UB4 SERIES GOLD LINE SHOT PIN

USE AS: RETRACTABLE LOCATING PINS, PART STOPS, PROBE SLIDES, WEDGE LOCKS, STRAIGHT CLAMP, LARGE PART METERS

NO LUBRICATION REQUIRED

INTEGRATED SINGLE ROD PNEUMATIC CYLINDER

SOLID STATE CYLINDER SWITCH* OR INTEGRATED WORLD SWITCH* WITH SWITCH GUARD

NPT or G PORTS*

STEEL RAM WITH WEAR RESISTANT COATING. ALSO AVAILABLE IN ALUMINUM

INTEGRATED DOUBLE ROD* PNEUMATIC CYLINDER

LIGHTWEIGHT ALUMINUM BODY

RAP OR RIGID COUPLER*

POSITION HOLD DETENT*

NAAMS STANDARD MOUNTING

SHROUD*

ADJUSTABLE (SHOWN) OR FIXED EXTEND STOP*

STOP PLATE

*OPTIONAL

RELEASED 1/21/21

Welker Engineered Products  1401 Piedmont, Troy MI 48083  (800) 229-0890  www.welkerproducts.com
| **Material** | N | Aluminum body, steel ram  
A | Aluminum body & ram  
Not available w Rap Coupler |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stroke</strong></td>
<td>025</td>
<td>025, 050, &amp; 075mm Stroke</td>
</tr>
</tbody>
</table>
| **Coupler** | A | Rap (shortens nominal cylinder stroke by 2mm)  
Rap only available with Actuator Options 01 or 02  
B | Rigid |
| **Actuator** | 01 | Pneumatic - Single Rod - NPT  
02 | Pneumatic - Single Rod - G Port  
03 | Pneumatic - Double Rod - NPT Port*  
04 | Pneumatic - Double Rod - G Port*  
* Requires Extend Stop E, F, G, P, S or T |
| **Options** | 0 | None  
E | Adjustable Extend Stop* Not available with Detent option  
F | Adjustable Extend Stop - 10mm Extra Stop*  
Not available with Detent option  
G | Fixed Extend Stop*  
M | Loose body for manual operation - Requires Actuator 01 or 02  
P | Loose body for manual operation with Palm Button*  
S | Loose body for manual operation with Extend Stop ("E")*  
Not available with Detent option  
T | Loose body for manual operation with Fixed Extend Stop ("G")*  
*Requires Actuator option 03 or 04  
NOTE: Options E, F, G, S & T will shorten stroke - see Sht 3 |
| **Detent Option** | 0 | None  
D | Detent  
(Steel ram only)  
Not available with Adjustable Extend Stop options E, F, S |
| **Port Position** | A | P1 Port Position  
B | P2 Port Position  
C | P3 Port Position  
D | P4 Port Position |
| **Shroud** | 0 | No Shroud  
1 | Shroud |
| **Switch** | See Sheet 4 |
| **Ram Style** | D | 4 Hole - Large  
L | 4 Hole - Medium |

**Manual Operation Note**  
Options M, P, S, T:  
Loose body units are not held to industry standard tolerances  

Standard Options - All other options may affect price and delivery.
DOUBLE ROD CYLINDER WITH EXTEND STOP OPTION "E"

**NOT AVAILABLE WITH DETENT OPTION**

PRE-SET TO
STROKE - 5mm

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

STROKE - 5mm

DOUBLE ROD CYLINDER WITH EXTEND STOP OPTION "G"

STROKE - 5mm

RECOMMENDED OPERATING PRESSURE:
60-80 PSI, FLOW CONTROLS NOT REQUIRED
**DOUBLE ROD CYLINDER WITH PALM BUTTON OPTION “P”**

**LOOSE BODY FOR MANUAL OPERATION**

**Manual Operation Note:**
Loose body units are not held to industry standard tolerances.

**SWITCH OPTIONS**

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Manufacturer’s Part Number</th>
<th>Mfr.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>NONE</td>
<td></td>
<td>ALL SWITCHES ARE QUICK DISCONNECT</td>
</tr>
<tr>
<td>99</td>
<td>WORLD SWITCH READY</td>
<td></td>
<td>Customer supplied World Switch</td>
</tr>
<tr>
<td>AE / AR</td>
<td>N2-Q6.5-AR6-0.1-FS 4.4X3/S304</td>
<td>Turck</td>
<td>4-Wire, 4-Pin, DC M12 X 1 (PNP)</td>
</tr>
<tr>
<td>BE / BR</td>
<td>N2-Q6.5-ADD32-0.1-FSB 5.4X4/S304</td>
<td>Turck</td>
<td>4-Wire, 5-Pin, AC/DC 1/2-20 (N.O.)</td>
</tr>
<tr>
<td>CE / CR</td>
<td>N2-Q6.5-ANG6-0.1-FS 4.4X3/S304</td>
<td>Turck</td>
<td>4-Wire, 4-Pin, DC M12 X 1 (NPN)</td>
</tr>
<tr>
<td>DE / DR</td>
<td>NBN2-F581-100S6-EB-V1</td>
<td>Pepperl &amp; Fuchs</td>
<td>4-Wire, 4-Pin, DC M12 X 1 (PNP)</td>
</tr>
<tr>
<td>EE / ER</td>
<td>BES-Z02KR2-PSC20F-P100-S04-V</td>
<td>Balluff</td>
<td>3-Wire, 4-Pin, DC M12 X 1 (PNP)</td>
</tr>
<tr>
<td>JE / JR</td>
<td>IN5374</td>
<td>Efecto</td>
<td>3-Wire, 4-Pin, DC M12 X 1 (PNP)</td>
</tr>
<tr>
<td>ZE / ZR</td>
<td>WWS001A</td>
<td>Welker</td>
<td>4-Wire, 4-Pin, DC M12 X 1 (PNP)</td>
</tr>
</tbody>
</table>

**CYLINDER SWITCHES**

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3</td>
<td>SWITCH L3 ~ Weld field immune*, comparable to World Switches. Dual sensor, single connector switch</td>
</tr>
<tr>
<td>L5</td>
<td>MK5113 ~ Single sensor, single connector switch: 2 switches installed on cylinder</td>
</tr>
</tbody>
</table>

*Note that some mid and low frequency DC resistance applications (i.e. aluminum resistance welding applications) may cause a fault. In these applications, it is recommended that the sensor be ignored/bypassed during the welding cycle.
STANDARD RAM OPTIONS
(SEE SUPPLEMENTAL RAM SHEET FOR NON-STANDARD RAM OPTIONS)

RAM STYLE 'D'

RAM STYLE 'L'
NOT AVAILABLE WITH ADJUSTABLE STOP OPTIONS E, F, S

DETENT OPTION IS A BALL SPRING PLUNGER INSTALLED IN UNIT BODY TO ASSIST WITH HOLDING THE RAM IN EXTENDED POSITION (ONLY) WITH LOSS OF AIR PRESSURE.

DETENT IS NOT DESIGNED TO HOLD GEO LOCATION WITH LOSS OF AIR PRESSURE.

DETENT OPTION WILL CAUSE VISIBLE LINES IN THE RAM’S EXTERIOR COATING.

BALL SPRING PLUNGER IS A WEAR ITEM AND WILL NEED TO BE REPLACED AT RECOMMENDED INTERVALS.

NOTE: IF RAP/RIGID COUPLER IS SWITCHED IN THE FIELD, THE BALL PLUNGER AND SET SCREW MUST BE SWITCHED TO OPPOSITE SIDES.

SET SCREW IS INSTALLED IN BODY ON OPPOSITE SIDE OF BALL PLUNGER.

BALL SPRING PLUNGER SHOWN AT LOCATION FOR RIGID COUPLER. (OPPOSITE SIDE FOR RAP)

UNIT BODY (SHROUD NOT SHOWN FOR CLARITY)

DETENT OPTION EFFECTIVE WEIGHT LIMIT IS 24 LBF FOR VERTICAL APPLICATIONS.

MOUNTED TOOLING MUST BE WITHIN APPROVED APPLICATION RADIUS FROM END OF RAM.

DO NOT SCALE DRAWING

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

SHEET 6
**Welker UB4 Series Shot Pin Technical Information**

**Body Mounting:** 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).** Tighten M10 mounting screws to 45 Nm (33 ft-lb).

**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 ±0.015” (0.38mm). For adjustable and repeatable “end of stroke” conditions, see extend stop options. Rap couplings cause the unit to be less than the nominal stroke of the cylinder. The 40mm ram units have a 2mm rap. The rap allows the cylinder to accelerate without load, acting like a slide hammer. The impact of the coupler helps free tooling from a bound condition, similar to a dowel puller. Most applications using a pneumatic shot pin should have rap couplings while most hydraulic shot pin applications should use a rigid coupler. Rigid couplers must be used on all extend and retract stop units.

Welker cylinders do not require lubrication.

**Switch:** UB4 is available with World Switch or cylinder switch.

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

**Wear:** Defined as 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.

**Mounting Tooling:** Tooling must be within approved application radius from end of ram:
- 100 lbf @ R = 150.0mm (6.0”) 40 RAM
- ±0.13 (±.005”) MAX DEFLECTION AT END OF RAM UP TO THE FOLLOWING STROKES:
  - 40mm RAM: 75mm STROKE
- NOTE: LOOSE BODY UNITS FOR MANUAL OPERATION ARE NOT HELD TO INDUSTRY STANDARD TOLERANCES

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