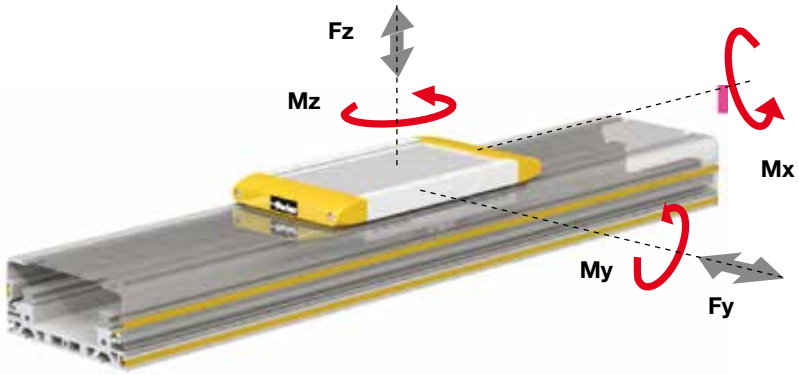
HMR Series

Ball Bearing Guide

The occurring loads, forces and bending moments depend on the application. The mass of the construction attached to the carriage has a center of gravity.
This mass creates static forces (F = m · g) and bending moments (M = m · g · l).

Additional dynamic moments (M = m · a · l) arise in dependence of the acceleration during travel.
Care should be taken when selecting suitable guides that the permissible sum of loads does not exceed 1.

Loads, Forces and Moments



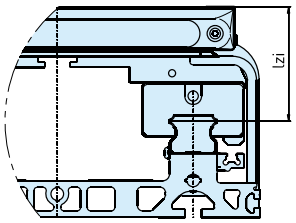
Combined loads

The maximum permissible load for linear drives subject to simultaneous multiple loads, forces and bending moments are calculated using the formula below. Maximum permissible loads must not be exceeded.

$$L = \frac{Fy}{Fy_{(max)}} + \frac{Fz}{Fz_{(max)}} + \frac{Mx}{Mx_{(max)}} + \frac{My}{My_{(max)}} + \frac{Mz}{Mz_{(max)}} \leq 1$$

The sum of all loads must under no circumstance be > 1.

Internal lever arm l_{zi}



Dimension table - l_{zi}

Product size		l_{zi}
HMR-085	[mm]	33.0
HMR-110	[mm]	39.5
HMR-150	[mm]	50.0
HMR-180	[mm]	57.5
HMR-240	[mm]	68.0

Maximum permissible loads based on a performance of 2,540 km

Product Size		HMRx08	HMRx11	HMRx15	HMRx18	HMRx24	HMRx08	HMRx11	HMRx15	HMRx18	HMRx24
Carriage		Standard					Tandem				
Max. permissible load											
F_{z2540} F_{y2540}	[N]	1,800	4,450	8,800	16,200	26,600	2,700	6,700	13,200	24,300	39,900
Max. permissible bending moment											
M_{x2540}	[Nm]	45	155	430	940	2,150	68	235	645	1,410	3,225
M_{y2540} M_{z2540}	[Nm]	80	200	560	1,230	2,430	120	300	840	1,845	3,645

Maximum permissible loads based on a performance of 8,000 km

Product Size		HMRx08	HMRx11	HMRx15	HMRx18	HMRx24	HMRx08	HMRx11	HMRx15	HMRx18	HMRx24
Carriage		Standard					Tandem				
Max. permissible load											
F_{z8000} F_{y8000}	[N]	1,250	3,000	6,000	11,000	18,200	1,875	4,500	9,000	16,500	27,300
Max. permissible bending moment											
M_{x8000}	[Nm]	30	105	290	640	1,460	45	160	435	960	2,190
M_{y8000} M_{z8000}	[Nm]	55	135	380	840	1,660	80	205	570	1,260	2,490

Ball Screw

Sizes 85, 110,150, 180, 240 mm

HMRS Series

Technical Data HMRS

Product Size			HMRS08		HMRS11		HMRS15		HMRS18		HMRS24	
Type of Screw			12 x 5	12 x 12	16 x 5	16 x 16	20 x 5	20 x 20	25 x 10	25 x 25	32 x 10	32 x 32
Pitch	p	[mm]	5	12	5	16	5	20	10	25	10	32
Max. speed	$v_{max.}$	[m/s]	0.25	0.60	0.25	0.80	0.25	1.00	0.50	1.25	0.50	1.60
Max. acceleration	$a_{max.}$	[m/s^2]	10		10		10		10		10	
Repeatability		[µm]	± 20		± 20		± 20		± 20		± 20	
Max. stroke		[mm]	1,200		1,500		2,500		3,400		4,000	
Thrust force and torque												
Max. thrust force	F_{Amax}	[N]	820	820	2,200	2,200	2,600	2,600	4,800	4,800	5,500	5,500
	F_{A2540}	[N]	820	650	1,550	1,150	1,800	2,160	3,300	3,960	3,500	4,880
Max. torque at drive shaft	M_{Amax}	[Nm]	0.7	1.7	1.9	6.1	2.2	9.0	8.3	20.8	9.5	30.4
	M_{A2540}	[Nm]	0.7	1.3	1.3	3.1	1.6	7.5	5.7	17.1	6.1	27.0
No load torque	M_0	[Nm]	0.2	0.2	0.3	0.4	0.7	0.9	0.9	1.0	1.0	1.1
Stroke dependent on speed												
	200	[mm]	250	600	250	800	250	1,000	500	1,250	500	1,600
	400	[mm]	250	600	250	800	250	1,000	500	1,250	500	1,600
	600	[mm]	152	366	197	631	250	1,000	500	1,250	500	1,600
	800	[mm]	102	245	132	424	169	678	382	956	423	1,354
	1000	[mm]	73	176	95	304	122	486	277	694	312	997
	1200	[mm]	55	132	71	228	91	366	211	526	239	765
	1400	[mm]	-	-	56	178	71	285	165	413	189	605
	1600	[mm]	-	-	45	143	57	228	133	333	153	491
	1800	[mm]	-	-	-	-	47	187	109	274	127	406
	2000	[mm]	-	-	-	-	39	156	92	229	107	342
	2200	[mm]	-	-	-	-	33	132	78	195	91	291
	2400	[mm]	-	-	-	-	28	113	67	167	79	251
	2600	[mm]	-	-	-	-	-	-	58	145	68	219
	2800	[mm]	-	-	-	-	-	-	51	128	60	193
	3000	[mm]	-	-	-	-	-	-	45	113	53	171
	3200	[mm]	-	-	-	-	-	-	40	100	48	152
	3400	[mm]	-	-	-	-	-	-	-	-	43	137
	3600	[mm]	-	-	-	-	-	-	-	-	39	123
	3800	[mm]	-	-	-	-	-	-	-	-	35	112
	4000	[mm]	-	-	-	-	-	-	-	-	32	102

Ball Screw

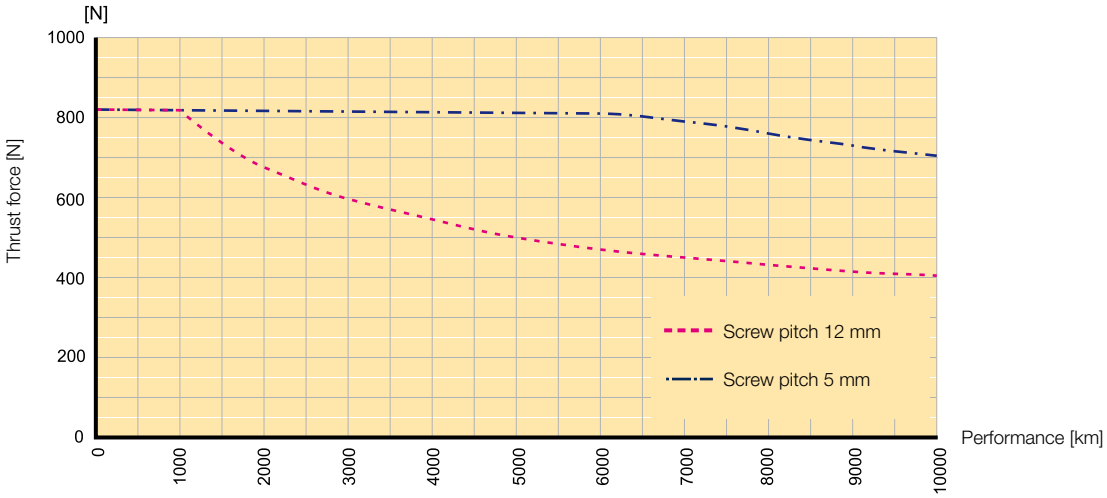
Sizes 85, 110,150, 180, 240 mm

HMRS Series

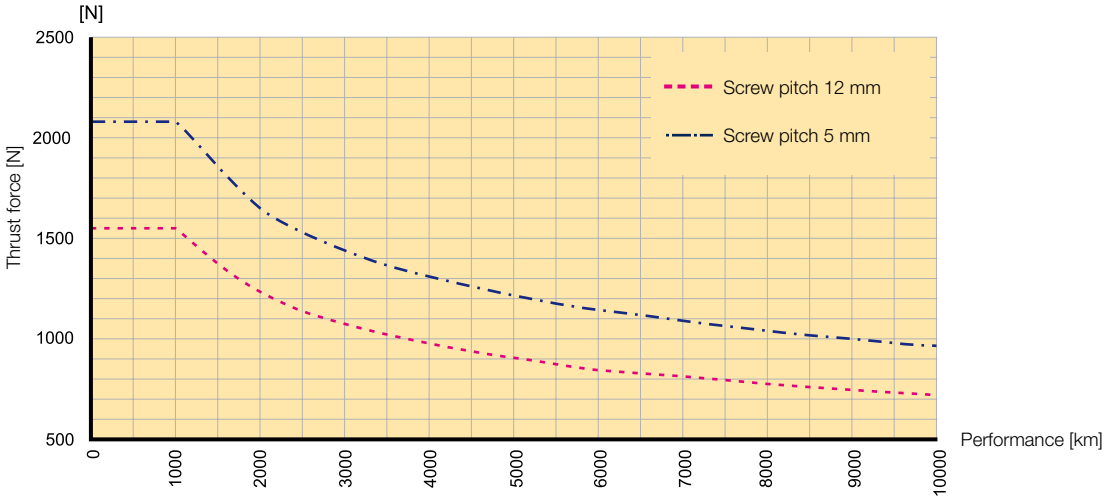
Performance expectancy depends on the application's required force.
An increase in force will reduce performance.

Performance / thrust force

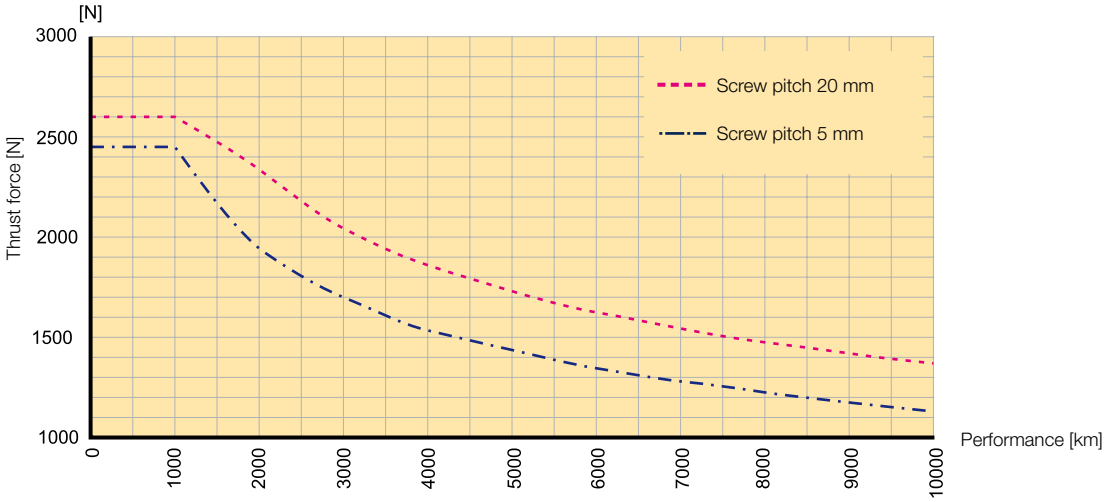
HMRS08 Performance / Thrust force



HMRS11 Performance / Thrust force



HMRS15 Performance / Thrust force



Ball Screw

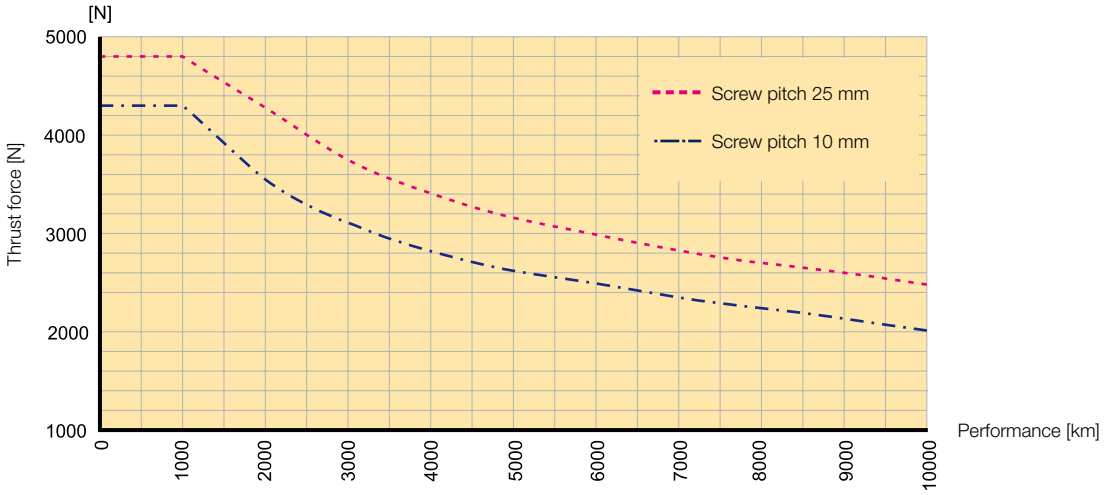
Sizes 85, 110,150, 180, 240 mm

HMRS Series

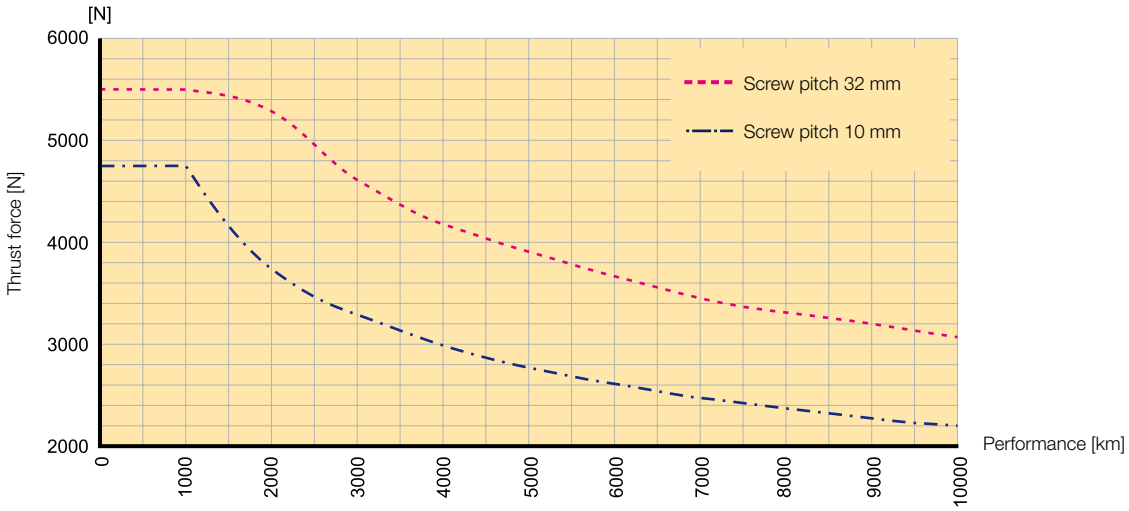
Performance expectancy depends on the application's required force.
An increase in force will reduce performance.

Performance / thrust force

HMRS18 Performance / Thrust force



HMRS24 Performance / Thrust force

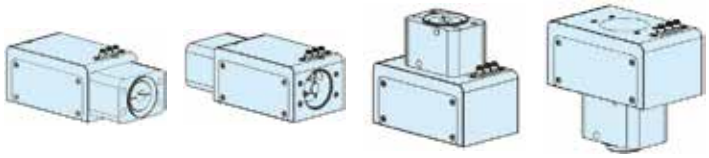


Belt Drive

Sizes 85, 110,150, 180, 240 mm

HMRB Series

Description Motor mounting position



horizontal	upright
090° / 270°	000° / 180°
BD, DD	AP, CP, AD, CD

Type and orientation of the belt is given by the motor mounting position.

Technical Data HMRB

Production size			HMRB08		HMRB11		HMRB15	
Motor mounting position			090°/270°	000°/180°	090°/270°	000°/180°	090°/270°	000°/180°
Lead constant	$s_{lin.}$	[mm]	66	66	90	90	100	125
Max. speed	$v_{max.}$	[m/s]	2				5	
Max. acceleration	$a_{max.}$	[m/s²]	30				50	
Repeatability		[µm]	±50					
Max. order stroke		[mm]	3,000		4,000		6,000	
Thrust force and torque								
Max. thrust force	$F_{Amax.}$	[N]	295	295	630	630	1,050	630
Max. torque on drive shaft	$M_{Amax.}$	[Nm]	3.1	3.1	9.0	9.0	17.0	13.0
No load torque	M_0	[Nm]	1.0	1.0	1.2	1.2	1.2	1.2

Production size			HMRB18		HMRB24	
Motor mounting position			090°/270°	000°/180°	090°/270°	000°/180°
Lead constant	$s_{lin.}$	[mm]	130	150	160	224
Max. speed	$v_{max.}$	[m/s]	5			
Max. acceleration	$a_{max.}$	[m/s²]	50			
Repeatability		[µm]	±50			
Max. order stroke		[mm]	6,000			
Thrust force and torque						
Max. thrust force	$F_{Amax.}$	N	1,300	1,000	4,000	3,750
Max. torque on drive shaft	$M_{Amax.}$	Nm	27	24	101	134
No load torque	M_0	Nm	2.0	2.0	4.0	4.0

Belt Drive

Sizes 85, 110,150, 180, 240 mm

HMRB Series

The permissible thrust force from the table is depending on speed level and order stroke length.

The minimum thrust force value must not be exceeded in the application.

Information:
Limiting the torque from the motor may avoid exceeding permitted thrust force.

HMRB thrust force

Product size			**HMRB08**		**HMRB11**		**HMRB15**		**HMRB18**		**HMRB24**	
Motor mounting position			090° / 270°	000° / 180°	090° / 270°	000° / 180°	090° / 270°	000° / 180°	090° / 270°	000° / 180°	090° / 270°	000° / 180°
Thrust force F_A corresponding to speed v	$F_{A(v<1\ m/s)}$	[N]	295	295	630	630	1,050	630	1,300	1,000	4,000	3,750
	$F_{A(v<2\ m/s)}$	[N]	295	295	550	550	990	630	1,300	1,000	4,000	3,380
	$F_{A(v<3\ m/s)}$	[N]	-	-	-	-	930	630	1,300	1,000	3,650	3,140
	$F_{A(v<4\ m/s)}$	[N]	-	-	-	-	890	630	1,300	1,000	3,370	2,950
	$F_{A(v<5\ m/s)}$	[N]	-	-	-	-	840	630	1,300	1,000	3,200	2,800
Thrust force F_A corresponding to order stroke length OS	$F_{A(OS<1000\ mm)}$	[N]	250	250	630	630	1,050	630	1,300	1,000	4,000	3,750
	$F_{A(OS<2000\ mm)}$	[N]	140	140	550	550	820	490	1,000	775	4,000	3,360
	$F_{A(OS<3000\ mm)}$	[N]	100	100	385	385	570	340	710	550	3,370	2,440
	$F_{A(OS<4000\ mm)}$	[N]	-	-	295	295	445	265	550	430	2,860	1,880
	$F_{A(OS<5000\ mm)}$	[N]	-	-	-	-	365	215	450	350	2,350	1,540
	$F_{A(OS<6000\ mm)}$	[N]	-	-	-	-	305	185	380	295	2,000	1,300

Example:

HMRB18 with motor mounting position 1 (090° front), speed v = 2 m/s (F_A = 1,300 N) and order stroke length OS = 2,500 mm (F_A = 710 N).
The maximum permissible thrust force F_A = 710 N must not be exceeded.

Protection Class

HMR Series

Standard - without cover

IP54 - with cover

HMR was developed for various environment conditions. HMR can be equipped with a cover to comply with IP54 protection class if a higher rating is required.

Version - Standard

Version - Protected Class IP54

Impact Protection

HMR Series

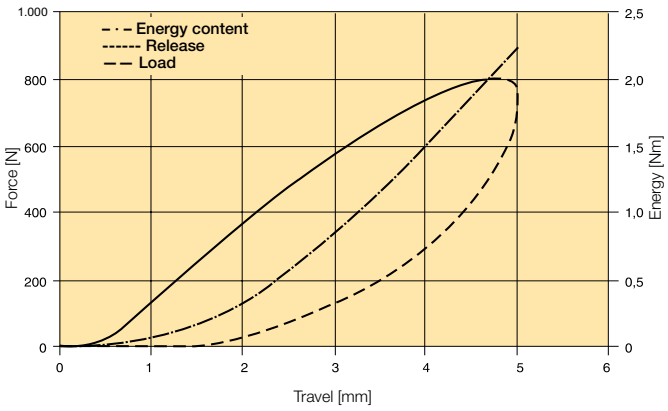
HMR can be equipped with impact protection. The mounted structure shock absorbers can compensate the energy released by unintentional impact and afford protection against mechanical damage.

Two structure shock absorbers are fitted to each side of the carriage prior to delivery.

Shock absorbers for impact protection

Product size	HMRx08	HMRx11	HMRx15	HMRx18	HMRx24
Shock absorber	TA12-5	TA12-5	TA12-5	TA17-7	TA17-7
Energy absorption	3.0 Nm	3.0 Nm	3.0 Nm	8.5 Nm	8.5 Nm
Maximum stroke	5.0 mm	5.0 mm	5.0 mm	7.0 mm	7.0 mm

Distance-force and energy-distance characteristic curve (dynamic) – production size HMR-145



Distance-force and energy-distance characteristic curve (dynamic) – production size HMR-175, HMR-225