Machine tooling technology

Zero-Point Clamping System

SPN

THE KNOW-HOW FACTORY
WE HAVE SUCCEEDED FOR YEARS BY OFFERING OUR CUSTOMERS INNOVATIVE AND INDIVIDUALIZED SOLUTIONS. ZIMMER HAS GROWN CONTINUOUSLY AND TODAY WE HAVE REACHED A NEW MILESTONE: THE ESTABLISHMENT OF THE KNOW-HOW FACTORY. IS THERE A SECRET TO OUR SUCCESS?

Foundation. Excellent products and services have always been the foundation of our company’s growth. Zimmer is a source of ingenious solutions and important technical innovations. This is why customers with high expectations for technology frequently find their way to us. When things get tricky, Zimmer Group is in its best form.

Style. We have an interdisciplinary approach to everything we do, resulting in refined process solutions in six technology fields. This applies not just to development but to production. Zimmer Group serves all industries and stands ready to resolve even the most unique and highly individualized problems. Worldwide.

Motivation. Customer orientation is perhaps the most important factor of our success. We are a service provider in the complete sense of the word. With Zimmer Group, our customers have a single, centralized contact for all of their needs. We approach each customer’s situation with a high level of competence and a broad range of possible solutions.
TECHNOLOGIES

HANDLING TECHNOLOGY

MORE THAN 30 YEARS OF EXPERIENCE AND INDUSTRY KNOWLEDGE: OUR PNEUMATIC, HYDRAULIC AND ELECTRICAL HANDLING COMPONENTS AND SYSTEMS ARE GLOBAL LEADERS.

Components. More than 2,000 standardized grippers, swivel units, robotic accessories and much more. We offer a complete selection of technologically superior products that are ready for rapid delivery.

Semi-standard. Our modular approach to design enables custom configurations and high rates of innovation for process automation.

DAMPING TECHNOLOGY

INDUSTRIAL DAMPING TECHNOLOGY AND SOFT CLOSE PRODUCTS EXEMPLIFY THE INNOVATION AND PIONEERING SPIRIT OF THE KNOW-HOW FACTORY.

Industrial damping technology. Whether standard or customized solutions, our products stand for the highest cycle rates and maximum energy absorption with minimal space requirements.

Soft Close. Development and mass production of pneumatic and fluid dampers with extraordinary quality and rapid delivery.

OEM and direct. Whether they need components, returning mechanisms or complete production lines – we are the trusted partner of many prestigious customers.

LINEAR TECHNOLOGY

WE DEVELOP LINEAR COMPONENTS AND SYSTEMS THAT ARE INDIVIDUALLY ADAPTED TO OUR CUSTOMERS’ NEEDS.

Clamping and braking elements. We offer you more than 4,000 types for profiled and round rails as well as for a variety of guide systems from all manufacturers. It makes no difference whether you prefer manual, pneumatic, electric or hydraulic drive.

Flexibility. Our clamping and braking elements ensure that movable components such as Z-axes or machining tables maintain a fixed position and that machines and systems come to a stop as quickly as possible in an emergency.

www.zimmer-group.com
PROCESS TECHNOLOGY

MAXIMUM EFFICIENCY IS ESSENTIAL FOR SYSTEMS AND COMPONENTS USED IN PROCESS TECHNOLOGY. HIGH-LEVEL CUSTOM SOLUTIONS ARE OUR TRADEMARK.

A rich reservoir of experience. Our know-how ranges from the development of materials, processes and tools through product design to production of series products.

Deep production capabilities. The Zimmer Group pairs these capabilities with flexibility, quality and precision, even when making custom products.

Series production. We manufacture demanding products out of metal (MIM), elastomers and plastics with flexibility and speed.

MACHINE TECHNOLOGY

ZIMMER GROUP DEVELOPS INNOVATIVE METAL, WOOD AND COMPOSITE MATERIAL PROCESSING TOOL SYSTEMS FOR ALL INDUSTRIES. NUMEROUS CUSTOMERS CHOOSE US AS THEIR SYSTEMS AND INNOVATION PARTNER.

Knowledge and experience. Industry knowledge and a decades-long development partnership in exchangeable assemblies, tool interfaces and systems make us bound for new challenges around the world.

Components. We deliver numerous standard components from stock and develop innovative, customized systems for OEM and end customers – far beyond the metal and wood processing industries.

Variety. Whether you have machining centers, lathes or flexible production cells, the power tools, holders, assemblies and drilling heads of Zimmer Group are ready for action.

SYSTEM TECHNOLOGY

ZIMMER GROUP IS ONE OF THE LEADING SPECIALISTS IN THE DEVELOPMENT OF CUSTOMIZED SYSTEM SOLUTIONS WORLDWIDE.

Customized. A team made up of more than 20 experienced designers and project engineers develop and produce customized solutions for special tasks in close collaboration with end customers and system integrators. It doesn’t matter if it is a simple gripper and handling solution or a complex system solution.

Solutions. These system solutions are used in many industries, from mechanical engineering to the automotive and supplier industries to plastics engineering and consumer goods industries, all the way to foundries. The Know-how Factory helps countless companies to thrive competitively by increasing automation efficiency.
# SPN ZERO-POINT CLAMPING SYSTEM

## ORDER INFORMATION

### STRUCTURE OF THE ORDER NUMBER

<table>
<thead>
<tr>
<th>Structure</th>
<th>Example</th>
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<tbody>
<tr>
<td>Clamping system</td>
<td>[S] Clamping system</td>
</tr>
<tr>
<td>Actuation</td>
<td>[P] Pneumatic</td>
</tr>
<tr>
<td>Characteristics</td>
<td>[N] Zero point clamping system</td>
</tr>
<tr>
<td>Installation size</td>
<td>Diameter [mm]</td>
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<tr>
<td>Design</td>
<td>[E] Insertion element</td>
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<tr>
<td>Operating pressure</td>
<td>4 bar, 6 bar</td>
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<tr>
<td>Versions</td>
<td>SD Standard, AD Advanced</td>
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<tr>
<td>Model series</td>
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</tbody>
</table>

Example: S P N 112 E 6 AD - B

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**www.zimmer-group.com**  ▶  Data, Drawings, 3-D Models, Operating Instructions
SPN ZERO-POINT CLAMPING SYSTEM
ADVANTAGES

► Increased Productivity

By automating processes the zero point clamping system dramatically increases productivity of processes that required precision. Machine set-up times are reduced by up to 90%, and cleaning and maintenance of the system is minimal. The option to link processes, one after the other, in a single workpiece clamping system, in various machining cells and equipped with identical clamping system geometries, allows previously unrealized synergies. The workpiece carrier with the zero point clamping system accompanies the workpiece all the way through the production process, thus ensuring the ultimate in precision and cost efficiency.

WITHOUT ZERO POINT CLAMPING SYSTEM

<table>
<thead>
<tr>
<th>Machine running time</th>
<th>Set-up of workpiece</th>
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</thead>
</table>

WITH ZERO POINT CLAMPING SYSTEM

<table>
<thead>
<tr>
<th>Machine running time</th>
<th>Change of pallet</th>
<th>Additional free machining capacity</th>
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</thead>
<tbody>
<tr>
<td>Ready the workpiece on a pallet when not processing</td>
<td></td>
<td></td>
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</table>

► Maximum repeatability and precision

The zero-point clamping system features a repeatability of 0.005 mm thanks to its sophisticated design. Thanks to its very high clamping forces and consistent use of tempered stainless steel, the system provides a high-precision, torsion-resistant base and also stabilizes parts that tend to vibrate.

► Increased process reliability

The zero-point clamping system reduces errors during milling, rotating, wire or die eroding, flat or cylindrical grinding, drilling, lasering and measuring. The maintenance-free design also contributes to the superior process reliability.

► Exactly the right system for your production

The modular zero-point clamping system from Zimmer Group gives you the right system for every requirement. In addition to a standard version reduced to the basic functions, which fulfills essential operations such as unlocking and a PLUS connection, there is also an advanced version with an extensive range of functions that are necessary for automated production, for example. Both variants feature positive locking via clamping segments that are specially adapted to the pin contour. This creates an extremely rigid system that can absorb the highest forces with maximum repeat accuracy. The product range is extended by many different types of clamping plates, available in every size and various configurations. To increase the protection of the particular zero-point clamping system and to prevent any intrusion of dirt, there is an optional automatic seal that reliably protects the pin opening.

Data, Drawings, 3-D Models, Operating Instructions ➤ www.zimmer-group.com
The zero-point clamping system of Zimmer Group’s Advanced series provides a number of functions that are one-of-a-kind in this form and composition. Functions such as the PLUS connection, positioning check and pneumatic piston position sensing are integrated as standard, as well as air discharge of the pin opening and contact surface cleaning. The zero-point clamping system offers two connection options for maximum flexibility: either via spot facing on the flange surface or via hoses at the base of the element. To ensure the best protection, in addition to the standard integrated blow-out function, there is also an automatic seal that reliably protects the pin opening. The zero-point clamping system is able to absorb maximum forces with maximum repeatability. This is achieved through a sophisticated clamping principle that uses clamping segments for positive locking. In comparison to conventional systems where balls are in point contact, clamping segments adapted to the clamping contour establish the surface contact between the clamping system and clamping pin. This gives the system a very high rigidity.

**TECHNICAL DETAILS**

1. Housing
2. Clamping pins
3. Cover
4. Clamp dog
5. Clamping segments
6. Spring assembly
7. Torque support/rotation lock
Zimmer Group’s standard zero-point clamping system is reduced to the essentials, with functions such as unlocking and a PLUS connection as well as the two torque reaction devices. Even this economical zero-point clamping system also uses the well-proven positive locking system by means of clamping segments. It therefore offers the best choice for a solution that is both cost-effective and high-quality. The range of accessories also offers an automatic seal for the pin opening, just like for the zero-point clamping system of the Advanced series.

**TECHNICAL DETAILS**

1. Housing
2. Clamping pins
3. Cover
4. Clamp dog
5. Clamping segments
6. Spring assembly
7. Torque support/rotation lock
SPN ZERO-POINT CLAMPING SYSTEM
FUNCTIONAL DESCRIPTION

► CLAMPED

► Clamping pins clamped in the zero-point clamping system
► Positive locking
► Clamped with no energy, so no power consumption

► OPEN

► Clamping pins not clamped in the zero-point clamping system
► Zero-point clamping system pressurized with compressed air
► Clamping mechanism is open

► HOSE-LESS CONNECTION

► All the functions can be controlled using the flange surface through spot facing

► HOSE CONNECTION

► Alternatively, the functions can be controlled using hoses at the base of the zero-point clamping system
When the additional PLUS connection is used on the zero-point clamping system, the clamping force can be significantly increased.

The housing is made of stainless steel – contact parts are tempered and thus wear-free.

Two integrated rotation locks enable torque support around the pin axis.
SPN ZERO-POINT CLAMPING SYSTEM
SERIES SPN

► OPTIONAL ACCESSORIES – AUTOMATIC SEAL

► To protect the pin opening reliably during operation, there is an automatic seal that descends when the clamping pin is inserted
► The automatic seal effectively prevents any dirt and chips from entering the zero-point clamping system
► In the Advanced series, the blow-out function is available with and without an automatic seal
► To provide optimum protection of the bolt opening, the delivery includes a locking bolt that closes the bolt opening when not in use

► Locking bolt
► With an automatic seal

► POSITIONING CHECK

► The pneumatic positioning check makes it possible to use an externally connected flowmeter (blue – flow) or pitot tube (orange – dynamic pressure) to check whether the workpiece or clamping pallet is laying correctly on the surface of the zero-point clamping system

► The clamped product is not resting correctly on the contact surface. - No dynamic pressure is generated
► The clamped product is resting correctly on the contact surface. - Dynamic pressure is generated

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**PISTON POSITION SENSING**

By directly sensing the piston position by means of pneumatic dynamic pressure, the status of the zero-point clamping system (open, clamped, clamping pins clamped) can be queried.

**Connection 4**
- Open: 0
- Clamped, with a clamping pin: 1
- Clamped, without a clamping pin: 1

**Connection 5**
- Open: 1
- Clamped, with a clamping pin: 0
- Clamped, without a clamping pin: 1

0 = dynamic pressure (orange)
1 = flow (blue)
In order to best redirect the forces of the device to be clamped, the displayed arrangement of clamping pins is recommended. This arrangement makes it possible to compensate for geometry errors that emerge from production tolerances or thermal expansion:

**Configuration with one zero-point clamping system**

When one zero-point clamping system is used, only one centering pin is needed. The centering pin secures the position in all three directions of the X, Y, Z coordinate system, thereby forming the zero point for the device to be secured in place. Two integrated rotation locks enable torque support around the pin axis.

**Configuration with two zero-point clamping systems**

When two zero-point clamping systems are used, a centering pin and a sword pin are needed. The sword pin can compensate for a change in length in one direction while absorbing the forces in the other two directions. It must be positioned so that it can support the torques applied around the centering pin in the Z direction.

**Configuration with four or more zero-point clamping systems**

When four or more zero-point clamping systems are used, retention pins are also needed in addition to the centering pin and sword pin. The retention pin can only absorb forces in the Z direction. It compensates for changes in length in the X and Y direction.
**SPN ZERO-POINT CLAMPING SYSTEM**

**CALCULATION EXAMPLE**

**Layout:**
- 4 Zero-Point Clamping System elements (assumed to be installation size SPN112)
- D = 112 mm
- X = 200 mm
- A = 350 mm
- $F_{\text{Cut}} = 5 \text{ kN}$ (cutting force)
- Safety $S = 2$

\[ \sum M = 0 \text{ (total of all moments = zero)} \]
\[ S \cdot F_{\text{Cut}} \cdot A \cdot 2 \cdot (F_{C} \cdot (X+D/2)+F_{C} \cdot D/2) = 0 \]
\[ F_{C} = S \cdot F_{\text{Cut}} \cdot A / (2X+2D) \]
\[ F_{C} = 2 \cdot 5 \text{ kN} \cdot 350 \text{ mm} / (2 \cdot 200 \text{ mm} + 2 \cdot 112 \text{ mm}) \]
\[ F_{C} = 5.6 \text{ kN} \]

**Selection of Zero-Point Clamping Systems:**
- SPN112E6AD-B clamping force = 6 kN

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SPN ZERO-POINT CLAMPING SYSTEM

APPLICATIONS

► EXAMPLES

Drilling

Milling

Honing

Laser cutting

Laser welding

Measuring

Friction stir welding

Stamping

Transport aircraft

Robotics

www.zimmer-group.com ➤ Data, Drawings, 3-D Models, Operating Instructions
### SPN ZERO-POINT CLAMPING SYSTEM

#### OVERVIEW

<table>
<thead>
<tr>
<th>Products</th>
<th>Operating pressure [bar]</th>
<th>Clamping force [kN]</th>
<th>Clamping force with PLUS connection [kN]</th>
<th>Rotation prevention</th>
<th>Contact monitoring</th>
<th>Piston position sensing</th>
<th>Page</th>
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<tbody>
<tr>
<td>SPN062 Advanced</td>
<td>4/6</td>
<td>1/2</td>
<td>2,5/5</td>
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<td>●</td>
<td>●</td>
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<td>1/2</td>
<td>2,5/5</td>
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<td>2,5/5</td>
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<td>10/15</td>
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<td>24/36</td>
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SPN ZERO-POINT CLAMPING SYSTEM
SPN062 ADVANCED

► PRODUCT ADVANTAGES

► Pre-positioning 18 mm before reaching end position
► Automatic centering and pull-in already 0,5 mm before reaching end position
► Resistant against contamination
► Mechanical locked in clamping position
► Low operating pressure of 4 or 6bar
► Maintenance free

► EQUIPMENT FEATURES

- Pneumatic
- Stainless steel
- Form fit
- Pins compatible with reference system
- PLUS connection
- Low height
- Tubeless connection
- Repeatability
- Torque support
- Hardened
- Automatic seal
- Piston position sensing / positioning check

► INCLUDED IN DELIVERY

- Mounting screw M3x8 12.9
  C0912030082
- O-Ring
  COR002010V
- Cover cap M3
  095138
- Venting filter
  CFILT00052
- Sealing pin
  SPZ062BV-B

► OPTIONAL ACCESSORIES

- Automatic seal
  SPZ062AV-B
# TECHNICAL DATA

<table>
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<tr>
<th>Order no.</th>
<th>Technical Data</th>
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<th>SPN062E4AD-B</th>
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<td>Retraction force [kN]</td>
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<td>1</td>
<td></td>
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<td>Pull-in force with PLUS connection [kN]</td>
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<td>2.5</td>
<td></td>
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<tr>
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<td>-10 ... +70</td>
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<tr>
<td>Rotation prevention</td>
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<td>PLUS connection</td>
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![Diagram](image-url)
SPN ZERO-POINT CLAMPING SYSTEM
SPN062 STANDARD

► PRODUCT ADVANTAGES

► Pre-positioning 18 mm before reaching end position
► Automatic centering and pull-in already 0,5 mm before reaching end position
► Resistant against contamination
► Mechanical locked in clamping position
► Low operating pressure of 4 or 6bar
► Maintenance free

► EQUIPMENT FEATURES

- Pneumatic
- Stainless steel
- Form fit
- Pins compatible with reference system
- PLUS connection
- Low height
- Tubeless connection
- Repeatability
- Torque support
- Hardened
- Automatic seal

► INCLUDED IN DELIVERY

- Mounting screw M3x8 12.9
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- O-Ring
  COR002010V
- Cover cap M3
  095138
- Venting filter
  CFILT00052
- Sealing pin
  SPZ062BV-B

► OPTIONAL ACCESSORIES

- Automatic seal
  SPZ062AV-B
## TECHNICAL DATA

### Technical Data

<table>
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<tr>
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<td><strong>Operating pressure [bar]</strong></td>
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<td><strong>Retraction force [kN]</strong></td>
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<td>-10 ... +70</td>
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### Technical Data

- **Release**
- **Plus connection**
- **Torque support**
- **Mounting screw zero-point clamping system**
- **Standard: hose-less connection**
- **Alternative: hose connection**

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**Data, Drawings, 3-D Models, Operating Instructions**

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SPN ZERO-POINT CLAMPING SYSTEM
SPN062P2 - CLAMPING PLATE

► 2-FOLD

- Compact design with optimized design height
- System assembly with high precision
- Integrated air supply/distribution
- Integrated PLUS connection
- Available with the advanced zero-point clamping system on request
- Variable mounting options

### Technical Data

<table>
<thead>
<tr>
<th></th>
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### Diagram

1. Release
2. Plus connection
6. Mounting screw*
7. Thread bore transport
8. Sealing cap
9. T-slot nut*
10. T-slot nut mounting screw*

* Not included in delivery
Order no. | SPN062P4E6SD-B | SPN062P4E4SD-B
---|---|---
Operation mode | Pneumatic | Pneumatic
Holding force max. | 4xM8 | 4xM8
Operating pressure [bar] | 6 ... 7 | 4 ... 7
Retraction force [kN] | 4x2 | 4x1
Pull-in force with PLUS connection [kN] | 4x5 | 4x2.5
Operating temperature [°C] | -10 ... +70 | -10 ... +70
Rotation prevention | Yes | Yes
PLUS connection | Yes | Yes
Air cleaning | No | No
Piston position sensing | No | No
Contact monitoring | No | No
Material | Tempered stainless steel/steel | Tempered stainless steel/steel
Weight [kg] | 9.8 | 9.8

► 4-FOLD

- Compact design with optimized design height
- System assembly with high precision
- Integrated air supply/distribution
- Integrated PLUS connection
- Available with the advanced zero-point clamping system on request
- Variable mounting options

Order no. SPN062P4E6SD-B SPN062P4E4SD-B
Operation mode | Pneumatic | Pneumatic
Holding force max. | 4xM8 | 4xM8
Operating pressure [bar] | 6 ... 7 | 4 ... 7
Retraction force [kN] | 4x2 | 4x1
Pull-in force with PLUS connection [kN] | 4x5 | 4x2.5
Operating temperature [°C] | -10 ... +70 | -10 ... +70
Rotation prevention | Yes | Yes
PLUS connection | Yes | Yes
Air cleaning | No | No
Piston position sensing | No | No
Contact monitoring | No | No
Material | Tempered stainless steel/steel | Tempered stainless steel/steel
Weight [kg] | 9.8 | 9.8

► Technical Data

1. Release
2. Plus connection
6. Mounting screw*
7. Thread bore transport
8. Sealing cap
9. T-slot nut*
10. T-slot nut mounting screw*

*Not included in delivery
SPN ZERO-POINT CLAMPING SYSTEM
SPN062P6 - CLAMPING PLATE

6-FOLD

► Compact design with optimized design height
► System assembly with high precision
► Integrated air supply/distribution
► Integrated PLUS connection
► Available with the advanced zero-point clamping system on request
► Variable mounting options

Order no.

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<td>Retraction force [kN]</td>
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<td>Pull-in force with PLUS connection [kN]</td>
<td>6x5</td>
<td>6x2.5</td>
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Technical Data

1. Release
2. Plus connection
3. Mounting screw*
4. Thread bore transport
5. Sealing cap
6. T-slot nut*
7. T-slot nut mounting screw*

* Not included in delivery

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## TECHNICAL DATA

### Technical Data

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<td>Ød2 [mm]</td>
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<td>Ød3 [mm]</td>
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<td>a [mm]</td>
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<td>12</td>
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<td>l [mm]</td>
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<tr>
<td>T [mm]</td>
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<td>3</td>
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<td>M *</td>
<td>M8</td>
<td>M8</td>
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<td>Mx **</td>
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*ISO 4762
Holding force 12.9 max. [kN]: M6 = 15 ; M8 = 25 ; M10 = 35 ; M12 = 50 ; M16 = 75
Holding force 10.9 max. [kN]: M6 = 12 ; M8 = 20 ; M10 = 30 ; M12 = 40 ; M16 = 60

**ISO 10642
Holding force 12.9 max. [kN]: M6 = 12 ; M8 = 20 ; M10 = 28 ; M12 = 40 ; M16 = 60
Holding force 10.9 max. [kN]: M6 = 9.5 ; M8 = 16 ; M10 = 24 ; M12 = 32 ; M16 = 48

---

[Images of technical drawings and parts labeled accordingly]
SPN ZERO-POINT CLAMPING SYSTEM
SPN112 ADVANCED

➤ PRODUCT ADVANTAGES

- Pre-positioning 22 mm before reaching end position
- Automatic centering and pull-in already 1 mm before reaching end position
- Resistant against contamination
- Mechanical locked in clamping position
- Low operating pressure of 4 or 6 bar
- Maintenance free

➤ EQUIPMENT FEATURES

- Pneumatic
- Stainless steel
- Form fit
- Pins compatible with reference system
- PLUS connection
- Low height
- Tubeless connection
- Repeatability
- Torque support
- Hardened
- Automatic seal
- Piston position sensing / positioning check

➤ INCLUDED IN DELIVERY

- Mounting screw
  M6x14 12.9
  C0912060144D
- O-ring
  3.5x1.5
  COR003515V
- Cover cap
  M6
  093088
- Venting filter
  CFILT00052
- Sealing pin
  SPZ112BV-B

➤ OPTIONAL ACCESSORIES

- Automatic seal
  SPZ112AV-B
### TECHNICAL DATA

#### Technical Data

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<td>M10/M12</td>
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<tr>
<td>Operating pressure [bar]</td>
<td>6 ... 7</td>
<td>4 ... 7</td>
</tr>
<tr>
<td>Retraction force [kN]</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Pull-in force with PLUS connection [kN]</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>-10 ... +70</td>
<td>-10 ... +70</td>
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<tr>
<td>Rotation prevention</td>
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<td>Yes</td>
</tr>
<tr>
<td>PLUS connection</td>
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<td>Yes</td>
</tr>
<tr>
<td>Air cleaning</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Contact monitoring</td>
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<td>Yes</td>
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<tr>
<td>Contact seal</td>
<td>Yes</td>
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<td>Repetition accuracy [mm]</td>
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<tr>
<td>Weight [kg]</td>
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</table>

#### Diagram

- **_Release**
- **Plus connection**
- **Blow out / cleaning / contact monitoring**
- **Monitoring: zero-point clamping system opened**
- **Monitoring: zero-point clamping system locked**
- **Torque support**
- **Mounting screw zero-point clamping system**
- **Standard: hose-less connection**
- **Alternative: hose connection**

---

Data, Drawings, 3-D Models, Operating Instructions  ➤ www.zimmer-group.com 27
SPN ZERO-POINT CLAMPING SYSTEM
SPN112 STANDARD

► PRODUCT ADVANTAGES

► Pre-positioning 22 mm before reaching end position
► Automatic centering and pull-in already 1 mm before reaching end position
► Resistant against contamination
► Mechanical locked in clamping position
► Low operating pressure of 4 or 6 bar
► Maintenance free

► EQUIPMENT FEATURES

Pneumatic
Form fit
PLUS connection
Tubeless connection
Torque support
Automatic seal

Stainless steel
Pins compatible with reference system
Low height
Repeatability
Hardened

► INCLUDED IN DELIVERY

Mounting screw
M6x14 12.9
C0912060144D

O-ring
3,5x1,5
COR003515V

Cover cap
M6
093088

Venting filter
CFILT00052

Sealing pin
SPZ112BV-B

► OPTIONAL ACCESSORIES

Automatic seal
SPZ112AV-B
## TECHNICAL DATA

### Technical Data

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<tr>
<td>Retraction force [kN]</td>
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<td>4</td>
</tr>
<tr>
<td>Pull-in force with PLUS connection [kN]</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>-10 ... +70</td>
<td>-10 ... +70</td>
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<tr>
<td>Rotation prevention</td>
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<td>Yes</td>
</tr>
<tr>
<td>PLUS connection</td>
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<td>Yes</td>
</tr>
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<td>Air cleaning</td>
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<td>No</td>
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<tr>
<td>Contact seal</td>
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<td>Repetition accuracy [mm]</td>
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<td>Weight [kg]</td>
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![Diagram](image-url)
SPN ZERO-POINT CLAMPING SYSTEM
SPN112P2 - CLAMPING PLATE

2-FOLD

- Compact design with optimized design height
- System assembly with high precision
- Integrated air supply/distribution
- Integrated PLUS connection
- Available with the advanced zero-point clamping system on request
- Variable mounting options

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<tr>
<td>Pull-in force with PLUS connection [kN]</td>
<td>2x15</td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
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<td>Rotation prevention</td>
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<tr>
<td>PLUS connection</td>
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<td>Material</td>
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<td>Weight [kg]</td>
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1. Release
2. Plus connection
6. Mounting screw*
7. Thread bore transport
8. Sealing cap
9. T-slot nut*
10. T-slot nut mounting screw*

* Not included in delivery
SPN ZERO-POINT CLAMPING SYSTEM
SPN112P4 - CLAMPING PLATE

► 4-FOLD

► Compact design with optimized design height
► System assembly with high precision
► Integrated air supply/distribution
► Integrated PLUS connection
► Available with the advanced zero-point clamping system on request
► Variable mounting options

Order no.

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SPN ZERO-POINT CLAMPING SYSTEM
SPN112P6 - CLAMPING PLATE

6-FOLD

- Compact design with optimized design height
- System assembly with high precision
- Integrated air supply/distribution
- Integrated PLUS connection
- Available with the advanced zero-point clamping system on request
- Variable mounting options

<table>
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<td>Weight [kg]</td>
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Order no. SPN112P6 - CLAMPING PLATE

► Compact design with optimized design height
► System assembly with high precision
► Integrated air supply/distribution
► Integrated PLUS connection
► Available with the advanced zero-point clamping system on request
► Variable mounting options

Order no. SPN112P6 - CLAMPING PLATE

- Release
- Plus connection
- Mounting screw*
- Thread bore transport
- Sealing cap
- T-slot nut*
- T-slot nut mounting screw*

* Not included in delivery
### TECHNICAL DATA

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<td>ØD1 [mm]</td>
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<td>18</td>
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<td>20</td>
<td>20</td>
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<td>M12</td>
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<td>M12</td>
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<td>M12</td>
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<td>Mx **</td>
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<td>M10</td>
<td>M8</td>
<td>M10</td>
<td>M8</td>
<td>M10</td>
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*ISO 4762
Holding force 12.9 max. [kN]: M6 = 15; M8 = 25; M10 = 35; M12 = 50; M16 = 75
Holding force 10.9 max. [kN]: M6 = 12; M8 = 20; M10 = 30; M12 = 40; M16 = 60

**ISO 10642
Holding force 12.9 max. [kN]: M6 = 12; M8 = 20; M10 = 28; M12 = 40; M16 = 60
Holding force 10.9 max. [kN]: M6 = 9.5; M8 = 18; M10 = 24; M12 = 32; M16 = 48
SPN ZERO-POINT CLAMPING SYSTEM
SPN138 ADVANCED

PRODUCT ADVANTAGES

- Pre-positioning 28 mm before reaching end position
- Automatic centering and pull-in already 1 mm before reaching end position
- Resistant against contamination
- Mechanical locked in clamping position
- Low operating pressure of 4 or 6 bar
- Maintenance free

EQUIPMENT FEATURES

- Pneumatic
- Stainless steel
- Form fit
- Pins compatible with reference system
- PLUS connection
- Low height
- Tubeless connection
- Repeatability
- Torque support
- Hardened
- Automatic seal
- Piston position sensing / positioning check

INCLUDED IN DELIVERY

Mounting screw M6x14 12.9
C0912060144D

O-ring 3,5x1,5
COR003515V

Cover cap M6
093088

Venting filter CFILT00052

Sealing pin SPZ138BV-B

OPTIONAL ACCESSORIES

Automatic seal SPZ138AV-B
**TECHNICAL DATA**

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Data, Drawings, 3-D Models, Operating Instructions  ► www.zimmer-group.com
SPN ZERO-POINT CLAMPING SYSTEM
SPN138 STANDARD

► PRODUCT ADVANTAGES

► Pre-positioning 28 mm before reaching end position
► Automatic centering and pull-in already 1 mm before reaching end position
► Resistant against contamination
► Mechanical locked in clamping position
► Low operating pressure of 4 or 6bar
► Maintenance free

► EQUIPMENT FEATURES

- Pneumatic
- Stainless steel
- Form fit
- Pins compatible with reference system
- PLUS connection
- Low height
- Tubeless connection
- Repeatability
- Torque support
- Hardened
- Automatic seal

► INCLUDED IN DELIVERY

Mounting screw
M6x14 12.9
C0912060144D

O-ring
3,5x1,5
COR003515V

Cover cap
M6
093088

Venting filter
Cfilt00052

Sealing pin
SPZ138BV-B

► OPTIONAL ACCESSORIES

Automatic seal
SPZ138AV-B

www.zimmer-group.com ➤ Data, Drawings, 3-D Models, Operating Instructions
# TECHNICAL DATA

## Technical Data

<table>
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<th>Order no.</th>
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![Diagram of technical data](image-url)

1. Release
2. Plus connection
3. Torque support
4. Mounting screw zero-point clamping system
5. Standard: hose-less connection
6. Alternative: hose connection

Data, Drawings, 3-D Models, Operating Instructions  ▸  www.zimmer-group.com
## Technical Data

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### Diagram

1. Release
2. Plus connection
3. Mounting screw*
4. Thread bore transport
5. Sealing cap
6. T-slot nut*
7. T-slot nut mounting screw*

* Not included in delivery
# SPN ZERO-POINT CLAMPING SYSTEM

## SPN138P4 - CLAMPING PLATE

### 4-FOLD

- Compact design with optimized design height
- System assembly with high precision
- Integrated air supply/distribution
- Integrated PLUS connection
- Available with the advanced zero-point clamping system on request
- Variable mounting options

### Technical Data

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### Diagram

- **1**: Release
- **2**: Plus connection
- **6**: Mounting screw*
- **7**: Thread bore transport
- **8**: Sealing cap
- **9**: T-slot nut*
- **10**: T-slot nut mounting screw*

*Not included in delivery

---

Data, Drawings, 3-D Models, Operating Instructions [www.zimmer-group.com](http://www.zimmer-group.com)
SPN ZERO-POINT CLAMPING SYSTEM
SPN138P6 - CLAMPING PLATE

6-FOLD

compact design with optimized design height
system assembly with high precision
integrated air supply/distribution
integrated PLUS connection
available with the advanced zero-point clamping system on request
variable mounting options

Technical Data

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Release
Plus connection
Mounting screw*
Thread bore transport
Sealing cap
T-slot nut*
T-slot nut mounting screw*

*Not included in delivery
TECHNICAL DATA

### Technical Data

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<th><strong>Ød3 [mm]</strong></th>
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<th><strong>a [mm]</strong></th>
<th><strong>l [mm]</strong></th>
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<td>32</td>
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<td>5</td>
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*ISO 4762
Holding force 12.9 max. [kN]: M6 = 15 ; M8 = 25 ; M10 = 35 ; M12 = 50 ; M16 = 75
Holding force 10.9 max. [kN]: M6 = 12 ; M8 = 20 ; M10 = 30 ; M12 = 40 ; M16 = 60

**ISO 10642
Holding force 12.9 max. [kN]: M6 = 12 ; M8 = 20 ; M10 = 28 ; M12 = 40 ; M16 = 60
Holding force 10.9 max. [kN]: M6 = 9.5 ; M8 = 18 ; M10 = 24 ; M12 = 32 ; M16 = 48

**SPZ138BZ12-B**
- Centering pin

**SPZ138BZ16-B**
- Centering pin

**SPZ138BE12-B**
- Retention pin

**SPZ138BE16-B**
- Retention pin

**SPZ138BS12-B**
- Sword pin

**SPZ138BS16-B**
- Sword pin
Can clamping pins be integrated directly into the workpiece?
The clamping pins can be integrated directly into the workpiece using the Zimmer zero-point clamping system to clamp the workpiece with precision, repeatability and cost efficiency. This approach makes it possible to perform complete 5-side machining in one workpiece clamping setup.

Why are there different clamping pins available?
The various clamping pins ensure the desired precision clamping behavior in different three-dimensional axes. The centering pin defines the reference point for the workpiece and provides precision in the X, Y and Z direction. The sword pin provides precision in the X or Y and Z direction and the clamping pin clamps only in the Z direction.

Do the zero-point clamping systems feature temperature compensation?
The Zimmer zero-point clamping systems can be implemented to provide temperature compensation if you only use sword pins.

Which distance tolerances should be observed for in-house production?
For safe operation, a distance tolerance of +/- 0.015 mm from clamping pin to clamping pin must be kept. The same applies to the zero-point clamping system.

What is a PLUS connection or how does a PLUS connection work?
Zimmer zero-point clamping systems come standard with an additional pneumatic connection. This connection can be used to increase the clamping force significantly.

How does the contact monitoring work?
The contact monitoring makes it possible to check whether the workpiece or clamping pallet is laying flat on the surface of the zero-point clamping system by using a connected flowmeter or Pitot tube.

How are the clamping force and the holding force of a zero-point clamping system defined?
The clamping force describes the force that is used for clamping the clamping pins and for form fit clamping in the zero-point clamping system. The holding force of the zero-point clamping system is limited by the maximum permitted pulling force of the pin mounting screw.

How is the repeatability defined?
Repeatability defines the tolerance zone within which the reference points defined on the workpiece can be clamped, released and clamped again. On Zimmer zero-point clamping systems, this repeatability is less than or equal to 0.005 mm.
## CHECKLIST
### SPN ZERO-POINT CLAMPING SYSTEM

<table>
<thead>
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<th>Customer number</th>
<th>Phone number</th>
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### Area or application

- **Clamping device**
  - Milling
  - Drilling
  - Measuring
  - Laser processing
  - Rotate
  - Rubbing

- **Process force** N
- **Compressed air system pressure** bar
- **Insertion force necessary** N
- **Lever arm between process force and clamping system** mm
- **Holding force necessary** N
- **Number of plannes clamping system per clamping device** piece

- **Alignment**
  - Sketch
  - 3D Model
  - Other

- **Environment**
  - **Temperature** min. °C max. °C
  - Chips
  - Dirt
  - Oil/Fat
  - Cool lubrication
  - Other

- **Number of clamping cycles per hour** cycles

- **Handling**
  - Manual
  - Automatic

- **Additional functions**
  - Flat-surface cleaning / positioning check

- **Notes/comments**
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DECLARATION OF INCORPORATION IN TERMS OF THE EC DIRECTIVE 2006/42/EC ON MACHINERY (ANNEX II 1 B)

We hereby declare that our elements meet the following basic requirements of the Machinery Directive 2006/42/EC as an incomplete machine

No.1.1.2, No.1.1.3, No.1.1.5, No.1.3.2, No.1.3.4, No.1.3.7, No.1.5.3, No.1.5.4, No.1.5.8, No.1.6.4, No.1.7.1, No.1.7.3, No.1.7.4.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive. We undertake to provide the market supervisory bodies with electronic versions of the incomplete machine’s special documents via our documentation department should they have reason to request them.

The incomplete machine may only be commissioned if the machine or system in which the incomplete machine is to be installed has been determined to satisfy the conditions of the Machinery Directive 2006/42/EC and the EC Declaration of Conformity has been produced in accordance with Annex II A.