**TECHNICAL BULLETIN**

**WP2 LEGACY STATUS**

**EFFECTIVE 1/1/21: WP2 IS LEGACY STATUS, ONLY AVAILABLE AS SERVICE PARTS**

**AVAILABILITY, PRICING & DELIVERY LEAD TIMES ARE NOT GUARANTEED.**

---

**UB2**

RECOMMENDED REPLACEMENT FOR WP2

---

**LEGACY SHOT PINS**

**WP2**

---
WP2 SERIES GOLD LINE SHOT PINS

50mm COMPACT CYLINDER WITH SOLID STATE CYLINDER SWITCH

50mm COMPACT CYLINDER WITH WORLD SWITCH

50mm COMPACT CYLINDER WITH FIXED EXTEND STOP & WORLD SWITCH

63mm BORE TIE ROD CYLINDER

63mm BORE TIE ROD CYLINDER WITH ADJUSTABLE EXTEND STOP & WORLD SWITCH
ORDERING INFORMATION

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

WP 2 N 0 0

Series
WP

Ram Size
2  24mm square

Stroke
025  025, 050

Coupler
A  Rap (shortens nominal cylinder stroke by 2mm)
   Rap only available with Actuator Options 30, 31, 01, or 02
B  Rigid

Actuator Options (See chart below)

Stop Options
0  None
E  Adjustable Extend Stop*
G  Fixed Extend Stop*
   NOTE: Options E & G will shorten stroke - see Sheet 5
   * Requires double rod cylinder. Available on
      Actuators 32, 33, 03 & 04

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

Switch Options (see Switch Charts)

Shroud
0  No Shroud
1  Shroud

Cylinder Prox (or "G" Port) Position
A  X1 Position
B  X2 Position
C  X3 Position
D  X4 Position

Ram Rotation
0  0° Rotation
9  90° Rotation

WP2 Actuator Options
30  Pneumatic - 50mm Compact - Single Rod (NPT Ports)
31  Pneumatic - 50mm Compact - Single Rod (G Ports)
32  Pneumatic - 50mm Compact - Double Rod (NPT Ports)
33  Pneumatic - 50mm Compact - Double Rod (G Ports)
01  Pneumatic - 63mm Bore Tie Rod - Single Rod (NPT Ports)
02  Pneumatic - 63mm Bore Tie Rod - Single Rod (G Ports)
03  Pneumatic - 63mm Bore Tie Rod - Double Rod (NPT Ports)
04  Pneumatic - 63mm Bore Tie Rod - Double Rod (G Ports)

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

*NOTE:
IF USING M6 MOUNTING SCREWS, TIGHTEN TO 9.5 Nm (7 ft-lb)
IF USING M8 MOUNTING SCREWS, TIGHTEN TO 22 Nm (16.5 ft-lb)

6X *M8x1.25 TAP FARSIDE & C'BORE
and
THRU FOR *M6 or 1/4" SHCS

2X 8mm DOWELS
PROTRUDING FROM FARSIDE

UNIT WEIGHTS

<table>
<thead>
<tr>
<th>ACTUATOR OPTION</th>
<th>30/31</th>
<th>32/33</th>
<th>01/02</th>
<th>03/04</th>
</tr>
</thead>
<tbody>
<tr>
<td>25mm STROKE</td>
<td>7 lbs</td>
<td>8.5 lbs</td>
<td>14.5 lbs</td>
<td>18 lbs</td>
</tr>
<tr>
<td>50mm STROKE</td>
<td>7.5 lbs</td>
<td>9 lbs</td>
<td>15 lbs</td>
<td>18.5 lbs</td>
</tr>
</tbody>
</table>

VIEW A-A

40.00 CENT.

(800) 229-0890 www.welkerproducts.com

ENGINEERED PRODUCTS
**SINGLE ROD CYLINDER INFORMATION**

**50mm COMPACT (30,31) SINGLE ROD CYLINDER**

**(3.0 SQ. IN. PUSI, 2.5 SQ. IN. PULL FORCE)**

- **X1 Rotation** (Default for 01 & 03)
- **X2 Rotation**
- **X3 Rotation**
- **X4 Rotation**

**50mm COMPACT CYLINDERS**

X1 option designates location of the port, to rotate the port location 90° clockwise, order the X2 option.

**63mm TIE ROD (01,02) SINGLE ROD CYLINDER**

**(4.8 SQ. IN. PUSI, 4.5 QU. IN. PULL FORCE)**

- **X1** option designates location of the G port. To rotate the port location 90° clockwise, order the X2 option. All other sides ported for cylinder 26mm (1.025") read depth.

**63mm NPT PORT TYPE**

For cylinder options 01 & 03, the cylinder is ported and prox ready on all sides. Use 'X1' as default.

**63mm "G" PORT CYLINDERS**

X1 option designates location of the G port. To rotate the port location 90° clockwise, order the X2 option. All other sides ported for cylinder 26mm (1.025") read depth.
**DOUBLE ROD CYLINDER & STOP OPTIONS**

**Stop Option**
- E: Adjustable Extend Stop*
- G: Fixed Extend Stop*
* Requires double rod cylinder

Double rod cylinders require Stop Option E or G

**EXTEND STOP (E) CYLINDER OPTIONS 03,04**

7.9

165.0 + STROKE

STOP PLATE

ADJUSTABLE EXTEND STOP
MAX ADJ +/- 4.0
CLAMP SCREW MUST BE TIGHTENED AFTER ADJUSTMENT

PRESET TO:
STROKE - 5mm

RAM IN EXTENDED POSITION WILL BE 5mm +/- 4.0mm SHORT OF STROKE

**EXTEND STOP (E) CYLINDER OPTIONS 32,33**

15.0

65.5 + STROKE

STOP PLATE

ADJUSTABLE EXTEND STOP
MAX ADJ +/- 4.0
CLAMP SCREW MUST BE TIGHTENED AFTER ADJUSTMENT

PRESET TO:
STROKE - 5mm

RAM IN EXTENDED POSITION WILL BE 5mm +/- 4.0mm SHORT OF STROKE

**EXTEND STOP (G) CYLINDER OPTIONS 32,33**

15.0

65.5 + STROKE

FIXED EXTEND STOP

STROKE - 5mm

RAM IN EXTENDED POSITION WILL BE 5mm SHORT OF STROKE

(SEE SHEET #4)
RAM OPTIONS
SEE SUPPLEMENTAL RAM SHEET FOR NON-STANDARD RAM OPTIONS

Ram Style
See Chart Below

Ram Rotation
0 0° Rotation
9 90° Rotation

ENGINEERED PRODUCTS
(800) 229-0890 www.welkerproducts.com

SHEET 7

0° RAM ROTATION
OPTION "0"

90° RAM ROTATION
OPTION "90"

<table>
<thead>
<tr>
<th>RAM STYLE</th>
<th>DOWELS</th>
<th>HOLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>8.0mm THRU</td>
<td>11.0mm THRU</td>
</tr>
<tr>
<td>L</td>
<td>8.0mm THRU</td>
<td>9.0mm THRU</td>
</tr>
</tbody>
</table>

(Do not scale drawing)
## Switch Options

### Compact Cylinder

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Part Number</th>
<th>Manufacturer</th>
<th>Description</th>
</tr>
</thead>
</table>
| SO1 (E)XTEND or SO1 (R)ETRACT | 00 | NONE | Customer Supplied Switch. Prepared for switches below:
| 99 | Switch Ready | | |
| AE or AR | N2-Q6.5-AP6-0.1-FS 4.4X3/S304 | Turck | 4-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect |
| BE or BR | N2-Q6.5-ADZ32-0.1-FSB 5.4X4/S304 | Turck | 4-Wire, 5-Pin, AC/DC 1/2-20 (N.O.) Quick Disconnect |
| DE or DR | NBN2-F581-100S6-EB-V1 | Pepperl & Fuchs | 3-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect |
| JE or JR | IN5374 | Efecto | 3-Wire, 4-Pin, DC M12 X 1 (PNP) Quick Disconnect |
| L3 | MK5113 | ifm Efector | 3-Wire, 4-Pin, DC M12 X 1 (NPN) Quick Disconnect |

### Cylinder Switches

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Part Number</th>
<th>Manufacturer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>SWITCH L3</td>
<td>Welker</td>
<td>L3 switch is weld field immune, comparable to World Switches</td>
</tr>
<tr>
<td>L5</td>
<td>MK5113</td>
<td>ifm Efector</td>
<td>This is a single sensor switch: 2 switches are installed per cylinder</td>
</tr>
</tbody>
</table>

### Standard Switch Option - All other options may affect price and delivery

* CYLINDER SWITCH ONLY AVAILABLE WITH CYLINDER OPTIONS 30, 31, 32, 33

---

**WEKER**

ENGINEERED PRODUCTS

(800) 229-0890 www.welkerproducts.com
**Welker WP2 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.

- If using M6 MOUNTING SCREWS, tighten to 9.5 Nm (7 ft-lb)
- If using M8 MOUNTING SCREWS, tighten to 22 Nm (16.5 ft-lb)

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 24mm ram and 40mm ram units have a 2mm 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 while most hydraulic shot pin applications should use a rigid coupler.

Welker cylinders do not require lubrication.

**Switch:** 24mm ram tie rod cylinders use prox switch (cylinder indicator) ports with 1.025” read depth (probe length). Shot pins ordered with compact cylinders are cylinder switch ready. Solid state cylinder switches and World Switches are available though Welker.

**Repeatability:** Shot pin units utilize a full contact bearing surface for high repeatability. Repeatability within ±0.002” (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 ± 0.05” 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.

![Diagram of mounting and deflection](image-url)

**WARNING:** MOUNTED TOOLING MUST BE WITHIN APPROVED APPLICATION RADIUS FROM END OF RAM:

- 24mm RAM: 50mm STROKE
- Up to the following strokes:
  - ±0.13 (±.005”) MAX
  - DEFLECTION AT END OF RAM
  - UP TO THE FOLLOWING STROKES:
  - 24mm RAM: 50mm STROKE

---

(800) 229-0890 www.welkerproducts.com