KING COBRA
Rugged & Economical Circular Connector Systems

PROFESSIONAL-QUALITY IP65 - RATED CIRCULAR CONNECTORS

- IP65 Environmental Rating
- Cable, Panel And PC Mount Options
- Solid Machined Contacts
- Unique “Twist-Lock” Mechanism

Positronic Industries
www.connectpositronic.com
FEATURES:
• Circular “Twist-Lock” connectors with competitive pricing!
• Dust and water ingress protection to IP65 per IEC 60529.
• High reliability power and signal solid machined contacts.
• High mating cycle life and vibration-resistant capabilities!

Typical Connector Assembly

Connecter Versions

Unless otherwise specified, dimensional tolerances are:
1) Male contact mating diameters : ±0.03 [0.001]
2) Contact termination diameters : ±0.08 [0.003]
3) All other diameters : ±0.13 [0.005]
4) All other dimensions : ±0.38 [0.015]

Dimensions are in millimeters [inches]. All dimensions are subject to change.

Positronic believes the data contained herein to be reliable. Since the technical information is given free of charge, the user employs such information at his own discretion and risk. Positronic assumes no responsibility for results obtained or damages incurred from use of such information in whole or in part.
**Technical Characteristics**

**Materials and Finishes**
- **Insulator:** Glass-filled nylon, UL 94V-0.
- **Contacts:** Precision machined copper alloy with gold over nickel plate.

**Electrical Characteristics**
- **Contact Current Ratings**
  - Size 16 Contacts: 20.0 amperes.
  - Size 20 Contacts: 7.5 amperes.
  - Size 22 Contacts: 3.0 amperes.

- **Initial Contact Resistance** per IEC 512-2, Test 2b.
  - Size 16 Contacts: 0.003 ohms, maximum.
  - Size 20/22 Contacts: 0.005 ohms, maximum.

- **Insulator Resistance per IEC 512-2, Test 3a.**
  - Insulator: 5 G ohms, minimum.

- **Proof Voltage**
  - Size 16 Contacts: 1300 V r.m.s.
  - Size 20/22 Contacts: 1000 V r.m.s.

- **Working Voltage**
  - Size 16 Contacts: 433 V r.m.s.
  - Size 20/22 Contacts: 333 V r.m.s.

**Climatic Characteristics**
- **Working temperature:** -55°C to +125°C
- **Dust and Water Protection**
  - IP65 per IEC 60529 in mated condition (when jacketed cable is used). Degree of protection is dust-tight (no ingress of dust) and protected against water projected in jets from any direction.

**Mechanical Characteristics**
- **Polarization:** Provided in insulator design.
- **Removable Contacts:** Insert contact in rear face of insulator; release from front face of insulator.
  - Size 22 Female contacts feature "Open Entry" 500 cycles design and "Closed Entry" 1000 cycles minimum design options.
- **Fixed Contacts:**
  - Size 16 female contacts feature "Closed Entry" 1000 cycles minimum design.
  - Size 20 female contacts feature "Open Entry" 500 cycles design.
- **Contact Retention in Insulator:**
  - Size 16 Contacts: 45 N [10 lbs.] minimum.
- **Coupling System:** Twist lock.
- **Shock and Vibration:** Pending.
- **Recognized**
  - UL certification in process.
  - Consult factory for TÜV recognition.

**Temperature Rise Curve and Contact Performance**

![Temperature Rise Curve](chart1.png)

Above curves developed separately using (a) KC316 connectors and 16 AWG wires, and (b) KC820 connectors and 20 AWG wires. All contacts under load.

![1000 Cycle Contact Performance](chart2.png)

Humidity conditioning per EIA-364-31B, Method II (Condition A) after 250, 500 and 1000 mating cycles. Above curves developed separately using (a) KC316 connectors, and (b) KC820 connectors.
**Outline Dimensions**

**Male Connector**

*Typical Part Number: KC820M200*

Specify code M2 in Step 2

*Suggested PCB Hole Sizes and Mounting Screw:*

- **Suggested ØA = Ø2.03 [0.080] holes** for size 16 contact termination holes. (Version 316).
- **Suggested ØB = Ø1.14 [0.045] holes** for size 20 contact termination holes. (Version 820).
- **Suggested ØC = Ø2.00±0.08 [0.079±0.003] holes** for use with push-on fasteners.
- **Suggested ØC = Ø2.54 [0.100] holes** for mounting connector with screws. Screws ordered separately. Screw part number 4546-7-1-16 for PCB thickness between 1.00 mm [0.039 inch] and 2.50 mm [0.098 inch]. (Consult factory for other PCB thickness requirements.)

**Female Connector**

*Typical Part Number: KC820F200*

Specify code F2 in Step 2

**Solder Cup Contacts**

Available in versions KC316 and KC820 only

<table>
<thead>
<tr>
<th>Version</th>
<th>ØD</th>
</tr>
</thead>
<tbody>
<tr>
<td>KC316</td>
<td>1.40 mm [0.055 inch]</td>
</tr>
<tr>
<td>KC820</td>
<td>1.19 mm [0.047 inch]</td>
</tr>
</tbody>
</table>

**PCB Mount Contact Dimensions and PCB Hole Patterns**

**Straight PCB Mount**

*(Available in male connectors only)*

Specify code M3 in Step 2

**Version 316**

- 3xØ1.60 [0.063]
- 8xØ5.71 [0.226]

**Version 820**

- 8xØ5.71 [0.226]

**Right Angle (90°) PCB Mount**

*(Available in male connectors only)*

Specify code M4 in Step 2

**Version 316**

- 3xØ1.60 [0.063]
- 8xØ5.71 [0.226]

**Version 820**

- 8xØ5.71 [0.226]

**Note:** Contact factory for availability of Female PCB Mount versions.

Suggested PCB Hole Sizes and Mounting Screw:

- **Suggested ØA = Ø2.03 [0.080] holes** for size 16 contact termination holes. (Version 316).
- **Suggested ØB = Ø1.14 [0.045] holes** for size 20 contact termination holes. (Version 820).
- **Suggested ØC = Ø2.00±0.08 [0.079±0.003] holes** for use with push-on fasteners.
- **Suggested ØC = Ø2.54 [0.100] holes** for mounting connector with screws. Screws ordered separately. Screw part number 4546-7-1-16 for PCB thickness between 1.00 mm [0.039 inch] and 2.50 mm [0.098 inch]. (Consult factory for other PCB thickness requirements.)
Panel Mounting Options
Available in male connectors only

Front Panel Mount
Typical Part Number: KC316M2P0
Specify code P in Step 3

Rear Panel Mount
Typical Part Number: KC820M2PR0
Screws, nuts and washers supplied separately.

Panel Cutout for Front Panel Mount
Maximum thickness 2.00 mm [0.079 inch]

Panel Cutout for Rear Panel Mount
Maximum thickness 2.00 mm [0.079 inch]

Accessories

Jam Nut
Supplied factory installed to connector.
(See ordering information - code P in step 3)

Material:
Jam Nut: Nylon, UL 94V-0.

Alignment Bar
Supplied factory installed on all right angle (90°) PCB mount connectors with 4 screws.

Materials and Finish:
Alignment Bar: Nylon, UL 94V-0.
Screw: Steel with zinc plate.

Panel Cutout Diagram

Spacers
Supplied factory installed to connector with 4 screws.
Specify code S in step 3

Materials and Finish:
Spacer: Nylon, UL 94V-0.
Screw: Steel with zinc plate

Spacers with Push-on Fasteners
Supplied factory installed to connector.
Specify code S6 in step 3

Materials and Finishes:
Push-on Fastener: Copper alloy with tin plate.
Spacer: Nylon, UL 94V-0.
Screw: Steel with zinc plate.

Dust Cover
Consult factory for availability.

Typical Part Number:
KC316F700
Specify code F7 in Step 2.
Available in version KC316 female connector only.

Materials and Finish:
Terminal and Screw: Copper alloy with tin plate
Plastic Shroud: Nylon, UL 94V-0.

Screw Termination Connector

Note:
Screw Termination accommodates maximum wire size AWG 18 [1.0 mm²].
KING COBRA
Circular Connectors

ENVIRONMENTAL FEATURES, HOODS, CONTACTS AND TOOLS

Detail of IP65 Version Connectors and Hood

Male Front Panel Mount Connector
Typical Part Number: KC820M2PE0
(Consult factory for rear panel mount IP65 applications.)

Female Cable Connector
Typical Part Number: KC316F20JE

Materials:
Hood and Gripper: Nylon, UL 94V-0.
Boot and Gasket: Nitrile.
O-Ring: Silicon.

Note:
Hood design can accommodate jacketed cable diameters between 4.00mm [0.157 inch] and 7.00mm [0.276 inch].

* For IP65 version only

Detail of Non-IP65 Version Connectors and Hood

Male Front Panel Mount Connector
Typical Part Number: KC316M2P0

Female Cable Connector
Typical Part Number: KC820F20J

Materials:
Hood and Gripper: Nylon, UL 94V-0.
O-Ring: Silicon.

Note:
Hood design can accommodate jacketed cable diameters between 4.00mm [0.157 inch] and 7.00mm [0.276 inch].

Removable Crimp Contacts for Version KC1222

<table>
<thead>
<tr>
<th>Male Contact</th>
<th>Female Contact</th>
<th>Wire Size AWG [mm²]</th>
<th>ØA</th>
<th>ØB</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC422N</td>
<td>FC422N4</td>
<td>22 [0.3] - 24 [0.25]</td>
<td>0.89 [0.035]</td>
<td>1.42 [0.056]</td>
</tr>
<tr>
<td>FC422N2 (Open Entry)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FC422N2 (Closed Entry)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please use correct wire size and it should be smaller than ØA of the contact
(Consult factory for solder style removable contacts.)

Recommended Tools for Crimp Contacts

<table>
<thead>
<tr>
<th>Contact Size</th>
<th>Contact Extraction Tool</th>
<th>Contact Insertion Tool</th>
<th>Hand Crimp Tool</th>
<th>Semi-Automatic Crimp Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 22</td>
<td>9081-3</td>
<td>9099-1</td>
<td>9507-0 with 9502-12 positioner (male contacts)</td>
<td>9550-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9507-0 with 9502-23 positioner (female contacts)</td>
<td></td>
</tr>
</tbody>
</table>
### Step 1: Connector Version

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KC316</td>
<td>M2</td>
<td>PE</td>
<td>JE</td>
<td>/AA - XXX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**King Cobra Version 316**

**STEP 2: Connector Gender and Type of Contacts**

- **M2**: Male panel mount, solder cup, fixed contacts.
- **M3**: Male straight PCB mount, solder.
- **M4**: Male right angle (90°) PCB mount, solder.
- **F2**: Female cable connector, solder cup, fixed contacts.

### Step 2: RoHS Compliance Options

**/AA**: Compliance per EU Directive 2002/95/EC (RoHS)

**Note**: If RoHS legislation is not required, this step will not be used.

### Step 4: Hoods

- **0**: None.
- **J**: Hood with gripper, non-IP65.
- **JE**: Hood with gripper and boot, IP65.

### Step 3: Mounting Styles

- **0**: None.
- **S**: Spacer for straight PCB mount connectors.
- **S6**: Spacer with push-on fastener for straight PCB mount connectors.
- **N**: Push-on fastener for use with alignment bar and right angle (90°) PCB mount connectors.
- **P**: Front panel mount male connectors with jam nut, non-IP65.
- **PE**: Front panel mount male connectors with jam nut and gasket, IP65.
- **PR**: Rear panel mount male connectors, non-IP65.
- **PRE**: Rear panel mount male connectors with gasket, IP65.

### Step 5: Special Options

Consult factory.

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### Step 1: Connector Version

<table>
<thead>
<tr>
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<th>6</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KC820</td>
<td>F2</td>
<td>0</td>
<td>JE</td>
<td>/AA - XXX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**King Cobra Version 820**

**STEP 2: Connector Gender and Type of Contacts**

- **M2**: Male panel mount, solder cup, fixed contacts.
- **M3**: Male straight PCB mount, solder.
- **M4**: Male right angle (90°) PCB mount, solder.
- **F2**: Female cable connector, solder cup, fixed contacts.

### Step 4: Hoods

- **0**: None.
- **J**: Hood with gripper, non-IP65.
- **JE**: Hood with gripper and boot, IP65.

### Step 3: Mounting Styles

- **0**: None.
- **S**: Spacer for straight PCB mount connectors.
- **S6**: Spacer with push-on fastener for straight PCB mount connectors.
- **N**: Push-on fastener for use with alignment bar and right angle (90°) PCB mount connectors.
- **P**: Front panel mount male connectors with jam nut, non-IP65.
- **PE**: Front panel mount male connectors with jam nut and gasket, IP65.
- **PR**: Rear panel mount male connectors, non-IP65.
- **PRE**: Rear panel mount male connectors with gasket, IP65.

### Step 5: Special Options

Consult factory.

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### Step 1: Connector Version

<table>
<thead>
<tr>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KC1222</td>
<td>M1</td>
<td>P</td>
<td>J</td>
<td>/AA - XXX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**King Cobra Version 1222**

**STEP 2: Connector Gender and Type of Contacts**

- **M1**: Male panel mount, removable crimp contacts.
- **F1**: Female cable connector, removable crimp contacts.

### Step 4: Hoods

- **0**: None.
- **J**: Hood with gripper, non-IP65.
- **JE**: Hood with gripper and boot, IP65.

### Step 3: Mounting Styles

- **0**: None.
- **P**: Front panel mount male connectors with jam nut, non-IP65.
- **PE**: Front panel mount male connectors with jam nut and gasket, IP65.
- **PR**: Rear panel mount male connectors, non-IP65.
- **PRE**: Rear panel mount male connectors with gasket, IP65.

### Step 5: Special Options

Consult factory.
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