BANJO BOLT MANIFOLDS

ADVANTAGES OF SUN BANJO BOLT MANIFOLDS

- Standard cavity for:
  - Counterbalance valves
  - Pilot to open check valves
  - Flow fuse valves
  - Flow control valves
  - 2/2 way directional valves
- Reduced piping
- Load holding valve can be mounted directly on the cylinder
- Direct mounting for high safety requirements
- For banjo bolts with male BSPP thread, metric thread on request
- Body rotatable
- High pressure banjo bolts (Parker Ermeto) with soft seal ring
- System pressure up to 350 bar (with cast iron bodies)

Example of use: X4C body with CK** valve

- Aluminium bodies optional for max. pressure 210 bar
- All manifolds come with banjo bolt and seal ring

INSTALLATION INSTRUCTIONS AND SPECIFICATIONS

Installation:
Recommended torque for banjo bolt 45 Nm to 49 Nm
(34-37 lb.ft.)

Installation:
Recommended torque for banjo bolt 70 Nm to 77 Nm
(52-58 lb.ft.)

Installation:
Recommended torque for banjo bolt 120 Nm to 132 Nm
(90-99 lb.ft.)

Installation:
Recommended torque for banjo bolt 230 Nm to 250 Nm
(172-187 lb.ft.)

See SUN Hydraulics datasheets for standard settings, adjustment ranges, max. pressures, seal materials, torques etc.
<table>
<thead>
<tr>
<th>BSPP ports</th>
<th>Component</th>
<th>Page</th>
<th>Component</th>
<th>Page</th>
<th>Component</th>
<th>Page</th>
<th>Component</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25 BSPP ports</td>
<td>X3S</td>
<td>2</td>
<td>X4E</td>
<td>4</td>
<td>X4A</td>
<td>6</td>
<td>2</td>
<td>163A</td>
</tr>
<tr>
<td></td>
<td>X3S/S</td>
<td>2</td>
<td>X4E/S</td>
<td>4</td>
<td>X4A/S</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.375 BSPP ports</td>
<td>X4L</td>
<td>2</td>
<td>X4F</td>
<td>4</td>
<td>X4B</td>
<td>6</td>
<td>X4I</td>
<td>8</td>
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<tr>
<td></td>
<td>X4L/S</td>
<td>2</td>
<td>X4F/S</td>
<td>4</td>
<td>X4B/S</td>
<td>6</td>
<td>X4I/S</td>
<td>8</td>
</tr>
<tr>
<td>.50 BSPP ports</td>
<td>X4M</td>
<td>3</td>
<td>X4G</td>
<td>5</td>
<td>X4C</td>
<td>7</td>
<td>X4J</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>X4M/S</td>
<td>3</td>
<td>X4G/S</td>
<td>5</td>
<td>X4C/S</td>
<td>7</td>
<td>X4J/S</td>
<td>9</td>
</tr>
<tr>
<td>.75 BSPP ports</td>
<td>X4N</td>
<td>3</td>
<td>X4H</td>
<td>5</td>
<td>X4D</td>
<td>7</td>
<td>X4K</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>X4N/S</td>
<td>3</td>
<td>X4H/S</td>
<td>5</td>
<td>X4D/S</td>
<td>7</td>
<td>X4K/S</td>
<td>9</td>
</tr>
</tbody>
</table>

Please ask for further manifolds not shown here and for metric porting.
Banjo Bolt Manifolds

■ Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)

<table>
<thead>
<tr>
<th>FQBA-XAN / 10.14</th>
<th>NFQ**** / 5.12</th>
<th>NCQ**** / 5.16</th>
<th>FCQB-*** / 5.22</th>
<th>FDQBA-*** / 5.24</th>
<th>DTDA-M** / 8.17</th>
<th>DLDA-M** / 8.16</th>
</tr>
</thead>
</table>

Ports .25 BSPP

1 Cavity T-162A

![Diagram of T-162A Cavity Locating Shoulder Depth 0.8 mm]

Typical cartridges for this body (model)

FQBA-XAN
NFBC-****
NCBB-****
FCBB-****

<table>
<thead>
<tr>
<th>Options</th>
<th>Aluminium</th>
<th>X3S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3S/S</td>
</tr>
</tbody>
</table>

Ports .375 BSPP

1 Cavity T-13A

![Diagram of T-13A Cavity Locating Shoulder Depth 0.8 mm]

Typical cartridges for this body (model)

FQCA-XAN
NFCC-****
NCCC-****
FCCS-****
FDCC-****
DLDA-M**
DTDA-M**

<table>
<thead>
<tr>
<th>Options</th>
<th>Aluminium</th>
<th>X4L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X4L/S</td>
</tr>
</tbody>
</table>
Banjo Bolt Manifolds
- Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)
- FQCA-XAN / 10.14
- NF***** / 5.12
- NC***** / 5.16
- FC3B-**** / 5.22
- FD**** / 5.24
- DTDA-M*** / 8.17
- DLDA-M*** / 8.16

Ports .50 BSPP
1 Cavity T-13A

Options
- Aluminium
- SG iron

Ports .75 BSPP
1 Cavity T-5A

Options
- Aluminium
- SG iron
Banjo Bolt Manifolds

Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)

<table>
<thead>
<tr>
<th>CB**** / 4.10</th>
<th>CA**** / 4.09</th>
<th>CC**** / 4.09</th>
<th>CK**** / 4.16</th>
<th>CKV****</th>
</tr>
</thead>
</table>

Ports .25 BSPP

1 Cavity T-163A

Typical cartridges for this body

(model)

CKB****

Options

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X4E</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X4E/S</td>
</tr>
</tbody>
</table>

Ports .375 BSPP *

1 Cavity T-11A

Typical cartridges for this body

(model)

CBC****

CBB****

CAC****

CCC****

CKC****

CKCV****

* Port 3 = .25 BSPP

Options

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X4F/S</td>
</tr>
</tbody>
</table>

T-163A Cavity
Locating Cavity
Depth 15.9 mm

T-11A Cavity
Locating Shoulder
Depth 17.5 mm
Banjo Bolt Manifolds

Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)

| CB***-**** / 4.10 | CA***-**** / 4.09 | CK***-**** / 4.16 | CKV***-**** |

Ports .50 BSPP *

1 Cavity T-11A

![Diagram of T-11A manifold]

T-11A Cavity Locating Shoulder Depth 17.5 mm

Typical cartridges for this body (model)

| CBC***-**** |
| CB***-**** |
| CA***-**** |
| CCC***-**** |
| CKC***-**** |
| CKCV***-**** |

* Port 3 = .25 BSPP

Options

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X4G</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X4G/S</td>
</tr>
</tbody>
</table>

Ports .75 BSPP *

1 Cavity T-2A

![Diagram of T-2A manifold]

T-2A Cavity Locating Shoulder Depth 18.3 mm

Typical cartridges for this body (model)

| CB***-**** |
| CB***-**** |
| CA***-**** |
| CC***-**** |
| CKC***-**** |
| CKCV***-**** |

* Port 3 = .25 BSPP

Options

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X4H</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X4H/S</td>
</tr>
</tbody>
</table>
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

**Typical cartridges for this body (model / catalogue page):**

**Ports .25 BSPP**

1 Cavity T-163A

![Diagram of T-163A Cavity Locating Shoulder Depth 15.9 mm]

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X4A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X4A/S</td>
</tr>
</tbody>
</table>

*Qmax at port 3 < 60% nominal flow

**Ports .375 BSPP**

1 Cavity T-11A

![Diagram of T-11A Cavity Locating Shoulder Depth 20.6 mm]

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X4B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X4B/S</td>
</tr>
</tbody>
</table>

*Qmax at port 3 < 60% nominal flow
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

### Ports .50 BSPP *

1 Cavity T-11A

Typical cartridges for this body (model)
- CB** ****
- CA** ****
- C**A** ****
- C**K** ****
- CKCV****

*Qmax at port 3 < 60% nominal flow

#### Options
- Aluminium: X4C
- SG iron: X4CS

### Ports .75 BSPP *

1 Cavity T-2A

Typical cartridges for this body (model)
- C**E** ****
- C**D** ****
- CA**E** ****
- C**C** ****
- CKE****
- CKEV****

*Qmax at port 3 < 60% nominal flow

#### Options
- Aluminium: X4D
- SG iron: X4D/S
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)

| CB**** / 4.10 | CA**** / 4.09 | CC***A **** / 4.09 | CK**** / 4.16 | CK**** / |

Ports .25 BSPP

1 Cavity

Typical cartridges for this body (model)

CKB****

Options

<table>
<thead>
<tr>
<th>Aluminum</th>
<th>SG iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>*** On request</td>
<td>***/S</td>
</tr>
</tbody>
</table>

Ports .375 BSPP *

1 Cavity T-11A

Typical cartridges for this body (model)

CBC****
CBB****
CAC****
CCC****
CKC****
CKCV****

* Port 3, M1 + M2 = .25 BSPP

Options

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>SG iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>X4I</td>
<td>X4I/S</td>
</tr>
</tbody>
</table>

Example of use X4C

T-11A Cavity
Locating Shoulder
Depth 17.5 mm

KDS soft seal ring
Orifice 0.4 mm
(Detail enlarged)

25 BSPP
plugged

31.1
31.1
39.1
35.7
37.5
25 BSPP
plugged

77.5
35.2
35.2
58.4
70.6
Banjo Bolt Manifolds

Typical cartridges for this body (model / catalogue page)

Ports .50 BSPP *

1 Cavity T-11A

* Port 3, M1 + M2 = .25 BSPP

T-11A Cavity
Locating Shoulder Depth 17.5 mm

Options
Aluminium
X4J
SG iron
X4J/S

Ports .75 BSPP *

1 Cavity T-2A

* Port 3, M1 + M2 = .25 BSPP

T-2A Cavity
Locating Shoulder Depth 18.3 mm

Options
Aluminium
X4K
SG iron
X4K/S

Aluminium rated to 210 bar / SG iron rated to 350 bar
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

**Typical cartridges for this body (model / catalogue page)**

<table>
<thead>
<tr>
<th>CB······ / 4.10</th>
<th>CA······ / 4.09</th>
<th>CC·A···· / 4.09</th>
<th>CK······ / 4.16</th>
<th>CKV·····</th>
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<td><img src="image2.png" alt="Diagram" /></td>
<td><img src="image3.png" alt="Diagram" /></td>
<td><img src="image4.png" alt="Diagram" /></td>
<td><img src="image5.png" alt="Diagram" /></td>
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</tbody>
</table>

**Ports .25 BSPP**

1 Cavity T-163A

Typical cartridges for this body (model)

<table>
<thead>
<tr>
<th>CK······</th>
</tr>
</thead>
</table>

Options

<table>
<thead>
<tr>
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<th>Aluminium</th>
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<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3T/S</td>
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**Ports .375 BSPP**

1 Cavity T-11A

Typical cartridges for this body (model)

<table>
<thead>
<tr>
<th>CBC······</th>
<th>CBS······</th>
<th>CAC······</th>
<th>CCC······</th>
<th>CKC······</th>
<th>CKCV·····</th>
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</thead>
<tbody>
<tr>
<td><img src="image6.png" alt="Diagram" /></td>
<td><img src="image7.png" alt="Diagram" /></td>
<td><img src="image8.png" alt="Diagram" /></td>
<td><img src="image9.png" alt="Diagram" /></td>
<td><img src="image10.png" alt="Diagram" /></td>
<td><img src="image11.png" alt="Diagram" /></td>
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</table>

Options

<table>
<thead>
<tr>
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<th>Aluminium</th>
<th>X3U</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3U/S</td>
</tr>
</tbody>
</table>

Banjo Bolt Manifolds 2023-205-14S
DAE8 SUN Hydraulik GmbH
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

### Typical cartridges for this body (model / catalogue page)

| CB-**** / 4.10 |
| CB-**** / 4.09 |
| CC-**** / 4.09 |
| CK-**** / 4.16 |
| CKV-**** |

### Ports .50 BSPP

1 Cavity T-11A

![Diagram of T-11A Cavity with dimensions and options]

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X3V</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3VIS</td>
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</table>

### Ports .75 BSPP

1 Cavity T-2A

![Diagram of T-2A Cavity with dimensions and options]

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X3W</th>
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<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3WS</td>
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Banjo Bolt Manifolds 999-901-745
Orbit SUN Hydraulik GmbH
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

**Typical cartridges for this body** (model / catalogue page)

<table>
<thead>
<tr>
<th>CB**** / 4.10</th>
<th>CA**** / 4.09</th>
<th>CC**** / 4.09</th>
<th>CK****/ 4.16</th>
<th>CKV****</th>
</tr>
</thead>
</table>

**Ports .25 BSPP**

2 Cavities

**Typical cartridges for this body** (model)

CK****

**Options**

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>On request</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>***</td>
</tr>
<tr>
<td>SG iron</td>
<td>***/S</td>
</tr>
</tbody>
</table>

**Ports .375 BSPP**

2 Cavities T-11A

**Typical cartridges for this body** (model)

CBC****
CBB****
CAC****
CCC****
CKC****
CKCV****

**Options**

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>SG iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>X3X</td>
<td>X3X/S</td>
</tr>
</tbody>
</table>
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

Typical cartridges for this body (model / catalogue page)

<table>
<thead>
<tr>
<th>CB●●●● / 4.10</th>
<th>CA●●●● / 4.09</th>
<th>CC●A●●●● / 4.09</th>
<th>CK●●●●● / 4.16</th>
<th>CK●V●●●●</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ports .50 BSPP**

2 Cavities T-11A

![Diagram of Ports .50 BSPP]

2 x T-11A Cavity Locating Shoulder Depth 17.5 mm

Options

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X3Y</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3YS</td>
</tr>
</tbody>
</table>

**Ports .75 BSPP**

2 Cavities T-2A

![Diagram of Ports .75 BSPP]

2 x T-2A Cavity Locating Shoulder Depth 18.3 mm

Options

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>X3Z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SG iron</td>
<td>X3Z/S</td>
</tr>
</tbody>
</table>
Banjo Bolt Manifolds

- Aluminium rated to 210 bar / SG iron rated to 350 bar

**Typical cartridges for this body (model/catalogue page)**

- CW... **** / 4.09
- CV... V*** / 4.09

**Ports .25 BSPP**

1 Cavity

*Example of use X4C*

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>SG iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>***</td>
<td>On request</td>
</tr>
<tr>
<td></td>
<td>***/S</td>
<td></td>
</tr>
</tbody>
</table>

**Ports .375 BSPP**

1 Cavity

*Port 3, 4, M1 + M2 = .25 BSPP*

**Options**

<table>
<thead>
<tr>
<th></th>
<th>Aluminium</th>
<th>SG iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>XSY</td>
<td>XSY/S</td>
</tr>
</tbody>
</table>

Banjo Bolt Manifolds 999-501-445
DIN 83 SUN Hydraulik GmbH
Banjo Bolt Manifolds

Aluminium rated to 210 bar / SG iron rated to 350 bar

**Typical cartridges for this body (model / catalogue page)**

| CW*·*** | CV*·*** / 4.09 |

| * Port 3, 4, M1 + M2 = .25 BSPP

**Ports .50 BSPP**

1 Cavity T-21A

**Options**

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X5Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X5Z/S</td>
</tr>
</tbody>
</table>

**Typical cartridges for this body (model)**

| CW*·*** |
| CV*·*** |

**Ports .75 BSPP**

1 Cavity T-22A

**Options**

<table>
<thead>
<tr>
<th>Aluminium</th>
<th>X6A</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG iron</td>
<td>X6A/S</td>
</tr>
</tbody>
</table>

**Typical cartridges for this body (model)**

| CWE··*** |
| CVEV··*** |

* Port 3, 4, M1 + M2 = .26 BSPP
CAUTION

Sun Hydraulics Corporation manufactures a variety of cartridge valves that will fit into the same Sun cavity. Each cartridge is marked with a seven-digit part identification code and a four-digit date code, stamped on the hex surfaces. Designers and users of Sun components are advised that physical interchangeability of cartridges does not necessarily mean functional interchangeability. When replacing any Sun cartridges, users should first check with the manufacturer's service literature, their local Sun distributor, or the Sun factory before making any part substitutions.

NOTE: To avoid serious injury, the manufacturer's service manual must be consulted before working on any hydraulic system.

LIMITED WARRANTY

Sun Hydraulics Corporation warrants its products free from defects in material, workmanship, and design for a period of three years after installation, provided the installation date is less than one year after manufacture. "O-rings" and seals are specifically exempted from this warranty. In no instance is there any warranty of fitness for a particular use and Sun Hydraulics Corporation cannot and does not accept responsibility of any type for any of its products that have been subjected to improper installation, improper application, negligence, tampering, or abuse, or which have been repaired or altered outside of the Sun Hydraulics factory. Sun Hydraulics Corporation liability under this warranty shall extend only to replacement or correction, f.o.b. our factory, of any defective part or product determined by inspection as not conforming to this warranty. We make no other warranties, expressed or implied, and are not responsible for any consequential damages resulting from use by any buyer or user, our liability being limited to the value of product sold or obligation to replace a defective part.

PERFORMANCE ASSURANCE

All Sun cartridges are individually tested at the factory and preset to specific pressure or flow settings where indicated in this catalogue. However, as the actual performance of buyers' equipment cannot be reproduced in Sun's testing laboratory, assurance of suitability of all Sun products in the buyer's application is the responsibility of the buyer. This is typically accomplished by the manufacture of a prototype followed by a test or qualification program on the part of the buyer.

APPLICATION LIMITATIONS

Sun's product designs and manufacturing facilities have been specifically developed to provide products for commercial, industrial and mobile hydraulic applications and Sun's products are only warranted for this type of use. Sun's distributors are not authorised to approve the use of Sun products in any of the following applications:

- Any steering or braking systems for passenger-carrying vehicles or on-highway trucks.
- Aircraft or space vehicles.
- Ordnance equipment.
- Life support equipment.
- Any end product which is used in a nuclear power plant application.

Specific written approval for any application of Sun products in any of the above named applications should be obtained from Sun Hydraulics Corporation. Consultation with Sun distributors or factory engineers is advised in unusual situations where applicability is questionable.