SB4 & SB6 SERIES GOLD LINE
SIDE-BY-SIDE SHOT PINS

SHOT PIN APPLICATIONS:
- RETRACTABLE LOCATING PINS
- PART STOPS
- PROBE SLIDES
- WEDGE LOCKS
- STRAIGHT CLAMPS
ORDERING INFORMATION

NOTE: ALL BOXES MUST BE FILLED IN FOR A COMPLETE PART NUMBER

Ram Size
- 4: 40mm square
- 6: 60mm square

Stroke
- 025: 025, 050, 075, 100, 125, 150, 175, 200

Coupler
- A: Rap: shortens ram retract stroke by 2mm on SB4
- B: Rigid

Cylinder Options
- 01: Pneumatic Single Rod (NPT Ports)
- 02: Pneumatic Single Rod (G Ports)
- 13: Pneumatic Single Rod Locking Cylinder (NPT ports)
- 14: Pneumatic Single Rod Locking Cylinder (G ports)

Ram Style
- D: 4 Hole - Large
- L: 4 Hole - Medium

Shroud
- 0: No Shroud
- 1: Shroud

Cylinder Position
- A: C1: Prox at X1
- B: C2: Prox at X1
- C: C3: Prox at X1
- D: C1: Prox at X2
- E: C2: Prox at X2
- F: C1: Prox at X3
- G: C3: Prox at X3
- H: C2: Prox at X4
- J: C3: Prox at X4

Shim Whole (mm) See note
- 0: None
- 1: 1mm
- 2: 2mm
- 3: 3mm
- 4: 4mm
- 5: 5mm

Note: Due to cylinder switch limitations, shimming past 5mm is not recommended.

When "00" is ordered, a 6mm shim set will be shipped loose with all pneumatic units.

Shim Quarter (mm) See note
- 0: None
- A: 0.25mm
- B: 0.50mm
- C: 0.75mm

Standard Options - All other options may affect price and delivery
**GENERAL DIMENSIONS**

ON SB SERIES SHOT PINS THE RAM EXTEND POSITION (DIM B + STROKE) IS THE SAME FOR RAP OR RIGID OPTION.
REMOVAL OF RIGID COUPLER CONVERTS UNIT TO RAP OPTION. SEE WEBSITE FOR DATA SHEET AND VIDEO www.welkerproducts.com

SB4 RAP OPTION SHORTENS RAM RETRACT BY 2mm. SB6 RAP OPTION SHORTENS RAM RETRACT BY 3mm

- **RIGID COUPLER = NOMINAL CYL STROKE**
- **RAP COUPLER = NOMINAL CYL STROKE - 2mm (SB4)**
- **RAP COUPLER = NOMINAL CYL STROKE - 3mm (SB6)**

SHIMMABLE HARD STOP
IF SHIMMING, WELKER RECOMMENDS 3mm, 5mm MAX.

**M + CYLINDER STROKE**

HARD STOPS

2X ØY DOWELS PROTRUDING FROM FARSIDE

ON SB SERIES SHOT PINS THE RAM EXTEND POSITION (DIM B + STROKE) IS THE SAME FOR RAP OR RIGID OPTION.
REMOVAL OF RIGID COUPLER CONVERTS UNIT TO RAP OPTION. SEE WEBSITE FOR DATA SHEET AND VIDEO www.welkerproducts.com

SB4 RAP OPTION SHORTENS RAM RETRACT BY 2mm. SB6 RAP OPTION SHORTENS RAM RETRACT BY 3mm

**SHOT PIN UNIT WEIGHT PER STROKE**

### TABLE 1: SHOT PIN UNIT WEIGHT PER STROKE

<table>
<thead>
<tr>
<th>Series</th>
<th>Strokes (25mm increments)</th>
<th>Nominal Ram</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB4</td>
<td>25, 50</td>
<td>40</td>
<td>39.997</td>
<td>39.987</td>
<td>140</td>
<td>137</td>
<td>112</td>
<td>99</td>
<td>N/A</td>
<td>50</td>
<td>30</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>SB4</td>
<td>75</td>
<td>40</td>
<td>39.997</td>
<td>39.987</td>
<td>140</td>
<td>187</td>
<td>162</td>
<td>149</td>
<td>130</td>
<td>50</td>
<td>30</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>SB4</td>
<td>100</td>
<td>40</td>
<td>39.997</td>
<td>39.987</td>
<td>140</td>
<td>187</td>
<td>162</td>
<td>149</td>
<td>130</td>
<td>100</td>
<td>50</td>
<td>30</td>
<td>175</td>
</tr>
<tr>
<td>SB4</td>
<td>125</td>
<td>40</td>
<td>39.997</td>
<td>39.987</td>
<td>140</td>
<td>287</td>
<td>262</td>
<td>249</td>
<td>230</td>
<td>150</td>
<td>50</td>
<td>30</td>
<td>175</td>
</tr>
<tr>
<td>SB4</td>
<td>150-200</td>
<td>40</td>
<td>39.997</td>
<td>39.987</td>
<td>140</td>
<td>287</td>
<td>262</td>
<td>249</td>
<td>230</td>
<td>150</td>
<td>150</td>
<td>30</td>
<td>230</td>
</tr>
<tr>
<td>SB6</td>
<td>25-200</td>
<td>60</td>
<td>60.000</td>
<td>59.987</td>
<td>200</td>
<td>303</td>
<td>265</td>
<td>249</td>
<td>230</td>
<td>180</td>
<td>60</td>
<td>60</td>
<td>280</td>
</tr>
</tbody>
</table>

| M     | 113.6                     | 69          | 50   | 60   | 90   | 170.4 | 40  | 85  | 19   | 80  | 10  | 80  |
| N     | 127.9                     | 70          | 90   | 100  | 135  | 255.4 | 60  | 127 | 30   | 120 | 12  | 120 |

**ENGINEERED PRODUCTS**

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STROKE OPTIONS

<table>
<thead>
<tr>
<th>Ram Size</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 4 (40mm square)</td>
<td>025, 050, 075, 100, 125, 150, 175, 200</td>
</tr>
<tr>
<td>6 6 (60mm square)</td>
<td></td>
</tr>
</tbody>
</table>

SB4 STROKES (SHORT BODY)
025, 050

SB4 STROKES (MEDIUM BODY)
075, 100

SB4 STROKES (LONG BODY)
125, 150, 175, 200

SB6 STROKES
025, 050, 075, 100, 125, 150, 175, 200
**CYLINDER INFORMATION**

<table>
<thead>
<tr>
<th>Code</th>
<th>Cylinder &amp; Port Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>C1 &amp; X1</td>
</tr>
<tr>
<td>B</td>
<td>C2 &amp; X1</td>
</tr>
<tr>
<td>C</td>
<td>C3 &amp; X1</td>
</tr>
<tr>
<td>D</td>
<td>C1 &amp; X2</td>
</tr>
<tr>
<td>E</td>
<td>C2 &amp; X2</td>
</tr>
<tr>
<td>F</td>
<td>C1 &amp; X3</td>
</tr>
<tr>
<td>G</td>
<td>C3 &amp; X3</td>
</tr>
<tr>
<td>H</td>
<td>C2 &amp; X4</td>
</tr>
<tr>
<td>J</td>
<td>C3 &amp; X4</td>
</tr>
</tbody>
</table>

**CHART A**

**Cylinder Position**

See Cylinder Position Chart A Below

**PROX* MOUNTS**

Located on Non-Port Sides

*CYLINDICATOR STYLE PROX SWITCHES ARE NOT INCLUDED

**PORTS**

See Charts A, B & Diagrams Below

**CYLINDER POSITIONS:** C1, C2, or C3

**PORT LOCATIONS:** X1, X2, X3, or X4

**CHART B**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Nominal Ram</th>
<th>Pneumatic Bore</th>
<th>Pneumatic Port Size</th>
<th>Prox* Port Read Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB4</td>
<td>40</td>
<td>63</td>
<td>3/8&quot; NPT or G3/8</td>
<td>26mm</td>
</tr>
<tr>
<td>SB6</td>
<td>60</td>
<td>100</td>
<td>1/2&quot; NPT or G1/2</td>
<td>32mm</td>
</tr>
</tbody>
</table>

**RECOMMENDED OPERATING PRESSURE**

PNEUMATIC: 60-80 PSI, FLOW CONTROLS NOT REQUIRED

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(Do not scale drawing)
SB LOCKING CYLINDER INFORMATION

**Ram Size**
- 4 40mm square
- 6 60mm square

**Cylinder Options**
- 13 Pneumatic Single Rod Locking Cylinder (NPT Ports)
- 14 Pneumatic Single Rod Locking Cylinder (G Ports)

**Cylinder Position**
See Cylinder Position Chart A Below

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**CHART A**

<table>
<thead>
<tr>
<th>Code</th>
<th>Cylinder &amp; Port Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>C1 &amp; X1 (SHN)</td>
</tr>
<tr>
<td>B</td>
<td>C2 &amp; X1</td>
</tr>
<tr>
<td>C</td>
<td>C3 &amp; X1</td>
</tr>
<tr>
<td>D</td>
<td>C1 &amp; X2</td>
</tr>
<tr>
<td>E</td>
<td>C2 &amp; X2</td>
</tr>
<tr>
<td>F</td>
<td>C1 &amp; X3</td>
</tr>
<tr>
<td>G</td>
<td>C3 &amp; X3</td>
</tr>
<tr>
<td>H</td>
<td>C2 &amp; X4</td>
</tr>
<tr>
<td>J</td>
<td>C3 &amp; X4</td>
</tr>
</tbody>
</table>

**PORTS**
See Charts A & B & Diagrams on Sheet 5

180 + STROKE (SB4)
235 + STROKE (SB6)

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**CHART B**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>Nominal Ram</th>
<th>Pneumatic Bore</th>
<th>Pneumatic Port Size</th>
<th>Lock Release Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB4</td>
<td>40</td>
<td>63</td>
<td>3/8&quot; NPT or G3/8</td>
<td>1/8&quot; NPT or G1/8</td>
</tr>
<tr>
<td>SB6</td>
<td>60</td>
<td>100</td>
<td>1/2&quot; NPT or G1/2</td>
<td>1/4&quot; NPT or G1/4</td>
</tr>
</tbody>
</table>

**LOCK RELEASE PORT**

NPT OR G PORTS

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**UNIT WEIGHTS IN LBS. (WEIGHTS SHOWN ARE APPROXIMATE, VARY WITH OPTIONS)**

<table>
<thead>
<tr>
<th>STROKE</th>
<th>25mm</th>
<th>50mm</th>
<th>75mm</th>
<th>100mm</th>
<th>125mm</th>
<th>150mm</th>
<th>175mm</th>
<th>200mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB4</td>
<td>26.6</td>
<td>27.8</td>
<td>30.4</td>
<td>36</td>
<td>40</td>
<td>41.5</td>
<td>42.7</td>
<td>43.9</td>
</tr>
<tr>
<td>SB6</td>
<td>110.4</td>
<td>113.1</td>
<td>115.8</td>
<td>118.7</td>
<td>122.6</td>
<td>125.3</td>
<td>127.8</td>
<td>130.5</td>
</tr>
</tbody>
</table>

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**RECOMMENDED OPERATING PRESSURE**
PNEUMATIC: 60-80 PSI, FLOW CONTROLS NOT REQUIRED

**MINIMUM LOCK RELEASE PRESSURE: 60 PSI**

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SHEET 6
STANDARD RAM OPTIONS
(See supplemental ram sheet for non-standard ram options)

Series Nominal Ram Style
[80x324]SB4 40 25 15 15 30 9.0 11.0 8.0 THRU 8.0 THRU 25 M8 X 1.25 - 15 DEEP

Series Nominal Ram Style
SB6 60 25 15 15 30 9.0 11.0 8.0 X 16 DEEP 8.0 X 16 DEEP 40 M10 X 1.5 - 20 DEEP

Ram Size
D 4 Hole - Large
L 4 Hole - Medium

Ram Style
40mm square
60mm square

DO NOT SCALE DRAWING

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SHEET 7
**WELKER SB SERIES SHOT PIN TECHNICAL INFORMATION**

**Body Mounting:** Square ram shot pin units have dual mounting capability. At all mounting locations, you have the option of mounting from the top using the counter-bored clearance holes or the same holes, tapped from the bottom. Using any four of the six holes, symmetrical about the centerline, is sufficient. Protruding mounting dowels are provided and are press fit into the body.

Square ram packages are high precision full contact plane bearing units and therefore must be mounted to a flat surface. **Mounting surfaces must be flat within .002" (0.05mm).**

**Ram Mounting:** Square ram shot pin units use a standard NAAMS L-Block pattern with 15mm spacing. Spacing allows mounting of 3 and 4 hole pin retainers and L-blocks to the ram. Through holes can be tapped and fitted with standard thread inserts.

**Shrouds:** Safety orange steel shrouds are available for additional protection. Shrouds prevent undesirable buildup of contamination from welding and machining applications. Welker specifically recommends shroud usage in MIG, TIG and arc welding applications. Shrouds should only be removed if clearance problems exist and conditions permit. Consult Welker.

**Wipers:** The wiper is the only maintenance item on Welker pin units. It is a custom molded moly impregnated urethane wiper. Welker recommends changing the wiper yearly. Specific applications may require more or less frequent wiper service.

**Stroke:** The stroke accuracy of shot pins is limited to that of the cylinder. Normal cylinder stroke accuracy is ± .015" (0.38mm). For control of "end of stroke" repeatability, see extend and retract stop options for each series.

Rap couplings cause the unit to be less than the nominal stroke of the cylinder. The 40mm ram units have a 2mm rap. The 60mm ram units have a 3mm rap. The rap allows the cylinder to begin moving before moving the ram. The impact of the coupler helps free tooling from a bound condition. Most applications using a pneumatic shot pin should have rap couplings. Rap coupler not available on hydraulic units.

Welker cylinders do not require lubrication.

**Switch:** 40mm ram tie rod cylinders use prox switch (cylindicator) ports with 1.025" read depth (probe length). 60mm ram tie rod cylinders have prox switch (cylindicator) ports with 1.250" read depth (probe length). **Prox switches (cylindicators) are NOT included.** Shot pins ordered with compact cylinders are cylinder switch ready. Cylinder switches are available though Welker. World switches are available through Welker for shot pins offering world switch capability.

**Repeatability:** Shot pin units utilize a full contact bearing surface for high repeatability. Repeatability within ±.002" (0.05mm) part to part is achievable.

**Wear:** Wear equals variance in position under load over time. Shot pin tests indicate maximum wear of .002" wear at 3 million cycles.

**Loading and Deflection:** Maximum deflection is ± .005" and is measured at the end of the ram up to the specified strokes and up to the loads and distances as shown below. Longer extensions can be used at lower tolerances and loads. Pins mounted closer to the body exhibit less deflection. For applications with longer strokes and higher loads, consult Welker.