nexen

LINEAR MOTION CONTROL

Technical Data Sheet

Profile Rail Brake, Generation II

Nexen's RB Series of linear profile guide rail brakes uses spring force to secure the load in holding applications. Superior response time and high force for stopping and holding in e-stop and power-off situations. Each RB brake clamps directly onto the center of the guide rail to provide positive braking and holding in all axes, with no effect on bearing surfaces. These profile rail brakes hold position accurately by reducing drive train backlash and elasticity.

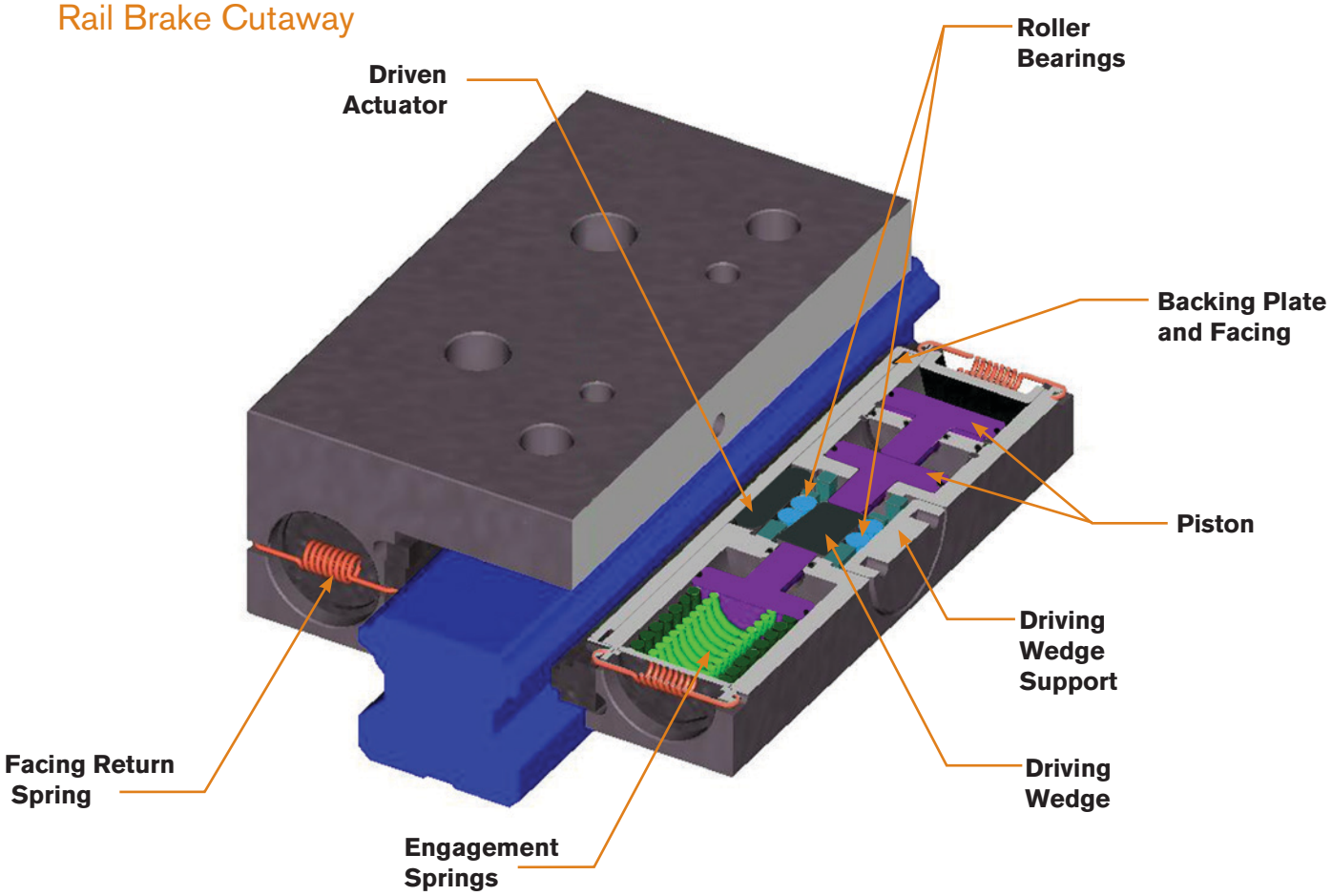
Nexen's RB Series is engineered for dependable performance. With a revolutionary set of patent pending features, the RB Series provides an industry leading braking solution for linear profile guide rails. If personnel safety is required, an unrelated, redundant safety system is recommended.

- Large friction facing contact area for consistent performance and low rail wear
- Field serviceable friction facing replacement
- Ideal for power-off, e-stop and holding applications
- Low backlash for accurate position holding
- Brake geometry is similar to linear bearing cassettes for easy installation
- Provides stiffness and eliminates vibration in linear drives
- Large clearance between brake and rail compensates for installation misalignment
- No lubrication or periodic maintenance required
- Models available to fit most common profile guide rails
- Highest spring engaged / air released holding force on the market
- Static holding cycle life in excess of one million cycles

CE

RoHS compliant 2002/95/EC

Rail Brake Cutaway



Rail Brake Product Numbers by Rail Type

Rail/Carriage Manufacturer	Rail Type	RB15	RB20	RB25	RB30	RB35	RB45
FESTO	FESTO	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
Hiwin	HGR[1]	968179[4]	968178	968161	968107	968174	968181
IKO	LWH	968132	968127	968158	968115	968171	968184
	LRX	968134	968129	968160	968116	968173	968182
	LWE	968133	968128	968159	968117	968172	968183
INA	KUSE	N/A	968148	968154	968118	968167	968194
	KUVE	N/A	968143	968155	968108	968168	968195
NOOK	NH	N/A[3]	N/A[3]	N/A[3]	N/A[3]	968198	N/A[3]
NSK	LS	968138	968144	968156	968119	968169	N/A[3]
	LH	968131	968125	968157	968120	968170	968185
Rockford	RPG	968217	968218	968112	968219	968220	968221
SBG	N/A	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
Schneeberger	MR	N/A	N/A[3]	968162	N/A[3]	N/A[3]	968206
SKF	LLRHS..A	968139	968146	968152	968105	968165	N/A[3]
	LLRHS..LA	968139	968146	968153	968105	968165	N/A[3]
	LLRHS..SA	968139	968146	968153	968105	968165	N/A[3]
STAR	1605	968139	968146	968152	968105	968165	968187
	1607	968139	968146	968152	968105	968165	968187
	1645	968139	968146	968152	968105	968165	968187
	1647	968139	968146	968152	968105	968165	968187
	1805	N/A	N/A[3]	968153	N/A[3]	968166	968197
	1807	N/A	N/A[3]	968153	N/A[3]	968166	968197
THK	HSR	968135[4]	968145	968130	968102	968101	968193
	SHS	968141[4]	968147	968150	968106	968163	968190
	SRG	968136	968142	968126	968114	968164	968192
	SR[1]	968177[4]	968180	968151	968113	968176	N/A[3]

Specifications

Model	Holding Force (F) (minimum)	Backlash at Full Brake Force (maximum)	Release Pressure (minimum)	Starting Engagement Time[2] (t_e)	Mass (average)
RB15	500 N [112 lbs]	Up to 0.10 mm [0.004 in]	5.5 bar [80 psi]	0.049 sec.	0.41 Kg [0.904 lbs]
RB20	800 N [180 lbs]	Up to 0.13 mm [0.005 in]	5.5 bar [80 psi]	0.044 sec.	0.62 Kg [1.367 lbs]
RB25	1000 N [225 lbs]	Up to 0.20 mm [0.008 in]	5.5 bar [80 psi]	0.050 sec.	0.84 Kg [1.86 lbs]
RB30	1300 N [292 lbs]	Up to .020 mm [0.008 in]	5.5 bar [80 psi]	0.070 sec	1.54 Kg [3.40 lbs]
RB35	1600 N [360 lbs]	Up to 0.20 mm [0.008 in]	5.5 bar [80 psi]	0.070 sec.	2.04 Kg [4.50 lbs]
RB45	2600 N [585 lbs]	Up to 0.20 mm [0.008 in]	5.5 bar [80 psi]	0.080 sec.	3.48 Kg [7.68 lbs]

[1] Rail brake holding forces are 10% less than show above when used with THK, “SR” and Hiwin “HGR” rail types.

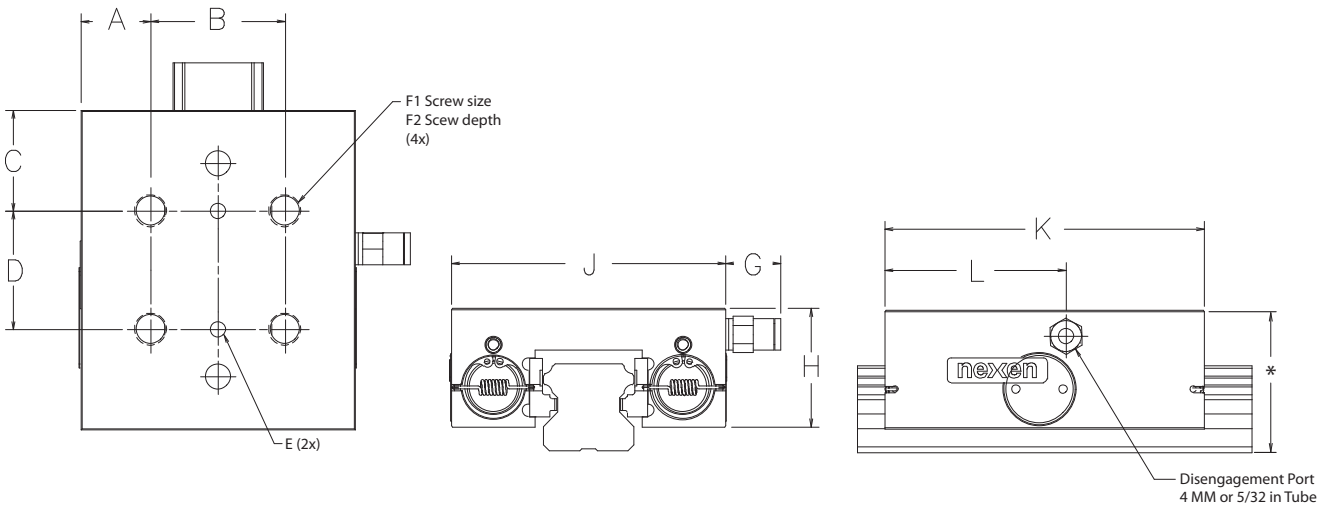
[2] Average, full engagement time with up to 2 meters length of 4mm, polyurethene tube, and 1.4 C_v, 24 volt directional control valve and no quick exhaust.

[3] Contact Nexen for Availability.

[4] RB15 product numbers 968135, 968141, 968177 and 968179 have a holding force of 400 N [90 lbs].

Profile Rail Brake, Approximate Dimensions

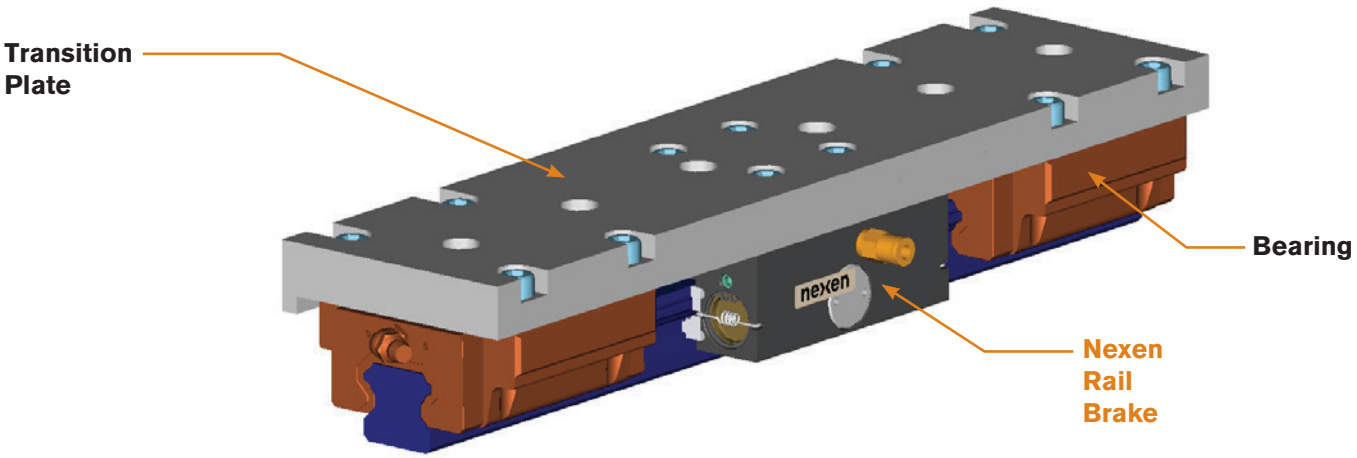
mm
in



Model	A	B	C	D	øE	F1	F2	G	H	J	K	L	Threaded Port
RB15B	14.25 [0.561]	26.00 [1.024]	20.50 [0.807]	26.00 [1.024]	3.00 [0.118]	M5 x 0.8-6H	5.20 [0.210]	13.90 [0.550]	21.00 [0.827]	54.50 [2.146]	67.00 [2.640]	41.00 [1.610]	M5 x 0.8-6H
RB20B	17.25 [0.679]	30.00 [1.181]	23.50 [0.930]	30.00 [1.181]	4.00 [0.157]	M6 x 1.00-6H	7.20 [0.280]	13.90 [0.550]	25.50 [1.004]	64.50 [2.539]	77.00 [3.030]	45.00 [1.770]	M5 x 0.8-6H
RB25B	17.75 [0.699]	34.00 [1.339]	25.50 [1.000]	30.00 [1.181]	4.00 [0.157]	M8 x 1.25-6H	9.00 [0.340]	13.90 [0.550]	30.00 [1.181]	69.50 [2.736]	80.90 [3.190]	45.90 [1.810]	M5 x 0.8-6H
RB30B	8.75 [0.344]	72.00 [2.835]	24.00 [0.940]	52.00 [2.047]	6.00 [0.236]	M10 x 1.5-6H	9.00 [0.350]	13.90 [0.550]	35.00 [1.378]	89.50 [3.524]	100.00 [3.937]	48.00 [1.890]	M6 x 1.0-6H
RB35B	8.75 [0.344]	82.00 [3.228]	22.00 [0.870]	62.00 [2.441]	6.00 [0.236]	M10 x 1.5-6H	9.00 [0.350]	13.90 [0.550]	40.00 [1.575]	99.50 [3.917]	106.00 [4.173]	52.20 [2.055]	M6 x 1.0-6H
RB45B	27.25 [1.073]	65.00 [2.559]	28.50 [1.120]	70.00 [2.756]	6.35 [0.250]	M12 x 1.75-6H	14.00 [0.550]	13.90 [0.550]	50.00 [1.969]	119.50 [4.705]	127.00 [5.000]	63.20 [2.49]	M6 x 1.0-6H

*Additional dimensions and tolerances are available in the drawings and CAD models on the product pages on Nexen's website.

Typical Mounting Arrangement



Rail Brake Sample Calculations for Emergency Stops

SAMPLE DATA

Brake Model[1]	Brake Force (F)[1]	Brake Engagement Time (t_e)[1]	Acceleration of Gravity (g)	Mass of Load (m)	Load Velocity (V)
RB25	1000 N	0.050 seconds	9.8 m/s^2	45.4 kg	0.50 m/s

[1]For brake specifications, see Specifications Table on page 2.

HORIZONTAL TRAVEL
(X and Y axis)

Dynamic Stopping Time (in seconds):

$$t_T = \frac{m \cdot V}{F} + t_e$$

$$t_T = \frac{45.4 \cdot 0.50}{1000} + .050 = 0.073 \text{ seconds}$$

Dynamic Stopping Distance (in meters):

Distance of Travel During Brake Engagement (L_e)

$$L_e = V \cdot t_e$$

$$L_e = 0.5 \cdot 0.050 = 0.025 \text{ meters}$$

Stopping Distance (L_s) at Full Brake Force

$$L_s = \frac{0.5 \cdot m \cdot V^2}{F}$$

$$L_s = \frac{0.5 \cdot 45.4 \cdot 0.50^2}{1000} = 0.006 \text{ meters}$$

Total Travel Distance

$$L_T = L_e + L_s$$

$$L_T = 0.025 + 0.006 = 0.031 \text{ meters or } 31 \text{ mm}$$

In this example, the load will travel 31 mm [1.22 in] from the time the RB25 engages until the system is brought to a complete stop.

VERTICAL TRAVEL (DOWNWARD)
(Z axis)

Dynamic Stopping Time (in seconds):

$$t_T = \frac{m \cdot (g \cdot t_e + V)}{[F - (m \cdot g)]} + t_e$$

$$t_T = \frac{45.4 \cdot (9.8 \cdot 0.050 + 0.50)}{[1000 - (45.4 \cdot 9.8)]} + 0.050 = 0.131 \text{ seconds}$$

Dynamic Stopping Distance (in meters):

Distance of Travel During Brake Engagement (L_e)

$$L_e = 0.5 \cdot (t_e^2) \cdot g + V \cdot t_e$$

$$L_e = 0.5 \cdot (.050^2) \cdot 9.8 + .5 \cdot .050 = 0.037 \text{ meters}$$

Stopping Distance (L_s) at Full Brake Force

$$L_s = 0.5 \cdot [(t_e \cdot g) + V] \cdot (t_T - t_e)$$

$$L_s = 0.5 \cdot [(.050 \cdot 9.8) + 0.5] \cdot (0.131 - 0.050)$$

$$L_s = 0.040 \text{ meters}$$

Total Travel Distance

$$L_T = L_e + L_s$$

$$L_T = 0.037 + 0.040 = 0.077 \text{ meters or } 77 \text{ mm}$$

In this example, the load will travel 77 mm [3.03 in] from the time the RB25 engages until the system is brought to a complete stop.

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In accordance with Nexen's established policy of constant product improvement, the specifications contained in this document are subject to change without notice. Technical data listed in this document are based on the latest information available at the time of printing and are also subject to change without notice. For current information, please consult www.nexengroup.com

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