

with NEW  
Dismountable Air Springs



# Air Springs





Triple Bellows Type



Double Bellows Type



Single Bellows Type



Sleeve Type



Rolling Lobe Type



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**NEW**



**NEW** Dismountable Air Springs



**E**nidine Air Springs are highly durable, precisely engineered and cost-effective for use in a wide variety of actuation and vibration isolation applications. With time-tested designs, fabric-reinforced Wingprene™ or Natural Rubber flex member construction and corrosion-protected end retainers, Enidine Air Springs provide superior quality and performance.

As an actuator, Enidine Air Springs provide linear or angular motion. These Air Springs offer a favorable stroke-to-compressed-height ratio when compared to air cylinders, and can accept a wide variety of actuation media such as air, water, nitrogen or anti-freeze. As an isolator, Enidine Air Springs are effective in reducing the harmful effects of vibration. They can simultaneously isolate vibration and regulate load height, as well as allow for consistent vibration isolation under varying loads.

Enidine offers a variety of Air Spring types to meet your actuation or isolation needs. The Single, Double and Triple Convolute Bellows, Rolling Lobe and Sleeve Types are available in a wide range of sizes, with the End Retainer Style required for your installation.

In addition, Enidine is also pleased to present our new all-metric Dismountable Air Springs, available in Single, Double and Triple Convolute Bellows Types. Enidine Dismountable Air Spring products offer consistent operation in temperatures up to 115°C, and have optional metal parts available in stainless steel. This makes them ideal for use in harsh environments such as the food processing industry. All new Dismountable products feature the same low compressed height-to-stroke ratio and actuation properties as our standard product lines (see pages 21 & 22).

**Note:**

*Products are manufactured for Enidine by The Goodyear Tire & Rubber Company.*

The contents of this publication are the result of many years of research and experience gained in application technology. All information is given in good faith; it does not represent a guarantee with respect to characteristics and does not exempt the user from testing the suitability of products, including checking with respect to industrial property rights of any third parties. No liability whatsoever will be accepted for damage, regardless of its nature and its legal basis, arising from advice given in this publication. Products are subject to technical changes as a result of new developments.

**Temperature Range Guidelines**

Enidine Air Springs are constructed of either Natural Rubber or Neoprene "Wingprene™" elastomeric compounds. The temperature range guidelines for air spring applications vary depending on construction and nature of service.

**Continuous Service**

The maximum operating temperature for all Enidine Air Springs should not exceed 57°C. Continuous service is defined as operating 40 or more hours per week at this temperature. Minimum allowable operating temperature is -21°C for air spring products made with "Wingprene™", -49°C for products made with Natural Rubber.

**Intermittent Service**

The maximum allowable temperature should not exceed 65°C. Intermittent Service is defined as operating less than 40 hours per week at this temperature. Minimum allowable operating temperature is -40°C for products made with "Wingprene™" and -60°C for products made with Natural Rubber. Note that minor cracking may occur with any prolonged operation at these minimum temperatures.

**Technical Data Note:**

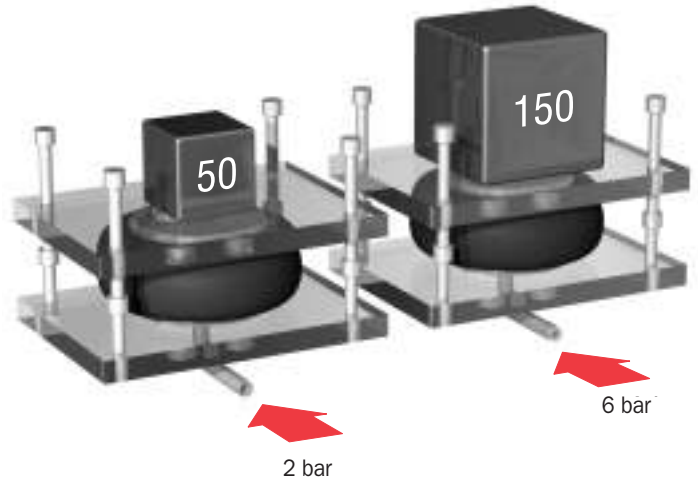
*Metric values detailed in the Imperial product section are converted from their original Imperial form using standard conversion formulas. Values detailed in the Metric products section are actual figures.*



## Advantages of Endine Air Springs

### Simple construction.

Varying loads can be supported by one Air Spring size. Therefore, no re-design is necessary for varying loads.

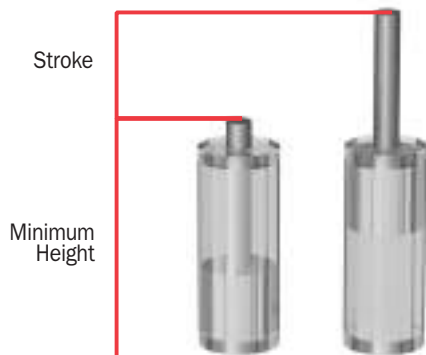


### Max. displacement 10mm.

Displacement permissible between upper and lower end plate. Therefore, no costly machining of mounting holes is necessary.

### Little space required, no sealing required.

Compared to conventional pneumatic cylinders, the minimum height of the Endine Air Spring is significantly lower at the same stroke.





## Standard Materials

Flex Members: Fabric-reinforced Wingprene™  
Fabric-reinforced natural rubber

End Retainers: Forged steel  
Cast zinc alloy  
Cast aluminum

## Environmental Considerations

Good for most industrial applications. Can be affected by certain chemicals. Contact Enidine or your Local Representative for specific information.

## Operating Temperature Range

Fabric - reinforced Wingprene™: -40°C to 65°C  
(-40°F to 150°F)

Fabric - reinforced Natural Rubber: -60°C to 65°C  
(-76°F to 150°F)

## Ordering Information

### EXAMPLE:

**100**                      **YI-1B6**                      -                      **535**

1. Select Quantity                      2. Select Product Description Number from Selection Chart                      3. Select Assembly Number from Selection Chart

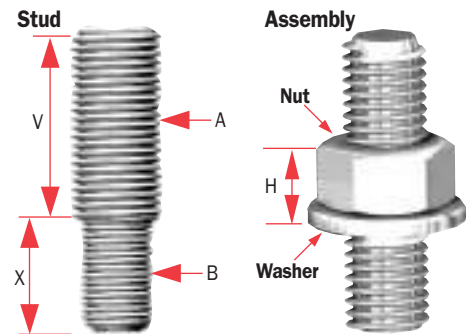
Model Number

\*Note: Allowable working temperature range varies. See temperature range guidelines for details.

## Accessories

### Assembly (Stud + Nut + Washer)

Part Number	A	B	H		V		X	
			in.	(mm)	in.	(mm)	in.	(mm)
YI-578-9-056	1/2" UNC	3/8" UNC	0,53	(13,5)	2,50	(63,5)	0,56	(14,2)
T9-1B5L	M10 x 1,5	3/8" UNC	0,39	(10,0)	2,50	(63,5)	0,56	(14,2)
T9-1B5LM8	M8 x 1,25	M8 x 1,25	0,32	(8,1)	2,50	(63,5)	0,56	(14,2)
T9-1B5LM10	M10 x 1,5	M8 x 1,25	0,39	(10,0)	2,50	(63,5)	0,56	(14,2)

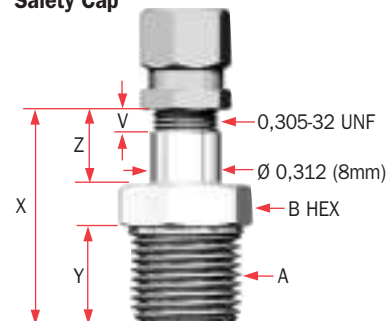


### Tank Valves Including Safety Cap

Part Number	A	B		V		X		Y		Z	
		in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
YI-579-08-9-033	1/8" NPTF	0,44	(11,18)	0,31	(7,9)	1,31	(33,0)	0,38	(9,7)	0,75	(19,0)
YI-578-92-9-122	1/4" NPTF	0,56	(14,2)	0,31	(7,9)	1,31	(33,0)	0,56	(14,2)	0,56	(14,2)
YI-579-08-9-033M	1/8" BSP	0,51	(12,95)	0,31	(7,9)	1,66	(42,0)	0,51	(12,95)	0,87	(22,1)
YI-578-92-9-122M	1/4" BSP	0,91	(23,1)	0,31	(7,9)	1,66	(42,0)	0,51	(12,95)	0,87	(22,1)



### Tank Valve Including Safety Cap





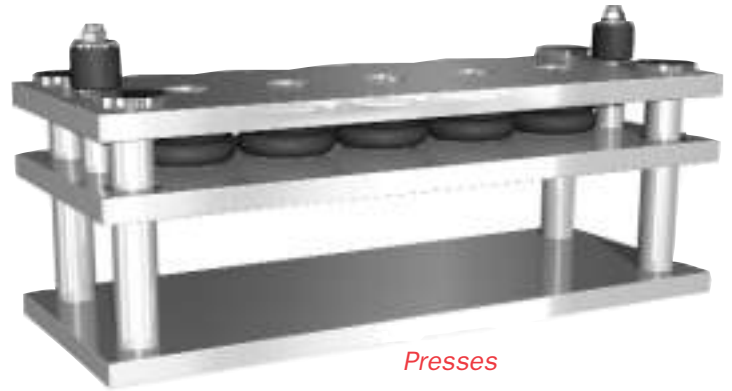
## Typical Applications for Actuation

### Scissor Lifts



- Scissor lifts
- Injection or ejection of parts in manufacturing equipment
- Vertical lift force for platforms and rotating tables
- Conveyor or transfer systems
- Rotary shaft actuators

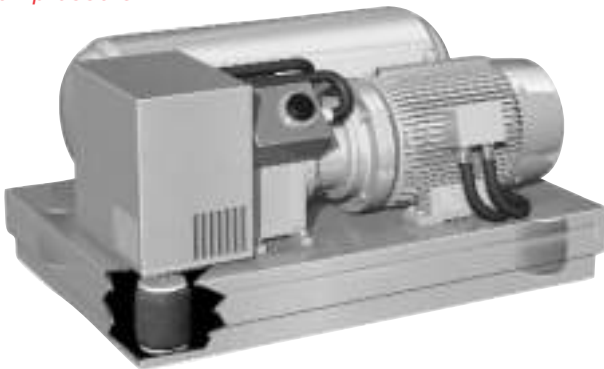
- Presses
- Bin-tilting devices
- Palletizers, label applicators in packaging equipment
- Amusement park rides
- Clutch and brake systems



Presses

## Typical Applications for Vibration Isolation

### Compressors



- Vibratory conveyors
- Large drying machines
- Centrifugal separators
- Coordinate measuring tables and machinery
- Commercial laundry machines

- Textile looms
- Conveyor loading points
- Compressors
- Electronic equipment

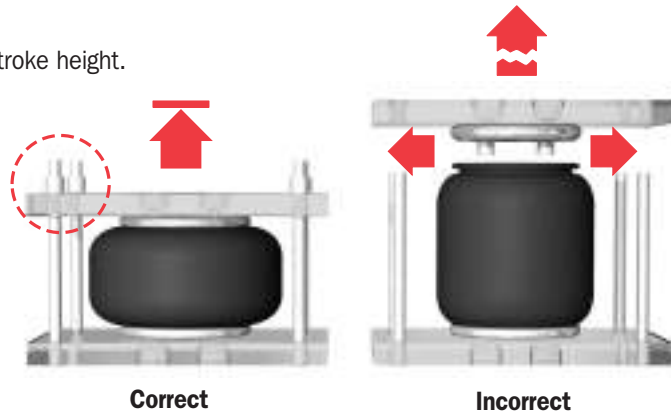


Electronic Equipment

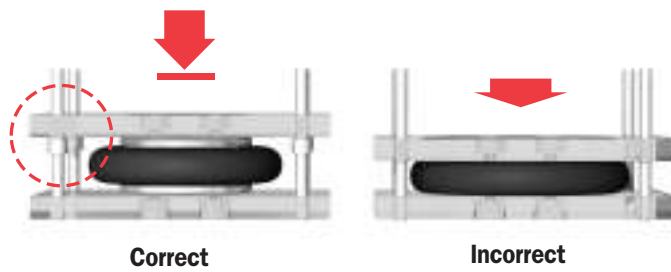


## Installation and Operating Instructions

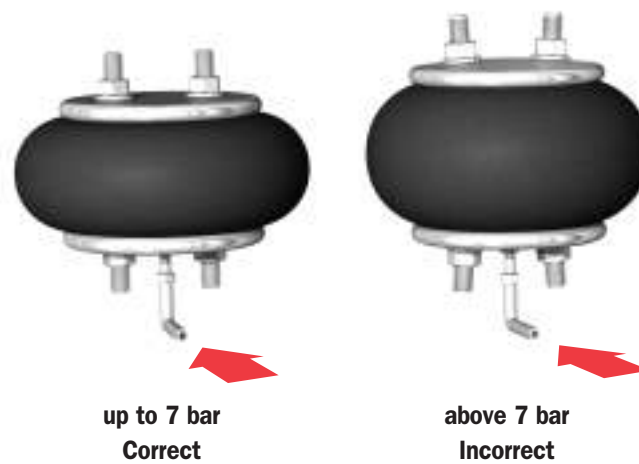
Provide stroke limitations, to prevent exceeding the maximum allowable stroke height.



Provide stops for minimal height, or use Air Springs with Internal Bumper.



Max. allowable pressure: 7 bar.



Do not use Air Springs in torsion.





## Selecting an Enidine Air Spring for Actuation

### Application Worksheet: Actuation

The following data should be given:	Symbol	Unit	Calculation:	
1. Total force required for actuation	$F_t$	_____ lbs. (N)	Force per Air Spring	Example:
2. Number of actuators	$n$	_____	$F = \frac{F_t}{n}$ lbs.	$F_t = 4\ 200$ lbs. (18 682 N)
3. Stroke required	$s$	_____ in. (mm)		$n = 4$
4. Available air pressure at the point of installation	$p$	_____ psi (bar)		$F = \frac{4\ 200\ \text{lbs.}}{4}$
5. Working temperature range**	$t$	_____ °F (°C)		$F = 1\ 050$ lbs. (4 671 N)
6. An internal bumper will be required if any of the following conditions occur: <ul style="list-style-type: none"> <li>External compression stops are not provided</li> <li>Severe impacting at the compressed height of the Air Spring.</li> </ul>		<input type="checkbox"/> Internal Bumper <input type="checkbox"/> No Bumper		Example:
7. Is a constant actuation force required for this application?		<input type="checkbox"/> Yes - only Sleeve and Rolling Lobe Type Air Springs <input type="checkbox"/> No - all type Air Springs <input type="checkbox"/> Yes	Corrected Force [ $F_c$ ]:*	$p = 50$ psi (3,5 bar)
8. Metric version		<input type="checkbox"/> Yes	$F_c = \frac{F \times 100\ \text{psi}}{p}$ ***	$F_c = \frac{1\ 050 \times 100}{50}$
			$F_c =$ _____ lbs.	$F_c = 2\ 100$ lbs. (9 341 N)

\* All Force values in the Selection Chart are based on a maximum operating pressure of 100 psi (7 bar). \*\*\* Actual force capabilities of the Air Spring depend on the air pressure available. The Corrected Force calculation compensates for available air pressure.

\*\* Working Temperature Range for Sleeve Type and Bellows Type YI-1B5, YI-1B6, YI-1B7, YI-1B8; YI-2B6, YI-2B7 and YI-2B8 is 40°C to 100°C (-40°F to 210°F). Working Temperature Range for all other Air Springs is 55°C to 70°C (-65°F to 160°F).

\*\*\* 8 bar (114 psi) for Dismountable Air Springs.

### Sizing Instructions

**Step 1:** Fill out the Application Worksheet.

**Step 2:** In most applications, a constant actuation force over the stroke is not required and sizing should begin with Single Convolute Bellows Type Air Springs. However, if a constant actuation force over the stroke is required, consider only the Sleeve and Rolling Lobe Type Air Springs.

**Step 3:** Refer to the Selection Chart under *Actuation Specifications*. In the *Force (lbs.) At A Stroke Of: Data Table* choose the column that is equal to or exceeds the Stroke Required (S) (i.e., if a stroke of 2,5 in. "[64mm]" is required, refer to the 3,0 in. "[75mm]" column). Identify the first Air Spring model that will generate a force equal to or greater than the Corrected Force ( $F_c$ ) required. This is the Enidine Air Spring that will best serve your application. Select a model that includes an internal bumper if one is needed in the application. Availability of internal bumpers can be found under the *Features* table for each Air Spring.

**Step 4:** Verify the *Envelope Dimensions* of the selected Enidine Air Spring to ensure that the Air Spring will fit the application. Allow a 2 in. (50mm) clearance on the diameter to prevent abrasion of the flex member. Select the *Model Number* that provides the *Features* and *Mounting Dimensions* required for the application.

### Installation Considerations

- External extension stops are required to limit the extension of the Air Spring(s).
- The path of motion must be guided, as Air Springs provide little lateral stability.

### Sizing Example

A 3 100 lb. (13 789 N) conveyor carrying an 1 100 lb. (4 893 N) package needs to be lifted 1,8 in. (46mm) to transfer the package to another conveyor. There will be four Actuators utilized and the warehouse has air lines with 50 psi (3,5 bar). A constant actuation force is not required. Ambient temperature is 68°F (20°C). There is a 12 in. (305mm) square space to house each Air Spring. Compression and extension stops are provided. Any *Air Fitting Port* and *End Retainer Style* would be acceptable.

**Step 1:** From the completed Application Worksheet, we know:

- Corrected force per actuator is 2 100 lbs. (9 341 N)
- Stroke required is 1,8 inches (46mm)
- An internal bumper is not required
- A constant actuation force is not required
- Working temperature is 68°F (20°C)

**Step 2:** A constant force is not needed. Therefore, all Air Spring types are considered, beginning with Single Convolute Bellows.

**Step 3:** In the 2,0 in. (50mm) column under the *Force lbs. [N] At A Stroke Of: Data Table*, identify an Air Spring that can generate 2 100 lbs. (9 341 N) of force. No internal bumper is required. Model YI-1B6-535 is selected (metric model YI-1B6-835 is selected).

**Step 4:** The maximum diameter of a YI-1B6-535 is 7 in. (metric model YI-1B6-835 has 178mm diameter). Therefore, we need a 9 in. (228mm) diameter space to house the Air Spring. A 12 in. (305mm) square space will easily house the Air Spring. Any *Air Fitting Port* and *End Retainer Style* would be acceptable. Model YI-1B6-535 is selected (or metric model YI-1B6-835 is selected).





## Selecting an Enidine Air Spring for Vibration Isolation

### Application Worksheet: Vibration Isolation

The following data should be given:	Symbol	Unit	Calculation:
1. Total load	$W_t$	_____ lbs. (N)	<b>Load per Air Spring:</b> $W = \frac{W_t}{n} =$ <div style="display: flex; justify-content: space-between; width: 100%;"> <span>lbs</span> <span>Example: <math>W_t = 8\,500</math> lbs. (37 810 N) <math>n = 4</math> <math>W = \frac{8500}{4}</math> <math>W = 2\,125</math> lbs. (9 452 N)</span> </div>
2. Number of isolators	$n$	_____	
3. Input excitation frequency	$f_i$	CPM or RPM/60 = Hz _____ Hz	<b>Corrected Load [<math>W_c</math>]:</b> $W_c = \frac{W \times 100 \text{ psi}^{***}}{p}$ <div style="display: flex; justify-content: space-between; width: 100%;"> <span>lbs.</span> <span>Example: <math>p = 100</math> psi (7 bar) <math>W_c = \frac{2\,125 \times 100}{100}</math> <math>W_c = 2\,125</math> lbs (9 452 N)</span> </div>
4. Available air pressure at the point of Installation	$p$	_____ psi (bar)***	
5. Working temperature range	$t$	_____ °F (°C)**	
6. Required isolation	$I$	<input type="checkbox"/> 80 % <input type="checkbox"/> 90 %	
7. An internal bumper will be required if any of the following conditions occur: <small>- External compression stops are not provided.            - Severe impacting at the compressed height of the Air Spring.            - Operation of vibrating equipment on a deflated Air Spring.</small>		<input type="checkbox"/> Internal Bumper <input type="checkbox"/> No Bumper	
8. Metric version		<input type="checkbox"/> Yes	

\* All Load values in the Selection Charts are based on a maximum operating pressure of 100 psi (7 bar)\*\*\*. Actual load bearing capabilities of the Air Spring depend on the air pressure available. The Corrected Load calculation compensates for available air pressure.  
 \*\* Working Temperature Range for Sleeve Type and Bellows Type YI-1B5, YI-1B6, YI-1B7, YI-1B8; YI-2B6, YI-2B7, YI-2B8 is -40°F to 210°F (-40°C to 100°C). Working Temperature Range for all other Air Springs is -65°F to 160°F (-55°C to 70°C).  
 \*\*\* If no air lines are available, a tank valve should be utilized; use 100 psi (7 bar)\*\*\* to select an Air Spring.  
 \*\*\* 8 bar (114 psi) for Dismountable Air Springs.

### Sizing Example

Vibrations generated by a pump weighing 8 500 lbs. (37 810 N) and rotating at 600 RPM are being transmitted onto sensitive monitors, causing them to malfunction. To control these damaging vibrations, four Isolators – located symmetrically about the center of gravity – will be used. The ambient temperature range is 60°F to 140°F (16°C to 60°C). Air lines are not available at the site. Therefore, a tank valve will be used. There is the possibility of depressurization of the Air Spring. An isolation of greater than 90% is required. There is a 9 in. (228mm) diameter space to house the Air Spring. Any *Air Fitting Port* and *End Retainer Style* would be acceptable.

**Step 1:** From the completed Application Worksheet, we know:

- Load per isolator is 2 125 lbs. (9 452 N)
- Because a tank valve is being utilized, size using 100 psi (7 bar)
- Corrected load per isolator is 2 125 lbs. (9 452 N)
- Working temperature range is 60°F to 140°F (16°C to 60°C)
- Because of the possibility of depressurization, an internal bumper is required
- Input excitation frequency is 600 CPM

**Step 2:** The first Enidine Imperial Air Spring model that has an internal bumper and is capable of supporting the Corrected Load Per Isolator is the YI-1B6-538. This Air Spring provides 90% isolation at 435 CPM and 97,4% at 870 CPM. Therefore, at 600 CPM, the percent isolation is estimated to be 94%.

**Step 3:** The maximum diameter of a YI-1B6-538 is 7 in. (178mm). Therefore, we need a 9-in. (228mm) diameter space to house the Air Spring. A 9-in. (228mm) diameter is available. Any *Air Fitting Port* and *End Retainer Style* would be acceptable. Imperial Model YI-1B6-538 is selected. Metric model YI-1B6-835 is selected.

(Note: this model has no internal bumper, therefore external endstops must also be used.)

### Sizing Instructions

**Step 1:** Fill out the Application Worksheet.

**Step 2:** Refer to the Selection Chart under *Isolation Specifications*. In the *Isolator Load Range @ 100 psi (7 bar)\*\*\** column, identify the first Air Spring model that will support the Corrected Load ( $W_c$ ) required for the application. Check the Data Table for *Percent Isolation at an Input Frequency Of:* and compare the Input Excitation Frequency ( $f_i$ ) to the input frequencies listed. Referring to the percent isolation for the model identified, estimate the approximate percent of isolation. If the first model identified does not meet the isolation requirements, then select the model that will **both** support the Corrected Load ( $W_c$ ) and provide the required percent of isolation. Select a model that includes an internal bumper, if one is needed in the application. Availability of internal bumpers can be found under the *Features* Table for each Air Spring.

**Step 3:** Verify the *Envelope Dimensions* of the selected Air Spring to ensure that the Air Spring will fit the application. Allow a 2 in. clearance on the diameter to prevent abrasion of the flex member. Select the *Model Number* that provides the *Features* and *Mounting Dimensions* required for the application.

### Installation Considerations

- To ensure stability, the distance from the floor to the center of gravity of the load should not exceed the shortest distance between Air Springs.
- Air Springs provide little lateral stability. Therefore, be sure to include a method of stabilization.
- Pressurize the Air Spring only when it is loaded.

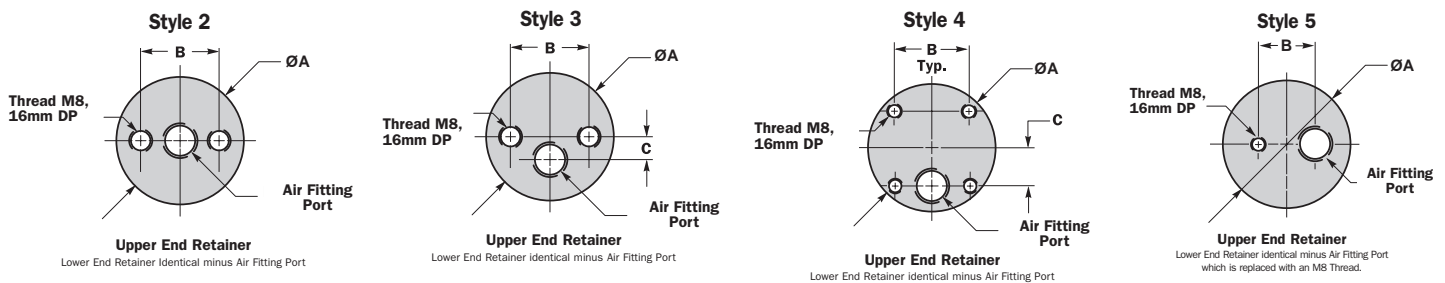


## Metric Single Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE @ 7 bar (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			25 (mm)	50 (mm)	75 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-1B5	*800	50	5 560	2 500	—	2 500	4 900 – 6 000	3,25	64 – 76	72	94	98
	*810	76	6 560	5 115	2 300	2 300	4 670 – 6 675	2,75	64 – 101	82	96	99
	820	101	7 120	6 560	5 115	1 960	4 450 – 6 675	2,67	89 – 127	83	96	99
YI-1B6	*833	71	8 460	6 680	—	3 780	6 680 – 8 460	2,75	77 – 101	78	95	98
	*835	130	9 800	9 350	8 460	3 340	6 680 – 9 350	2,25	102 – 152	90	97	99
YI-1B7	*840	81	10 680	8 460	4 900	3 780	7 120 – 9 800	2,67	89 – 114	83	96	99
YI-1B8	*850	84	14 685	11 800	7 120	4 900	8 900 – 12 900	2,83	96 – 120	83	96	99
	*860	119	15 575	14 690	12 900	7 100	8 450 – 14 690	2,33	102 – 165	85	96	99
YI-1B9	*215	91	22 470	18 465	12 680	6 680	14 240 – 17 350	2,50	114 – 127	84	96	99
YI-1B12	*318	124	38 500	35 600	31 150	16 020	32 480 – 39 160	2,33	77 – 127	89	97	99
YI-1B14	371	152	60 075	56 960	51 620	21 360	51 620 – 60 075	2,33	83 – 133	87	97	99
	*372	124	56 515	52 065	44 500	21 805	44 500 – 55 625	2,33	102 – 133	86	96	99

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

## End Retainer Styles

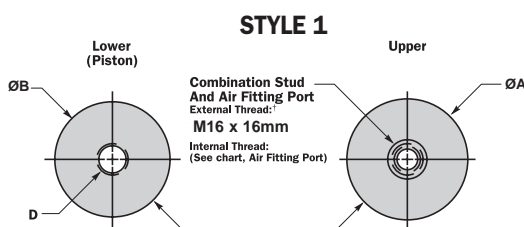


## Metric Sleeve Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 7 BAR (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY (Hz)***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			25 (mm)	50 (mm)	75 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-1S3	*016	53	2 490	800	—	535	1 960 – 2 580	3,25	51–76	71	93	98
YI-1S4	*155	125	3 780	3 780	3 690	1 380	3 560 – 3 780	2,17	97–112	90	97	99

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

## End Retainer Styles



\* Listed strokes start from the compressed height of the Air Spring.  
 \*\* This range is based on 7 bar; to obtain the lower limit (i.e., minimum load @ 1,4 bar) divide the smaller value by 5.  
 \*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable, if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.



## Metric Single Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
145	46	96	86,4	20,0	—	5	1/8	NO	*800	YI-1B5
153	46	122	86,4	44,5	—	2	1/4	NO	*810	
166	46	147	86,4	44,5	—	2	1/4	NO	820	
166	51	122	105,4	44,5	—	2	1/4	NO	*833	YI-1B6
178	51*	180	105,4	44,5	—	2	1/4	NO	*835	
196	51	132	105,4	44,5	—	2	1/4	NO	*840	YI-1B7
221	51	134	127,0	70,0	—	2	1/4	NO	*850	YI-1B8
239	51**	170	127,0	70,0	—	2	1/4	NO	*860	
280	59	150	162,6	89,0	44,4	3	3/4	NO	*215	YI-1B9
336	59	183	228,6	157,5	72,9	3	3/4	NO	*318	YI-1B12
404	59	211	287,0	158,8	79,4	4	3/4	NO	371	YI-1B14
387	59	183	287,0	158,0	79,4	4	3/4	NO	*372	

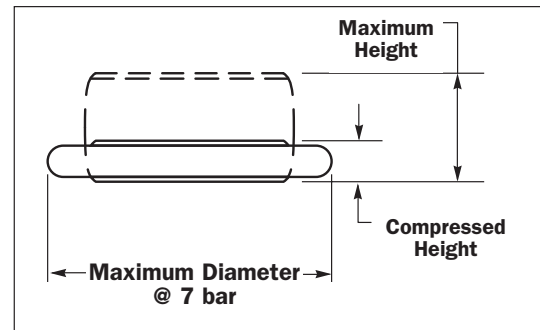
\*Do not use below 94mm as an actuator.  
\*\*Do not use below 89mm as an actuator.

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.



Single Bellows Type



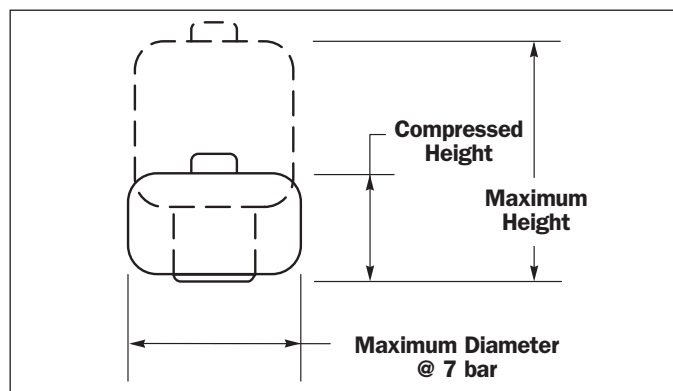
## Metric Sleeve Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 BAR (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B LOWER END PLATE DIAM. (mm)	D THREAD SIZE (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
92	39	92	61,0	86,4	M8	1	1/8	NO	*016	YI-1S3
117	56	181	104,1	104,1	M8	1	1/8	NO	*155	YI-1S4

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.



Sleeve Type





## Metric Double Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE @ 7 bar (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			50 (mm)	100 (mm)	150 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-2B6	*833	114	8 010	4 005	—	2 580	5 780 – 8 900	2,33	115 – 165	85	96	99
	*835	149	9 790	6 670	—	2 490	6 675 – 10 120	2,16	127 – 177	92	97	99
YI-2B7	*840	165	12 900	10 230	5 560	3 560	7 115 – 11 120	2,08	153 – 203	91	97	99
YI-2B8	*850	180	16 000	12 000	8 000	4 450	10 230 – 12 010	1,92	178 – 203	93	97	99
YI-2B9	*235	193	20 690	17 130	11 345	4 890	10 230 – 16 460	1,92	190 – 241	92	97	99
	*273	220	21 350	17 790	14 450	6 675	13 345 – 16 900	1,67	204 – 254	93	98	99
YI-2B12	*343	193	37 365	32 040	23 140	12 010	23 130 – 32 060	1,83	191 – 241	92	98	99
	*344	276	40 715	36 030	31 595	11 565	31 580 – 36 030	1,58	191 – 241	92	98	99
YI-2B14	*467	198	57 380	49 375	37 380	15 125	37 165 – 49 375	1,83	191 – 241	93	98	99
	*468	297	61 855	58 270	52 400	19 135	52 490 – 58 270	1,58	191 – 241	93	98	99

## Metric Triple Convolute Bellows Type

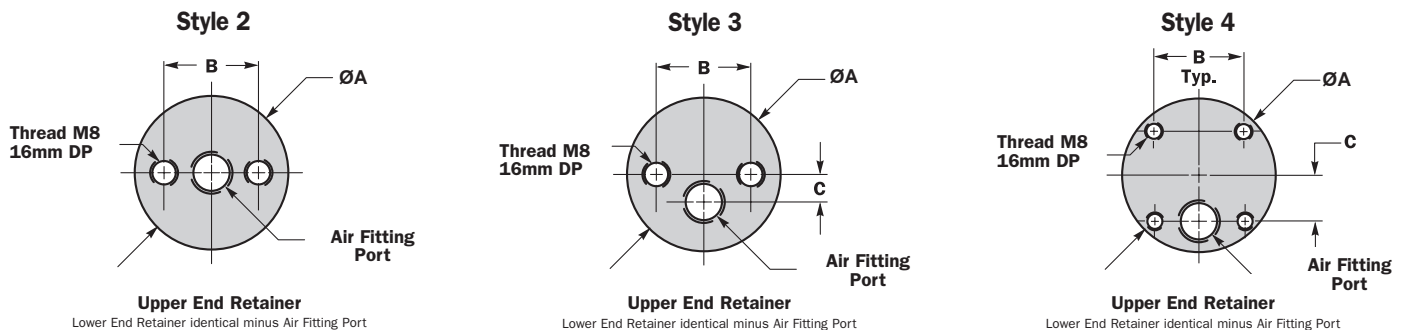
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE @ 7 bar (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			75 (mm)	150 (mm)	225 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-3B12	*320	337	39 160	32 250	26 700	12 905	23 130 – 31 580	1,50	280 – 381	94	98	99
YI-3B14	409	337	60 075	52 955	43 385	20 905	47 595 – 53 845	1,50	267 – 317	95	98	99

## Metric Bead Ring Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			50 (mm)	100 (mm)	200 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-2B19	8423	222	114 700	103 600	60 000	47 600	78 700 – 105 400	1,67	178 – 254	92	97	99
YI-2B22	8529	235	155 680	137 890	93 400	65 800	123 200 – 141 000	1,58	178 – 228	93	97	99

**NOTE:** \* denotes regularly stocked Endine product; available with shortest lead times.

## End Retainer Styles



\* Listed strokes start from the compressed height of the Air Spring.

\*\* This range is based on 100 psi (7 bar); to obtain the lower limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable, if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.

Note: For values other than 100 psi (7 bar), consult factory.



## Metric Double Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
166	72	196	123,0	44,5	—	2	1/4	NO	*833	YI-2B6
178	82	231	123,0	70,0	—	3	1/4	NO	*835	
204	64	229	127,0	70,0	—	2	1/4	NO	*840	YI-2B7
224	82	257	149,0	70,0	—	2	1/4	NO	*850	YI-2B8
262	89	274	162,6	89,0	38,1	3	3/4	NO	*235	YI-2B9
262	89	310	162,6	89,0	38,1	3	3/4	NO	*273	
331	89	282	228,6	157,5	72,9	3	3/4	NO	*343	YI-2B12
348	89	365	228,6	157,5	72,9	3	3/4	NO	*344	
384	89	287	287,0	158,8	79,4	4	3/4	NO	*467	YI-2B14
407	89	386	287,0	158,8	79,4	4	3/4	NO	*468	

## Metric Triple Convolute Bellows Type

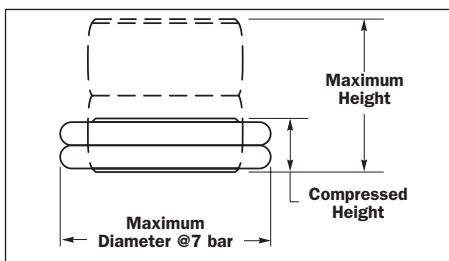
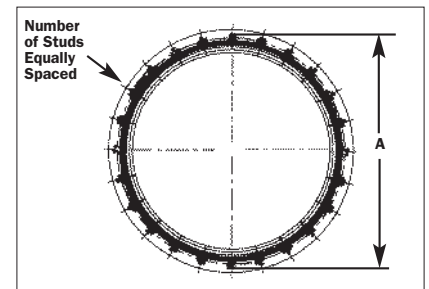
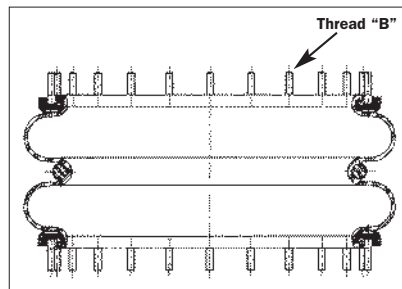
ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
331	120	457	228,6	157,5	72,9	3	3/4	NO	*320	YI-3B12
394	120	457	287,0	158,8	79,4	4	3/4	NO	409	YI-3B14

## Metric Bead Ring Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			SPARE PARTS	MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A MOUNTING DIAMETER (mm)	B THREAD	C NUMBER OF STUDS	FLEX MEMBER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
521,0	82,5	304,0	419,0	M10 X 1,5 x 52	24	Y6-556-23-8350	8423	YI-2B19
585,0	82,5	317,0	482,6	M10 X 1,5 x 52	24	Y6-556-23-8203	8529	YI-2B22

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

## Bead Ring Dimension



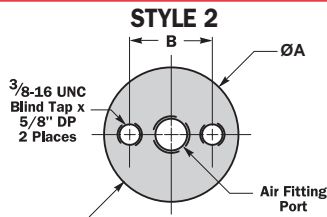


## Imperial Single Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 7 bar** (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			25 (mm)	50 (mm)	75 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-1B5	*500 *502	50	5 560	2 450	—	2 450	4 890 – 6 090	3,25	64 – 76	72	94	98
	*510 *512	76	6 670	5 340	2 450	2 450	4 780 – 6 940	2,75	64 – 102	82	96	99
	520 521	101	7 120	6 670	5 120	2 000	4 230 – 6 920	2,67	89 – 127	83	96	99
YI-1B6	530	71	8 450	6 670	—	3 780	6 670 – 8 450	2,75	76 – 102	78	95	98
	531	71	8 450	6 670	—	3 780	6 670 – 8 450	2,75	76 – 102	78	95	98
	532	63	8 010	6 670	—	3 780	6 670 – 8 450	2,75	76 – 102	78	95	98
	*535	130	9 790	9 340	8 450	3 340	6 670 – 9 340	2,25	102 – 152	90	97	99
	*536	130	9 790	9 340	8 450	3 340	6 670 – 9 340	2,25	102 – 152	90	97	99
	538	121	10 010	9 560	8 230	3 340	6 670 – 9 340	2,25	102 – 152	90	97	99
YI-1B7	*540	81	10 680	8 450	4 890	3 780	7 120 – 9 790	2,67	102 – 127	83	96	99
	541	81	10 680	8 450	4 890	3 780	7 120 – 9 790	2,67	102 – 127	83	96	99
	542	74	10 230	7 780	—	3 780	7 120 – 9 790	2,67	102 – 127	83	96	99
YI-1B8	*550	84	14 680	11 790	7 120	4 890	8 900 – 12 900	2,83	95 – 121	83	96	99
	*552	84	14 680	11 790	7 120	4 890	8 900 – 12 900	2,83	95 – 121	83	96	99
	553	84	14 680	11 790	7 120	4 890	8 900 – 12 900	2,83	95 – 121	83	96	99
	554	76	14 230	11 120	4 890	4 890	8 900 – 12 900	2,83	95 – 121	83	96	99
	560 562	119	15 570	14 680	12 900	7 120	8 450 – 14 680	2,33	102 – 165	85	96	99
	563	119	14 680	14 680	12 900	7 120	8 450 – 14 680	2,33	102 – 165	85	96	99
	564	112	15 350	14 230	12 680	7 120	8 450 – 14 680	2,33	102 – 165	85	96	99
YI-1B9	*202 204	91	22 460	18 460	12 680	6 670	14 230 – 17 350	2,50	114 – 127	84	96	99
	201 205	68	18 460	12 680	—	6 670	14 230 – 17 350	2,50	114 – 127	84	96	99
	207	91	22 460	18 460	12 680	6 670	14 230 – 17 350	2,50	114 – 127	84	96	99
	208	68	18 460	12 680	—	6 670	14 230 – 17 350	2,50	114 – 127	84	96	99
YI-1B12	*313 304	124	38 700	35 590	31 140	16 010	32 470 – 39 140	2,33	76 – 127	89	97	99
	301 305	116	37 810	34 030	28 910	16 010	32 470 – 39 140	2,33	76 – 127	89	97	99
YI-1B14	*350 352	124	56 270	51 150	44 040	21 800	44 480 – 52 930	2,33	102 – 133	86	96	99
	351 353	76	44 700	34 470	21 800	21 800	44 480 – 52 930	2,33	108 – 133	86	96	99
	364 362	152	60 050	56 940	51 600	21 350	51 600 – 60 050	2,25	83 – 133	87	97	99
YI-1B15	375 377	142	66 280	61 830	54 270	21 800	53 380 – 60 940	2,17	112 – 137	91	97	99
	376 378	94	55 160	45 820	32 690	21 800	53 380 – 60 940	2,17	112 – 137	91	97	99

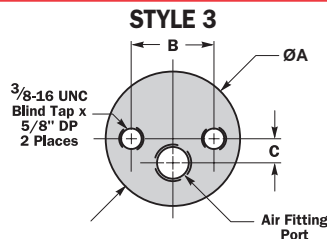
**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

## End Retainer Styles



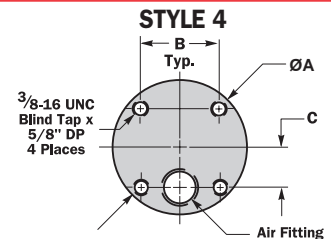
**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port



**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port



**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port

\* Listed strokes start from the compressed height of the Air Spring.

\*\* This range is based on 100 psi (7 bar); to obtain the lower limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable, if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.

Note: For values other than 100 psi (7 bar), consult factory.



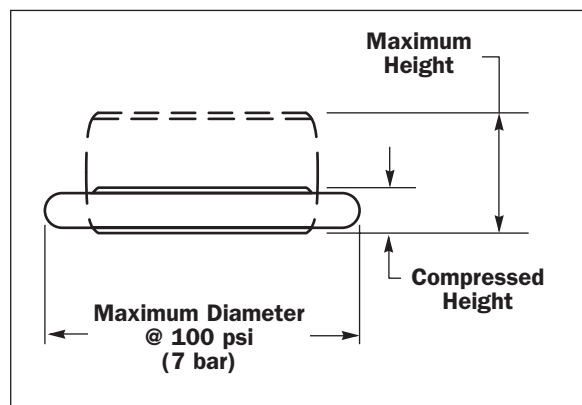
## Imperial Single Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A END PLATE RET. DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
145	46	96	86,0	44,5	—	2	1/4 3/4	NO	*500 *502	YI-1B5
152	46	122	86,0	44,5	—	2	1/4 3/4	NO	*510 *512	
165	46	147	86,0	44,5	—	2	1/4 3/4	NO	520 521	
165	51	122	105,0	44,5	—	2	1/4	NO	530	YI-1B6
165	51	122	105,0	69,9	35,1	3	1/4	NO	531	
165	58	121	105,0	69,9	35,1	3	1/4	YES	532	
178	51	179	105,0	44,5	—	2	1/4	NO	*535	
178	51	179	105,0	69,9	35,1	3	1/4	NO	*536	
178	58	179	105,0	69,9	35,1	3	1/4	YES	538	
196	51	132	105,0	44,5	—	2	1/4	NO	*540	YI-1B7
196	51	132	105,0	69,9	35,1	3	1/4	NO	541	
196	58	132	105,0	69,9	35,1	3	1/4	YES	542	
221	51	135	127,0	69,9	—	2	1/4	NO	*550	YI-1B8
221	51	135	127,0	69,9	—	2	3/4	NO	*552	
221	51	135	127,0	69,9	35,1	3	1/4	NO	553	
221	58	134	127,0	69,9	35,1	3	1/4	YES	554	
239	51	170	127,0	69,9	—	2	1/4 3/4	NO	560 562	
239	51	170	127,0	69,9	35,1	3	1/4	YES	563	
239	58	170	127,0	69,9	35,1	3	1/4	NO	564	
279	58	149	163,0	88,9	44,5	3	1/4 1/2	NO	*202 204	YI-1B9
279	81	149	163,0	88,9	44,5	3	1/4 1/2	YES	201 205	
279	58	149	163,0	88,9	38,1	3	3/4	NO	207	
279	81	149	163,0	88,9	38,1	3	3/4	YES	208	
335	58	182	229,0	157,5	72,9	3	1/4 3/4	NO	*313 304	YI-1B12
335	66	182	229,0	157,5	72,9	3	1/4 3/4	YES	301 305	
386	58	182	287,0	158,8	79,2	4	1/4 3/4	NO	*350 352	YI-1B14
386	107	183	287,0	158,8	79,2	4	1/4 3/4	YES	351 353	
404	58	210	287,0	158,8	79,2	4	1/4 3/4	NO	364 362	
445	58	200	287,0	158,8	79,2	4	1/4 3/4	NO	375 377	YI-1B15
445	107	201	287,0	158,8	79,2	4	1/4 3/4	YES	376 378	

**NOTE:** \* denotes regularly stocked Endidine product; available with shortest lead times.



Single Bellows Type





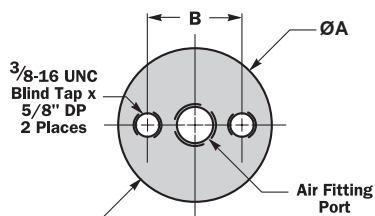
## Imperial Double Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			50 (mm)	100 (mm)	228 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-2B6	*530	114	8 010	4 890	—	2 670	5 780 – 8 900	2,09	114 – 165	85	96	99
	531	114	8 010	4 890	—	2 670	5 780 – 8 900	2,09	114 – 165	85	96	99
	532	109	7 560	3 560	—	2 670	5 780 – 8 900	2,09	114 – 165	85	96	99
	535	149	10 450	7 120	3 110	2 450	6 670 – 9 790	2,09	127 – 178	92	97	99
	536	144	9 340	6 450	3 110	2 450	6 670 – 9 790	2,09	127 – 178	92	97	99
YI-2B7	540 / 546	165	12 900	10 230	5 560	3 560	7 120 – 11 120	2,08	152 – 203	91	97	99
	541	165	12 900	10 230	5 560	3 560	7 120 – 11 120	2,08	152 – 203	91	97	99
	542	145	12 230	8 900	—	3 560	7 120 – 11 120	2,08	152 – 203	91	97	99
YI-2B8	550 / 552	183	16 010	12 010	8 010	4 450	10 230 – 12 010	1,92	178 – 203	93	97	99
	553	183	16 010	12 010	8 010	4 450	10 230 – 12 010	1,92	178 – 203	93	97	99
	554	168	14 900	11 120	6 230	4 450	10 230 – 12 010	1,92	178 – 203	93	97	99
YI-2B9	200 / 204	193	20 680	17 130	11 340	4 890	10 230 – 16 460	1,92	191 – 241	92	97	99
	201 / 205	178	19 570	15 790	9 340	4 890	10 230 – 16 460	1,92	191 – 241	92	97	99
	216	193	20 680	17 130	11 340	4 890	10 230 – 16 460	1,92	191 – 241	92	97	99
	208	178	19 570	15 790	9 340	4 890	10 230 – 16 460	1,92	191 – 241	92	97	99
	250	221	21 350	17 790	14 460	6 670	13 340 – 16 900	1,67	203 – 254	93	98	99
	251	213	20 910	17 350	13 790	6 670	13 340 – 16 900	1,67	203 – 254	93	98	99
	263	221	21 350	17 790	14 460	6 670	13 340 – 16 900	1,67	203 – 254	93	98	99
YI-2B12	*425 / 429	193	37 370	32 030	23 130	12 010	23 130 – 32 030	1,83	191 – 241	92	98	99
	309 / 318	175	35 810	29 360	18 900	12 010	23 130 – 32 030	1,83	191 – 241	92	98	99
	437	193	37 370	32 030	23 130	12 010	23 130 – 32 030	1,83	191 – 241	92	98	99
	416 / 419	276	40 480	36 030	31 580	11 570	31 580 – 36 030	1,58	191 – 241	92	98	99
YI-2B14	*354 / 352	198	57 380	49 380	37 370	15 120	37 370 – 49 380	1,83	191 – 241	93	98	99
	355 / 353	162	51 600	41 810	21 350	15 120	37 370 – 49 380	1,83	191 – 241	93	98	99
	362 / 363	297	64 500	58 270	52 490	19 130	52 490 – 58 160	1,58	191 – 241	93	98	99
	452	279	60 720	56 490	49 820	19 130	52 490 – 58 160	1,58	191 – 241	93	98	99
YI-2B15	375 / 377	236	60 940	54 710	45 820	11 120	45 820 – 54 710	1,67	191 – 241	93	98	99
	376 / 378	200	57 160	48 710	35 140	11 120	45 820 – 54 710	1,67	191 – 241	93	98	99

**NOTE:** \* denotes regularly stocked Endine product; available with shortest lead times.

## End Retainer Styles

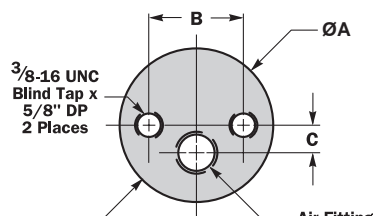
**STYLE 2**



**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port

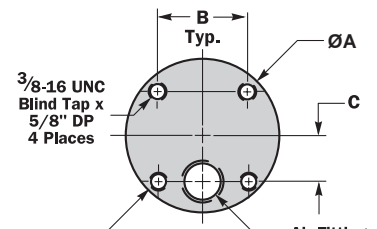
**STYLE 3**



**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port

**STYLE 4**



**Upper End Retainer**

Lower End Retainer identical minus Air Fitting Port

\* Listed strokes start from the compressed height of the Air Spring.

\*\* This range is based on 100 psi (7 bar); to obtain the lower limit (i.e., minimum load @ 20 psi) divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable if, the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.

Note: For values other than 100 psi (7 bar), consult factory.





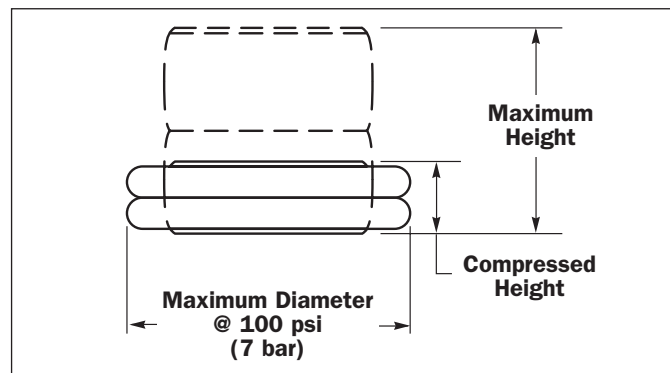
## Imperial Double Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A END PLATE RET. DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
165	81	195	123,0	44,5	—	2	1/4	NO	*530	YI-2B6
165	81	195	123,0	69,9	35,1	3	1/4	NO	531	
165	86	195	123,0	69,9	35,1	3	1/4	YES	532	
178	81	230	123,0	69,9	35,1	3	1/4	NO	535	
178	86	230	123,0	69,9	35,1	3	1/4	YES	536	
203	64	229	127,0	69,9	—	2	1/4 3/4	NO	540 546	YI-2B7
203	64	229	127,0	69,9	35,1	3	1/4	NO	541	
203	84	229	127,0	69,9	35,1	3	1/4	YES	542	
224	74	257	149,0	69,9	—	2	1/4 3/4	NO	550 552	YI-2B8
224	74	257	149,0	69,9	35,1	3	1/4	NO	553	
224	89	257	149,0	69,9	35,1	3	1/4	YES	554	
262	81	274	163,0	88,9	44,5	3	1/4 1/2	NO	200 204	YI-2B9
262	97	274	163,0	88,9	44,5	3	1/4 1/2	YES	201 205	
262	81	274	163,0	88,9	38,1	3	3/4	NO	216	
262	97	274	163,0	88,9	38,1	3	3/4	YES	208	
262	89	310	163,0	88,9	44,5	3†	1/4	NO	250	
262	97	310	163,0	88,9	44,5	3†	1/4	YES	251	
262	89	310	163,0	88,9	44,5	3	1/2	NO	263	
330	89	282	229,0	157,5	72,9	3	1/4 3/4	NO	*425 429	YI-2B12
330	107	282	229,0	157,5	72,9	3	1/4 3/4	YES	309 318	
330	89	282	229,0	157,5	—	2	1/4	NO	437	
348	89	365	229,0	157,5	72,9	3	1/4 3/4	NO	416 419	
384	89	287	287,0	158,8	79,2	4	1/4 3/4	NO	*354 352	YI-2B14
384	124	286	287,0	158,8	79,2	4	1/4 3/4	YES	355 353	
406	89	386	287,0	158,8	79,2	4	1/4 3/4	NO	362 363	
406	107	386	287,0	158,8	79,2	4	1/4	YES	452	
424	89	325	287,0	158,8	79,2	4	1/4 3/4	NO	375 377	YI-2B15
424	124	324	287,0	158,8	79,2	4	1/4 3/4	YES	376 378	

**NOTE:** \* denotes regularly stocked Endine product; available with shortest lead times.



Double Bellows Type



†For Models YI-2B9-250 and YI-2B9-251, the Upper End Retainer is supplied with 1/2-13 UNC X 0,63 inch long Mounting Studs.



## Imperial Triple Convolute Bellows Type

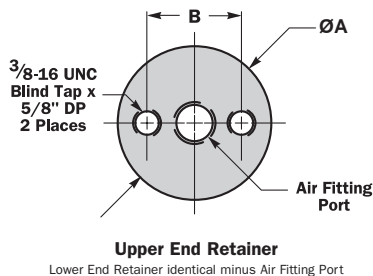
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			75 (mm)	150 (mm)	225 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-3B12	304 305	337	37 810	32 920	25 800	12 900	23 130 – 31 580	1,50	279 – 381	94	98	99
	308	337	37 810	32 920	25 800	12 900	23 130 – 31 580	1,50	279 – 381	94	98	99
	450 374	400	55 160	48 490	42 930	20 020	45 370 – 48 930	1,25	267 – 318	95	99	99
YI-3B14	453 411	396	55 490	48 040	42 260	20 020	45 370 – 48 930	1,25	267 – 318	95	98	99
	354 361	338	60 050	52 930	43 370	21 570	47 600 – 53 820	1,50	267 – 318	95	98	99
	351 353	272	52 930	44 480	31 800	21 570	47 600 – 53 820	1,50	267 – 318	95	98	99
YI-3B15	375 377	312	64 500	56 270	44 930	27 360	49 820 – 56 940	1,42	267 – 318	91	97	99
	376 378	246	57 830	46 710	32 030	27 360	49 820 – 56 940	1,42	267 – 318	91	97	99

## Imperial Bead Ring Type

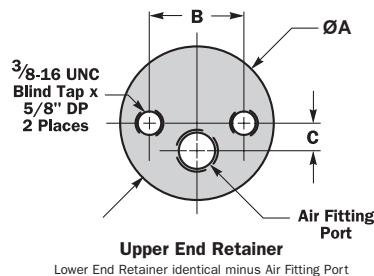
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE (N)**	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz***	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			50 (mm)	100 (mm)	200 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-2B9	240	203	20 680	17 130	2 220	2 220	11 570 – 16 080	1,92	203 - 229	92	98	99
YI-2B12	340	193	37 590	32 030	—	12 900	20 350 – 32 050	1,83	191 - 241	93	98	99
YI-2B19	8433	222	114 720	103 550	60 940	47 600	14 230 – 105 420	1,67	178 - 254	92	97	99
YI-2B22	8539	235	154 800	138 780	92 080	65 830	23 130 – 141 010	1,58	178 - 229	93	97	99

## End Retainer Styles

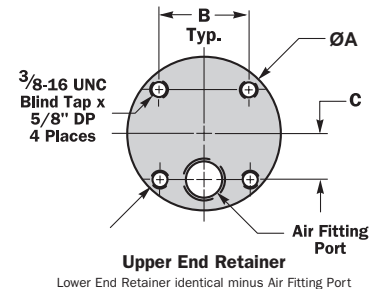
STYLE 2



STYLE 3



STYLE 4



\* Listed strokes start from the compressed height of the Air Spring.

\*\* This range is based on 100 psi (7 bar); to obtain the lower limit (i.e., minimum load @ 20 psi) divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable, if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.

Note: For values other than 100 psi (7 bar), consult factory.



## Imperial Triple Convolute Bellows Type

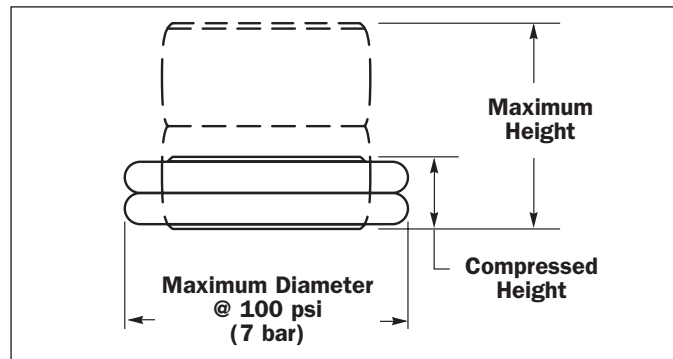
ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A END PLATE RET. DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
330	120	457	228,6	157,5	72,9	3	1/4 3/4	NO	304 305	YI-3B12
330	120	457	228,6	157,5	—	2	1/4	NO	308	
394	120	520	287,0	158,8	79,5	4	1/4 3/4	NO	450 374	YI-3B14
394	124	520	287,0	158,8	79,5	4	1/4 3/4	YES	453 411	
394	120	457	287,0	158,8	79,2	4	1/4 3/4	NO	354 361	
394	185	457	287,0	158,8	79,2	4	1/4 3/4	YES	351 353	
419	120	431	287,0	158,8	79,2	4	1/4 3/4	NO	375 377	YI-3B15
419	185	431	287,0	158,8	79,2	4	1/4 3/4	YES	376 378	

## Imperial Bead Ring Type

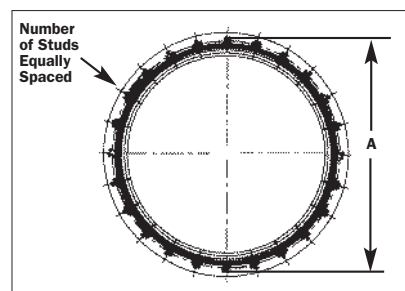
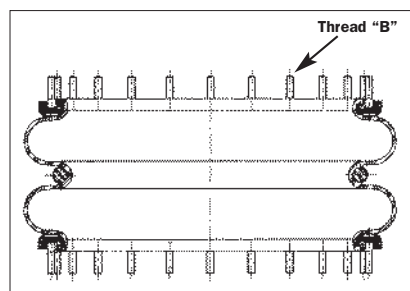
ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			SPARE PARTS	MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A MOUNTING DIAMETER	B THREAD	C NUMBER OF STUDS	FLEX MEMBER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
262	89	292	159,0	5/16-24 UNC	8	Y6-578-92-3-202	240	YI-2B9
330	89	282	227,0	5/16-24 UNC	12	Y6-578-92-3-309	340	YI-2B12
521	83	305	419,0	3/8-24UNF x 2,05	24	Y6-556-23-8350	8433	YI-2B19
584	83	318	483,0	3/8-24UNF x 2,05	24	Y6-556-23-8203	8539	YI-2B22



Triple Bellows Type



## Bead Ring Dimension





## Imperial Sleeve Type

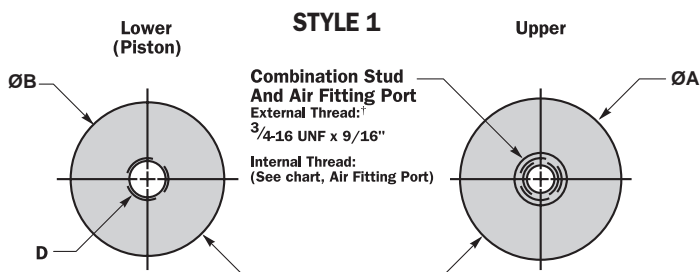
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 7 BAR** (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz†	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			25 (mm)	75 (mm)	125 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-1S3	*011	112	1 780	1 780	—	490	1 560 – 1 780	2,00	279 – 381	92	97	99
	*013	53	2 490	—	—	530	1 960 – 2 580	3,25	279 – 381	71	93	98
YI-1S4	007	124	3 780	3 690	—	1 380	3 780 – 3 910	2,17	267 – 318	90	97	99
	*008	165	3 110	4 000	3 780	2 400	3 560 – 4 000	1,33	267 – 318	95	98	99
YI-1S5	005	140	4 450	4 890	4 000	3 560	3 560 – 4 000	1,58	267 – 318	95	98	99
	006	165	4 450	5 120	4 890	3 340	4 670 – 4 890	1,50	267 – 318	96	99	99
	010	102	4 890	4 230	—	2 490	4 110 – 4 890	2,00	267 – 318	90	97	99
YI-1S6	023	173	7 870	7 250	7 070	5 340	7 250 – 6 940	1,58	267 – 318	94	98	99

## Imperial Rolling Lobe Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 7 BAR** (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz*	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			100 (mm)	200 (mm)	300 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YI-1R8	005	330	14 645	13 345	—	—	13 345 – 13 790	1,33	267 – 330	95	95	98
	009	300	12 120	—	—	—	12 010 – 12 900	1,17	267 – 330	96	98	99
YI-1R9	003	312	15 090	13 580	6 895	5 560	14 235 – 16 460	1,42	204 – 304	93	98	99
	009	218	18 150	6 750	—	4 005	17 350 – 19 575	1,67	153 – 190	91	97	99
YI-1R10	089	358	22 240	23 575	16 425	9 340	22 240 – 23 130	1,25	242 – 343	96	99	99
YI-1R11	028	236	27 920	17 525	—	10 235	24 465 – 29 800	1,58	153 – 254	95	98	99
	039	279	29 805	25 355	—	10 235	28 915 – 31 140	1,67	204 – 304	94	98	99
YI-1R12	092	340	33 130	31 630	20 200	12 010	30 250 – 33 800	1,42	267 – 419	96	99	99
	095	231	31 715	17 600	—	10 675	30 250 – 32 470	1,58	178 – 228	94	98	99
	103	445	33 165	31 465	29 525	11 565	30 690 – 32 470	1,25	381 – 508	96	99	99
	132	274	32 915	26 020	—	12 010	32 915 – 33 800	1,67	204 – 254	93	98	99
	256	498	33 735	32 165	31 135	13 790	31 135 – 32 970	1,17	407 – 508	96	99	99
YI-1R14	274	373	33 145	32 470	23 370	13 345	32 470 – 33 360	1,17	287 – 363	96	99	99
	019	429	37 810	37 810	—	—	36 380 – 37 810	1,17	356 – 457	96	99	99
	018	376	37 525	37 365	27 760	11 120	37 365 – 37 810	1,25	280 – 419	96	99	99
	037	312	48 725	39 825	15 350	13 125	45 505 – 49 830	1,75	191 – 279	92	98	99

**NOTE:** \* denotes regularly stocked Endidine product; available with shortest lead times.

## End Retainer Styles



\* Listed strokes start from the compressed height of the Air Spring.  
 \*\* This range is based on 100 psi (7 bar); to obtain the lower limit (i.e., minimum load @ 20 psi) divide the smaller value by 5.  
 \*\*\* In the "Isolation Specification" section, there is a column titled: "% Isolation At Input Frequency." The figures in this column reflect the approximate percentage of isolation obtainable if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. If the design height is above or below the design height range, vibration isolation may be slightly higher or lower, respectively.

Note: For values other than 100 psi (7 bar), consult factory.

† For YI-1S3-013, External thread is 5/8-11 UNC x 25mm long.  
 For YI-1S6-023, External thread is M20 x 2,5-6g is 16mm long.



## Imperial Sleeve Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B LOWER END PLATE DIAM. (mm)	D BLIND TAP FOR MOUNTING	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
83	91	203	69,9	69,9	1/2-13 UNC x 0,63 DP.	1	1/8	NO	*011	YI-1S3
91	38	91	61,0	86,4	5/16-18 UNC x 0,44 DP.	1	1/8	NO	*013	
117	56	180	104,1	104,1	3/8-16 UNC x 0,50 DP.	1	1/8	NO	007	YI-1S4
117	102	267	104,1	104,1	1/2-13 UNC x 0,63 DP.	1	1/8	NO	*008	
142	102	241	104,1	104,1	1/2-13 UNC x 0,63 DP.	1	1/8	NO	005	YI-1S5
142	102	267	129,5	129,5	1/2-13 UNC x 0,63 DP.	1	1/8	NO	006	
142	56	159	129,5	129,5	3/8-16 UNC x 0,50 DP.	1	1/8	NO	010	
173	104	277	160,0	160,0	M20-2,5-6g x 15mm Long	1	1/8	NO	023	YI-1S6

## Imperial Rolling Lobe Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAX. Ø @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B LOWER END PLATE DIAM. (mm)	D BLIND TAP FOR MOUNTING	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
221	142	472						NO	005	YI-1R8
221	173	472						YES	009	
241	142	455						NO	003	YI-1R9
241	81	300						NO	009	
279	152	511						NO	089	YI-1R10
292	94	330						NO	028	YI-1R11
297	155	434						YES	039	
323	196	536						YES	092	YI-1R12
323	112	343						YES	095	
323	241	686						YES	103	
328	155	429						YES	132	
320	241	739						YES	256	
325	206	579						YES	274	
371	226	655						YES	019	YI-1R14
371	196	572						YES	018	
376	145	457						YES	037	

FOR ROLLING LOBE TYPE AIR SPRINGS:  
  
CONTACT YOUR LOCAL REPRESENTATIVE OR ENIDINE FOR MOUNTING AND AIR FITTING DIMENSIONS.

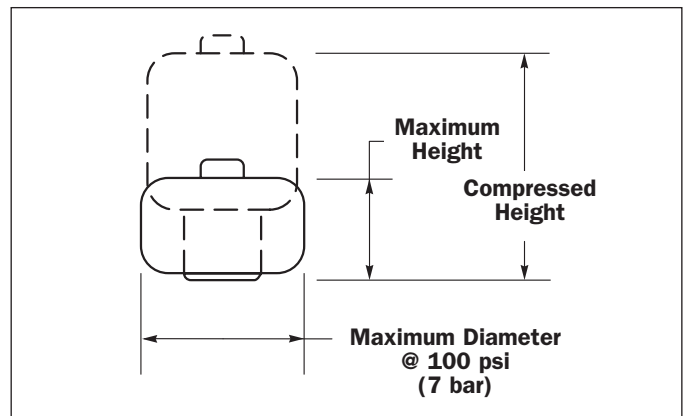
**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.



Sleeve Type



Rolling Lobe Type





**NEW**

## METRIC DISMOUNTABLE Single Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz*	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			25 (mm)	50 (mm)	75 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YM-1B4	*2334	40	4 000	—	—	1 950	1 050 – 3 350	3,9	72	63	92	98
YM-1B6	*1645	55	10 200	5 800	—	4 700	1 850 – 6 100	3,5	90	72	94	99
YM-1B8	*1537	80	20 500	14 500	9 250	7 500	3 350 – 11 050	2,9	100	83	96	99
YM-1B12	*1540	100	47 000	40 000	31 000	20 000	7 950 – 24 550	2,5	120	88	97	99

## METRIC DISMOUNTABLE Double Convolute Bellows Type

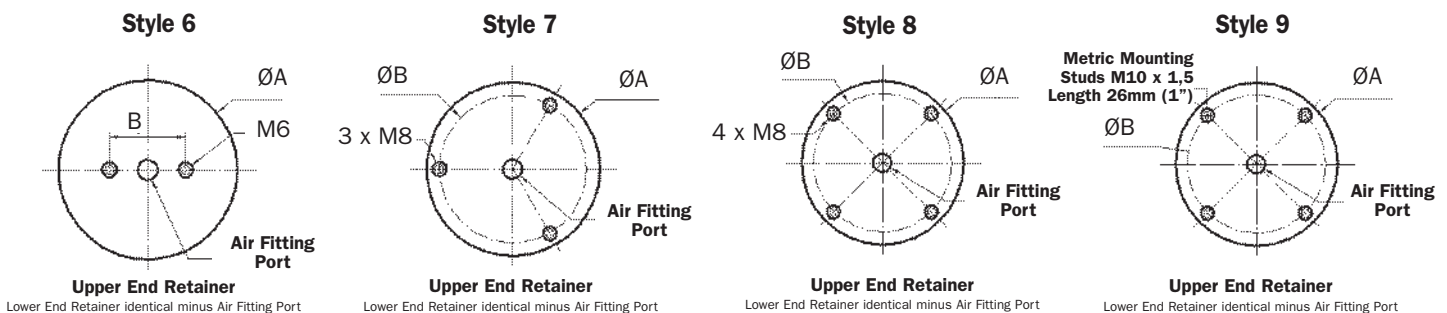
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz*	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			50 (mm)	100 (mm)	150 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YM-2B2	*2042	45	750	—	—	750	450 – 1 400	3,8	90	66	93	98
YM-2B4	*2441	85	4 200	—	—	2 350	750 – 2 600	2,7	130	85	96	99
YM-2B6	*1646	115	10 000	5 900	—	4 650	1 750 – 5 600	2,3	160	90	97	99
YM-2B8	*1490	175	18 800	13 600	9 000	6 150	2 650 – 8 400	2,0	200	92	98	99
YM-2B10	*1538	225	30 500	25 000	19 000	8 750	4 700 – 14 550	1,8	220	94	98	99
YM-2B12	*1541	225	46 000	38 000	29 000	12 000	7 000 – 22 500	1,8	220	96	99	99
YM-2B14	*1556	265	74 000	64 000	53 000	23 000	11 850 – 35 600	1,7	250	96	99	99
YM-2B16	*1557	315	81 000	73 000	65 000	27 000	12 700 – 38 650	1,5	290	96	99	99

## METRIC DISMOUNTABLE Triple Convolute Bellows Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAX. STROKE (mm)	FORCE (N) AT STROKE OF:				ISOLATOR LOAD RANGE (N)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz*	DESIGN HEIGHT RANGE (mm)	% ISOLATION AT INPUT FREQ OF:		
			75 (mm)	150 (mm)	225 (mm)	Max. (mm)				7,25 Hz	14,5 Hz	30 Hz
YM-3B10	*1539	330	29 000	23 500	17 500	9 000	4 350 – 13 400	1,5	320	96	99	99

**NOTE:** \* denotes regularly stocked Endine product; available with shortest lead times.

## End Retainer Styles





# Dismountable Air Springs

**NEW**

## METRIC DISMOUNTABLE Single Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
125	50	90	110,0	93,0	—	7	3/8	NO	*2334	YM-1B4
175	55	110	153,5	127,0	—	8	1/2	NO	*1645	YM-1B6
230	50	130	184,0	155,5	—	9	1/2	NO	*1537	YM-1B8
330	50	150	260,0	232,0	—	9	1/2	NO	*1540	YM-1B12

## METRIC DISMOUNTABLE Double Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
80	65	110	78,0	36,0	—	6	1/4	NO	*2042	YM-2B2
125	65	150	110,0	93,0	—	7	3/8	NO	*2441	YM-2B4
175	80	195	153,5	127,0	—	8	1/2	NO	*1646	YM-2B6
220	75	250	184,0	155,0	—	9	1/2	NO	*1490	YM-2B8
270	75	300	210,0	181,0	—	9	1/2	NO	*1538	YM-2B10
325	75	300	260,0	232,0	—	9	1/2	NO	*1541	YM-2B12
400	75	340	310,0	282,5	—	9	1/2	NO	*1556	YM-2B14
440	75	390	310,0	282,5	—	9	1/2	NO	*1557	YM-2B16

## METRIC DISMOUNTABLE Triple Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 7 bar (mm)	COMPRESSED HEIGHT (mm)	MAXIMUM HEIGHT (mm)	A UPPER END PLATE DIAM. (mm)	B BLIND TAP SPACING (mm)	C FILL PORT OFFSET (mm)	END RETAINER STYLE	AIR FITTING PORT (BSP)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
270	100	430	210,0	181,0	—	9	1/2	NO	*1539	YM-3B10

**NOTE:** \* denotes regularly stocked Enidine product; available with shortest lead times.

## METRIC DISMOUNTABLE Product Range



Single Bellows Type



Double Bellows Type



Triple Bellows Type

