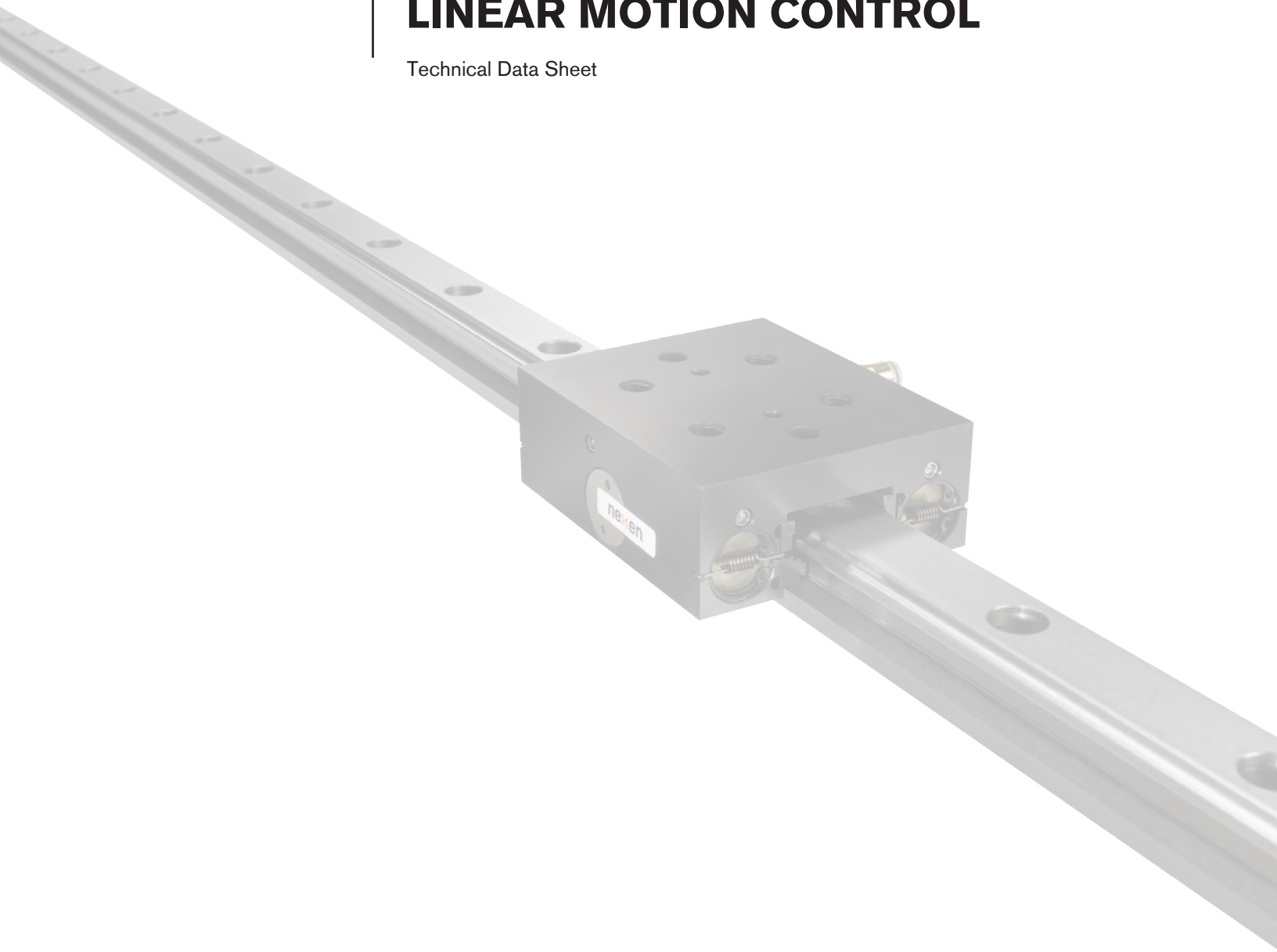
nexen | In-Position Technologies

LINEAR MOTION CONTROL

Technical Data Sheet



Profile Rail Brake, Generation II

CE

RoHS compliant 2002/95/EC

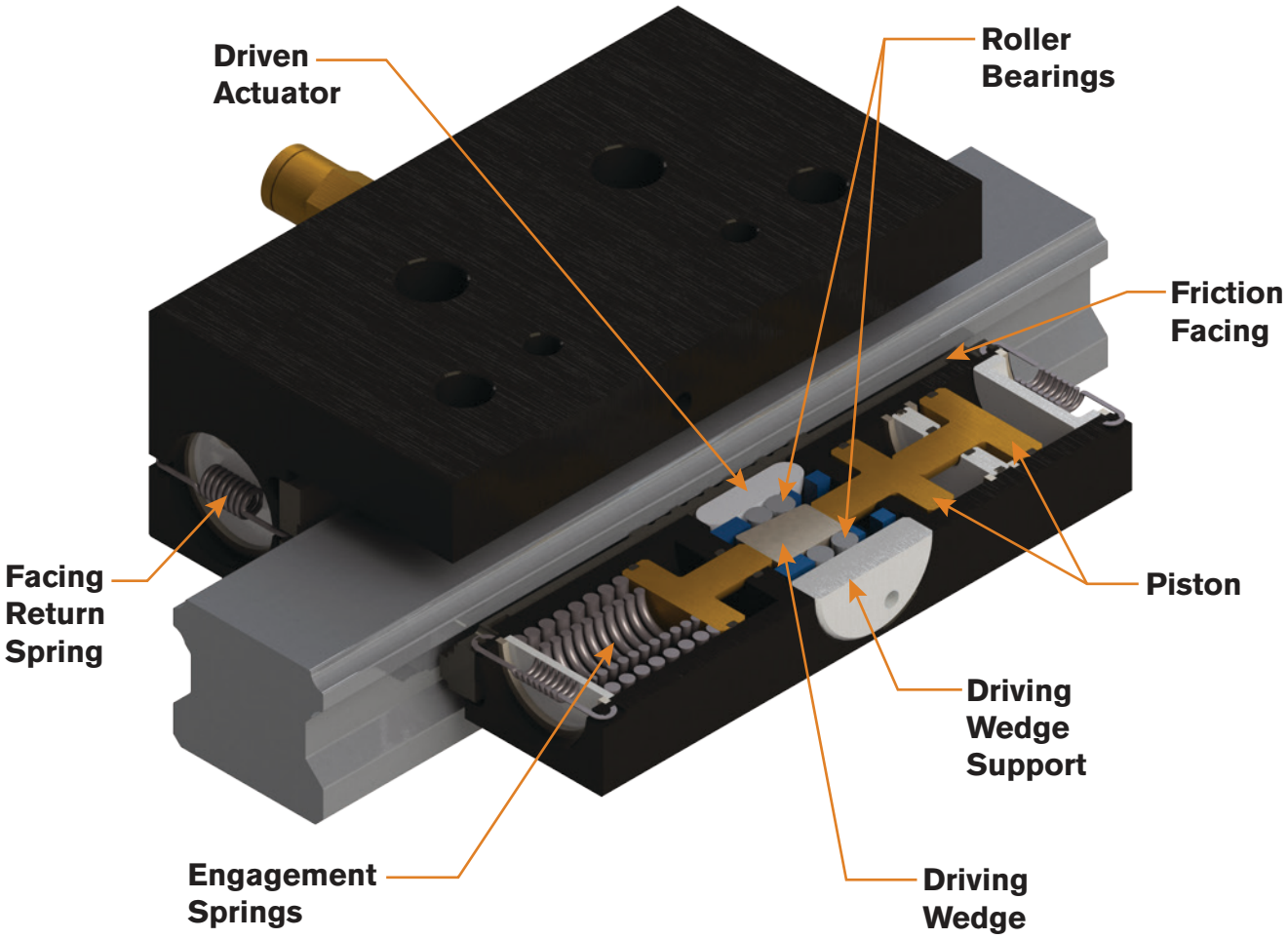
A New Standard In Performance

Nexen's RB Series of linear profile guide rail brakes use 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 patented 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

Rail Brake Specifications



Specifications

Model	Holding Force (F) (minimum)	Backlash at Full Brake Force (maximum)	Release Pressure (minimum)	Starting Engagement Time[1] (t_e)	Mass (average)
RB15B	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]
RB20B	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]
RB25B	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]
RB30B	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]
RB35B	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]
RB45B	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]
RBL55B	2600 N [585 lbs]	Up to 0.20 mm [0.008 in]	5.5 bar [80 psi]	0.225 sec.	5.21 Kg [11.49 lbs]
RBL65B	3400 N [764 lbs]	Up to 0.20 mm [0.008 in]	5.5 bar [80 psi]	0.230 sec.	7.10 Kg [15.65 lbs]

[1] 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.

Rail Brake Product Numbers by Rail Type

Rail/Carriage Manufacturer	Rail Type	RB15B	RB20B	RB25B	RB30B	RB35B	RB45B	RBL55B	RBL65B
HIWIN	HGR[1]	968179[2]	968178	968161	968107	968174	968181	N/A	N/A
IKO	LWH	968132	968127	968158	968115	968171	968184	968254[5]	968259[4,5]
	LRX	968134	968129	968160	968116	968173	968182	968253[5]	968258[4,5]
	LWE	968133	968128	968159	968117	968172	968183	N/A	N/A
INA	KUSE	N/A	968148	968154	968118	968167	968194	N/A	N/A
	KUVE	968137	968143	968155	968108	968168	968195	N/A	N/A
LINTECH	HRC	968214	968215	968216	N/A[3]	N/A[3]	N/A[3]	N/A	N/A
NB	SGL[1]	968223[2]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A	N/A
NOOK	NH	N/A[3]	N/A[3]	968213	N/A[3]	968198	N/A[3]	N/A	N/A
NSK	LS/NS	968138	968144	968156	968119	968169	N/A	N/A	N/A
	LH/NH	968131	968125	968157	968120	968170	968185	968255[5]	968260[4,5]
PMI	MSA	968200	968201	968202	968203	968204	968205	N/A[3]	N/A[3]
ROCKFORD	RPG	968217	968218	968112	968219	968220	968221	N/A	N/A
SBC	SBG	N/A[3]	968188	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
	SBI	N/A[3]	968186	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
SCHNEEBERGER	MR	N/A	N/A	968162	N/A	N/A[3]	968206	N/A[3]	N/A[3]
SKF	LLRHS..A	968139	968146	968152	968105	968165	N/A[3]	N/A	N/A
	LLRHS..LA	968139	968146	968153	968105	968165	N/A[3]	N/A	N/A
	LLRHS..SA	968139	968146	968153	968105	968165	N/A[3]	N/A	N/A
	LLTHR	N/A[3]	N/A[3]	968121	968111	N/A[3]	N/A[3]	N/A	N/A
STAR (BOSCH) (REXROTH)	1605	968139	968146	968152	968105	968165	968187	N/A[3]	N/A[3]
	1607	968139	968146	968152	968105	968165	968187	N/A[3]	N/A[3]
	1645	968139	968146	968152	968105	968165	968187	N/A[3]	N/A[3]
	1647	968139	968146	968152	968105	968165	968187	N/A[3]	N/A[3]
	1805	N/A	N/A	968153	N/A[3]	968166	968197	N/A[3]	N/A[3]
	1807	N/A	N/A	968153	N/A[3]	968166	968197	N/A[3]	N/A[3]
TBI	TRH	968207	968208	968209	968210	968211	N/A[3]	N/A[3]	N/A[3]
THK	HSR	968135[2]	968145	968130	968102	968101	968193	968252[5]	968257[4,5]
	SHS	968141[2]	968147	968150	968106	968163	968190	968250[5]	968256[4,5]
	SRG	968136	968142	968126	968114	968164	968192	968251[5]	N/A[3]
	SR[1]	968177[2]	968180	968151	968113	968176	N/A	N/A	N/A
THOMSON	400	N/A[3]	968149	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A

[1] Rail brake holding forces are 10% less than shown on the previous page when used with THK: “SR”, Hiwin: “HGR” and NB: “SGL” rail types.

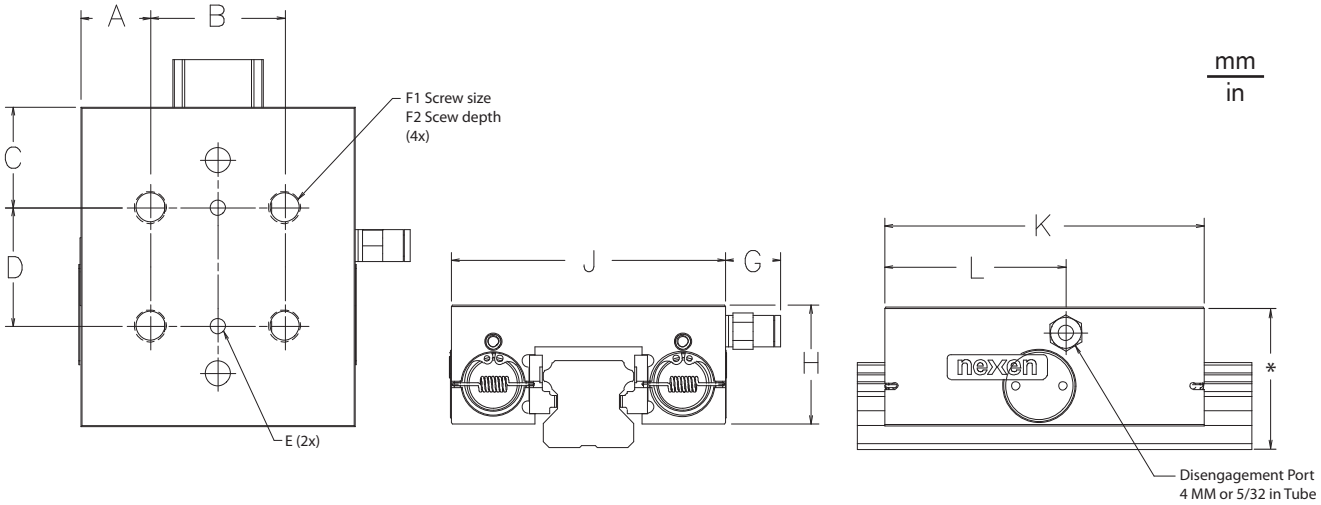
[2] RB15 product numbers 968135, 968141, 968177, 968223 and 968179 have a holding force of 400 N [90 lbs].

[3] Contact Nexen for Availability.

[4] RBL65 Not Recommended for E-Stops.

[5] RBL55 and RBL65 are not CE rated.

Rail Brake Dimensions

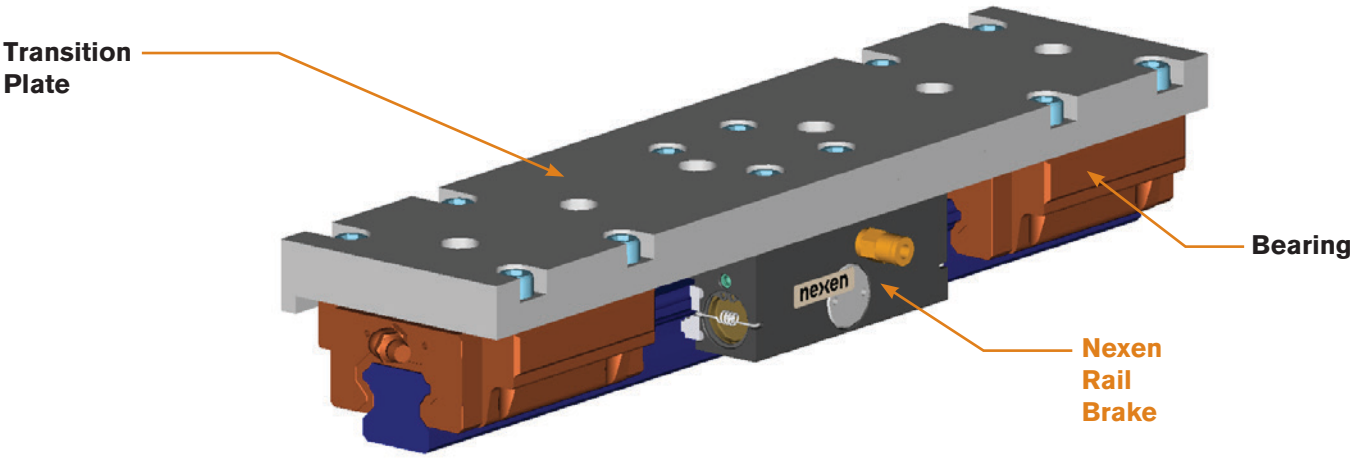


mm
in

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
RBL55B	27.5 [1.08]	75.00 [2.953]	26.0 [1.02]	75.00 [2.953]	N/A	M12 x 1.75-6H	14.00 [0.550]	14.70 [0.579]	58.00 [2.283]	130.00 [5.118]	127.00 [5.000]	62.60 [2.465]	M6 x 1.0-6H
RBL65B	32.0 [1.26]	76.00 [2.992]	28.5 [1.12]	70.00 [2.756]	N/A	M16 x 2.00-6H	20.00 [0.787]	14.70 [0.579]	75.00 [2.953]	140.00 [5.512]	127.00 [5.000]	75.00 [2.953]	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, 2]	Brake Force (F)[1]	Brake Engagement Time (t_e)[1]	Acceleration of Gravity (g)	Mass of Load (m)	Load Velocity (V)
RB25B	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 4.

[2]RBL65B not recommended for E-Stops.

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 RB25B 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 RB25B engages until the system is brought to a complete stop.

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