



# Air Springs



Solutions in Energy Absorption and Vibration Isolation.



An IMC Company

# Enisize for Air Springs



**Enisize for Air Springs (E.A.S.)** can help you size the proper Air Spring for your application. Once installed on your PC, just launch the program from the E.A.S. ICON on your desktop. The program will need a few input parameters to provide you with Air Spring recommendations.

You can review all the important technical information required to specify the Air Spring in your application. Your results can be viewed within the program or saved onto your desktop in a convenient PDF format for printing or e-mail. For more product information or pricing, please contact Enidine's customer service department at 1.800.852.8508.

## Supported operating systems

- Windows® 98/98SE
- Windows® ME
- Windows® NT with Service Pack 6a or better
- Windows® 2000 with latest Service Pack
- Windows® XP Home or Pro Versions
- Windows® server 2003 Family Release Versions Only

**NEW!**  
**Free Sizing Tools**

## Required software installation\*

- Microsoft® .net framework automatically installed by program installer.
- Microsoft® data access components (mdac) 2.6 or later Provided on CD and installed by user.
- The program will prompt for installation if necessary.
- Microsoft® Internet Explorer® 5.0 or later
- Adobe® Acrobat Reader® 5.0 or later, may be downloaded at: [www.adobe.com](http://www.adobe.com)

\*Please contact Enidine for installation assistance if required.

## Minimum hardware requirements

- Pentium® 133mhz (*Or minimum required by the operating system*)
- 128 megabytes of ram (*Or minimum required by the operating system*)
- 150 megabytes of free hard disk space (*Estimated*)



CD-ROM available by contacting us at: 1-800-852-8508 or download at [www.enidine.com](http://www.enidine.com)



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(Triple) Bellows Type



Rolling Lobe Type



(Double) Bellows Type



Sleeve Type



(Single) Bellows Type



**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.

### Note:

*Products are manufactured for Enidine Incorporated 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 135°F (57°C). Continuous service is defined as operating 40 or more hours per week at this temperature. Minimum allowable operating temperature is -20°F (-29°C) for air spring products made with "Wingprene", -56°F (-49°C) for products made with Natural Rubber.

### Intermittent Service

The maximum allowable temperature should not exceed 150°F (65°C). Intermittent Service is defined as operating less than 40 hours per week at this temperature. Minimum allowable operating temperature is -40°F (-40°C) for products made with "Wingprene" and -76°F (-60°C) for products made with Natural Rubber. Note that minor cracking may occur with any prolonged operation at these minimum temperatures.

### Enisize for Air Springs

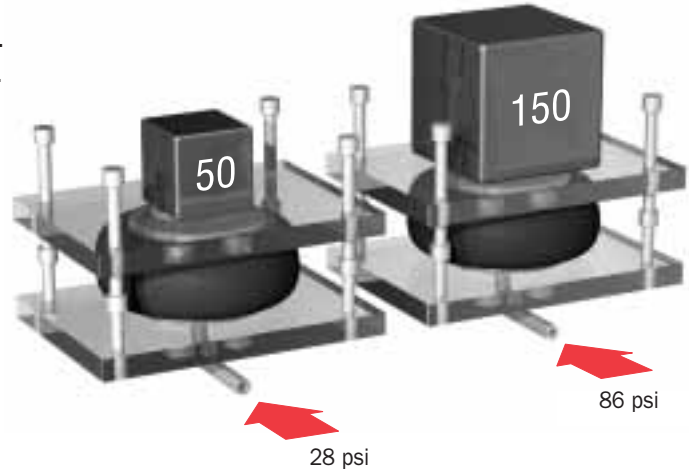
Enisize for Air Springs is primarily an automated selection program designed to provide qualified users with recommendations. Due to the nature and scope of this program, all previously existing or imbedded catalog documentation is superceded by the data and results generated by Enisize for Air Springs. It is the user's sole responsibility for the use of this program and its results. The program contains the latest information available at the time of release and is subject to change without notice.



## Advantages of Enidine Air Springs

### Simple construction.

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

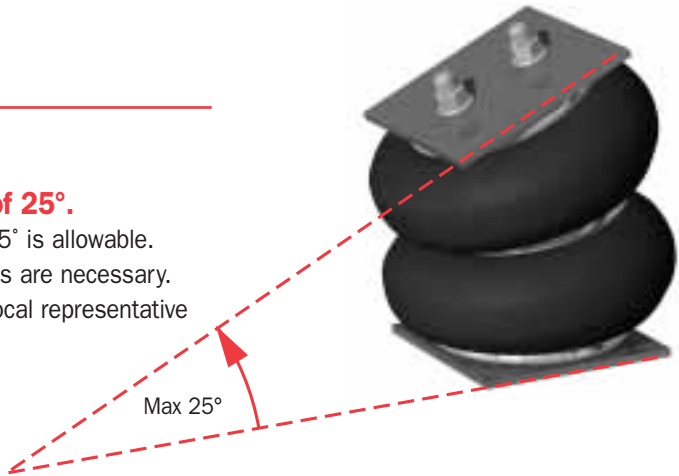


### Max. displacement .39 in.

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

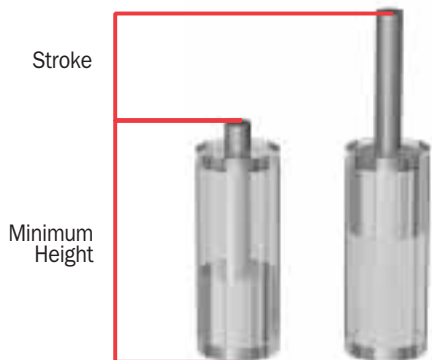
### Maximum tilt angle of 25°.

A maximum tilt angle of 25° is allowable. No costly reversing devices are necessary. (Contact Enidine or your local representative for technical help)



### Little space required, no sealing required.

Compared to conventional pneumatic cylinders, the minimum height of the Enidine 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

## Operating Temperature Range

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

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

Note: See temperature range guidelines page 2, for details.

## Environmental Considerations

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

## 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

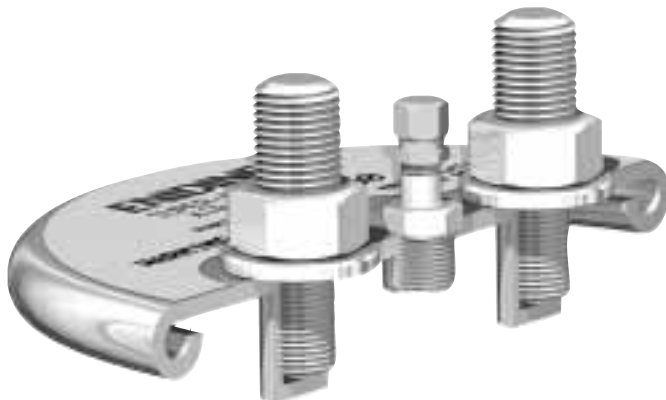
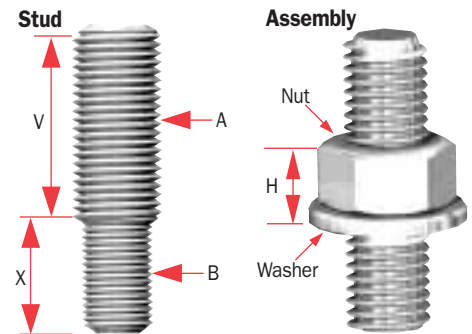
## Accessories

### Assembly (Stud + Nut + Washer)

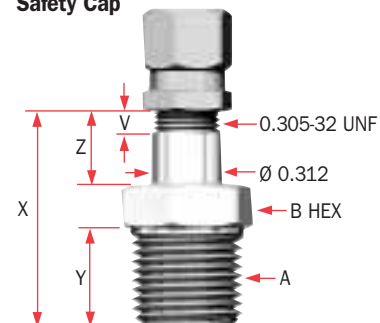
Part Number	A	B	H in.	V in.	X in.
YI-578-9-056	1/2" UNC	3/8" UNC	.53	2.50	.56

### Tank Valves Including Safety Cap

Part Number	A	B in.	V in.	X in.	Y in.	Z in.
YI-579-08-9-033	1/8" NPTF	.44	.31	1.31	.38	.75
YI-578-92-9-122	1/4" NPTF	.56	.31	1.31	.56	.56
YI-579-08-9-033M	1/8" BSP	.51	.31	1.66	.51	.87
YI-578-92-9-122M	1/4" BSP	.91	.31	1.66	.51	.87



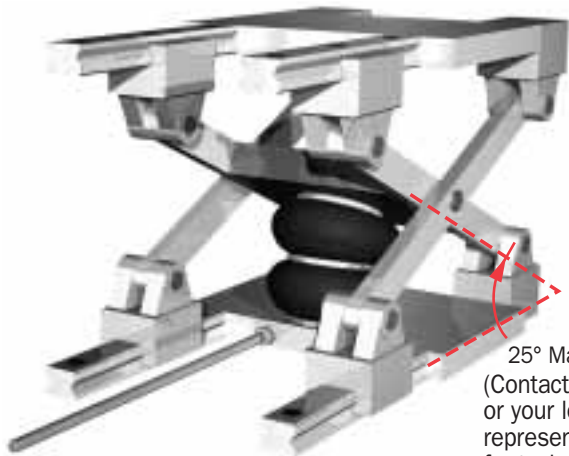
### Tank Valve Including Safety Cap





## Typical Applications for Actuation

### Scissor Lifts



25° Maximum  
(Contact Enidine  
or your local  
representative  
for technical help.)

- 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

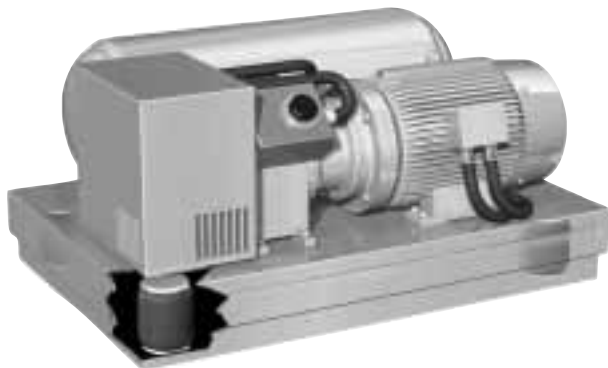
### Presses

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



## Typical Applications for Vibration Isolation

### Compressors



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

### Electronic Equipment

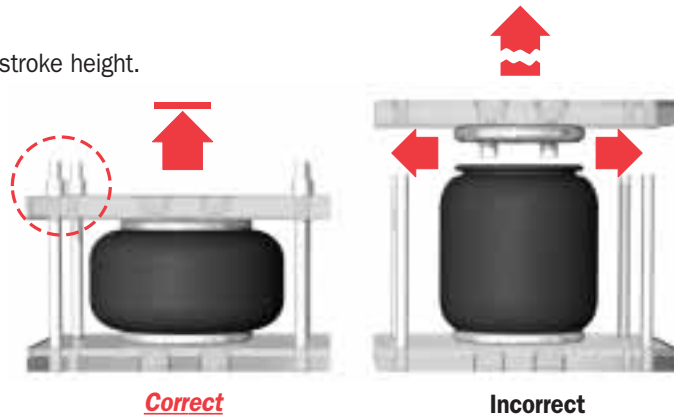
- Textile looms
- Conveyor loading points
- Compressors
- Electronic equipment



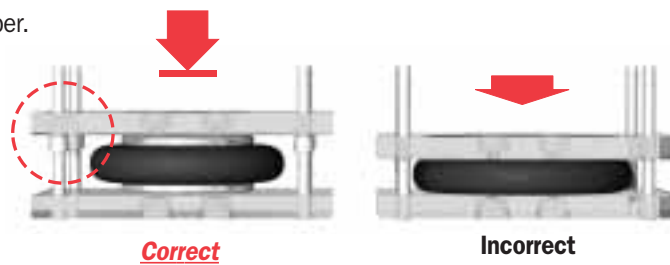


## Installation and Operating Instructions

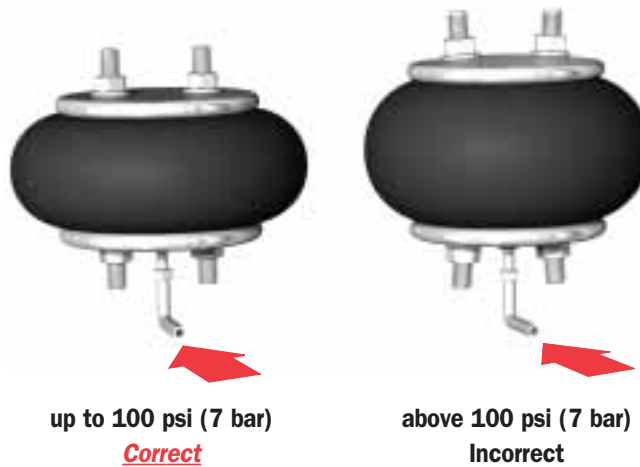
Provide stroke limitations,  
to prevent exceeding the maximum allowable stroke height.



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



Max. allowable pressure: 100 psi (7 bar).



Never use Air Springs in torsion.





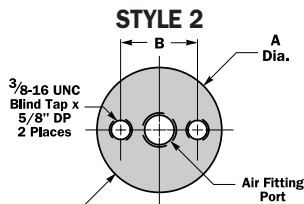
**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Single Convolute Bellows Type

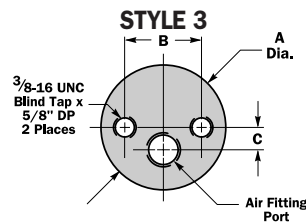
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			1.0 (in.)	2.0 (in.)	3.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
<b>YI-1B5</b>	<b>500</b> 502	2.00	1,250	560	—	560	1,100 – 1,350	3.25	2.5 – 3.0	72	94	98
	<b>510</b> 512	3.00	1,500	1,200	520	550	1,050 – 1,500	2.75	2.5 – 4.0	82	96	99
	520 521	4.00	1,600	1,500	1,150	440	1,000 – 1,500	2.67	3.5 – 5.0	83	96	99
<b>YI-1B6</b>	<b>530</b>	2.80	1,900	1,500	—	850	1,500 – 1,900	2.75	3.0 – 4.0	78	95	98
	531	2.80	1,900	1,500	—	850	1,500 – 1,900	2.75	3.0 – 4.0	78	95	98
	532	2.50	1,800	1,500	—	850	1,500 – 1,900	2.75	3.0 – 4.0	78	95	98
	<b>535</b>	5.10	2,200	2,100	1,900	750	1,500 – 2,100	2.25	4.0 – 6.0	90	97	99
	536	5.10	2,200	2,100	1,900	750	1,500 – 2,100	2.25	4.0 – 6.0	90	97	99
	538	4.80	2,150	2,050	1,850	750	1,500 – 2,100	2.25	4.0 – 6.0	90	97	99
<b>YI-1B7</b>	<b>540</b>	3.20	2,400	1,900	1,100	850	1,600 – 2,200	2.67	4.0 – 5.0	83	96	99
	541	3.20	2,400	1,900	1,100	850	1,600 – 2,200	2.67	4.0 – 5.0	83	96	99
	542	2.90	2,300	1,750	—	850	1,600 – 2,200	2.67	4.0 – 5.0	83	96	99
<b>YI-1B8</b>	<b>550</b>	3.30	3,300	2,650	1,600	1,100	2,000 – 2,900	2.83	3.75 – 4.75	83	96	99
	<b>552</b>	3.30	3,300	2,650	1,600	1,100	2,000 – 2,900	2.83	3.75 – 4.75	83	96	99
	553	3.30	3,300	2,650	1,600	1,100	2,000 – 2,900	2.83	3.75 – 4.75	83	96	99
	554	3.00	3,200	2,500	1,100	1,100	2,000 – 2,900	2.83	3.75 – 4.75	83	96	99
	<b>560</b> <b>562</b>	4.70	3,500	3,300	2,900	1,600	1,900 – 3,300	2.33	4.0 – 6.5	85	96	99
	563	4.70	3,500	3,300	2,900	1,600	1,900 – 3,300	2.33	4.0 – 6.5	85	96	99
	564	4.40	3,450	3,200	2,850	1,600	1,900 – 3,300	2.33	4.0 – 6.5	85	96	99
<b>YI-1B9</b>	<b>202</b> <b>204</b>	3.60	5,050	4,150	2,850	1,500	3,200 – 3,900	2.50	4.5 – 5.0	84	96	99
	201 205	2.70	4,150	2,850	—	1,500	3,200 – 3,900	2.50	4.5 – 5.0	84	96	99
	<b>207</b>	3.60	5,050	4,150	2,850	1,500	3,200 – 3,900	2.50	4.5 – 5.0	84	96	99
	208	2.70	4,150	2,850	—	1,500	3,200 – 3,900	2.50	4.5 – 5.0	84	96	99
<b>YI-1B12</b>	<b>313</b> <b>304</b>	4.90	8,700	8,000	7,000	3,600	7,300 – 8,800	2.33	3.0 – 5.0	89	97	99
	301 305	4.60	8,500	7,650	6,500	3,600	7,300 – 8,800	2.33	3.0 – 5.0	89	97	99
<b>YI-1B14</b>	350 <b>352</b>	4.90	12,650	11,500	9,900	4,900	10,000 – 11,900	2.33	4.0 – 5.25	86	96	99
	351 353	3.00	10,050	7,750	4,900	4,900	10,000 – 11,900	2.33	4.25 – 5.25	86	96	99
	364 362	6.00	13,500	12,800	11,600	4,800	11,600 – 13,500	2.25	3.25 – 5.25	87	97	99
<b>YI-1B15</b>	375 <b>377</b>	5.60	14,900	13,900	12,200	4,900	12,000 – 13,700	2.17	4.4 – 5.4	91	97	99
	376 378	3.70	12,400	10,300	7,350	4,900	12,000 – 13,700	2.17	4.4 – 5.4	91	97	99

**Important Note:** All catalog performance data is based on 100 psi maximum operating pressure. For product selection at pressures less than 100 psi, please refer to the manual selection procedure within this catalog or use E.A.S. our automated sizing software or contact Enidine customer service at 1-800-852-8508.

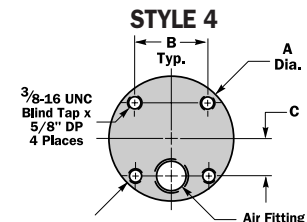
## End Retainer Styles



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port

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

\*\* To obtain the lower load range limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, this data reflects 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. Note: For values other than 100 psi, consult factory.





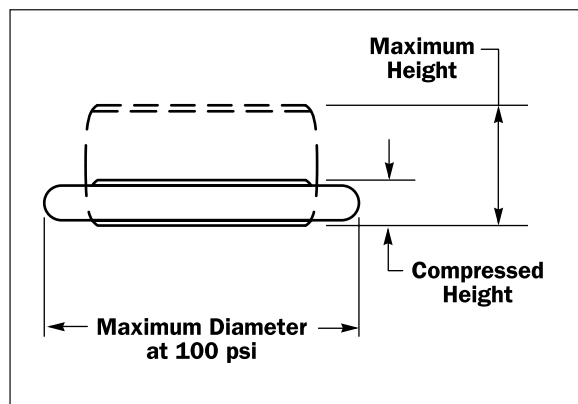
**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Single Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER		PRODUCT DESCRIPTION NUMBER
MAXIMUM DIAMETER @ 100 psi (in.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A END PLATE RET. DIAM. (in.)	B BLIND TAP SPACING (in.)	C FILL PORT OFFSET (in.)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER		
5.70	1.80	3.80	3.40	1.75	—	2	1/4 3/4	NO	<b>500</b>	502	<b>YI-1B5</b>
6.00	1.80	4.80	3.40	1.75	—	2	1/4 3/4	NO	<b>510</b>	512	
6.50	1.80	5.80	3.40	1.75	—	2	1/4 3/4	NO	520	521	
6.50	2.00	4.80	4.15	1.75	—	2	1/4	NO	<b>530</b>		<b>YI-1B6</b>
6.50	2.00	4.80	4.15	2.75	1.38	3	1/4	NO	531		
6.50	2.30	4.80	4.15	2.75	1.38	3	1/4	YES	532		
7.00	2.00	7.10	4.15	1.75	—	2	1/4	NO	<b>535</b>		
7.00	2.00	7.10	4.15	2.75	1.38	3	1/4	NO	536		
7.00	2.30	7.10	4.15	2.75	1.38	3	1/4	YES	538		
7.70	2.00	5.20	4.15	1.75	—	2	1/4	NO	<b>540</b>		<b>YI-1B7</b>
7.70	2.00	5.20	4.15	2.75	1.38	3	1/4	NO	541		
7.70	2.30	5.20	4.15	2.75	1.38	3	1/4	YES	542		
8.70	2.00	5.30	5.00	2.75	—	2	1/4	NO	<b>550</b>		<b>YI-1B8</b>
8.70	2.00	5.30	5.00	2.75	—	2	3/4	NO	<b>552</b>		
8.70	2.00	5.30	5.00	2.75	1.38	3	1/4	NO	553		
8.70	2.30	5.30	5.00	2.75	1.38	3	1/4	YES	554		
9.40	2.00	6.70	5.00	2.75	—	2	1/4 3/4	NO	<b>560</b>	562	
9.40	2.00	6.70	5.00	2.75	1.38	3	1/4	NO	563		
9.40	2.30	6.70	5.00	2.75	1.38	3	1/4	YES	564		
11.00	2.30	5.90	6.40	3.50	1.75	3	1/4 1/2	NO	<b>202</b>	204	<b>YI-1B9</b>
11.00	3.20	5.90	6.40	3.50	1.75	3	1/4 1/2	YES	201	205	
11.00	2.30	5.90	6.40	3.50	1.50	3	3/4	NO	207		
11.00	3.20	5.90	6.40	3.50	1.50	3	3/4	YES	208		
13.20	2.30	7.20	9.00	6.20	2.87	3	1/4 3/4	NO	<b>313</b>	304	<b>YI-1B12</b>
13.20	2.60	7.20	9.00	6.20	2.87	3	1/4 3/4	YES	301	305	
15.20	2.30	7.20	11.30	6.25	3.12	4	1/4 3/4	NO	350	<b>352</b>	<b>YI-1B14</b>
15.20	4.20	7.20	11.30	6.25	3.12	4	1/4 3/4	YES	351	353	
15.90	2.30	8.30	11.30	6.25	3.12	4	1/4 3/4	NO	364	362	
17.50	2.30	7.90	11.30	6.25	3.12	4	1/4 3/4	NO	375	<b>377</b>	<b>YI-1B15</b>
17.50	4.20	7.90	11.30	6.25	3.12	4	1/4 3/4	YES	376	378	



(Single) Bellows Type





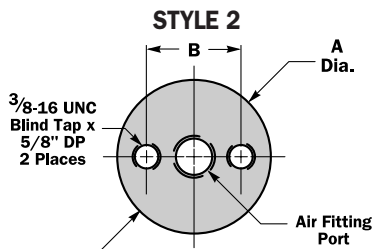
**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Double Convolute Bellows Type

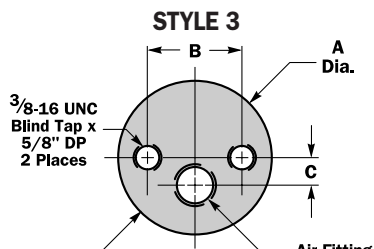
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			2.0 (in.)	4.0 (in.)	6.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
<b>YI-2B6</b>	<b>530</b>	4.90	1,900	1,100	—	580	1,300 – 2,000	2.09	4.5 – 6.5	85	96	99
	531	4.90	1,900	1,100	—	580	1,300 – 2,000	2.09	4.5 – 6.5	85	96	99
	532	4.30	1,700	800	—	580	1,300 – 2,000	2.09	4.5 – 6.5	85	96	99
	535	6.30	2,350	1,600	700	560	1,500 – 2,200	2.09	5.0 – 7.0	92	97	99
	536	5.70	2,100	1,450	700	560	1,500 – 2,200	2.09	5.0 – 7.0	92	97	99
<b>YI-2B7</b>	<b>540</b> 546	6.50	2,900	2,300	1,250	800	1,600 – 2,500	2.08	6.0 – 8.0	91	97	99
	541	6.50	2,900	2,300	1,250	800	1,600 – 2,500	2.08	6.0 – 8.0	91	97	99
	542	5.70	2,750	2,000	—	800	1,600 – 2,500	2.08	6.0 – 8.0	91	97	99
<b>YI-2B8</b>	<b>550</b> 552	7.20	3,600	2,700	1,800	1,000	2,300 – 2,700	1.92	7.0 – 8.0	93	97	99
	553	7.20	3,600	2,700	1,800	1,000	2,300 – 2,700	1.92	7.0 – 8.0	93	97	99
	554	6.60	3,350	2,500	1,400	1,000	2,300 – 2,700	1.92	7.0 – 8.0	93	97	99
<b>YI-2B9</b>	<b>200</b> 204	7.60	4,650	3,850	2,550	1,100	2,300 – 3,700	1.92	7.5 – 9.5	92	97	99
	201 205	7.00	4,400	3,550	2,100	1,100	2,300 – 3,700	1.92	7.5 – 9.5	92	97	99
	<b>216</b>	7.60	4,650	3,850	2,550	1,100	2,300 – 3,700	1.92	7.5 – 9.5	92	97	99
	208	7.00	4,400	3,550	2,100	1,100	2,300 – 3,700	1.92	7.5 – 9.5	92	97	99
	250	8.70	4,800	4,000	3,250	1,500	3,000 – 3,800	1.67	8.0 – 10.0	93	98	99
	251	8.40	4,700	3,900	3,100	1,500	3,000 – 3,800	1.67	8.0 – 10.0	93	98	99
	255	8.40	4,700	3,900	3,100	1,500	3,000 – 3,800	1.67	8.0 – 10.0	93	98	99
	256 263	8.70	4,800	4,000	3,250	1,500	3,000 – 3,800	1.67	8.0 – 10.0	93	98	99
	275	8.70	4,800	4,000	3,250	1,500	3,000 – 3,800	1.67	8.0 – 10.0	93	98	99
	<b>YI-2B12</b>	<b>425</b> 429	7.70	8,400	7,200	5,200	2,700	5,200 – 7,200	1.83	7.5 – 9.5	92	98
309 318		6.90	8,050	6,600	4,250	2,700	5,200 – 7,200	1.83	7.5 – 9.5	92	98	99
437		7.70	8,400	7,200	5,200	2,700	5,200 – 7,200	1.83	7.5 – 9.5	92	98	99
416 419		10.80	9,100	8,100	7,100	2,600	7,100 – 8,100	1.58	7.5 – 9.5	92	98	99
<b>YI-2B14</b>	354 <b>352</b>	7.80	12,900	11,100	8,400	3,400	8,400 – 11,100	1.83	7.5 – 9.5	93	98	99
	355 353	6.40	11,600	9,400	4,800	3,400	8,400 – 11,100	1.83	7.5 – 9.5	93	98	99
	362 363	11.40	14,500	13,100	11,800	4,300	11,800 – 13,100	1.58	7.5 – 9.5	93	98	99
	452	11.00	13,650	12,700	11,200	4,300	11,800 – 13,075	1.58	7.5 – 9.5	93	98	99
<b>YI-2B15</b>	375 <b>377</b>	9.10	13,700	12,300	10,300	2,500	10,300 – 12,300	1.67	7.5 – 9.5	93	98	99
	376 378	7.90	12,850	10,950	7,900	2,500	10,300 – 12,300	1.67	7.5 – 9.5	93	98	99

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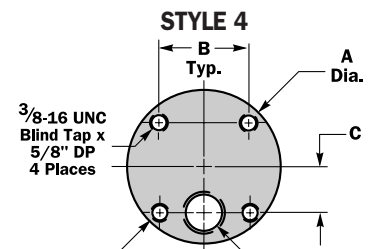
## End Retainer Styles



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port

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

\*\* To obtain the lower load range limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

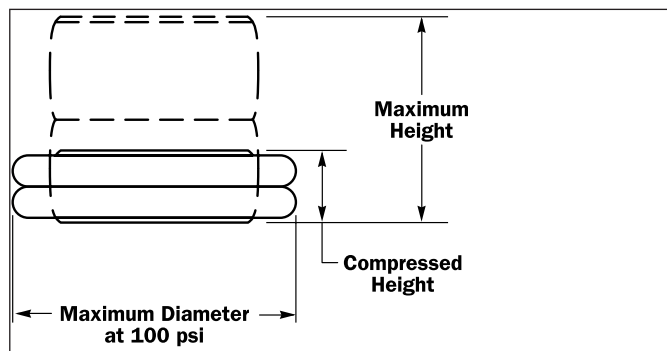
\*\*\* In the "Isolation Specification" section, this data reflects the approximate percentage of isolation obtainable, if the design height is at the center of the design height range, and the load per air spring is within the isolator load range. Note: For values other than 100 psi, consult factory.



**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Double Convolute Bellows Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 100 psi (in.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A END PLATE RET. DIAM. (in.)	B BLIND TAP SPACING (in.)	C FILL PORT OFFSET (in.)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
6.50	2.80	7.70	4.84	1.75	—	2	1/4	NO	<b>530</b>	
6.50	2.80	7.70	4.84	2.75	1.38	3	1/4	NO	531	
6.50	3.40	7.70	4.84	2.75	1.38	3	1/4	YES	532	<b>YI-2B6</b>
7.00	2.80	9.10	4.84	2.75	1.38	3	1/4	NO	535	
7.00	3.40	9.10	4.84	2.75	1.38	3	1/4	YES	536	
8.00	2.50	9.00	5.00	2.75	—	2	1/4 3/4	NO	<b>540</b>	546
8.00	2.50	9.00	5.00	2.75	1.38	3	1/4	NO	541	<b>YI-2B7</b>
8.00	3.30	9.00	5.00	2.75	1.38	3	1/4	YES	542	
8.80	2.90	10.10	5.87	2.75	—	2	1/4 3/4	NO	<b>550</b>	552
8.80	2.90	10.10	5.87	2.75	1.38	3	1/4	NO	553	<b>YI-2B8</b>
8.80	3.50	10.10	5.87	2.75	1.38	3	1/4	YES	554	
10.30	3.20	10.80	6.40	3.50	1.75	3	1/4 1/2	NO	<b>200</b>	204
10.30	3.80	10.80	6.40	3.50	1.75	3	1/4 1/2	YES	201	205
10.30	3.20	10.80	6.40	3.50	1.50	3	3/4	NO	<b>216</b>	
10.30	3.80	10.80	6.40	3.50	1.50	3	3/4	YES	208	<b>YI-2B9</b>
10.30	3.50	12.20	6.40	3.50	1.75	3†	1/4	NO	250	
10.30	3.80	12.20	6.40	3.50	1.75	3†	1/4	YES	251	
10.30	3.80	12.20	6.40	3.50	1.75	3	1/4	YES	255	
10.30	3.50	12.20	6.40	3.50	1.75	3	1/4 1/2	NO	256	263
10.30	3.50	12.20	6.40	3.50	1.50	3	3/4	NO	275	
13.00	3.40	11.10	9.00	6.20	2.87	3	1/4 3/4	NO	<b>425</b>	<b>429</b>
13.00	4.20	11.10	9.00	6.20	2.87	3	1/4 3/4	YES	309	318
13.00	3.40	11.10	9.00	6.20	—	2	1/4	NO	437	
13.70	3.60	14.40	9.00	6.20	2.87	3	1/4 3/4	NO	416	419
15.10	3.50	11.30	11.30	6.25	3.12	4	1/4 3/4	NO	354	<b>352</b>
15.10	4.90	11.30	11.30	6.25	3.12	4	1/4 3/4	YES	355	353
16.00	3.50	15.20	11.30	6.25	3.12	4	1/4 3/4	NO	362	363
16.00	4.20	15.20	11.30	6.25	3.12	4	1/4	YES	452	
16.70	3.70	12.80	11.30	6.25	3.12	4	1/4 3/4	NO	375	<b>377</b>
16.70	4.90	12.80	11.30	6.25	3.12	4	1/4 3/4	YES	376	<b>YI-2B15</b>



(Double) Bellows Type

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



**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Triple Convolute Bellows Type

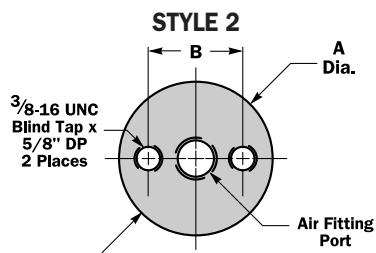
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			3.0 (in.)	6.0 (in.)	9.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
<b>YI-3B12</b>	304 <b>305</b>	13.20	8,500	7,400	5,800	2,900	5,200 – 7,100	1.50	11.0 – 15.0	94	98	99
	308	13.20	8,500	7,400	5,800	2,900	5,200 – 7,100	1.50	11.0 – 15.0	94	98	99
	325 <b>326</b>	14.40	10,500	8,750	7,250	2,900	6,300 – 8,400	1.50	11.0 – 15.0	94	98	99
<b>YI-3B14</b>	450 <b>374</b>	15.80	12,400	10,900	9,650	4,500	10,200 – 11,000	1.25	10.5 – 12.5	95	99	99
	453 <b>411</b>	15.60	12,250	10,800	9,500	4,500	10,200 – 11,000	1.25	10.5 – 12.5	95	98	99
	403 <b>361</b>	13.00	13,500	11,900	9,750	4,700	10,700 – 12,100	1.50	10.5 – 12.5	95	98	99
	351 <b>353</b>	10.70	11,900	10,000	7,150	4,700	10,700 – 12,100	1.50	10.5 – 12.5	95	98	99
	375 <b>377</b>	12.30	14,500	12,650	10,100	6,100	11,200 – 12,800	1.42	10.5 – 12.5	91	97	99
<b>YI-3B15</b>	376 <b>378</b>	9.70	12,500	10,500	7,200	6,100	11,200 – 12,800	1.42	10.5 – 12.5	91	97	99

## Imperial Bead Ring Type

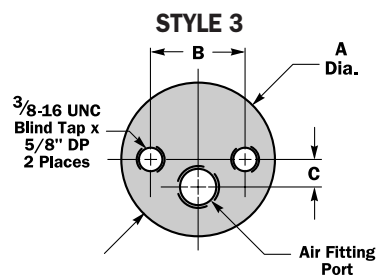
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			2.0 (in.)	4.0 (in.)	8.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
YI-2B9	240	8.00	4,650	3,850	500	500	2,600 – 3,615	1.92	8.0 - 9.0	92	98	99
YI-2B12	340	7.60	8,450	7,200	—	2,900	4,575 – 7,205	1.83	7.5 - 9.5	93	98	99
YI-2B19	8433	8.75	24,500	19,500	14,700	10,700	3,200 – 23,700	1.67	7.0 - 10.0	92	97	99
YI-2B22	8539	9.25	34,800	31,200	20,700	14,800	5,200 – 31,700	1.58	7.0 - 9.0	93	97	99

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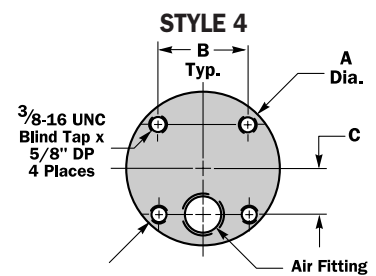
## End Retainer Styles



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port



Upper End Retainer shown  
Lower End Retainer identical minus Air Fitting Port

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

\*\* To obtain the lower load range limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, this data reflects 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. Note: For values other than 100 psi, consult factory.



**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Triple Convolute Bellows Type

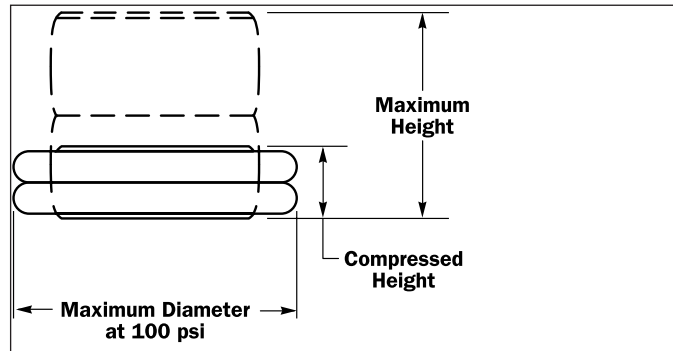
ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 100 psi (in.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A END PLATE RET. DIAM. (in.)	B BLIND TAP SPACING (in.)	C FILL PORT OFFSET (in.)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
13.00	4.80	18.00	9.00	6.20	2.87	3	1/4 3/4	NO	304 <b>305</b>	<b>YI-3B12</b>
13.00	4.80	18.00	9.00	6.20	-	2	1/4	NO	308	
13.80	4.60	19.00	10.30	6.20	2.87	3	1/4 3/4	NO	325 326	
15.50	4.70	20.50	11.30	6.25	3.13	4	1/4 3/4	NO	450 374	<b>YI-3B14</b>
15.50	4.90	20.50	11.30	6.25	3.13	4	1/4 3/4	YES	453 411	
15.50	5.00	18.00	11.30	6.25	3.12	4	1/4 3/4	NO	403 <b>361</b>	
15.50	7.30	18.00	11.30	6.25	3.12	4	1/4 3/4	YES	351 353	
16.50	4.70	17.00	11.30	6.25	3.12	4	1/4 3/4	NO	375 <b>377</b>	<b>YI-3B15</b>
16.50	7.30	17.00	11.30	6.25	3.12	4	1/4 3/4	YES	376 378	

## Imperial Bead Ring Type

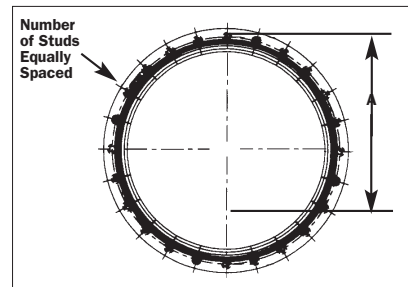
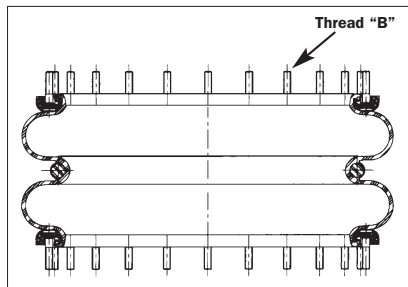
ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			SPARE PARTS		MODEL NUMBER	
MAXIMUM DIAMETER @100 psi (lbs.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A MOUNTING-DIAMETER	B THREAD	NUMBER OF STUDS	FLEX MEMBER		ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
10.30	3.50	10.80	6.25	5/16-24 UNC	8	Y6-578-92-3-202		240	YI-2B9
13.00	3.50	11.10	8.95	5/16-24 UNC	12	Y6-578-92-3-309		340	YI-2B12
20.50	3.25	12.00	16.50	3/8-24UNF x 2.05	24	Y6-556-23-8350		8433	YI-2B19
23.00	3.25	12.50	19.00	3/8-24UNF x 2.05	24	Y6-556-23-8203		8539	YI-2B22



(Triple) Bellows Type



## Bead Ring Dimension





**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Sleeve Type

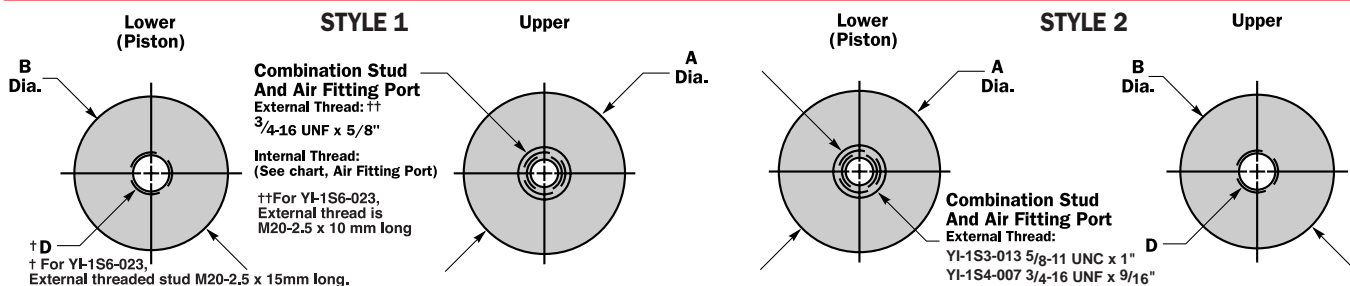
MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			1.0 (in.)	3.0 (in.)	5.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
<b>YI-1S3</b>	<b>011</b>	4.40	400	400	—	110	350 – 400	2.00	5.0 – 6.0	92	97	99
	<b>013</b>	2.10	560	—	—	120	440 – 580	3.25	2.0 – 3.0	71	93	98
<b>YI-1S4</b>	<b>007</b>	4.90	850	830	—	310	840 – 850	2.17	3.8 – 4.4	90	97	99
	008	6.50	700	900	850	540	800 – 900	1.33	6.5 – 7.5	95	98	99
YI-1S5	005	5.50	1,000	1,100	900	800	1,000 – 1,100	1.58	6.2 – 7.2	95	98	99
	006	6.50	1,000	1,150	1,100	750	1,050 – 1,100	1.50	7.0 – 9.0	96	99	99
	010	4.00	1,100	1,000	1,000	560	1,000 – 1,100	2.00	3.8 – 4.3	90	97	99
YI-1S6	023	6.80	1,770	1,630	1,590	1,200	1,560 – 1,630	1.58	7.0 – 8.6	94	98	99

## Imperial Rolling Lobe Type

MODEL NUMBER		ACTUATION SPECIFICATIONS					ISOLATION SPECIFICATIONS					
PRODUCT DESCRIPTION NUMBER	ASSEMBLY NUMBER	MAXIMUM STROKE (in.)	FORCE (lbs.) @ 100 psi AT A STROKE OF:*				ISOLATOR LOAD RANGE @ 100 psi** (lbs.)	APPROXIMATE SYSTEM NATURAL FREQUENCY Hz	DESIGN HEIGHT RANGE (in.)	% ISOLATION AT INPUT FREQ OF:***		
			4.0 (in.)	8.0 (in.)	12.0 (in.)	MAXIMUM STROKE				7.25 Hz	14.5 Hz	30 Hz
YI-1R8	005	13.00	3,280	2,950	—	—	3,000 – 3,100	1.33	10.5 – 13.0	95	98	99
	009	11.80	2,800	—	—	—	2,700 – 2,900	1.17	10.5 – 13.0	96	98	99
YI-1R9	003	12.30	3,350	3,040	1,300	1,250	3,200 – 3,700	1.42	8.0 – 12.0	93	98	99
	009	8.60	4,150	1,600	—	900	3,900 – 4,400	1.67	6.0 – 7.5	91	97	99
YI-1R10	089	14.10	5,100	5,250	3,550	2,100	5,000 – 5,200	1.25	9.5 – 13.5	96	99	99
YI-1R11	028	9.30	6,450	3,800	—	2,300	5,500 – 6,700	1.58	6.0 – 10.0	95	98	99
	039	11.00	6,700	5,750	—	2,300	6,500 – 7,000	1.67	8.0 – 12.0	94	98	99
YI-1R12	092	13.40	7,440	7,200	4,350	2,700	6,800 – 7,600	1.42	10.5 – 16.5	96	99	99
	095	9.10	7,100	3,800	—	2,400	6,800 – 7,300	1.58	7.0 – 9.0	94	98	99
	103	17.50	7,450	7,050	6,600	2,600	6,900 – 7,300	1.25	15.0 – 20.0	96	99	99
	132	10.80	7,350	5,900	—	2,700	7,400 – 7,600	1.67	8.0 – 10.0	93	98	99
	256	19.60	7,575	7,225	6,900	3,100	7,000 – 7,300	1.17	16.0 – 20.0	96	99	99
	274	14.70	7,300	7,300	5,100	3,000	7,300 – 7,500	1.17	11.3 – 14.3	96	99	99
YI-1R14	019	16.90	8,500	8,500	—	—	8,400 – 8,500	1.17	14.0 – 18.0	96	99	99
	018	14.80	8,400	8,400	6,100	2,500	8,400 – 8,500	1.25	11.0 – 16.5	96	99	99
	037	12.30	10,500	8,500	3,000	2,900	10,400 – 11,000	1.75	7.5 – 11.0	92	98	99

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## End Retainer Styles



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

\*\* To obtain the lower load range limit (i.e., minimum load @ 20 psi), divide the smaller value by 5.

\*\*\* In the "Isolation Specification" section, this data reflects 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. Note: For values other than 100 psi, consult factory.



**Bold numbers** indicate featured stock – contact Enidine customer service for details.

## Imperial Sleeve Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 100 psi (in.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A UPPER END PLATE DIAM. (in.)	B LOWER END PLATE DIAM. (in.)	D BLIND TAP FOR MOUNTING (in.)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
3.25	3.60	8.00	2.75	2.75	1/2-13 UNC x 0.63 DP.	1	1/8	NO	<b>011</b>	YI-1S3
3.60	1.50	3.60	2.40	3.40	5/16-18 UNC x 0.44 DP.	2	1/8	NO	<b>013</b>	
4.60	2.20	7.10	4.10	4.10	3/8-16 UNC x 0.50 DP.	2	1/8	NO	<b>007</b>	YI-1S4
4.60	4.00	10.50	4.10	4.10	1/2-13 UNC x 0.63 DP.	1	1/8	NO	008	
5.60	4.00	9.50	5.10	5.10	1/2-13 UNC x 0.63 DP.	1	1/8	NO	005	YI-1S5
5.60	4.00	10.50	5.10	5.10	1/2-13 UNC x 0.63 DP.	1	1/8	NO	006	
5.60	2.20	6.25	5.10	5.10	3/8-16 UNC x 0.50 DP.	2	1/8	NO	010	
6.80	4.10	10.90	6.30	6.30	† M20-2.5-6g x 10 mm Long	1	1/8	NO	023	YI-1S6

## Imperial Rolling Lobe Type

ENVELOPE DIMENSIONS			MOUNTING DIMENSIONS			FEATURES			MODEL NUMBER	
MAXIMUM DIAMETER @ 100 psi (in.)	COMPRESSED HEIGHT (in.)	MAXIMUM HEIGHT (in.)	A UPPER END PLATE DIAM. (in.)	B LOWER END PLATE DIAM. (in.)	D BLIND TAP FOR MOUNTING (in.)	END RETAINER STYLE	AIR FITTING PORT (NPTF)	INTERNAL BUMPER	ASSEMBLY NUMBER	PRODUCT DESCRIPTION NUMBER
8.70	5.60	18.60						NO	005	YI-1R8
8.70	6.80	18.60						YES	009	
9.50	5.60	17.90						NO	003	YI-1R9
9.50	3.20	11.80						NO	009	
11.00	6.00	20.10						NO	089	YI-1R10
11.50	3.70	13.00						NO	028	YI-1R11
11.70	6.10	17.10						YES	039	
12.70	7.70	21.10						YES	092	YI-1R12
12.70	4.40	13.50						YES	095	
12.70	9.50	27.00						YES	103	
12.90	6.10	16.90						YES	132	
12.60	9.50	29.10						YES	256	
12.80	8.10	22.80						YES	274	YI-1R14
14.60	8.90	25.80						YES	019	
14.60	7.70	22.50						YES	018	
14.80	5.70	18.00						YES	037	

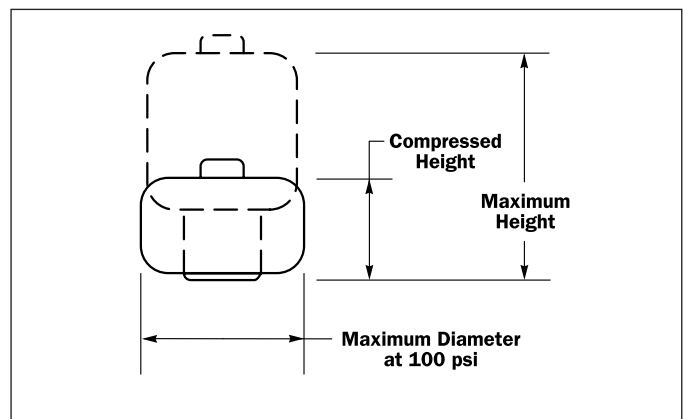
FOR ROLLING LOBE TYPE AIR SPRINGS:  
  
CONTACT YOUR LOCAL REPRESENTATIVE OR ENIDINE FOR MOUNTING AND AIR FITTING DIMENSIONS.



Sleeve Type



Rolling Lobe Type





## 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.	<u>Force per Air Spring</u>	<u>Example:</u>
2. Number of actuators	$n$	_____	$F = \frac{F_t}{n}$ lbs.	$F_t = 4,400$ lbs.
3. Stroke required	$s$	_____ in.		$n = 4$
4. Available air pressure at the point of installation	$p$	_____ psi		$F = \frac{4,400 \text{ lbs.}}{4}$
5. Working temperature range	$t$	_____ °F		$F = 1,100$ lbs.
6. An internal bumper will be required if any of the following conditions occur:				
• External compression stops are not provided				
• Severe impacting at the compressed height of the Air Spring.				
		<input type="checkbox"/> Internal Bumper		
		<input type="checkbox"/> No Bumper	<u>Corrected Force [<math>F_c</math>]:*</u>	<u>Example:</u>
7. Is a constant actuation force required for this application?		<input type="checkbox"/> Yes - only Sleeve and Rolling Lobe Type Air Springs	$F_c = \frac{F \times 100 \text{ psi}}{p}$	$p = 50$ psi
		<input type="checkbox"/> No - all type Air Springs	$F_c =$ _____ lbs.	$F_c = \frac{1,100 \times 100}{50}$
		<input type="checkbox"/> Yes		$F_c = 2,200$ lbs.

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

### 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. is required, refer to the 3.0 in. 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. 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 3,200-lb. conveyor carrying an 1,200-lb. package needs to be lifted 1.8 in. to transfer the package to another conveyor. There will be four Actuators utilized and the warehouse has air lines with 50 psi. A constant actuation force is not required. Ambient temperature is 68°F. There is a 12-in. 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 2,200 lbs.
- Stroke required is 1.8 inches
- An internal bumper is not required
- A constant actuation force is not required
- Working temperature is 68°F

**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. column under the *Force lbs. At A Stroke Of:* Data Table, identify an Air Spring that can generate 2,200 lbs. of force. No internal bumper is required. Model YI-1B8-550 is selected.

**Step 4:** The maximum diameter of a YI-1B8-550 is 8.7 in. Therefore, we need a 10.7-in. diameter space to house the Air Spring. A 12-in. square space will easily house the Air Spring. Any *Air Fitting Port* and *End Retainer Style* would be acceptable. Model YI-1B8-550 is selected.





## Selecting an Enidine Air Spring for Vibration Isolation

### Application Worksheet: Vibration Isolation

The following data should be given:	Symbol	Unit
1. Total load	$W_t$	_____ lbs.
2. Number of isolators	$n$	_____
3. Input excitation frequency	$f_i$	CPM or RPM/60 = Hz _____ Hz
4. Available air pressure at the point of Installation	$p$	_____ psi**
5. Working temperature range	$t$	_____ °F
6. Required isolation	$l$	<input type="checkbox"/> 80 % <input type="checkbox"/> 90 % <input type="checkbox"/> Internal Bumper <input type="checkbox"/> No Bumper
7. An internal bumper will be required if any of the following conditions occur: - 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.		<input type="checkbox"/> Yes

Calculation:	
<u>Load per Air Spring:</u>	<u>Example:</u>
$W = \frac{W_t}{n} =$	$W_t = 8,500 \text{ lbs.}$ $n = 4$ $W = \frac{8,500}{4}$ $W = 2,125 \text{ lbs.}$
<u>Corrected Load [<math>W_c</math>]:</u>	<u>Example:</u>
$W_c = \frac{W \times 100 \text{ psi}^*}{p}$	$p = 100 \text{ psi}$ $W_c = \frac{2,125 \times 100}{100}$ $W_c = 2,125 \text{ lbs.}$
$W_c =$	lbs.

\* All Load values in the Selection Charts are based on a maximum operating pressure of 100 psi. Actual load bearing capabilities of the Air Spring depend on the air pressure available. The Corrected Load calculation compensates for available air pressure.  
\*\* If no air lines are available, a tank valve should be utilized; use 100 psi to select an Air Spring.

### Sizing Example

Vibrations generated by a pump weighing 8,500 lbs. 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. 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 12-in. 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.
  - Because a tank valve is being utilized, size using 100 psi
  - Corrected load per isolator is 2,125 lbs.
  - Working temperature range is 60°F to 140°F
  - 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-1B8-554. This Air Spring provides 90% isolation at 435 CPM and 96% at 870 CPM. Therefore, at 600 CPM, the percent isolation is estimated to be 90%.

**Step 3:** The maximum diameter of a YI-1B8-554 is 8.7-in. Therefore, we need a 10.7-in. diameter space to house the Air Spring. A 12-in. diameter is available. Any *Air Fitting Port* and *End Retainer Style* would be acceptable. Imperial Model YI-1B8-554 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* 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.

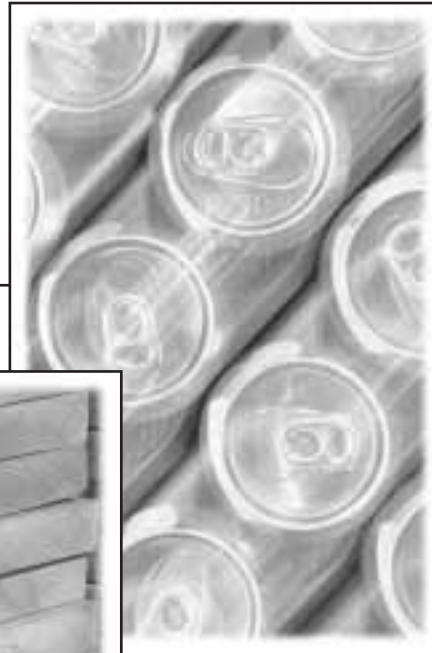


## AIR SPRING APPLICATIONS BY INDUSTRIES



### **Oil Exploration**

-Air springs are used as vibration isolators



### **Aluminum Can Recycling**

-Used as replacement for steel tensioning spring between rolls which crush the cans



### **Press Manufacturing**

-Laminating presses in the wood and plastic industries



### **Container Manufacturers**

-Cylinder cushions in can forming operations



### **Foundries**

-Flask lifts, vibrating conveyors and shake out systems

## ADDITIONAL APPLICATIONS

- **Steel Manufacturing Equipment**
- **Glass Manufacturing (Plate Glass)**
- **Paper Industry**
- **Automotive Related Equipment**
- **Shaker Screens**
- **Sewage Processing Equipment**



## AIR SPRING APPLICATIONS BY INDUSTRIES



### **Material Handling Industry**

-Palletizers and depalletizers,  
roller conveyors



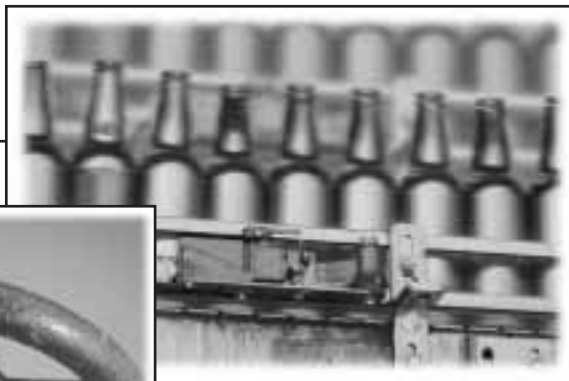
### **Vibrating Equipment & Conveyors**

-Vibrating tables,  
vibrating conveyors,  
shaker screens



### **Lumber Industry**

-Transfer tables  
and gluing machines



### **Bottling Equipment**

-Carton and case filling  
machines, generally to  
lift the case when  
bottles are being  
inserted



### **Valve Mfg**

-Air springs are being  
designed into valves as  
actuators

## ADDITIONAL APPLICATIONS

- Logging Industry
- Large Concrete Pipe Industry
- Rubber Industry
- Amusement Rides
- Scissors Lift Manufacturing
- Food Packaging
- Tape Manufacturing Industry

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