

# SZ Compact Cylinder



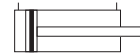
## Specifications

Features	
Type	Compact Cylinder
Series	SZ
Configurations	SZ6 Double Acting, Single Rod, Magnetic Piston SZD6 Double Acting, Double Rod, Magnetic Piston SZV6 Double Acting, Non-Rotating, Magnetic Piston SZ7 Single Acting, Single Rod, Magnetic Piston, Spring Return
Construction Materials	
Barrel	Extruded Aluminum, Anodized (10µ)
Front Cover	Brass: Ø 12 to 40 Aluminum: Ø 50 to 100
Rear Cover	Aluminum, Anodized (10µ)
Piston Rod	Stainless Steel
Rod Bearing	Teflon Impregnated Brass
Piston	Delron: Ø 12 to 40 Aluminum: Ø 50 to 100
Seals	NBR (Optional: Viton)
Guide Rods	Stainless Steel
Guide Rod Bearings	Teflon Impregnated Steel
Tooling Plate	Aluminum, Anodized (10µ)
Bumpers	Polyurethane
Characteristics	
Operating Temperature	14° F (-10°C) to 158 °F (+70°C)
Operating Pressure	Min. SZ 6/SZV6 15 PSI (1 bar) SZD ø12 38 PSI (2.5 bar) ø16, 20 30 PSI (2 bar) ø25-40 22 PSI (1.5 bar) ø50-100 15 PSI (1 bar) Max. 145 PSI (10 bar)
Normal Operating Pressure	90 PSI (6 bar)
Lubrication	Pre-lubricated at factory. If additional lubrication is required, use oil compatible with NBR seals and designed for use in pneumatic systems.
Media	Filtered and Regulated Compressed Air
Installation	In any Position
Weight	See Chart - Page 19
Stroke Length	Varies by Bore Size
Theoretical Forces	See Technical Information Sheet
Load Capacity	See Technical Information Sheet
Specifications	
Piston Diameter	12 16 20 25 32 40 50 63 80 100
Port Sizes	NPT 10•32 10•32 10•32 1/8 1/8 1/8 1/8 1/8 1/8 1/4 1/4 Metric (G) M5 M5 M5 1/8 1/8 1/8 1/8 1/8 1/8 1/4 1/4
Rod Diameter	Inch 0.24 0.31 0.39 0.47 0.47 0.63 0.78 0.78 0.78 0.98 1.26 mm 6 8 10 12 12 20 20 20 20 25 32

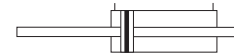
## Series SZ

Ø12mm - 100mm

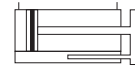
### SZ 6: Double Acting, Single Rod, Magnets



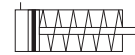
### SZD 6: Double Acting, Double Rod, Magnets



### SZV 6: Double Acting, Non-Rotating, Magnets



### SZ 7: Single Acting, Single Rod, Magnets



## Features:

- Stainless Steel Rod
- Magnetic Piston
- Bumpers
- Pre-Lubricated Design
- Inch or Metric Construction

# SZ Compact Cylinder



## Ordering Information

**Example:** SZV-U 6050/50-D  
Compact Cylinder  
Non-Rotating  
U.S. Option  
Double Acting, Magnets  
50mm Bore  
50mm Stroke  
Threaded Body Option

S Z V - U 6 0 5 0 / 5 0 - D

### Versions:

- SZ - Single Rod
- SZD - Double Rod
- SZV - Non-Rotating

### Design:

- - Metric Construction
- U - US Construction: NPT Ports & UNC Threads

### Actuation:

- 6 - Double Acting, Magnets
- 7 - Single Acting, Magnets

### Options:

- - Standard
- D - Threaded Body, top & bottom

### Stroke:

- MM: (standard)
- any mm increment
  - see stroke length chart on next page for maximum stroke lengths
  - contact factory for special stroke lengths

### Bore:

- 012 - 12mm (nom. 1/2")
- 016 - 16mm (nom. 3/4")
- 020 - 20mm (nom. 7/8")
- 025 - 25mm (nom. 1")
- 032 - 32mm (nom. 1-1/4")
- 040 - 40mm (nom. 1-1/2")
- 050 - 50mm (nom. 2")
- 063 - 63mm (nom. 2-1/2")
- 080 - 80mm (nom. 3-1/8")
- 100 - 100mm (nom. 4")

**Proximity Sensors/Brackets: See Page 73**

# SZ Compact Cylinder



## Cylinder Details

Standard Strokes (MM)	Bore Ø									
	12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
<b>SZ-U 6</b>	<b>Double Acting, Single Rod</b>									
<b>SZD-U 6</b>	<b>Double Acting, Double Rod</b>									
5	•	•	•	•	•	•	•	•	•	•
10	•	•	•	•	•	•	•	•	•	•
15	•	•	•	•	•	•	•	•	•	•
20	•	•	•	•	•	•	•	•	•	•
25	•	•	•	•	•	•	•	•	•	•
30			•	•	•	•	•	•	•	•
40			•	•	•	•	•	•	•	•
50			•	•	•	•	•	•	•	•
60				•	•	•	•	•	•	•
80					•	•	•	•	•	•
<b>SZV-U 6</b>	<b>Double Acting, Non-Rotating</b>									
5			•	•	•	•	•	•		
10			•	•	•	•	•	•		
15			•	•	•	•	•	•		
20			•	•	•	•	•	•		
25			•	•	•	•	•	•		
30			•	•	•	•	•	•		
40			•	•	•	•	•	•		
50			•	•	•	•	•	•		
60				•	•	•	•	•		
80					•	•	•	•		
<b>SZ-U 7</b>	<b>Single Acting, Single Rod</b>									
5	•	•	•	•	•	•				
10	•	•	•	•	•	•	•	•	•	•
25		•	•	•	•	•	•	•	•	•

(Contact the factory for non-standard stroke lengths)

## Spring Forces

Mode		Bore Ø									
		12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
Cylinder Extended	<b>lbf</b>	<b>2.25</b>	<b>4.05</b>	<b>6.07</b>	<b>6.97</b>	<b>10.57</b>	<b>13.04</b>	<b>19.33</b>	<b>23.60</b>	<b>29.23</b>	<b>33.72</b>
	N	10	18	27	31	47	58	86	105	130	150
Retracted Stroke (5mm)	<b>lbf</b>	<b>1.80</b>	<b>3.37</b>	<b>5.17</b>	<b>5.85</b>	<b>8.54</b>	<b>10.79</b>	--	--	--	--
	N	8	15	23	26	38	48	--	--	--	--
Retracted Stroke (10mm)	<b>lbf</b>	<b>1.35</b>	<b>2.70</b>	<b>4.27</b>	<b>4.72</b>	<b>6.29</b>	<b>8.54</b>	<b>15.74</b>	<b>20.23</b>	<b>25.63</b>	<b>31.02</b>
	N	6	12	19	21	28	38	70	90	114	138
Spring Constant	<b>lbf/in</b>	<b>2.23</b>	<b>3.08</b>	<b>4.05</b>	<b>5.14</b>	<b>10.34</b>	<b>11.71</b>	--	--	--	--
	N/mm	0.39	0.54	0.71	0.9	1.81	2.05	--	--	--	--
Retracted Stroke (25mm)	<b>lbf</b>	--	<b>2.47</b>	<b>4.27</b>	<b>4.50</b>	<b>6.29</b>	<b>8.54</b>	<b>10.79</b>	<b>15.06</b>	<b>20.23</b>	<b>26.98</b>
	N	--	11	19	20	28	38	48	67	90	120
Spring Constant	<b>lbf/in</b>	--	<b>1.54</b>	<b>2.00</b>	<b>2.57</b>	<b>4.28</b>	<b>4.57</b>	<b>8.62</b>	<b>8.79</b>	<b>9.25</b>	<b>12.33</b>
	N/mm	--	0.27	0.35	0.45	0.75	0.8	1.51	1.54	1.62	2.16

## Weights

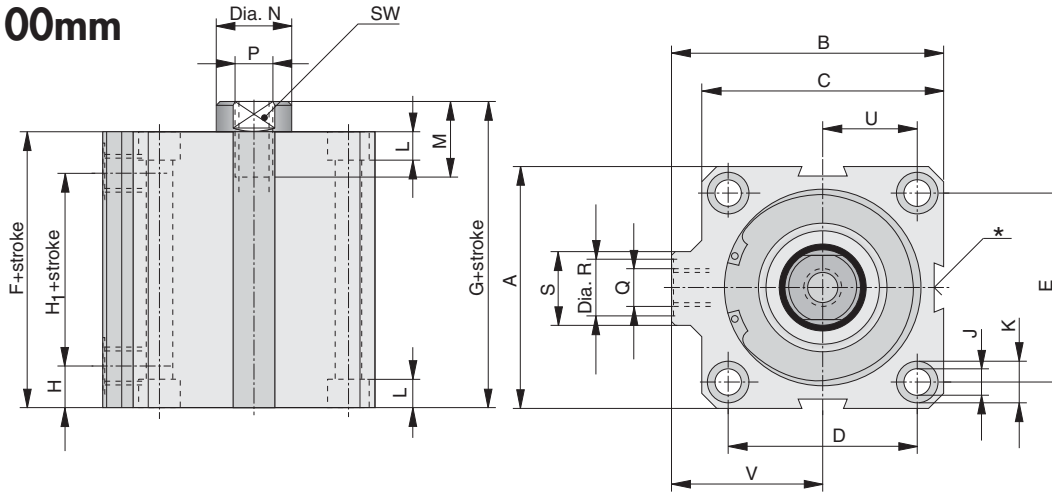
Cylinder Type		Bore Ø									
		12mm	16mm	20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm
SZ 6/7 per 0.38"(10mm)	<b>lbs</b>	<b>0.11</b>	<b>0.18</b>	<b>0.24</b>	<b>0.35</b>	<b>0.51</b>	<b>0.77</b>	<b>1.10</b>	<b>1.98</b>	<b>2.87</b>	<b>4.63</b>
	kg	0.05	0.08	0.11	0.16	0.23	0.35	0.50	0.90	1.30	2.10
	<b>lbs</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.07</b>	<b>0.09</b>	<b>0.13</b>	<b>0.18</b>	<b>0.24</b>	<b>0.30</b>	<b>0.47</b>
SZD 6 per 0.38"(10mm)	kg	0.013	0.018	0.022	0.033	0.042	0.059	0.080	0.108	0.138	0.213
	<b>lbs</b>	<b>0.13</b>	<b>0.22</b>	<b>0.31</b>	<b>0.44</b>	<b>0.62</b>	<b>0.95</b>	<b>1.43</b>	<b>2.34</b>	<b>3.44</b>	<b>5.60</b>
	kg	0.06	0.10	0.14	0.20	0.28	0.43	0.64	1.06	1.56	2.54
SZV 6 per 0.38"(10mm)	<b>lbs</b>			<b>0.05</b>	<b>0.08</b>	<b>0.10</b>	<b>0.14</b>	<b>0.20</b>	<b>0.25</b>		
	kg			0.024	0.036	0.046	0.065	0.090	0.115		
	<b>lbs</b>			<b>0.49</b>	<b>0.62</b>	<b>0.77</b>	<b>1.06</b>	<b>1.41</b>	<b>2.65</b>		
kg			0.22	0.28	0.35	0.48	0.65	1.20			

# SZ Compact Cylinder

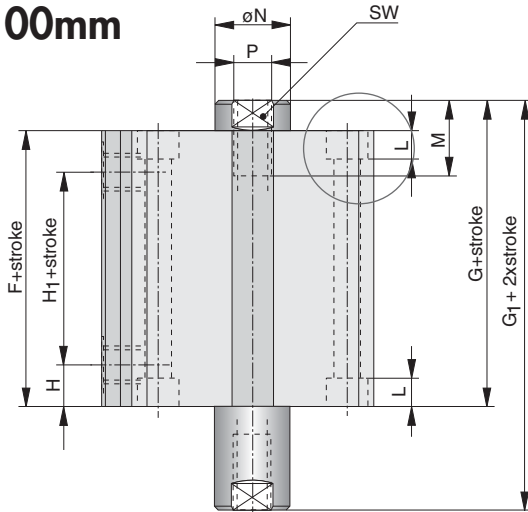


## Dimensional Data

### SZ6 and SZ7 Ø12-100mm



### SZD 6 Ø12-100mm



#### Threaded Mounting Holes: OPTION- D

In addition to the counter bored thru-holes, threaded mounting holes are available. The diagram below details this feature.

# of threaded hole: SZV: (2) Bottom Only  
SZ6/7 & SZD 6: (8) Bottom & Top

#### Dimension Explanations:

- J- Hole diameter thru Extrusion
- K- Counter Bore Diameter
- L- Body Counter Bore Depth
- L<sub>1</sub>- Depth of Counterbore in Tooling Plate
- M- Piston Rod Thread Depth
- N<sub>1</sub>- Diameter of Guide Rods

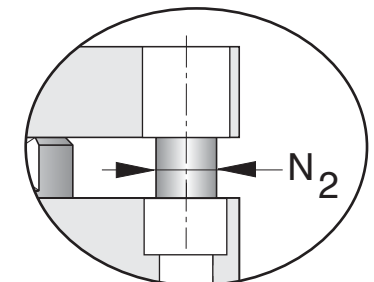
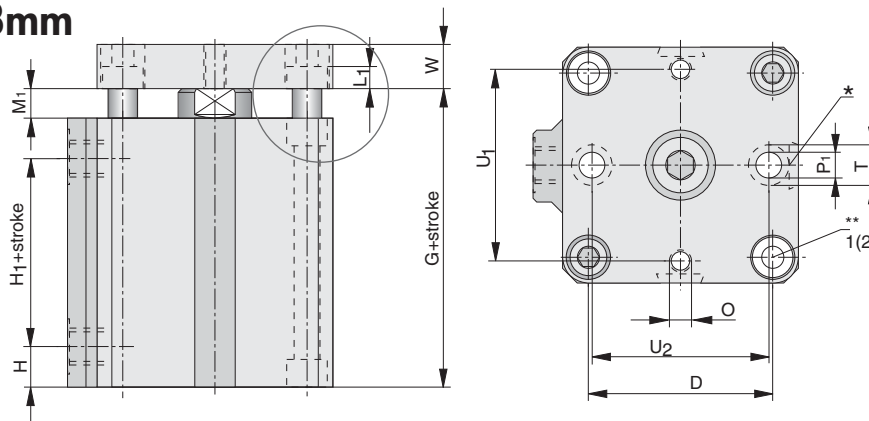
#### Notes:

- \* The center sensor dovetail is omitted on the Bore 20 Cylinder.
- 1- Through holes in Tooling Plate for SZV version
- \*\* Thru-hole in Tooling Plate

#### Counter Bored Holes:

The standard cylinders have thru mounting holes that are counter bored. The diagram below shows details of this feature.

### SZV 6 Ø20-63mm



# SZ Compact Cylinder



## Dimensional Data

Bore Ø	A	B	C	D	E	F + stroke	G + stroke	G <sub>1</sub> + 2 x stroke	H	H <sub>1</sub> + stroke	J
12	0.91 23	1.06 27	0.98 25	0.68 17.2	0.51 13	1.34 34	1.52 38.5	1.69 43	0.39 10	0.55 14	0.13 3.4
16	1.10 28	1.18 30	1.10 28	0.79 20	0.79 20	1.36 34.5	1.57 40	1.79 45.5	0.39 10	0.55 14	0.13 3.4
20	1.26 32	1.34 34	1.26 32	0.87 22	0.87 22	1.42 36	1.65 42	1.89 48	0.43 11	0.55 14	0.18 4.5
25	1.46 37	1.73 44	1.54 39	1.10 28	1.02 26	1.52 38.5	1.77 45	2.03 51.5	0.45 11.5	0.61 15.5	0.18 4.5
32	1.77 45	2.05 52	1.89 48	1.42 36	1.26 32	1.54 39	1.79 45.5	2.05 52	0.35 9	0.81 20.5	0.22 5.5
40	2.17 55	2.32 59	2.17 55	1.61 41	1.61 41	1.65 42	1.89 48	2.17 55	0.35 9	0.94 24	0.26 6.7
50	2.52 64	2.83 72	2.52 64	1.97 50	1.97 50	1.77 45	2.09 53	2.40 61	0.43 11	0.91 23	0.26 6.7
63	3.15 80	3.46 88	3.15 80	2.44 62	2.44 62	2.07 52.5	2.38 60.5	2.70 68.5	0.47 12	1.12 28.5	0.33 8.5
80	3.70 94	4.09 104	3.70 94	2.87 73	2.87 73	2.24 57	2.60 66	2.95 75	0.51 13	1.22 31	0.33 8.5
100	4.61 117	4.94 125.5	4.61 117	3.56 90.5	3.56 90.5	2.30 58.5	2.70 68.5	3.09 78.5	0.55 14	1.22 31	0.41 10.5
Bore Ø	J <sub>1</sub>	K	L	L <sub>1</sub>	L <sub>2</sub>	M	M <sub>1</sub>	N	N <sub>2</sub>	O	P
12	8•32 M4	0.24 6	0.13 3.4		0.48 12	0.24 6		0.24 6			4•40 M3
16	8•32 M4	0.24 6	0.13 3.4		0.48 12	0.31 8		0.31 8			8•32 M4
20	1/4•20 M5	0.30 7.5	0.19 4.8	0.20 5	0.74 15	0.31 8	0.24 6	0.39 10	0.20 5	10•32 M4	10•32 M5
25	1/4•20 M5	0.30 7.5	0.19 4.8	0.20 5	0.74 15	0.47 12	0.26 6.5	0.47 12	0.20 5	10•32 M4	1/4•20 M6
32	5/16•18 M7	0.39 10	0.23 5.8	0.24 6	0.93 24	0.47 12	0.26 6.5	0.47 12	0.24 6	10•32 M5	1/4•20 M8
40	5/16•18 M8	0.43 11	0.27 6.8	0.24 6	0.93 24	0.47 12	0.24 6	0.63 16	0.24 6	10•32 M5	5/16•18 M8
50	5/16•18 M8	0.43 11	0.27 6.8	0.28 7	0.93 24	0.69 17.5	0.31 8	0.79 20	0.31 8	10•32 M6	3/8•16 M10
63	1/2•13 M10	0.55 14	0.33 8.3	0.35 9	1.49 30	0.69 17.5	0.31 8	0.79 20	0.39 10	10•32 M6	3/8•16 M12
80	1/2•13 M10	0.55 14	0.33 8.3		1.49 30	0.98 25		0.98 25			1/2•13 M16
100	1/2•13 M12	0.71 18	0.43 11		1.49 36	1.10 28		1.26 32			3/4•10 M20
Bore Ø	P <sub>1</sub>	Q	R	S	SW	T	U	U <sub>1</sub>	U <sub>2</sub>	V	W
12		10•32 M5	0.31 8	0.43 11	5		0.34 8.6			0.57 14.5	
16		10•32 M5	0.31 8	0.43 11	6		0.39 10			0.63 16	
20	0.18 4.5	10•32 M5	0.31 8	0.43 11	8	0.30 7.5	0.43 11	0.87 22	0.87 22	0.71 18	0.31 8
25	0.18 4.5	1/8 NPT G1/8	0.59 15	0.75 19	10	0.31 8	0.55 14	1.02 26	1.10 28	0.96 24.5	0.31 8
32	0.22 5.5	1/8 NPT G1/8	0.59 15	0.75 19	10	0.39 10	0.71 18	1.26 32	1.42 36	1.10 28	0.39 10
40	0.22 5.5	1/8 NPT G1/8	0.59 15	0.75 19	13	0.39 10	0.81 20.5	1.57 40	1.57 40	1.24 31.5	0.39 10
50	0.27 6.8	1/8 NPT G1/8	0.59 15	0.75 19	17	0.45 11.5	0.98 25	1.97 50	1.97 50	1.57 40	0.47 12
63	0.35 9	1/8 NPT G1/8	0.59 15	0.91 23	17	0.57 14.5	1.22 31	2.44 62	2.44 62	1.89 48	0.47 12
80		1/4 NPT G1/4	0.75 19	0.91 23	22		1.44 36.5			2.24 57	
100		1/4 NPT G1/4	0.75 19	0.91 23	27		1.78 45.25			2.64 67	

### NOTE: SZ 7 Spring Return Version: 1" (25mm) Stroke

It is necessary to add the following to the base F & G dimensions

Bores: 16 to 25      Add 0.39" (10mm)  
 32, 40              Add 0.197" (5mm)