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</table>
1 General

1.1 Information About these Instructions

These instructions will help you to use the device safely and efficiently. These instructions are a key component of the device and must be kept in the direct vicinity of the device and be available for the staff at all times.

The staff should carefully read and understand these instructions before beginning any work. The basic foundation for safe work is compliance with all of the safety instructions and operating instructions provided in this manual.

The local accident prevention guidelines and general safety conditions for the location the device is used in also apply.

Figures in these instructions are intended for general comprehension and may vary from the actual design.

1.2 Explanation of Symbols

Safety Instructions

Safety instructions are indicated with symbols in these instructions. The safety instructions are introduced by key words which express the extent of the risk.

**DANGER!**

This combination of symbol and key word indicates a directly hazardous situation which could lead to death or severe injuries if it is not avoided.

**WARNING!**

This combination of symbol and key word indicates a possible hazardous situation which could lead to death or severe injuries if it is not avoided.

**CAUTION!**

This combination of symbol and key word indicates a possible hazardous situation which could lead to minor or light injuries if it is not avoided.

**ATTENTION!**

This combination of symbol and key word indicates a possible hazardous situation which could lead to material and environmental damages if it is not avoided.

Specific Safety Instructions

The following symbols are used in the safety instructions to call attention to specific risks:

**DANGER!**

This combination of symbol and key word indicates a directly hazardous situation caused by electrical current. Severe or fatal injuries could result from not observing a sign thus labeled.

Tips and Recommendations

This symbol indicates useful tips and recommendations as well as information to allow efficient, trouble-free operation.

Safety Instructions in Operating Instructions

Safety instructions can pertain to specific, individual operating instructions. Such safety instructions are included within the operation instructions so that they do not interrupt the reading flow during operation. The key words described previously are used.

Example:

1. Loosen screws.

2. **CAUTION!**

   Cover presents risk of crushing.

   Carefully close the cover.

3. Tighten screws.

Additional Marks

The following marks are used in these instructions to emphasize operating instructions, results, lists, references and other elements:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Step-by-step operating instructions</td>
</tr>
<tr>
<td>⇒</td>
<td>Results of operating steps</td>
</tr>
<tr>
<td>■</td>
<td>Lists without specified order</td>
</tr>
<tr>
<td>B01</td>
<td>The following only applies to the option indicated</td>
</tr>
</tbody>
</table>

1.3 Copyright Protection

The contents of these instructions are protected by copyright. Their use within the framework of the use of the device is allowed. Any use beyond this is not allowed without the written permission of the manufacturer.

1.4 Warranty Conditions

The warranty conditions are found within the General Terms and Conditions of the manufacturer.

1.5 Customer Service

For questions please contact your local distributor (http://www.phdinc.com/apps/distributors/) or our customer service department.

<table>
<thead>
<tr>
<th>Address</th>
<th>PHDinEurope GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Zum Carl-Alexander-Park 6</td>
</tr>
<tr>
<td></td>
<td>52499 Baesweiler, GERMANY</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone</th>
<th>+49 (0) 2401 619 77 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax</td>
<td>+49 (0) 2401 619 77 99</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:info@PHDinEurope.de">info@PHDinEurope.de</a></td>
</tr>
<tr>
<td>Internet</td>
<td><a href="http://www.phdinc.com">www.phdinc.com</a></td>
</tr>
</tbody>
</table>

In addition, we are also interested in receiving information and hearing about your experiences using our products which could be valuable for the improvement of our products.
2 Safety

This section will provide an overview of the very important safety aspects for personal safety as well as safe, trouble-free operation. Additional task-related safety instructions are included in the sections for the individual phases.

2.1 Conditional Use

The system where the PNC is used could be either automated or manual. After attachment to an industrial system, the Series PNC Number Cruncher® is used exclusively to stamp information into appropriate materials.

Compliance with all of the specifications in these instructions is also a component of the conditional use.

Any use going beyond the conditional use or any other kind of use constitutes misuse.

WARNING!

Danger caused by misuse!

Misusing the Series PNC Number Cruncher® can cause dangerous situations.

- Never operate in potentially explosive areas.
- Never operate outside of the specifications listed in the "Technical Data" section.
- Never operate outside of the permissible temperature range.
- Never operate outside of the permissible pressure range.
- Never exceed the performance limits.
- Only operate with character tooling, jaw tooling and anvils appropriate for the materials.
- Never guide materials manually.
- Never conduct unconditional functions, such as cutting.
- Never alter or change any component without first contacting manufacturer or an authorized distributor.

2.2 Basic Risks

Residual risks which could occur even with the conditional use of the device are named in the following section.

In order to reduce the risks of personal and material damages and to avoid dangerous situations, please note the safety instructions listed here and in the other sections of these instructions.

Battery Current

DANGER!

Risk of fatal injury from electrical current!

The device can optionally be equipped with proximity switches with different (partial/high) voltages. There is a direct risk of fatal injury from electrical shock if current-carrying parts are touched. Damages to the insulation or the individual components could result in fatal injuries.

- Allow only qualified electricians to work on the electrical system.
- If the insulation is damaged, immediately turn off the power supply and allow repairs to be conducted.

Pneumatics

WARNING!

Risk of injuries from movements caused by stored pneumatic energy!

The device is connected to the operator’s pneumatic system. Pneumatically driven components can move unexpectedly and cause severe injuries due to stored residual energy.

- Allow only qualified pneumatic technicians to work on the pneumatic system.
- The pneumatic system must be completely depressurized before beginning work on the device. Completely empty the pressure reservoir.

Falling Materials

WARNING!

Risk of injury from falling materials!

The materials can fall or be ejected uncontrollably during operation and cause severe injuries.

- Do not enter hazardous areas during normal operation.
- Wear a protective helmet, safety boots and protective clothing when entering hazardous areas (e.g. while making preparations).

Robot Movements

WARNING!

Risk of injury from robot movements!

The device can be attached to an industrial system. The collision of moving parts of the industrial system with persons or objects can cause potentially fatal injuries and severe material damages.

- Observe all safety instructions of the manufacturer of the industrial system.
- Do not interfere with moving parts during operation or handle moving components.
- Never open removable protective devices during operation.

Spring Force

WARNING!

Risk of injury from compression spring under tension!

Strong compression springs under pressure are located inside the device. This stored spring force can cause severe injuries during disassembly.

- Do not open or disassemble the device.

2.3 Responsibility of the Operator

Operator

The operator is the person who operates the device themselves for commercial or business purposes or allows a third party to use the device and bears the legal product responsibility for the protections of the user, personnel or third party during the operation.
Operator Obligations
The device will be used in industrial areas. The operator of the device is thus subject to the legal obligations for occupational safety.

The valid safety, accident prevention and environmental protection guidelines for the location the device is used must be complied with in addition to the safety procedures in these instructions.

This especially includes the following:

- The operator must be aware of the valid occupational safety guidelines and use a risk evaluation to determine additional risks presented by the special work conditions at the location where the device is used. They must implement these in the form of operating instructions for the operation of the device.
- Over the course of the entire period of use of the device, the operator must ensure that the operating instructions correspond to the current state of the regulations and adjust these if necessary.
- The operator must clearly regulate and specify the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operator must ensure that all persons who handle the device have read and understood these instructions. In addition, they must train the personnel at regular intervals and inform them about the risks.
- The operator must provide the personnel with the required protective equipment and require the wearing of the required protective equipment.

In addition, the operator is also responsible for ensuring that the device is always in a technically flawless condition. The following applies to this:

- The operator must ensure that the maintenance intervals prescribed in these instructions are complied with.
- The operator must regularly inspect all safety devices for functionality and completeness.

### 2.4 Personnel Requirements

#### 2.4.1 Qualifications

The various tasks described in these instructions place different requirements on the qualifications of the persons entrusted with these tasks.

**WARNING! Risk from unqualified personnel!**

Unqualified personnel cannot estimate the risks involved in handling the device and expose themselves and others to the risk of severe or fatal injuries.

- All work may only be conducted by qualified personnel.
- Unqualified personnel are not allowed in the work area.

Only such persons are allowed to conduct work that can be expected to reliably perform such work. Personnel whose ability to react is affected, e.g. by drugs, alcohol or medications, are not allowed to conduct work.

In these instructions, the qualifications of the personnel for the various tasks will be listed in the following:

### 2.4.2 Unauthorized Persons

**WARNING! Risk of fatal injury for unauthorized persons from risks in the hazardous area and work area!**

Unauthorized persons who do not fulfill the requirements described here are not aware of the risks in the work area. As a result, there is a risk of severe injuries or death for unauthorized persons.

- Keep unauthorized persons out of the risk area and work area.
- In cases of doubt, address these persons and inform them of the risk area and work area.
- Interrupt the work for as long as unauthorized persons are in risk areas and work areas.

### 2.4.3 Instruction

The operator must regularly instruct the personnel. For the purposes of better traceability, an instruction protocol with the following minimum content will be created:

- Date of the instruction
- Name of the person(s) receiving instruction
- Contents of the instruction
- Name of the person providing instruction
- Signature of the person receiving and person providing instruction

### 2.5 Personal Protective Equipment

Personal protective equipment serves to protect persons from injury while working.

The personnel must wear personal protective equipment while conducting the various tasks on and around the device which is specially indicated in the individual sections of these instructions.

#### Description of the Personal Protective Equipment

The personal protective equipment will be explained in the following:

- **Protective Glasses**
  The protective glasses are used to protect the eyes while working with the pneumatic system.

- **Protective Gloves**
  Protective gloves are used to protect the hands against rubbing, abrasions, punctures or more severe injuries as well as from contact with hot surfaces.

- **Protective Boots**
  Protective boots are used to protect the feet from being crushed, falling parts and sliding on slippery surfaces.
# 2.6 Safety Devices

**WARNING!**
Risk of fatal injury from non-functional safety devices!

There is the risk of severe injury or death in the event of non-functioning or deactivated protective devices.
- Check whether all safety devices are functional and properly installed before beginning work.
- Never deactivate or override safety devices.
- Ensure that the safety devices always remain accessible.

## Description of the Installed Safety Devices

**Safety Lock-Out Pin**

![Safety Lock-Out Pin Diagram](image)

1 Storage Location  
2 Lock-Out Location

The mechanical movement of the jaws can be blocked with the safety lock-out pin. Insert the provided safety lock-out pin into the lock-out location through the housing and jaws to the housing on the other side.

### Integration Within an Emergency Shutdown Concept is Required

The device is intended for use within a system. It does not have its own control system and does not have an independent emergency shutdown function.

Emergency shutdown devices must be installed and integrated within the safety sequence of the control system before the device can be operated.

The emergency shutdown devices must be connected in such a manner that hazardous situations for persons and material assets are ruled out upon the interruption of the power supply or the activation of the power supply after an interruption.

The emergency shutdown devices must be freely accessible at all times.

# 2.7 Conduct in Hazardous Situations

Observe the guidelines of the manufacturer of the entire machine and the operating instructions of the operator during hazardous situations.

# 2.8 Environmental Protection

**ATTENTION!**
Risk to the environment caused by improper handling of environmentally hazardous materials!

Significant damage to the environment can occur in the event of improper handling of environmentally hazardous materials, especially in the event of improper disposal.

- Always observe the instructions for handling environmentally hazardous materials and their disposal provided below.
- Immediately take appropriate measures if environmentally hazardous materials are unintentionally released into the environment. In case of doubt, inform the responsible municipal authorities of the damages and ask them about appropriate measures.

The following environmentally hazardous materials are used:

**Lubricants**
Lubricants such as grease and oils contain poisonous substances. They may not be released into the environment. They must be disposed of using a specialist disposal company.

**Cleaning Spirits**
Cleaning spirits are an environmentally hazardous substance. Cleaning spirits may not be released into the environment. They must be disposed of using a specialist disposal company.
3 Technical Data

3.1 Dimensions

Fig. 2: Dimensions

Fig. 3: Dimensions
### 3.2 Operating Conditions

**SPECIFICATIONS**

- **SERIES PNC CLAMPS**
  - Operating pressure: 30 psi min. - 100 psi max. 
    - [2 bar min. - 7 bar max.]
  - Max. pressure with option B01: 90 psi max. [6.2 bar max.]
  - Temperature range: -20°F [-30°C] to 180°F [82°C]

### 3.3 Performance Values and Weight

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>UNIT WEIGHT</th>
<th>TOTAL CLAMP FORCE AT 87 psi [6 bar]</th>
<th>CLOSE OR OPEN TIME 87 psi [6 bar]</th>
<th>DISPLACEMENT</th>
<th>CLAMP FORCE FACTOR (C&lt;sub&gt;f&lt;/sub&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb</td>
<td>kg</td>
<td>sec.</td>
<td>in&lt;sup&gt;2&lt;/sup&gt;</td>
<td>cm&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>PNC44x-x-S16-S16</td>
<td>19.0</td>
<td>8.65</td>
<td>9000</td>
<td>0.12</td>
<td>19.60</td>
</tr>
<tr>
<td>PNC55x-x-S16-S16</td>
<td>22.2</td>
<td>10.09</td>
<td>15000</td>
<td>0.12</td>
<td>19.60</td>
</tr>
</tbody>
</table>

#### MOUNTING CODES

- **P**: Rear Mounting Plate
- **R**: 1” [25.4] Non-Spherical Mtg Bracket
- **V**: 1-1/4” [31.8] Non-Spherical Mtg Bracket
- **M**: Side Mounting Plate

#### TIP KIT DESCRIPTIONS

- **63140-00**: Green Anvil, Backer, Retainer, 6 SHCS, & 9 Characters
- **63140-01**: Black Anvil, Backer, Retainer, 6 SHCS, & 9 Characters
- **63140-02**: Silver Anvil, Backer, Retainer, 6 SHCS, & 9 Characters
- **63140-03**: Gold Anvil, Backer, Retainer, 6 SHCS, & 9 Characters

*Characters ordered separately*
3.4 Jaw Tooling and Anvil Dimensions

### Jaw Tooling

![Jaw Tooling Diagram]  

**Fig. 4: Dimensions**

<table>
<thead>
<tr>
<th>LETTER DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKER KIT NO.</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>63120-09</td>
</tr>
<tr>
<td>65320-08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LETTER DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKER KIT NO.</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>63120-09</td>
</tr>
<tr>
<td>65320-08</td>
</tr>
</tbody>
</table>

### Anvil

![Anvil Diagram]  

**Fig. 5: Dimensions**

<table>
<thead>
<tr>
<th>LETTER DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKER KIT NO.</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>63120-09</td>
</tr>
<tr>
<td>65320-08</td>
</tr>
</tbody>
</table>

**NOTE:** 1) NUMBER IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.

<table>
<thead>
<tr>
<th>PANEL THICKNESS</th>
<th>PART COLOR</th>
<th>ANVIL KIT NO.</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 - 1.25 mm</td>
<td>GREEN</td>
<td>65500-00</td>
<td>0,197</td>
<td>5,0</td>
<td>0,625</td>
<td>15,9</td>
</tr>
<tr>
<td>1.25 - 2.50 mm</td>
<td>BLACK</td>
<td>65500-01</td>
<td>0,197</td>
<td>5,0</td>
<td>0,625</td>
<td>15,9</td>
</tr>
<tr>
<td>2.50 - 3.75 mm</td>
<td>SILVER</td>
<td>65500-02</td>
<td>0,197</td>
<td>5,0</td>
<td>0,625</td>
<td>15,9</td>
</tr>
<tr>
<td>3.75 - 4.75 mm</td>
<td>GOLD</td>
<td>65500-03</td>
<td>0,197</td>
<td>5,0</td>
<td>0,625</td>
<td>15,9</td>
</tr>
</tbody>
</table>

**NOTE:** 1) NUMBER IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.
3.5 Total Clamp Force

The total clamp force can be determined by multiplying the air pressure by the clamp force multiplier \( C_f \).

The greatest clamp force occurs during the last 2.40° of total jaw rotation. The jaw tooling/anvil combination must be selected so that the jaws cannot close completely. The anvil must be adjusted to the material to be stamped.

To achieve maximum clamp force, custom tooling must not restrict the jaws from closing completely.

![Diagram of Total Clamp Force](image)

Information for PNC44

<table>
<thead>
<tr>
<th>AIR PRESSURE</th>
<th>TOTAL CLAMP FORCE</th>
<th>PNC44</th>
</tr>
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<tbody>
<tr>
<td>psi</td>
<td>bar</td>
<td>lb</td>
</tr>
<tr>
<td>30</td>
<td>2.06</td>
<td>3105</td>
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<td>9315</td>
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<tr>
<td>100</td>
<td>6.89</td>
<td>10350</td>
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</tbody>
</table>

**Fig. 7: PNC44x-x-S16-S16-LAA Tip Combination**
### Information for PNC55

**PNC55**

<table>
<thead>
<tr>
<th>PRESSURE</th>
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<tbody>
<tr>
<td>psi</td>
<td>bar</td>
</tr>
<tr>
<td>30</td>
<td>2.06</td>
</tr>
<tr>
<td>40</td>
<td>2.76</td>
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<td>4.14</td>
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<td>4.83</td>
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<tr>
<td>90</td>
<td>6.21</td>
</tr>
<tr>
<td>100</td>
<td>6.89</td>
</tr>
</tbody>
</table>

**COLOR/DESCR.**

- GREEN ANVIL: 60 psi, 6 bar
- BLACK ANVIL: 60 psi, 6 bar
- SILVER ANVIL: 60 psi, 6 bar
- GOLD ANVIL: 60 psi, 6 bar

**AIR PRESSURE**

- (Cf) = 170,0 N
- 667 lb
- 890 lb
- 1112 lb
- 1334 lb
- 1557 lb
- 1779 lb
- 2002 lb
- 2224 lb

**B01**

**WARNING!** Danger caused by misuse!

Misusing the Series PNC Number Cruncher can cause dangerous situations.
- Maximum pressure with option -B01 is 90 psi max. (6.2 bar max.)

<table>
<thead>
<tr>
<th>PRESSURE</th>
<th>TOTAL CLAMP FORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>bar</td>
</tr>
<tr>
<td>30</td>
<td>2.06</td>
</tr>
<tr>
<td>40</td>
<td>2.76</td>
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<tr>
<td>50</td>
<td>3.45</td>
</tr>
<tr>
<td>60</td>
<td>4.14</td>
</tr>
<tr>
<td>70</td>
<td>4.83</td>
</tr>
<tr>
<td>80</td>
<td>5.52</td>
</tr>
<tr>
<td>90</td>
<td>6.21</td>
</tr>
</tbody>
</table>

**COLOR/DESCR.**

- GREEN ANVIL: 60 psi, 6 bar
- BLACK ANVIL: 60 psi, 6 bar
- SILVER ANVIL: 60 psi, 6 bar
- GOLD ANVIL: 60 psi, 6 bar

**AIR PRESSURE**

- (Cf) = 292,0 N
- 38966 lb
- 51955 lb
- 64944 lb
- 77332 lb
- 90921 lb
- 103919 lb
- 116899 lb
- 136899 lb

**Fig. 8: PNC55x-x-S16-S16-LAA Tip Combination**

**Fig. 9: PNC55x-x-S16-S16-LAA-B01 Tip Combination**
## 4 Structure and Functions

### 4.1 Ordering Data

**TO ORDER SPECIFY:**
- Size, Mounting, Design No., Jaw Option (A & B), Jaw Opening (A & B), and Fitting Option if desired.

#### MOUNTING
- **N** - No Mounting
- **P** - Rear Mounting Plate
- **R** - 1” [25.4] Non-Spherical Mounting Bracket
- **V** - 1-1/4” [31.8] Non-Spherical Mounting Bracket
- **M** - Side Mounting Plate

#### JAW OPTIONS - JAW A
- **JAW STYLE OPTION**
  - S - Standard Jaw (to accept Tip Kits)
- **JAW OPENING**
  - 16 - 16° Opening

#### JAW OPTIONS - JAW B
- **JAW STYLE OPTION**
  - S - Standard Jaw (to accept Tip Kits)
- **JAW OPENING**
  - 16 - 16° Opening

#### PORT FITTINGS
- **BLANK** - None
- **LAA** - 90° Swivel Fitting

---

**NOTES:**
1) Metric units have metric ports and mounting.
2) Tandem cylinder (B01 Option) available on PNC55 units only.
3) Numbers in [] are for metric units and are in mm.

---

**Example**

![Ordering Data Diagram](image)

**Fig. 10: Ordering Data**

**Additional Options**

- **Bxx** - **Fxx** - **Gxx** - **JAx** - **JBxx** - **Mxx** - **Sxx** - **PSxxx** - **TAxx** - **TBxx**

---

**Fig. 12: Additional Options**
4.2 Overview

Fig. 13: Overview

1 Jaw A with Jaw Tooling
2 Safety Lock-Out Pin
3 Non-Spherical Mounting Bracket
4 Compressed air connection “close”
5 Compressed air connection “open”
6 Blue, Self-Locking Screws
7 Jaw B with Anvil

4.3 Short Description

The device is pneumatically powered and is intended for installation within an industrial system. A piece of material is automatically guided into the device. The jaw tooling and anvil clamp the material and the characters in the backer and retainer are stamped into the material.

4.4 Jaw Tooling and Anvil

Jaw Tooling (JAW A - Backer and Retainer)

Anvil (JAW B - Anvil)

4.5 Options and Accessories

Please see the catalog or contact your authorized distributor for more information. For contact information, please see section 1.5 “Customer Service” on page 2. There are special versions of Number Cruncher with e.g. longer jaws or automatic numbering heads. Please contact Customer Service.
4.5.1 Mounting Brackets (Optional)
4.5.1.1 Rear Mounting Bracket

PNCxx® Designation

NOTES:
1) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.
2) PLATE MAY ROTATE IN 45° INCREMENTS ABOUT UNIT CENTERLINE.

Kit Number 63099-02

TIGHTEN TO 85 in-lbs [9.6 Nm]

NOTE:
REMOVAL OF 8 CAP SFHCS IS REQUIRED BEFORE REAR MOUNTING PLATE CAN BE ASSEMBLED.

Fig. 16: Rear Mounting Bracket Kit
4.5.1.2 Side Mounting Bracket

**PNCxx M** Designation

**NOTE:**
REMOVAL OF 4 IMPACT PLATE SHCS IS REQUIRED BEFORE SIDE MOUNTING PLATE CAN BE ASSEMBLED.

**SAFETY LOCK-OUT PIN HOLES**

TIGHTEN TO 85 in-lbs [9.6 Nm]

**NOTE:**
NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.

### LETTER DIM

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>DIM</th>
<th>PNC44</th>
<th>PNC55</th>
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<tbody>
<tr>
<td>M3</td>
<td>in</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.283</td>
<td>58.0</td>
</tr>
<tr>
<td>M4</td>
<td>0.784</td>
<td>19.9</td>
<td>1.176</td>
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</table>

When PS(R) option is ordered with PNCxxM option, the switch housing position takes precedence over the mount position.
4.5.1.3 Non-Spherical Mounting Bracket

**PNCxxR**

**PNCxxV**

Designation

---

**NOTES:**
1) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.
2) BRACKET MAY ROTATE 360° ABOUT M4 TUBE.

---

**PNCxxR**

Kit Number 63099-01

**PNCxxV**

Kit Number 63099-04

---

**Fig. 19: Non-Spherical Mounting Bracket**

**Fig. 20: Non-Spherical Mounting Kit**
4.5.2 Port Fittings (Optional)

<table>
<thead>
<tr>
<th>LETTER</th>
<th>DIM</th>
<th>MODEL NUMBER</th>
<th>PNCxx</th>
<th>NOTE: TO ORDER FITTINGS SEPARATELY, PART NO. 62178-010 -IMPERIAL PART NO. 62195-010 -METRIC</th>
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</thead>
<tbody>
<tr>
<td>PF1</td>
<td>0,767</td>
<td>20,5</td>
<td></td>
<td></td>
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<tr>
<td>PF2</td>
<td>1,102</td>
<td>28,0</td>
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<td>PF3</td>
<td>0,551</td>
<td>14,0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig. 21: Port Fittings

4.5.3 Tandem Cylinder (Optional)

PNC55 can be augmented with a second cylinder. The second cylinder is mounted directly to the back of the device. This increases the clamp force by 70%.

Fig. 22: Tandem Cylinder

WARNING!
Danger caused by misuse!
Misusing the Series PNC Number Cruncher can cause dangerous situations.
- Maximum pressure with option -B01 is 90 psi max. (6,2 bar max.)
NOTES:
1) ALL DIMENSIONS ARE REFERENCE UNLESS SPECIFICALLY TOLERANCED.
2) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.

<table>
<thead>
<tr>
<th>CLAMP SIZE</th>
<th>WEIGHT ADDER</th>
<th>LENGTH ADDER</th>
<th>TOTAL CLAMP FORCE AT 87 psi [6 bar]</th>
<th>DISPLACEMENT</th>
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<tbody>
<tr>
<td>55</td>
<td>5.4 lb</td>
<td>3.59 in</td>
<td>32440 N</td>
<td>19.60 in³</td>
</tr>
<tr>
<td></td>
<td>2.45 kg</td>
<td>91.2 mm</td>
<td></td>
<td>321 in³</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>41.74 in³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>684 in³</td>
</tr>
</tbody>
</table>

Example of ordering data. The shaded codes are required.
PNC 55 N-5-S16-S16-LAA -B01

Mounting Brackets
The tandem cylinder can be used with the following mounting bracket options: P, R, V and M.

4.5.4 Port Fittings for the Tandem Cylinder (Optional)

NOTES:
1) ALL DIMENSIONS ARE REFERENCE UNLESS SPECIFICALLY TOLERANCED.
2) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.

1 Compressed air connection “close”
2 Compressed air connection “close”
3 Compressed air connection “open”
4 Breather Vent

Fig. 23: Port Fittings for the Tandem Cylinder
4.5.5 Welding Slag Shields (Optional)

Protection from flying sparks and weld slag. Only available for PNC55.

Fig. 24: Welding Slag Shields

4.5.6 Quick Change Tooling Jaw (Optional)

Characters can be changed more quickly with the quick change tooling jaw. No tools are required.

Fig. 25: Quick Change Tooling Jaw

4.5.7 Positional Sensing Detection (Optional)

An aluminum housing with integrated sensors can be installed on the device to sense the positions of the jaws in the “open” or “closed” position.

Please consult the catalog for additional options for positional sensing.

Fig. 26: Positional Sensing Detection

NOTES:
1) ALL DIMENSIONS ARE REFERENCE UNLESS SPECIFICALLY TOLERANCED.
2) NUMBERS IN [ ] ARE FOR METRIC UNITS AND ARE IN mm.
5.1 Safety Instructions for Transportation

Falling Loads

CAUTION!
Risk of crushing from falling loads!
Hands or feet may be crushed by the careless handling of the package.
- Be careful when handling the package.
- Do not throw the package.
- Wear protective gloves and protective boots.

Improper Transportation

ATTENTION!
Risk of material damages from improper transport!
The shipment can fall or overturn with improper transportation. This could cause a significant amount of material damages.
- Be careful when unloading the shipment upon delivery as well as during the internal transportation and observe the symbols and instructions on the packaging.
- Do not remove the packaging until shortly before installation.

5.2 Transportation Inspection

Check the delivery immediately after receipt for completeness and transportation damages.
Proceed as follows for externally detectable transportation damages:
- Do not accept the delivery or only accept it conditionally.
- Note the extent of the damages on the transportation documents or the delivery note of the transporter.
- File a claim.

ATTENTION!
Report any defect as soon as it is noticed. Damage compensation claims can only be honored within the valid claim period.

5.3 Packaging

About the Packaging
The individually packed articles are packaged in accordance with the expected transportation materials. Only environmentally friendly materials are used for the packaging.
The packaging should protect the individual components from transportation damages, corrosion and other damages until they are installed. Therefore, do not destroy the packaging and do not remove until shortly before installation.

Handling the Packaging Materials
Dispose of the packaging materials in accordance with the valid legal conditions and local regulations.

5.4 Storage

Storage of the Packaged Articles
Store the packaged articles under the following conditions:
- Do not store outside.
- Store in a dry, dust-free environment.
- Do not expose packaged articles to any aggressive agents.
- Keep away from sunlight.
- Avoid mechanical vibrations.
- Storage temperature: 15 to 35 °C.
- Relative humidity: max. 60 %.
- In the event of storage periods longer than 3 months, regularly check the general condition of all parts and the packaging. Refresh or replace the preservative measures, if necessary.

ATTENTION!
Storage instructions which vary from the regulations named here may appear on the packaged articles under certain circumstances. Follow these accordingly.
6 Installation and First Setup

6.1 Safety Instructions for Installation and First Startup

Robot Movements

**WARNING!**
Risk of injury from robot movements!
Installation and first startup work may take place within the movement range of the industrial system. The collision of moving parts of the industrial system with persons or objects can cause potentially fatal injuries and severe material damages.
- The power supply of the industrial system, the industrial control system and the pneumatic system must be turned off before any work is conducted and secured against being turned back on.
- Remove air from all pressure lines.
- Mechanically block possible hazardous movements.

Pneumatics

**WARNING!**
Risk of injury from the pneumatic system!
Severe injuries can be caused by leak or improper connections in the pneumatic system.
- Work on the pneumatic system may only be conducted by qualified pneumatic technicians.
- Check the pneumatic system for leaks before starting up the device.

Changing the Parameters of the Industrial Robot

The following parameters of the industrial system may change based on the installation of the device.
- The size of the movement range/hazardous area
- The load is increased by the weight of the system
- The loading capacity is reduced by:
  - Increasing the tool load
  - Enlarging the center of gravity of the load

SHCS

When using screws, please note:
- Screw tightening torque
- Screw-in depth
- Strength classes

6.2 Preparations

The operator’s pneumatic system must be operational. Please see the section “Technical Data” for specifications.

6.3 Installation

6.3.1 Attaching the Mounting Bracket to the Device
The manufacturer offers multiple mounting brackets which can be attached to the device.

6.3.1.1 Attaching the Rear Mounting Bracket

**Fig. 26: Rear Mounting Bracket**
1. SHCS 8 x M6, tightening torque 9.6 Nm
2. Rear mounting bracket

**Personnel:**
- Specialist

**Special tools:**
- Allen wrench
- Torque wrench

**Fig. 27: Rear Mounting Plate Rotation**
1. Place the safety lock-out pin in the “lock-out” location.
2. Remove 8 SFHCS before installing rear mounting plate (Fig. 26/1).
3. Orient the rear mounting plate (Fig. 26/2) so that the holes in the device and mounting plate are aligned.
4. Tighten SHCS (Fig. 26/1). Observe the tightening torque of 9.6 Nm.
5. Place the safety lock-out pin in the “storage” location.

The mounting plate can also be rotated by 45°.
6.3.1.2 Attaching the Side Mounting Plate

Fig. 28: Side Mounting Plate
1 SHCS 4 x M6, tightening torque 9,6 Nm
2 Holes for the safety lock-out pin
3 Side mounting plate

Personnel: 
Specialist

Special tools: 
Allen wrench
Torque wrench

1. Place the safety lock-out pin in the “lock-out” location (Fig. 28/2).
2. Remove 4 SHCS before installing side mounting plate (Fig. 28/1).

The mounting plate can be attached to either side of the device.
The safety lock-out pin must be inserted from the opposite side during the attachment of the mounting plate.

3. Orient the mounting plate (Fig. 28/3) so that the safety lock-out pin holes in the unit are aligned with the holes in the mounting plate.
4. Tighten SHCS (Fig. 28/1).
Observe the tightening torque of 9,6 Nm.
5. Place the safety lock-out pin in the “storage” location.

6.3.1.3 Attaching the Non-Spherical Mounting Bracket

Fig. 29: Non-Spherical Mounting Bracket
1 SHCS, 3 x M10, tightening torque 14,1 Nm
2 Bracket halves

Personnel: 
Specialist

Special tools: 
Allen wrench
Torque wrench

1. Place the safety lock-out pin in the “lock-out” location.
2. Place the device between the two bracket halves.
3. Tighten SHCS A (Fig. 29/1). Observe the tightening torque of 14,1 Nm.
The device can be shifted.
4. Tighten SHCS C until the device can no longer be rotated.
5. Tighten SHCS B.
Observe the tightening torque of 14,1 Nm.
6. Tighten SHCS C.
Observe the tightening torque of 14,1 Nm.
7. Place the safety lock-out pin in the “storage” location.

6.3.2 Mechanically Connect the Device to the Industrial Robot

Personnel: 
Specialist

Protective equipment: 
Protective boots

Special tools: 
Allen wrench

1. Connect the mounting bracket of the device to the industrial robot.
6.3.3 Attaching the Jaw Tooling

The jaw tooling must be adjusted to the material to be stamped.

Fig. 30: Jaw Tooling
1 SHCS 2 x M6, tightening torque 14,1 Nm
2 Jaws
3 Backing Plate
4 Characters
5 Retainer
6 SHCS 2 x M6 or 2 x M8, tightening torque 14,1 Nm

Personnel: ■ Specialist
Special tools: ■ Allen wrench ■ Torque wrench

1. Place the safety lock-out pin in the “lock-out” location.
2. Insert the required characters into the retainer.
3. Assemble retainer SHCS, characters with retainer and the backing plate and attach them to the jaws with SHCS.
4. Tighten SHCS.
   Observe the tightening torque of 14,1 Nm.
5. Place the safety lock-out pin in the “storage” location.

6.3.4 Attaching the Anvil

The anvil must be adjusted to the material to be stamped.

Fig. 31: Anvil
1 Anvil plate
2 Jaws
3 SHCS 2 x M6, tightening torque 14,1 Nm

Personnel: ■ Specialist
Special tools: ■ Allen wrench ■ Torque wrench

1. Place the safety lock-out pin in the “lock-out” location.
2. Attach the anvil plate to the jaws using the SHCS.
   Observe the tightening torque of 14,1 Nm.
3. Tighten SHCS.
4. Place the safety lock-out pin in the “storage” location.

6.4 Connecting the Compressed Air Supply

The unconnected compressed air connections must be sealed with compressed air plugs.

Fig. 32: Compressed Air Connections
1 Compressed air connection “close”
2 Compressed air connection “open”

Personnel: ■ Specialist
1. Place the safety lock-out pin in the “lock-out” location.
2. Properly connect the operator’s pneumatic system. To do so, press the compressed air lines until the connections automatically lock into place.
   Compressed air connection for closing the jaws: Fig. 32/1.
   Compressed air connection for opening the jaws: Fig. 32/2.
3. Remove safety lock-out pin.
4. Inspect the functionality of the device.
5. Place the safety lock-out pin in the “storage” location.

6.5 Connecting the Positional Sensing Detection (Optional)

**DANGER!**
Risk of fatal injury from electrical current!
The device can optionally be equipped with proximity switches with different (partial/high) voltages. There is a direct risk of fatal injury from electrical shock if current-carrying parts are touched. Damages to the insulation or the individual components could result in fatal injuries.
- Allow only qualified electricians to work on the electrical system.
- Do not supply the sensor with electrical power while work is being conducted.
- Check the insulation for damages and replace it if necessary.

You can obtain information about the positional sensing detection from the manufacturer or from an authorized distributor. See page 2 for contact information.

6.6 First Startup

Personnel: ■ Specialist
1. Ensure that there are no persons located in the hazardous area.
2. Inspect the functionality of the device in conjunction with the control system and the industrial system. To do so, move through all possible movements and operating conditions.

7 Operation

7.1 Safety Instructions for Operation

**WARNING!**
Risk of crushing from manual operation!
Manual guiding of the material can result in severe injuries from the crushing of the hands.
- Only allow the material to be automatically guided.

7.2 Activation/Normal Operation

The device is not specially activated. The device is ready for use after being installed on the industrial system and being supplied with compressed air. The device is exclusively powered by the operator’s pneumatic system.

7.3 Deactivation

The device does not have to be specially deactivated. The device is deactivated when the operator’s compressed air supply is interrupted.

7.4 Using the Quick Change Tooling Jaw (Optional)

**Fig. 33: Quick Change Tooling Jaw**

**Fig. 34: Jaw Tooling**

**Fig. 35: Hand Retractable Plunger**

Personnel: ■ Specialist
1. Place the safety lock-out pin in the “lock-out” location.
2. In order to change the jaw tooling (Fig. 34), pull out the cylinder with the help of the hand retractable plunger (Fig. 35).
3. Remove and/or insert the jaw tooling.
4. Align the hole in the middle of the jaw tooling with the cylinder.
5. Release the cylinder.
6. Place the safety lock-out pin in the “storage” location.
8 Maintenance

8.1 Safety Instructions for Maintenance

Compression Spring Under Tension

⚠️ WARNING!
Risk of injury from compression spring under tension!

Strong springs are compressed inside the device. This stored spring force can cause severe injuries during disassembly.

- Do not open or disassemble the device.

Pneumatics

⚠️ WARNING!
Risk of injuries from movements caused by stored pneumatic energy!

The device is connected to the operator’s pneumatic system. Pneumatically driven components can move unexpectedly and cause severe injuries due to stored residual energy.

- Allow only qualified pneumatic technicians to work on the pneumatic system.
- The pneumatic system must be completely depressurized before beginning work on the device. Completely empty pressure reservoir.

8.2 Replacement Parts

⚠️ WARNING!
Risk of injury from the use of improper replacement parts!

Risks to the personnel as well as damages, malfunctions or a total failure could be caused by the use of improper or defective replacement parts.

- Use only original replacement parts of the manufacturer or replacement parts approved by the manufacturer.
- Always contact the manufacturer or an authorized distributor if you have any questions.

Loss of Warranty
The manufacturer’s warranty is void in the event of the use of unapproved replacement parts.

Obtain your replacement parts from authorized distributors or directly from the manufacturer. For contact information, please see section 1.5 “Customer Service” on page 2.

8.3 Maintenance Schedule

The maintenance work required for the optimal, trouble-free operation of the device is described in the following section.

If increased wear is detected during the regular inspections, reduce the required maintenance intervals in accordance with the actual wear. Please contact the manufacturer with any questions about maintenance work and intervals using the contact information in section 1.5 “Customer Service” on page 2.

The maintenance intervals provided are based on the following operational loads:

- 1 cycle/s
- 30 cycles/min
- 1,800 cycles/h
- 43,200 cycles/day
- 302,400 cycles/week

<table>
<thead>
<tr>
<th>Interval</th>
<th>Maintenance Work</th>
<th>Personnel</th>
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<tbody>
<tr>
<td>After 200,000 cycles</td>
<td>For lubrication, please see section 8.4.2 “Lubrication” on page 25.</td>
<td>Specialist</td>
</tr>
<tr>
<td>Daily</td>
<td>For cleaning, please see section 8.4.1 “Cleaning” on page 24.</td>
<td>Specialist</td>
</tr>
</tbody>
</table>

8.4 Maintenance Tasks

8.4.1 Cleaning

![Fig. 36: Safety Lock-Out Pin](image)

1. Place the safety lock-out pin in the “lock-out” location.
2. Remove any heavy debris from the device, such as chips.

Clean the surface of the device with a lint-free cloth. Use cleaning spirits to remove lubricant, if necessary.

Do not use any aggressive cleaning products.
Do not use any separating agents containing silicone.
Do not use any high pressure, water pressure or steam cleaners.
Do not use compressed air.

1. Storage Location
2. “Lock-out” Location

Personnel: Specialist
Special Tools: Lint-free cloth
Cleaning spirits
3. Look for and identify the blue socket head cap screws (SHCS) on the device.

   The SHCS of the device are marked blue. This makes them easy to distinguish from chips and other materials and will thus not be mistakenly included in the additional processing of these materials. This allows damages to be avoided.

4. Place the safety lock-out pin in the “storage” location.

### 8.4.2 Lubrication

![Fig. 37: Lubrication](image)

1. Roller bearing - oil with viscosity W30
2. Spring cover
3. Grease zerk - bearing grease for applications under high-pressure
4. Gap between jaws

Personnel:
- Specialist

Special tools:
- Grease gun
- Oil can
- Lubrication oil

Materials:
- Bearing grease

1. Place the safety lock-out pin (Fig. 36) in the “lock-out” location.
2. Lubricate the roller bearings (Fig. 37/1). To do so, apply oil with a viscosity of W30 in the slotted holes of the spring covers with an oil can (Fig. 37/2).
   
   This will allow the oil to be distributed to all moving parts inside the device.
3. Apply bearing grease with a grease gun in the grease zerks (Fig. 37/3) until grease squeezes out the gap between the jaws (Fig. 37/4).
4. Place the safety lock-out pin in the “storage” location.

### 8.5 Measures Conducted After Maintenance

Conduct the following steps after completing the maintenance work and before turning on the device:

1. Check that all loosened screws are now firmly tightened.
2. Check whether the device is again properly installed on the industrial system.
3. Check whether all protective devices and covers of the industrial system which have been removed have been properly replaced.
4. Ensure that all tools, materials and other equipment used have been removed from the work area.
5. Clean the work area and remove any possible excess lubricants.
6. Ensure that all safety devices of the PNC unit and the industrial system are functioning properly.

### 9 Faults

The possible causes for faults are described in the following section.

In the event of the increased occurrence of faults, reduce the maintenance intervals in accordance with the actual load.

Please contact the manufacturer if any faults occur using the contact information in section 1.5 “Customer Service” on page 2.

#### 9.1 Signs of Faults

Faults can be detected by the presence of:
- Unusual vibrations
- Unusual noises
- Blockages

#### 9.2 Conduct in the Event of Faults

In general:

1. Immediately activate the emergency shutdown in the event of faults that present a direct risk to persons or material assets.
2. Determine the cause of the fault.
3. If troubleshooting requires work in a hazardous area, turn off the device and secure it against being turned back on.
   
   Inform the responsible party at the location of use about the fault.
4. All faults are to be corrected only by authorized personnel.

#### 9.3 Startup After Remedy of a Fault

Conduct the following steps when starting the device up after correcting a fault:

1. Ensure that there are no persons located in the hazardous area.
2. Start the industrial system in accordance with the information provided by the manufacturer.
3. Check the functionality of the device while connected to the industrial system in all possible program phases and operating modes.
10 Dismounting and Disposal

Once the service life of the device has been reached, the device must be removed and/or replaced. The old device must be disposed of in an environmentally compatible manner.

10.1 Safety Instructions for Dismounting and Disposal

Improper Dismounting

**WARNING!**
Risk of injury from improper dismounting!
Movements of the industrial system, stored residual energy, sharp components, tips and corners in and around the device or on the required tools could cause injuries.

- Shutdown the industrial system and secure it against being turned back on before conducting any work.
- Render all pressure-carrying components and lines pressureless.
- Ensure that there is sufficient space.
- Handle components with sharp edges carefully.
- Ensure that the work place is clean and orderly!
- Only dismount the device as a whole.
- Do not open or disassemble the device.
- Always contact the manufacturer or an authorized distributor if you have any questions.

10.2 Dismounting

Personnel: □ Specialist

Protective equipment: □ Protective gloves
□ Protective glasses

1. Turn off the industrial system and the entire pneumatic system and secure it against being turned back on.
2. Discharge any stored residual energy. Render all pressure-carrying components and lines depressurized.

**WARNING!**
Risk of injury from compressed spring!
Strong springs are compressed inside the device. This stored spring force can cause severe injuries during disassembly.

- Do not open or disassemble the device.

3. Properly clean the device while observing valid local occupational safety and accident prevention guidelines.

10.3 Disposal

If return or disposal agreements have been made, dispose of the components as follows:

- Provide metals for scrapping.
- Recycle plastic elements.
- Dispose of other components in accordance with their material properties.

**ATTENTION!**
Risk of environmental damage from improper disposal!
Damage to the environment could result from the improper disposal.
- Allow approved specialist companies to dispose of electrical scrap, electronic components, lubricants and other auxiliary materials.
- If there are questions, obtain information about environmentally compatible disposal from the local municipal authorities or special disposal companies.
11 Appendix

11.1 Replacement Parts PNC44x

Fig. 38: PNC44x
## PART DESCRIPTION

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11.2 Replacement Parts PNC55x

**Fig. 39: PNC55x**

**KEY**

1. Body Imperial
2. Metric
3. Piston & Rod
4. Cam
5. Roller Bearing
6. Slider Bushing
7. Cap
8A. Impact Plate
8B. Jaw (A)
9. Jaw (B)
10. Bushing Block
11. Spring Cover
12. Spring Retainer Cup
13. Spring
14. Spring Step
15. Shock Pad
16. Impact Plate SHCS
17. Piston & Rod SHCS
18. Spring Cover SHCS
19. Spring Cover SHCS
20. Cap SFHCS
21. Pivot Pin
22. Roller Bearing Pin
23. Cam Pin
24. Spring Retainer Cup Pin
25. Rod Seal
26. Piston Seal
27. Cap Seal
28. Safety Lock-out Pin
29. Grease Zerk
30. Bushing Block Pin
31. Bushing Block SHCS
32. Seal Kit
33. Fastener Kit
34. Non-Spherical Mounting Bracket Kit Imperial 1"
35. Rear Mounting Plate Kit
36. Side Mounting Plate Kit
37. Oversize Non-Spherical Mounting Bracket Kit Imperial 1-1/4"

**KIT DESCRIPTION**

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- 63093
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- 63095
- 63096
- 63097-02
- 63098-01
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- 63099-04
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- 17831-059
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- 63101
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