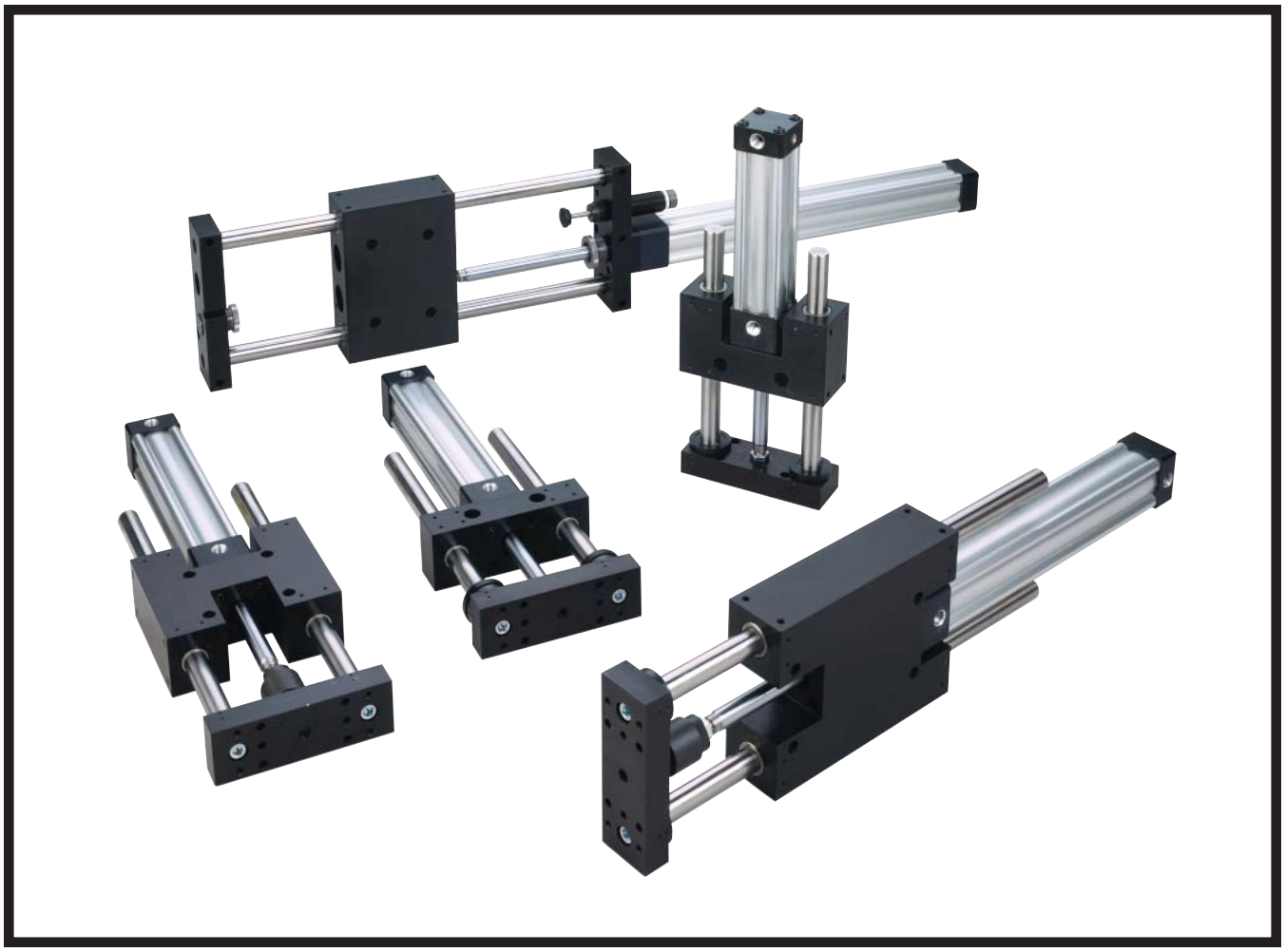
HB Series

Guided Cylinders



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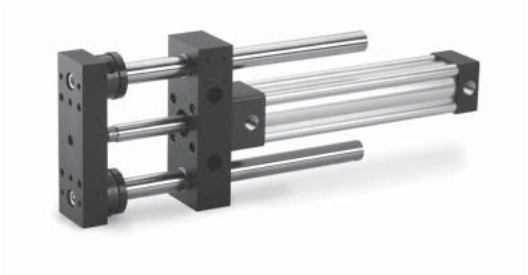
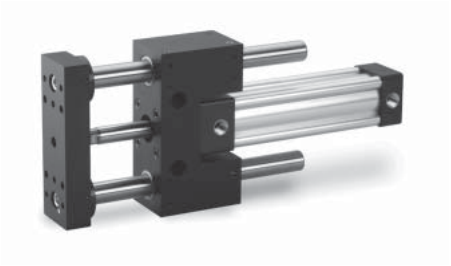
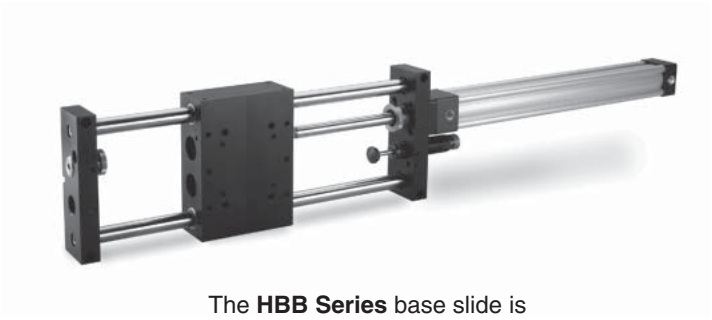
The HB Series slides are an ideal pneumatic actuator for guided linear motion applications such as material handling, packaging, product testing, assembly, parts transfer, machine loading/unloading, clamping and many other automation operations. The HB Series is rigid enough to tackle the toughest applications, yet with the compact sizes of the HBC and HBN, are light enough to suit every application need.



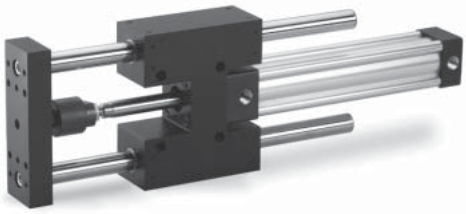
The **HBN Series** non-rotating slide is designed for light-duty horizontal loads and vertical lifting applications.



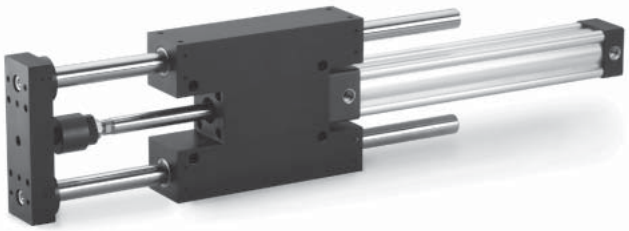
The **HBC Series** compact thrust slide is designed for short travel in either the horizontal or vertical direction where side loading may be introduced.



The **HBB Series** base slide is designed for gantry style applications where high load or minimal deflection is required.



The **HBT Series** thrust slide is designed for medium duty linear motion applications.



The **HBR Series** reach slide is designed for heavy duty or high load applications where minimal deflection is desired.

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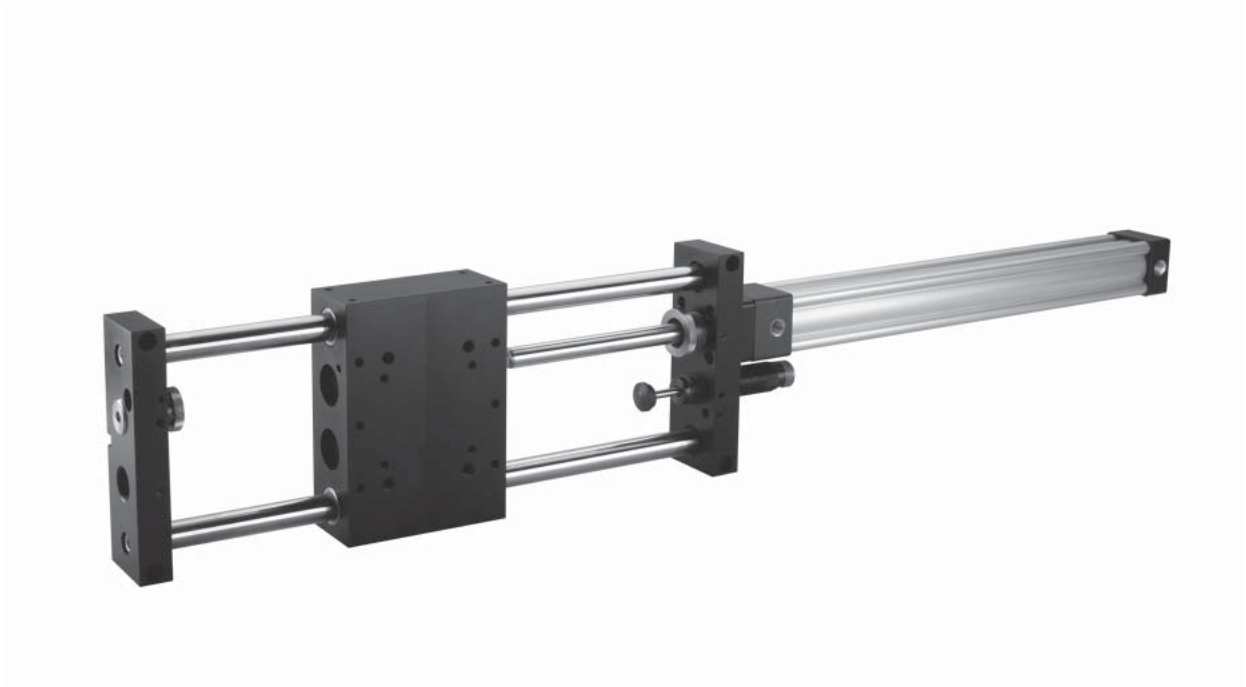
HBB Series
Base Slides



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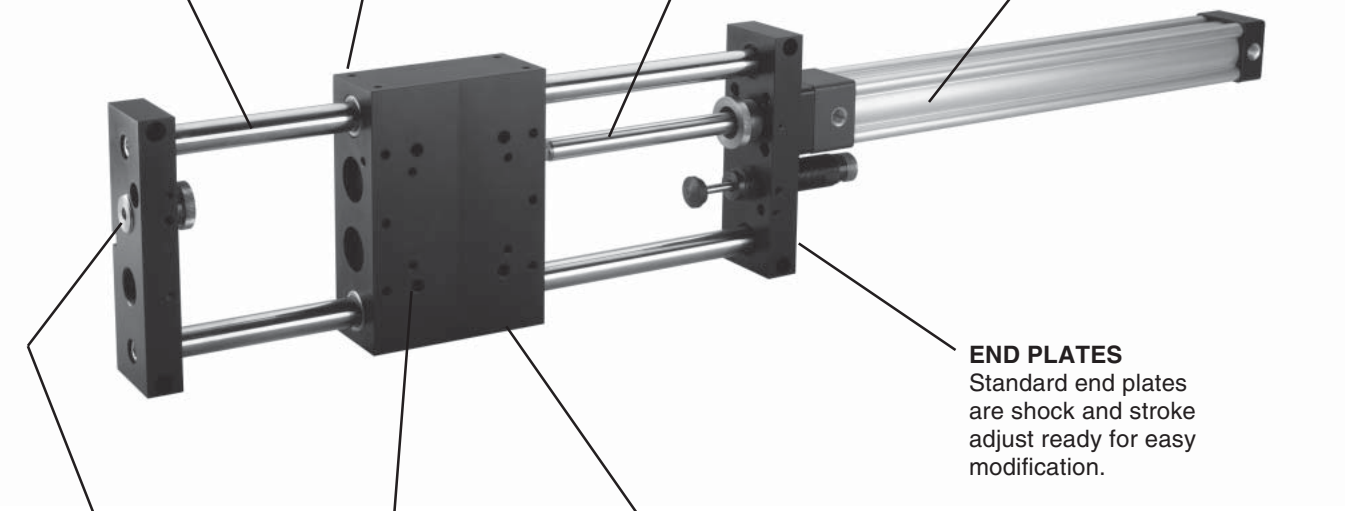
BUSHINGS
Composite bushings with oversized shafting are available for higher loads and lower cost. Sealed recirculating ball bushings provide precise alignment with very low friction and wear.

PISTON ROD
Hard chrome plated and polished piston rod of 100,000 PSI yield, high tensile strength steel, case hardened to Rc 50-54 for reliable performance, reduced friction and long rod seal life.

SUPPORT SHAFTS
Case hardened to Rc 60 - 65, support shafts are machined from high carbon alloy steel. Stainless steel and oversized shafting are available.

CYLINDER PISTON
Aluminum piston with nylon wearband eliminates metal-to-metal contact. This increases cylinder life especially when the support rods deflect under load. Magnetic piston standard on all HB slides.



END PLATES
Standard end plates are shock and stroke adjust ready for easy modification.

THREADED STROKE ADJUSTERS
Used to achieve precise end of stroke adjustment. Available with shock absorbers and optional shock pads to reduce noise.

DIRECT MOUNTING
Tapped holes provide direct mounting capabilities to HBN and HBC Series.

CARRIAGE
A machined aluminum one-piece anodized body with tapped and counterbored through holes on three faces for mounting flexibility. Standard dowel pin holes provide accurate mounting.

3D CAD FILES
available for download at
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HBB Series Base Slide

The HBB Series base slides are designed for gantry style linear motion applications. Two parallel precision ground, case hardened support shafts are guided by four linear bushings incorporated into the carriage assembly. The bearings are prelubricated to provide millions of trouble-free cycles. Composite bushings with standard or oversized shafting or linear ball bushings are available. The HBB Series features a machined, anodized one-piece aluminum carriage with tapped and counterbored through holes for mounting flexibility. Standard dowel pin holes provide precision mounting for the carriage. The power behind the HBB Series is Parker's premium NFPA aluminum, steel, or ISO cylinder.

The rugged, repairable cylinder is guided internally by a wear band. This feature allows the piston rod assembly to "float" in the bore, thereby eliminating metal-to-metal contact. The result is dramatically greater cylinder seal life, especially when the support shafts deflect under load. This ensures very long cylinder life with reduced maintenance and downtime.

The HBB Series is an ideal pneumatic actuator for gantry applications such as material handling, packaging, product testing, assembly, parts transfer, machine loading/unloading, clamping and many other automation operations.

Available options include inductive proximity sensors, prox ready, solid state and reed switches, oversized shafting with composite bushings, shock absorbers, cylinder cushions, external bumpers, adjustable stop collars, flow controls, fluorocarbon seals, 3-position cylinders, cylinder with rod lock mechanism, and slides without cylinders. Consult factory for other application needs.

SPECIFICATIONS

- Maximum operating pressure: 150 psi (air)
  250 psi (oil) – 2ML cylinder only
  750 psi (oil) – 3L cylinder only
- Operating characteristics: double acting
- Four support rod sizes: 20, 25, 30 and 35 mm
- Stroke tolerance: +.030, -.000
- Mounting: unrestricted
- Operating temperature range (cylinder):
  Standard seals 0 to 165°F
  Fluorocarbon seals* 0 to 250°F
- Filtration requirement: 40 micron filtered, dry air

* See fluorocarbon seal option for high temperature applications.

Quick Reference Data

Model	Standard Support Rod Diameter mm (in)**	Oversized Rod Diameter mm (in)	NFPA Cylinder Bore Size (in)	ISO Cylinder Bore Size (mm)	Maximum Suggested Stroke (in)**	Force Output on Extension at 80 psi (lb)	Force Output on Retraction at 80 psi (lb)	Weight (lb)			
								Standard Rod		Oversized Rod	
								Base	Per in. Stroke	Base	Per in. Stroke
15	20 (0.79)	25 (0.98)	1-1/2	40	30	142	117	11.05	0.48	11.92	0.63
20	25 (0.98)	30 (1.18)	2	50	36	251	226	18.65	0.64	19.81	0.83
25	30 (1.18)	35 (1.38)	2-1/2	63	42	393	368	31.78	0.85	33.32	1.08

** For any long-stroke applications, it is recommended to use linear ball bushings. Consult factory for longer strokes.

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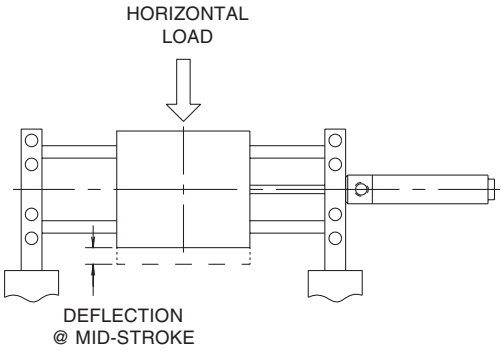
Horizontal Load Capactiy & Deflection with Standard Shafting

The plots on these two pages illustrate the side load vs. actuator stroke for the three HBB slide sizes. Applied loads will cause a slight deflection of the support rods. Deflection distance is also shown. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.

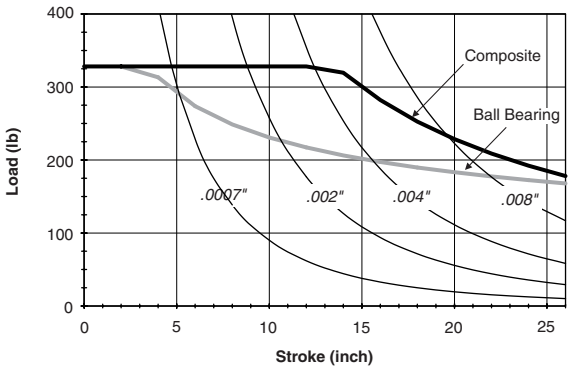
NOTE: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

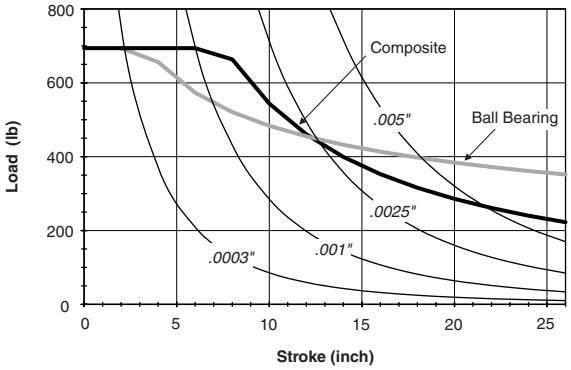


EXAMPLE:
An HBB15 with ball bearings and a stroke of 12" would have a load capacity of 215 lbs.

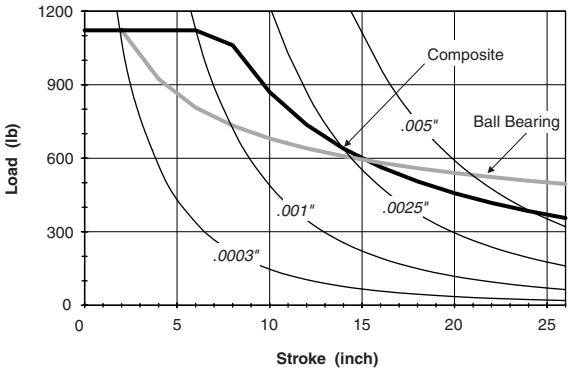
HBB15



HBB20



HBB25



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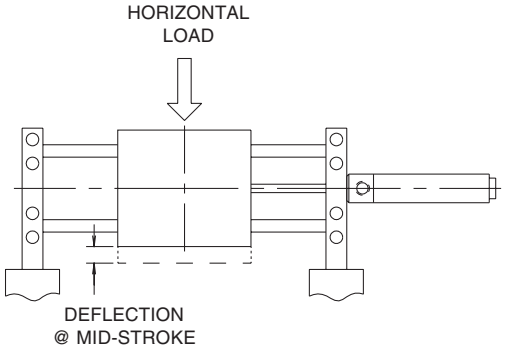
Horizontal Load Capactiy & Deflection with Oversized Shafting

The plots on these two pages illustrate the side load vs. actuator stroke for the three HBB slide sizes. Applied loads will cause a slight deflection of the support rods. Deflection distance is also shown. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.

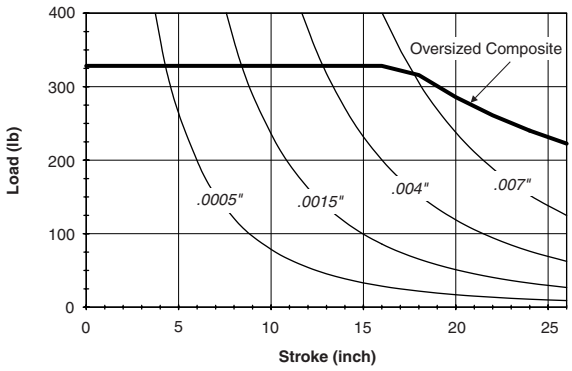
NOTE: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

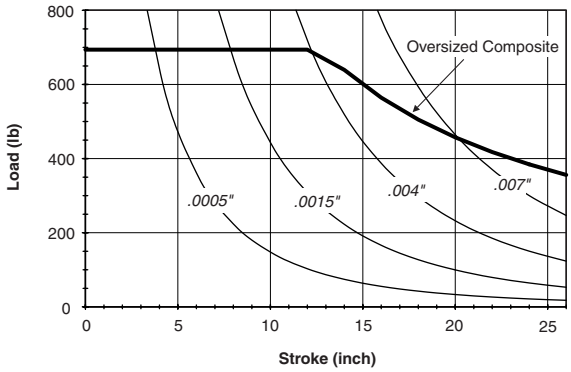


EXAMPLE:
An HBB15 with oversized composite bushings and a stroke of 12" would have a load capacity of 320 lbs.

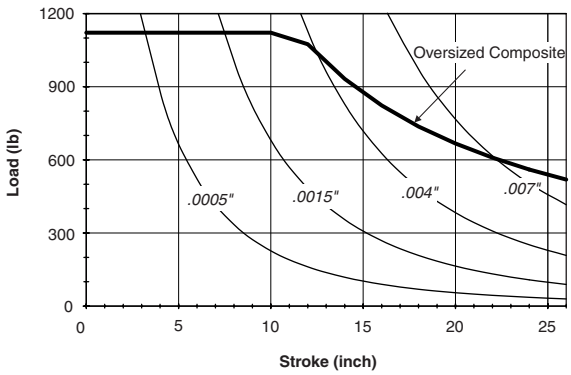
HBB15



HBB20



HBB25



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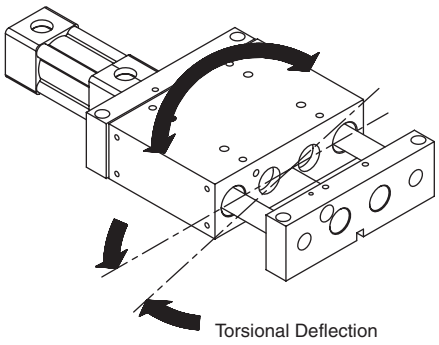
Symmetrical Torque Capacity with Standard Shafting

The plots on this page provide the torsional load vs. actuator stroke for the three HBB slide sizes. Torsional loads will cause a slight amount of angular deflection of the tooling plate. Angular deflection is also shown. The data presented is based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dymanic torques will reduce cycle life. For static torque, multiply the information in the graph by 1.5.

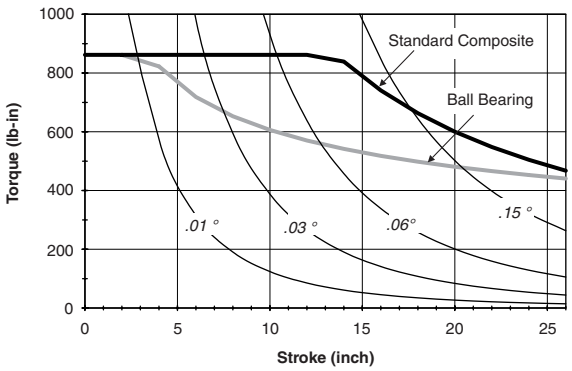
NOTE: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

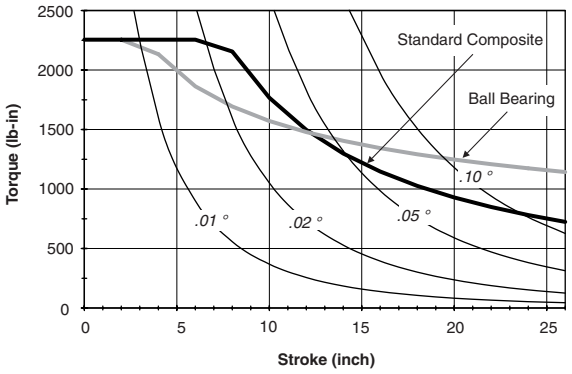


EXAMPLE:
An HBB25 with composite bushings and a stroke of 12" would have a torque capacity of 3500 lb-in.

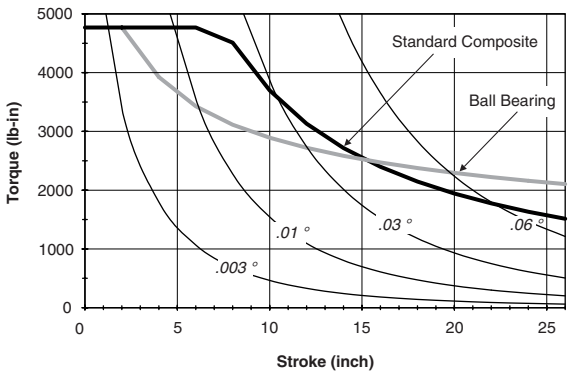
HBB15



HBB20



HBB25



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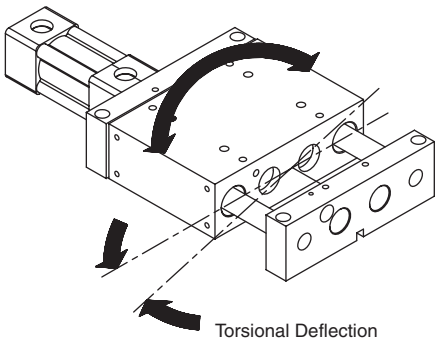
Symmetrical Torque Capacity with Oversized Shafting

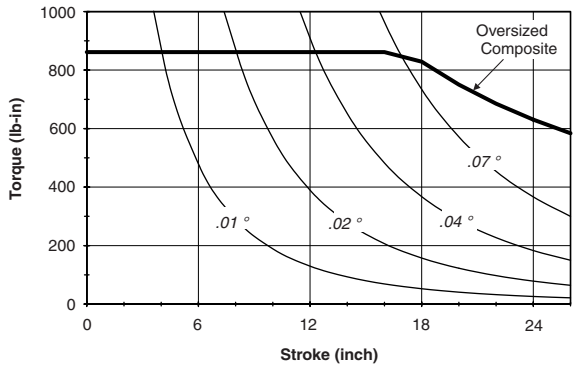
The plots on this page provide the torsional load vs. actuator stroke for the three HBB slide sizes. Torsional loads will cause a slight amount of angular deflection of the tooling plate. Angular deflection is also shown. The data presented is based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dymanic torques will reduce cycle life. For static torque, multiply the information in the graph by 1.5.

NOTE: Actuator life may vary depending on the severity of the following variables:
- Acceleration
- Velocity

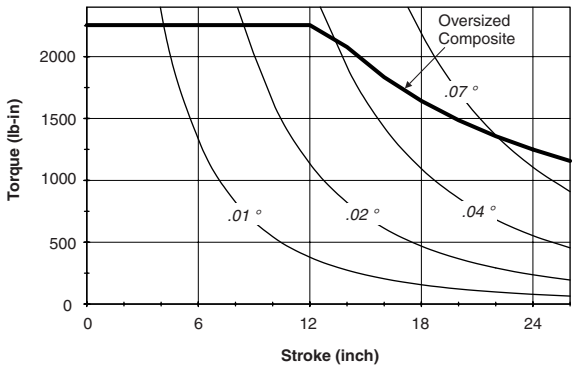


EXAMPLE:
An HBB25 with composite bushings and a stroke of 12" would have a torque capacity of 4500 lb-in.

HBB15



HBB20



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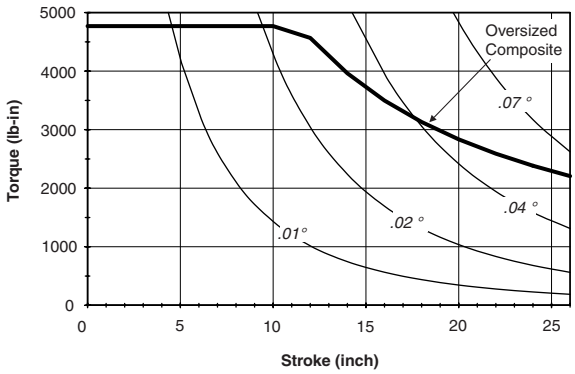

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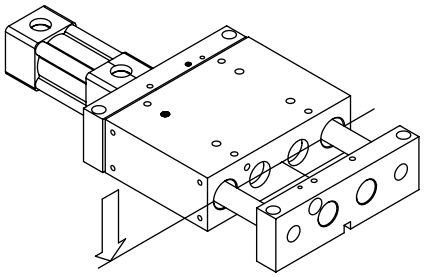
Asymmetrical Torque Capacity

Asymmetrical loading occurs when the load is applied to one side of the unit. HBB Series units can resist torsional loads that are asymmetrical. The graphs on these two pages show torsional load capacity for both standard and oversized shafting.

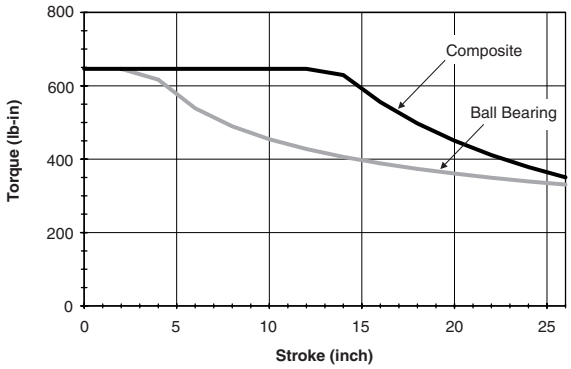
NOTE: Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation



EXAMPLE:
An HBB20 with composite bushings and a stroke of 15" would have an asymmetrical torque capacity of 810 lb-in.

HBB15



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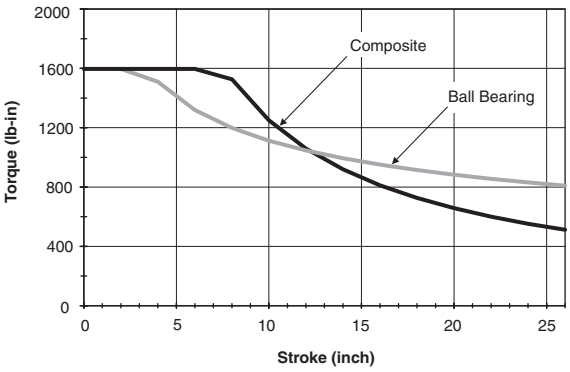
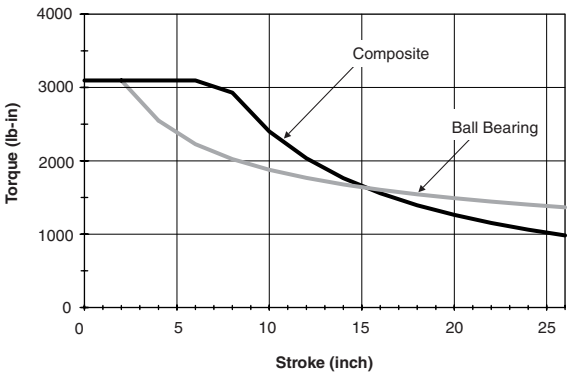


HBB25



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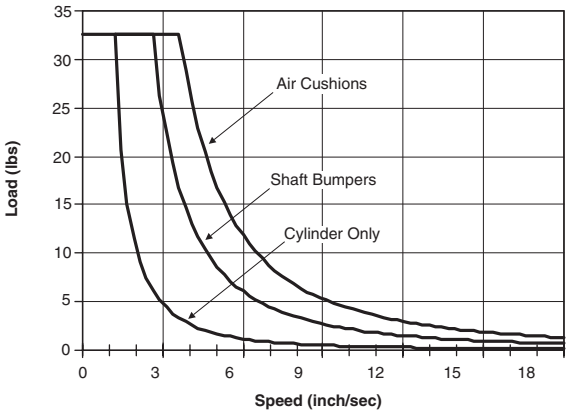
Kinetic Energy

These plots illustrate the stopping capacity of the HBB Series with bumpers, cushions or cylinder only. This type of sizing is based on the weight of the load and the speed at which the load is moving. The bumper plots are based on a 0.020 deflection.

For values above the cushion line, shock absorbers must be specified. Follow the shock absorber sizing steps on the following page to ensure proper stopping capacity.

NOTE: *These charts are to be used only to determine the stopping capacity of each guided cylinder.*

HBB15



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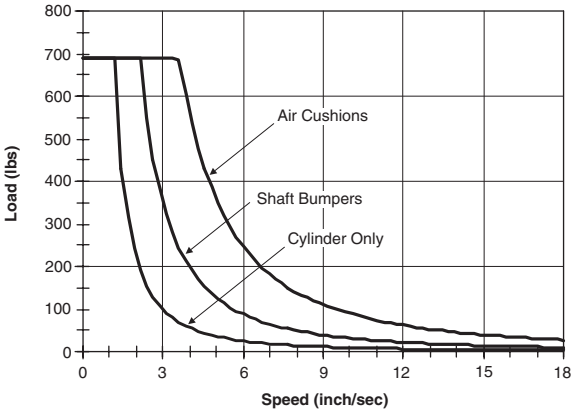

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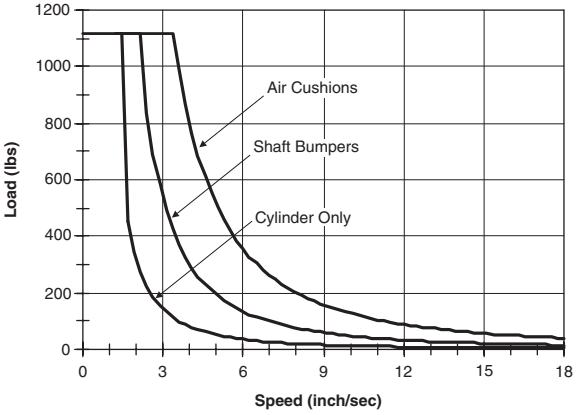

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Kinetic Energy

Steps to sizing a guided cylinder with shocks:

1) Determine the "Moving Weight", W.

   Use Table 1 to determine the "Kinetic Energy Weight" of a given slide. This value should be added to the weight of the load the slide will be carrying.

   Moving Weight (lbs) =
   Kinetic Energy Weight (lbs) + Weight of Load (lbs)

2) Determine the velocity of the load, V (ft/second)

3) Determine the cylinder force output at the operating pressure, $F_{cylinder}$ (lbs)

4) Detemine the Kinetic Energy of the load:

   $KE = 0.2 \times W \times V^2$ (lb-in)

5) Determine the Energy per Cycle, E_{cycle} (lb-in):

   $E_{cycle} = KE + F_{cylinder} \times$ Shock Stroke
   (unless stroke adjusters are used, 1 inch is standard)

   This value should be less than the value listed in table 2

6) Determine the Energy per Hour: E_{hour} (in-lbs)

   $E_{hour} = 2 \times E_{cycle} \times$ # of cycles in one hour
   (a cycle is defined as the extension and retraction of the slide)

   This value should be less than the value listed in table 2

7) Determine the Effective Weight of the load

$$W_{effective} = \frac{E_{cycle}}{0.2 \times V^2}$$

This value should be between the values listed in table 2

Table 1

Model	Base Weight (lb)	Stroke Adder (lb per in)	Base Weight*, Oversized (lb)	Stroke Adder*, Oversized (lb per in)
HBB15	7.93	0.09	7.93	0.09
HBB20	13.94	0.22	13.94	0.22
HBB25	25.03	0.42	25.03	0.42

* Support rods do not move with the carriage, so kinetic energy weights are the same for standard and oversized support rods.

Table 2

Size	Total Energy per Cycle (lb-in)	Total Energy per Hour (lb-in)	Effective Weight (lb)	Velocity Range (in/sec)
15	600	600,000	20 - 3000	6 - 144
20	900	800,000	30 - 4500	6 - 144
25	1500	670,000	28 - 3800	6 - 120

Example:

An HBB20-10D-B with standard support rods and shock absorbers will be carrying a load of 40 lbs at a velocity of 17 in/second (cycling 15 times per hour) while operating at 80psi. Is this unit properly sized?

1) Moving Weight = [13.94 + (10 × 0.22)] + 40 lbs = 56.14 lbs
2) V = 17 in/second = 1.4 ft/second
3) $F_{cylinder}$ = 251 lbs
4) $KE = 0.2 \times 56.14 \times 1.4^2 = 22.01$ lb-in
5) $E_{cycle} = 22.01 + 251 = 273.01$ lb-in
6) $E_{hour} = 2 \times 273.01 \times 15 = 8190$ lb-in

7) $$W_{effective} = \frac{273.01}{0.2 \times (1.4)^2} = 696 \text{ lbs}$$

The shock will dissipate the energy of the load.

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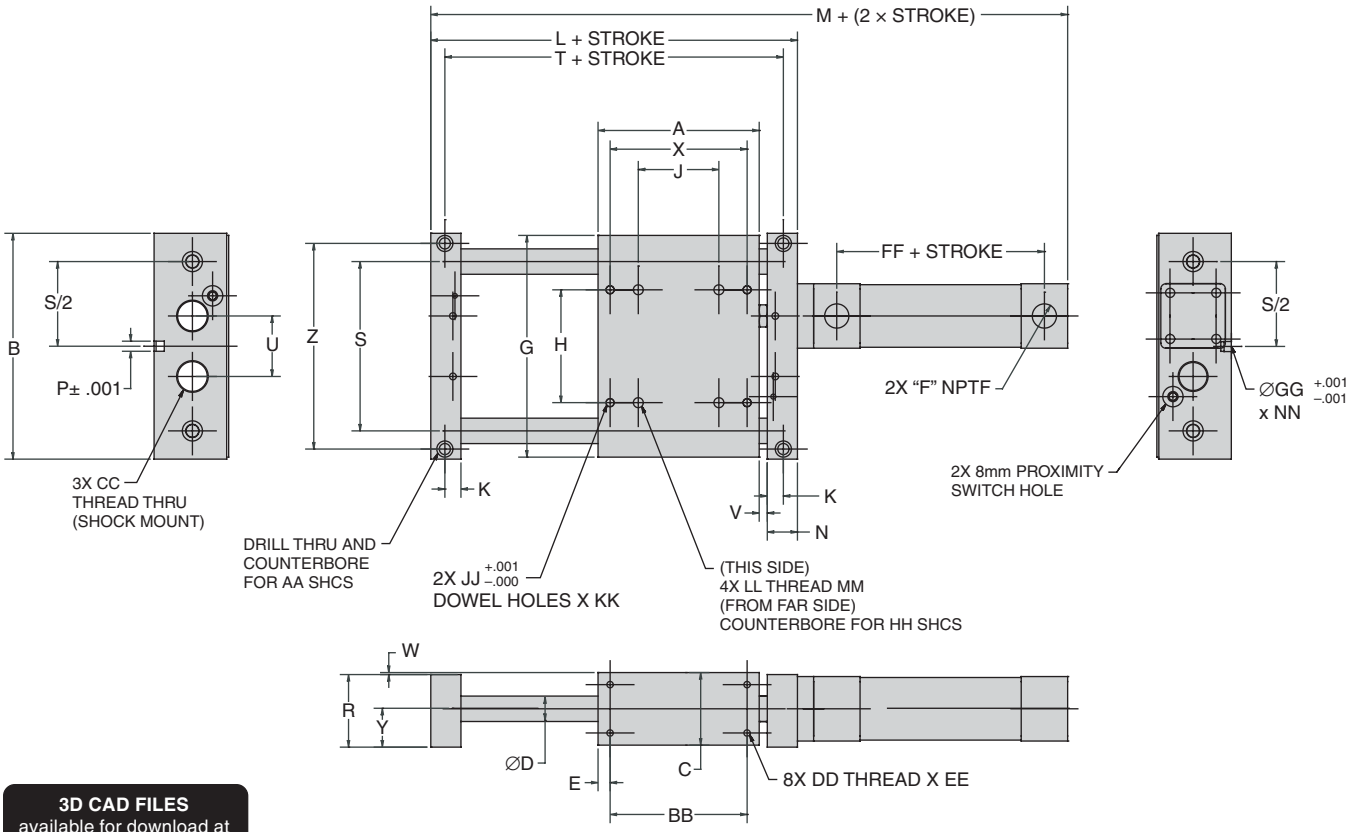
HBB Series



3D CAD FILES
available for download at
parker.com/automation
or ThomasRegister.com

Model	A	B	C	Ds	Do	E	F	G	H	J	K	L
15	5.00	7.00	2.25	20mm (0.79)	25mm (0.98)	0.375	1/4	6.875	3.50	2.50	0.50	7.00
20	5.50	8.75	2.75	25mm (0.98)	30mm (1.18)	0.500	3/8	8.625	4.50	2.50	0.50	8.00
25	6.50	11.00	3.25	30mm (1.18)	35mm (1.38)	0.500	3/8	10.875	6.00	3.00	0.50	9.50

Model	M	N	P	R	S	T	U	V	W	X	Y	Z
15	11.13	0.94	0.313	2.25	5.25	6.13	1.88	0.13	0.06	4.25	1.188	6.375
20	12.13	1.19	0.313	2.75	6.50	6.63	2.25	0.13	0.06	4.25	1.438	8.000
25	13.75	1.44	0.313	3.25	8.50	7.63	3.50	0.13	0.06	5.00	1.688	10.000

Model	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	NN
15	5/16-18	4.25	25mm	1/4-20	0.50	2.31	0.313	5/16-18	0.251	0.27	3/8-16	0.75	0.25
20	3/8-16	4.50	25mm	5/16-18	0.63	2.31	0.313	5/16-18	0.251	0.27	3/8-16	0.75	0.25
25	1/2-13	5.50	1 1/4-12	3/8-16	0.75	2.38	0.313	5/16-18	0.313	0.33	3/8-16	0.75	0.25

All dimensions in inches unless otherwise noted.

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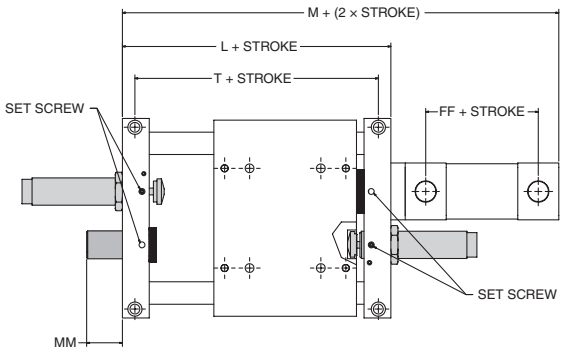
Shock Absorbers

Adjustable shock absorbers are provided when this option is specified. These dissipate kinetic energy over a wide range of velocities and weights. Cylinder stroke is adjusted by moving the threaded stroke adjuster. It is important to adjust the threaded stroke adjuster to prevent the shock from "bottoming". **Maximum adjustment is 1/2".**

Shock Absorber Adjustment Procedure: Proper adjustment is important to maximize a shock absorber's performance. With a range of zero to ten, shocks are factory pre-set at five. Cycle the slide to impact the shock absorber. Rotate the shock's adjustment knob to achieve smooth deceleration. Adjusting towards zero increases resistance. If the initial impact is too hard, rotate the knob towards ten to lessen the resistance. If the final setting is less than one, a larger shock and/or slide should be considered. Tighten the adjusting knob set screw to maintain resistance.

NOTE: A standard HBB unit includes mounting holes in the end plates to allow field installation of the shock absorbers.

Shock Absorbers (A, A1, A2)



Model	L	T	M	FF	MM
15	7.38	6.50	11.75	2.56	1.25
20	8.38	7.00	12.75	2.56	1.00
25	9.88	8.00	14.38	2.63	1.00

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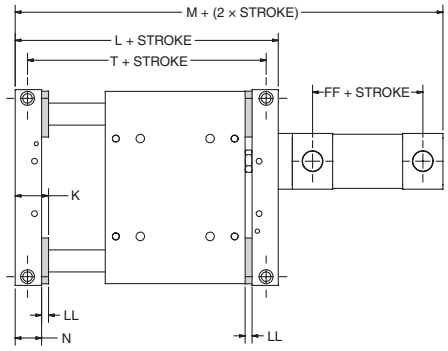
Bumpers/Adjustable Stop Collars (B, B1, B2, B3, B4, B5)

Bumpers absorb shock, reduce noise and permit faster cycle times thereby increasing production rates. They can be placed on the extend, retract or both positions.

A stop collar can be provided for travel adjustment. This stop collar is optional and is only provided if requested.

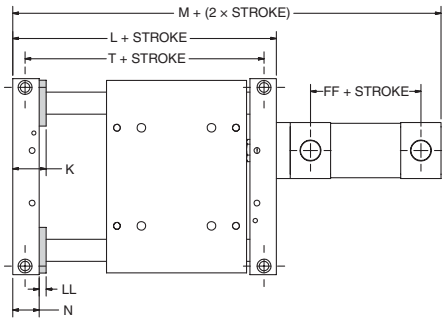
NOTE: *Stop collars must be adjusted evenly to avoid creating a moment between the guide rods.*

Bumpers Both Ends (B)



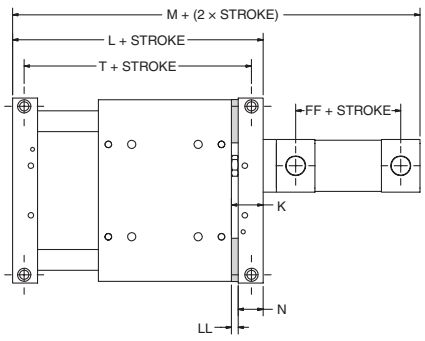
Model	L	T	M	K	N	FF	LL
15	7.375	6.50	11.75	1.19	0.94	2.56	0.25
20	8.375	7.00	12.75	1.44	1.19	2.56	0.25
25	9.875	8.00	14.38	1.69	1.44	2.63	0.25

Bumpers, Extend Only (B1)



Model	L	T	M	K	N	FF	LL
15	7.25	6.38	11.50	1.19	0.94	2.44	0.25
20	8.25	6.88	12.50	1.44	1.19	2.44	0.25
25	9.75	7.88	14.13	1.69	1.44	2.51	0.25

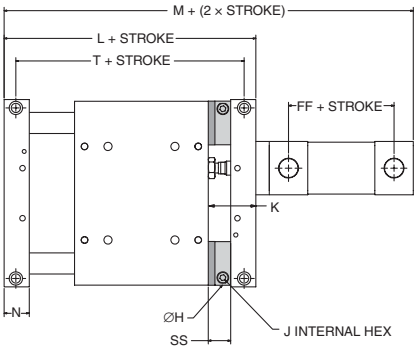
Bumpers on Retract Only (B2)



Model	L	T	M	K	N	FF	LL
15	7.13	6.25	11.38	1.19	0.94	2.44	0.25
20	8.13	6.75	12.38	1.44	1.19	2.44	0.25
25	9.63	7.75	14.00	1.69	1.44	2.51	0.25

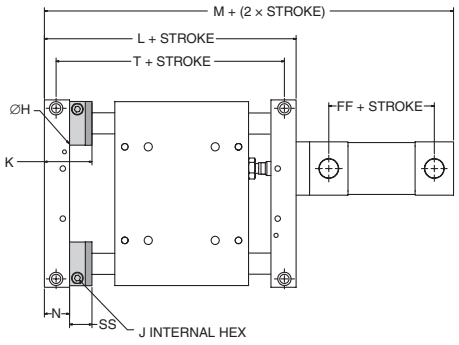
All dimensions shown in inches.

Bumpers and Adjustable Stop Collars, Retract Only (B3)



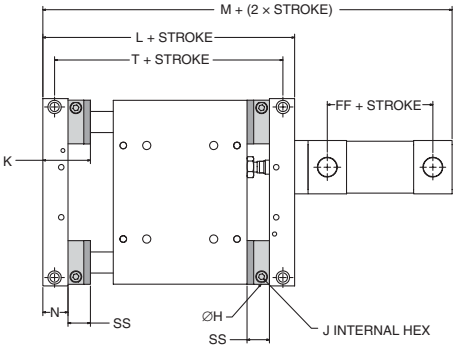
Model	L	T	M	K	N
15	7.72	6.84	11.98	1.78	0.94
20	8.72	7.34	12.98	2.03	1.19
25	10.22	8.34	14.60	2.28	1.44
Model	**Hs***	**Ho***	**J**	**FF**	**SS**
15	1.57	1.77	3/16	2.44	0.84
20	1.77	2.12	3/16	2.44	0.84
25	2.12	2.23	3/16	2.50	0.84

Bumpers and Adjustable Stop Collars, Extend Only (B4)



Model	L	T	M	K	N
15	7.85	6.97	12.10	1.78	0.94
20	8.85	7.47	13.10	2.03	1.19
25	10.35	8.47	14.73	2.28	1.44
Model	**Hs***	**Ho***	**J**	**FF**	**SS**
15	1.57	1.77	3/16	2.44	0.84
20	1.77	2.12	3/16	2.44	0.84
25	2.12	2.23	3/16	2.50	0.84

Bumpers and Adjustable Stop Collars, Both Ends (B5)



Model	L	T	M	K	N
15	8.56	7.68	12.93	1.78	0.94
20	9.56	8.18	13.93	2.03	1.19
25	11.06	9.18	15.56	2.28	1.44
Model	**Hs***	**Ho****	**J**	**FF**	**SS**
15	1.57	1.77	3/16	2.56	0.84
20	1.77	2.12	3/16	2.56	0.84
25	2.12	2.23	3/16	2.63	0.84

* Standard support rods
** Oversized support rods

All dimensions shown in inches.

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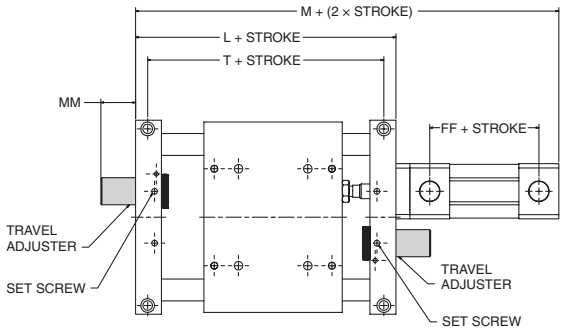
Threaded Stroke Adjusters (E, E1, E2, E3)

The threaded stroke adjust option allows for precise end of stroke positioning. The maximum stroke adjustment is one inch (1"). Threaded stroke adjusters are standard with shock absorbers.

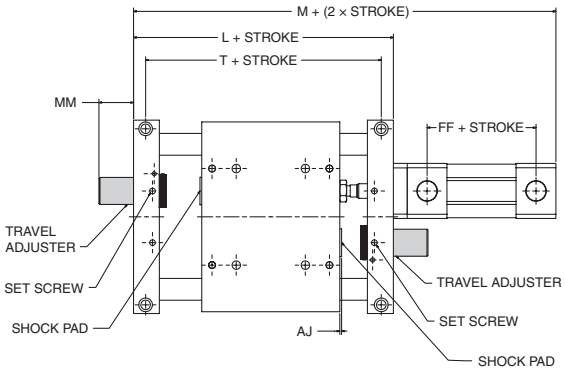
NOTE:
Not available with Bumper Options B, B1, B2, B3, B4.

Threaded Stroke Adjusters, Both Ends (E)



Model	L	T	M	FF	MM
15	7.38	6.50	11.75	2.56	1.25
20	8.38	7.00	12.75	2.56	1.00
25	9.88	8.00	14.38	2.63	1.00

Stroke Adjusters and Shock Pads (E1, E2, E3)



Both Ends (E1)

Model	L	T	M	FF	MM	AJ
15	7.63	6.75	12.00	2.56	1.25	0.13
20	8.63	7.25	13.00	2.56	1.00	0.13
25	10.13	8.25	14.63	2.63	1.00	0.13

Extend Only (E2)

Model	L	T	M	FF	MM	AJ
15	7.38	6.50	11.75	2.56	1.25	0.13
20	8.38	7.00	12.75	2.56	1.00	0.13
25	9.88	8.00	14.38	2.63	1.00	0.13

Retract Only (E3)

Model	L	T	M	FF	MM	AJ
15	7.25	6.38	11.63	2.56	1.25	0.13
20	8.25	6.88	12.63	2.56	1.00	0.13
25	9.75	7.88	14.25	2.63	1.00	0.13

All dimensions shown in inches.

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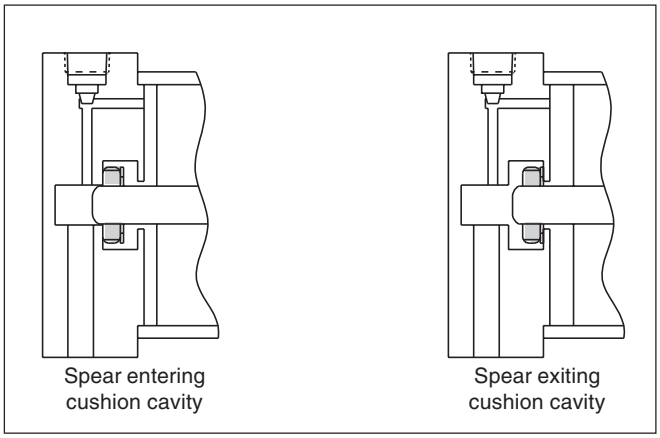
Cushions on Cylinder (C, C1, C2)

Optional cylinder cushions are available at either or both ends. The check seal cushions float radially and longitudinally to compensate for problems with misalignment. Flow paths molded on the circumference of the seal allow exceptionally rapid return stroke without the use of ball checks. A captive cushion screw provides safe cushion adjustment while the cylinder is pressurized. The brass adjustment screw provides maximum corrosion resistance.

Cushion Location*: The cushion adjustment screws are located on the same face as the port unless specified otherwise. The port is machined off-center to allow space for the cushion screw.

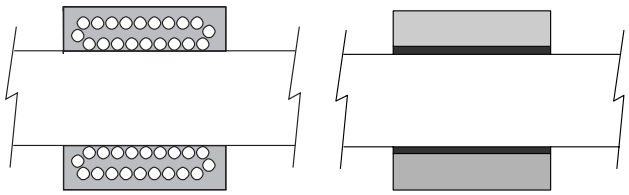
* For steel body cylinders, the cusion adjustment screw is located on the face opposite the port. Consult factory for other locations.



Bushings (D, T, T1, TC)

Selection should be based on the following criteria:

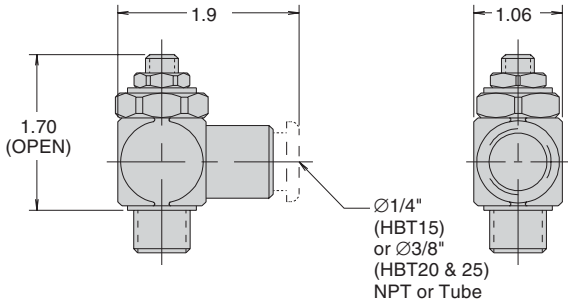
Application Requirement	Ball Bearing	Composite
Precision	Excellent	Good
Friction	Low	Higher
Friction Coefficient	Constant	Variable
Precision over Life of Bearing	Constant	Variable
Static Load Capacity	Good	Excellent
Dynamic Load Capacity	Good	Good with Lower Efficiency
Lubrication	Required	Not Required
Vibration Resistance	Fair	Excellent
Contamination Resistance	Fair	Excellent
Washdown Compatibility	Poor	Excellent



For bushing load capacities, reference the Engineering Data pages of this section.

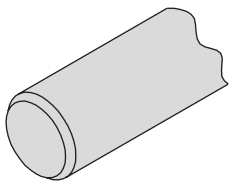
Flow Controls (F, G)

Right angle flow control valves allow precise adjustment of cylinder speed by metering exhaust air flow. Presto-Lok push-in or NPT ports provide 360° orientation capability.



Stainless Steel Shafts (K)

Case hardened, high carbon alloy steel shafting is utilized for standard slides. Stainless steel shafting can be specified for corrosive applications.



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NFPA Steel Air Cylinder (S)*

Parker's 2A Series steel air cylinder is available for extremely rugged applications. Magnetic pistons are not available with this option. Consult factory for other switching and sensing options.

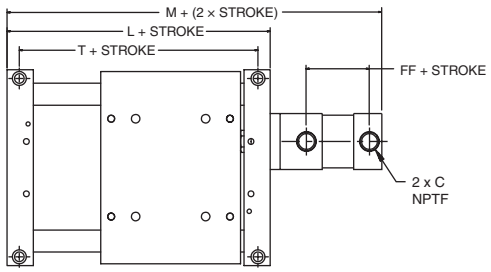
250 PSI NFPA Hydraulic Cylinder (L)

Parker's 2ML Series extruded aluminum NFPA cylinder is available for hydraulic service. Cushions are not available.

750 PSI NFPA Hydraulic Cylinder (S1)*

Parker's 3L Series NFPA steel cylinder is available for hydraulic service requiring higher force and precise control. Magnetic pistons are not available with this option. Consult factory for other switching and sensing options.

**If cushions are specified with this option, the adjustment screw is located on the face opposite the port. Consult factory for other locations.*

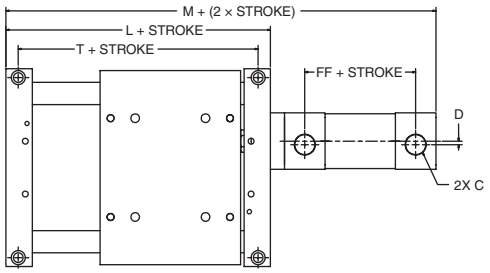


Model	L	T	M	C (NPTF)	FF	Cyl. Bore (mm)
15	7.00	6.13	C/F	3/8	2.25	40
20	8.00	6.63	C/F	3/8	2.25	50
25	9.50	7.63	C/F	3/8	2.38	63

C/F = Consult Factory

ISO Air Cylinder (R, U)

An ISO cylinder (Parker's MP Series) is available for metric requirements. Magnetic pistons are standard. Consult factory for an all-metric unit.
If switches are required, they must be ordered from the Sensors section of this catalog.



Model	L	T	M	C		D	FF	Cyl. Bore (mm)
				BSP	NPTF			
15	7.0	6.13	11.63	1/4	1/4	0.22	2.95	40
20	8.0	6.63	12.67	1/4	3/8	0.34	2.83	50
25	9.5	7.63	14.76	3/8	3/8	0.24	3.50	63

All dimensions in inches unless otherwise noted.

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Rod Lock Cylinder (R1, U1)

A rod lock mechanism may be integrated into the front head of the cylinder. This increases the cylinder length as shown. The powerful rod lock device is air/spring activated and enables the piston rod to be locked in any position. In the absence of air signal pressure, full holding force is applied to the piston rod. When an air signal pressure of 60 PSI (4 bar) is applied, the locking device is released. Exhaust air can be piped away when a contaminant-free environment is required.

Applications: Vertical guided cylinders
In the event of pressure loss
In the event of electrical control failure

Design Tip: The piston rod should not be moving when the locking device is activated. The locking device is not intended to repeatedly brake movement. See sample pneumatic circuit.

NOTE: Rod locking cylinders automatically include cushions, but include cushions ("C") in model code. If switches are required, they must be ordered from the Sensors section of this catalog.

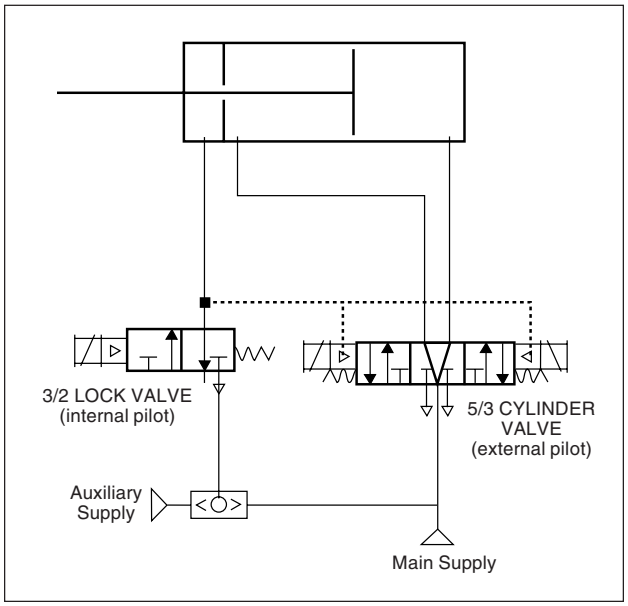
TECHNICAL DATA

Maximum Pressure: 145 PSI (10 bar)
Maximum Signal Pressure: 60 PSI (4 bar) ±10%

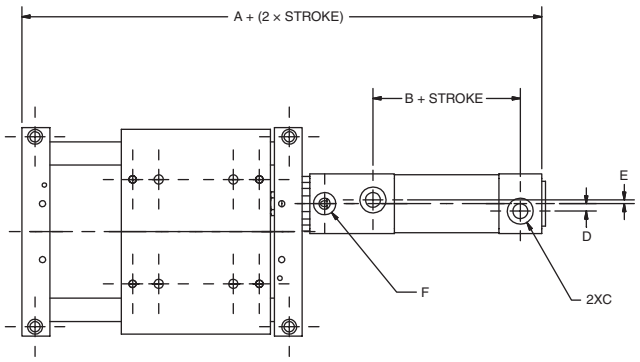
Model	Bore (mm)	Holding Force, lb (N)
15	40	193 (860)
20	50	303 (1345)
25	63	481 (2140)

ROD LOCK CIRCUIT

Lock valve must be maintained energized during cylinder motion, otherwise rod lock is engaged and cylinder valve shifts to mid position. For manual override of the rod lock, insert a shuttle valve and an auxiliary air supply to disable rod lock.



DIMENSIONAL DATA



Size	A	B	C*	D	E	F*	Cyl. Bore (mm)
15	13.41	3.21	1/4	0.22	0.12	1/8	40
20	C/F	2.81	1/4	0.33	0.22	1/8	50
25	C/F	3.47	3/8	0.24	0.12	1/8	63

* NPT or BSP

All dimensions shown in inches unless otherwise noted.

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No Cylinder (Q)

The unit is supplied without a cylinder so that one may be field-added. Consult factory for required cylinder rod length.

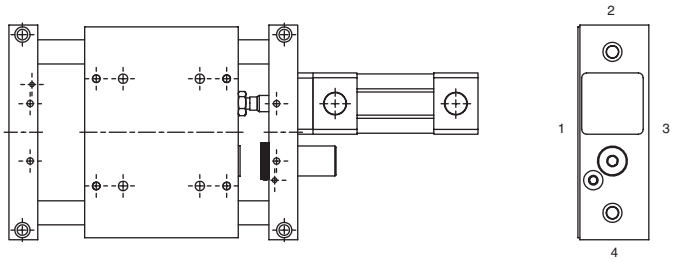
Special (X)

Other common modifications are available. Consult factory for specifications.

- NC9 cylinder
- Cylinder feedback (example: Temposonics Probe)
- Clean Plus cylinder
- Bumpers on cylinder only

Port Location (L3)

Cylinder ports are located in position 3 if this option is specified.



Fluorocarbon Seals (V)

Standard abrasion resistant nitrile seals should be used for general purpose applications with temperatures of 0 - 165°F. Fluorocarbon seals are recommended for high temperature applications up to 250°F.

Option	Temperature Range (°F)
Shock Absorbers	32 - 150
Bumpers	0 - 200
Piston Magnets	0 - 165
Switches	14 - 140

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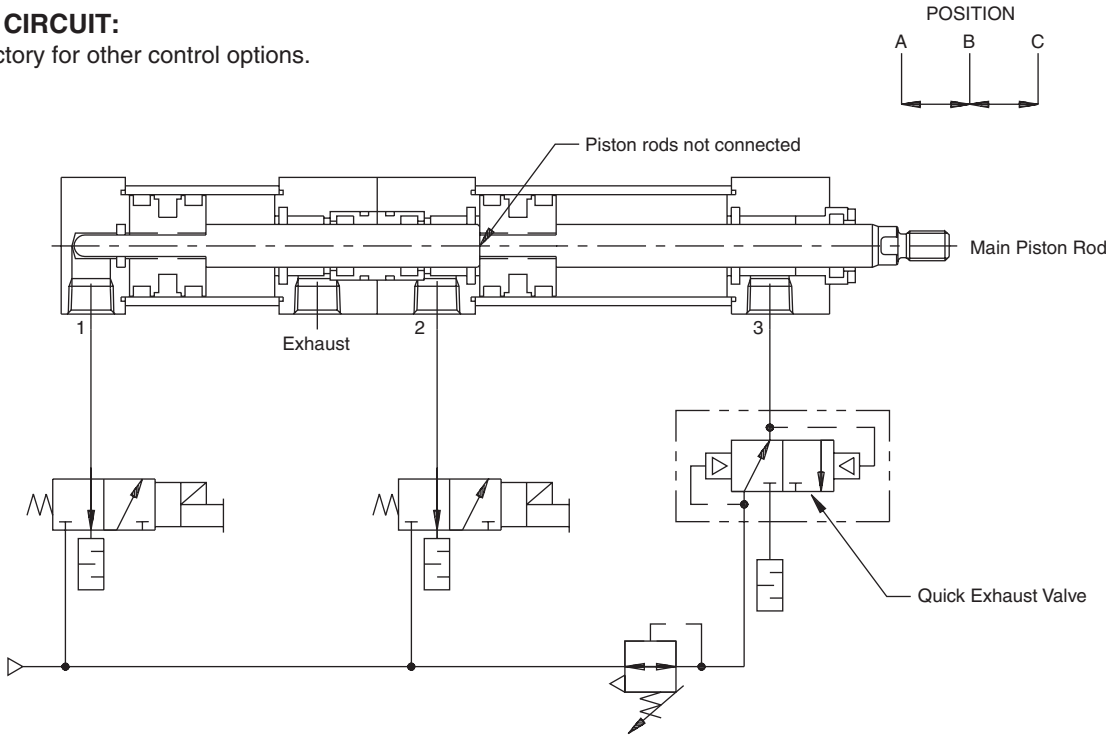
Three Position Cylinder

The three position unit utilizes a duplex air cylinder to provide the center position. This option can be specified with all other options. However, bumpers and body mounted inductive proximity switches operate on the fully extended and retracted positions only. Cylinder mounted reed and solid state sensors can be used to detect the center position of the slide.

SAMPLE CIRCUIT:

Consult factory for other control options.



OPERATION:

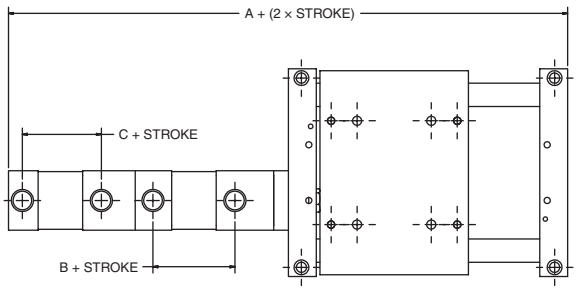
Position A (fully retracted) is obtained by applying pressure to Port 3 with Ports 2 and 1 vented to atmosphere.

Position B (mid-position) is obtained by applying pressure to Port 1 while maintaining a lower pressure to Port 3. The pressure at Port 3 prevents the main piston rod from over-travelling. A quick exhaust valve can be used to maintain pressure while allowing full exhaust capability.

Position C (fully extended) is obtained by applying pressure to Port 2.

DIMENSIONAL DATA:

Three position units utilize a longer cylinder.
All other dimensions remain the same.



Model	A	B	C
HBB15	15.25	2.38	2.31
HBB20	16.25	2.38	2.31
HBB25	17.94	2.38	2.38

All dimensions shown in inches.

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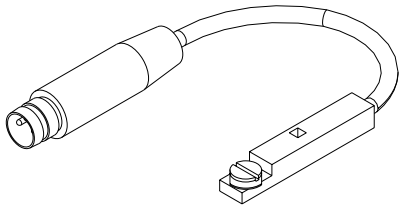
Solid State and Reed Switches

Switches and sensors must be ordered separately.
Magnetic piston is standard.

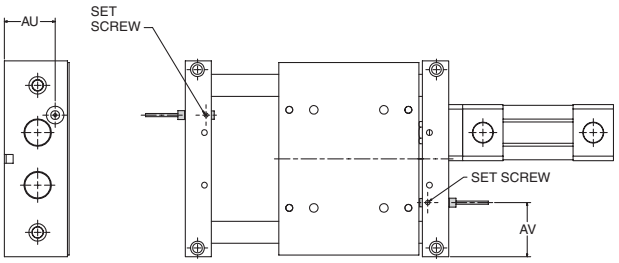
See Sensors section for part numbers and sensor specifications.

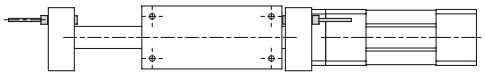


Inductive Proximity Sensors

8mm barrel type proximity sensors may be ordered with the HB Series slides (options P, N, P1, N1). The slides can also be ordered "prox ready" (J, J1). A piston magnet is standard.

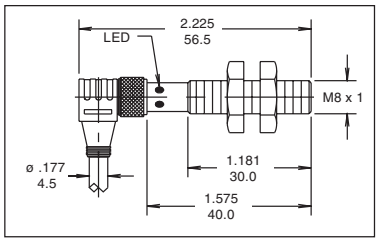
See Sensors section for sensor specifications.





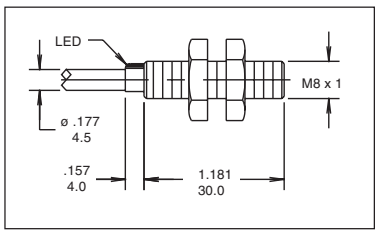
PLUG-IN SENSOR (P1, N1)

A threaded right angle cordset is included as standard. The cordset contains two LEDs: 1 - power, 2 - target indication. Cordset length is 20 ft. (6m).



POTTED-IN SENSOR (P, N)

Lead type sensor with 20 ft. (6m) cord length



Dimensions

Model	AU	AV
HBB15	1.81	1.94
HBB20	2.19	2.63
HBB25	2.31	2.75

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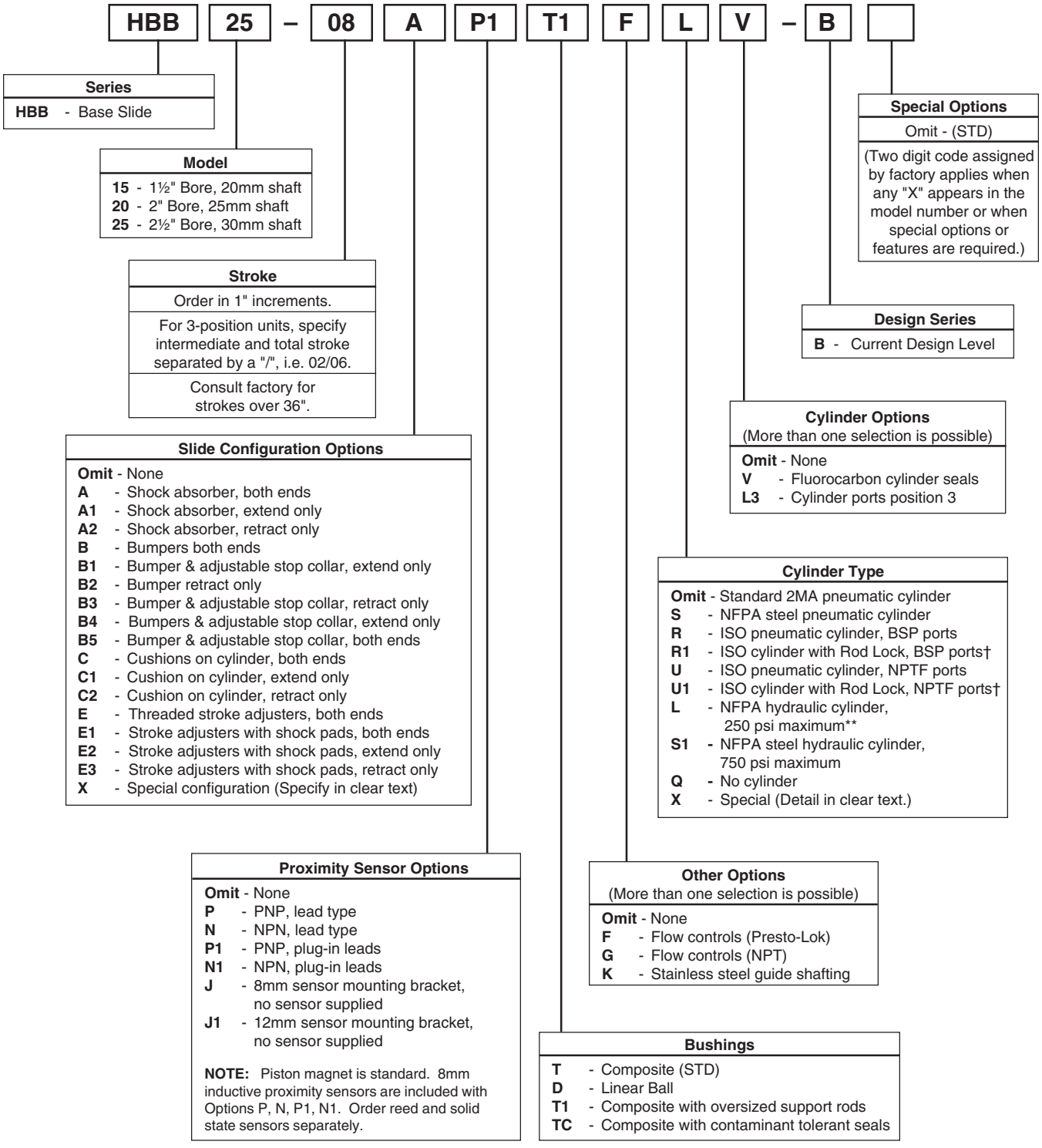
Model Number Code

Example: HBB25-08AP1T1FLV-B



** Cushions are not available with this option.
† Options R1 and U1 require cushions on cylinder. Include "C" in model code.

NOTE: If solid state or reed switches are required, they must be ordered from the Sensors section of this catalog.

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